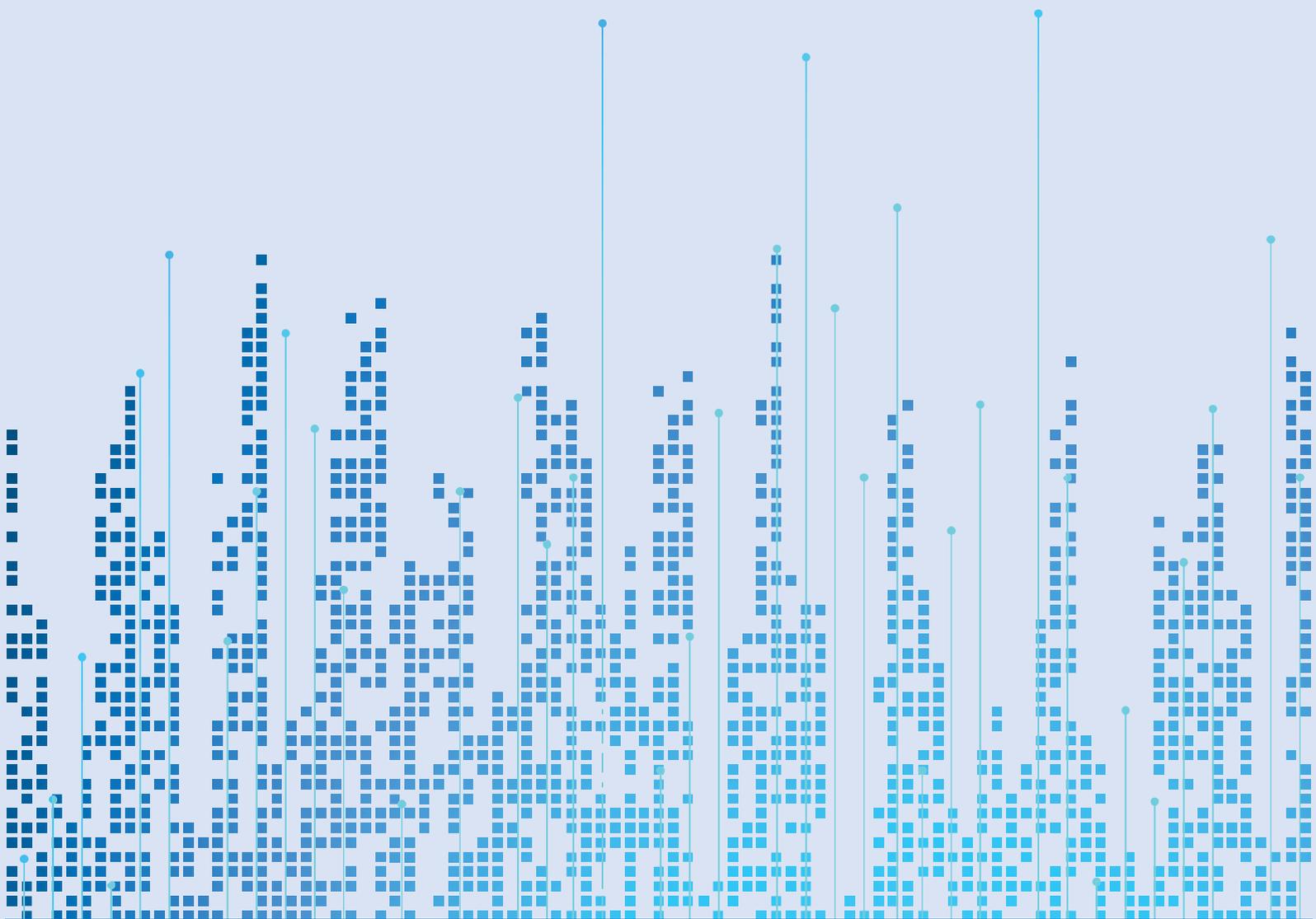


Policy Note: Adequacy of Pensions in Croatia

July 2019



Contents

- Introduction 3
- Summary 4
- 2 Overview of trends in the field of pensions in the EU 9
- 3 Overview of trends in Croatia 12
 - 3.1 Fiscal sustainability 12
 - 3.2 Pension adequacy 17
 - 3.3 Key factors affecting pension adequacy 21
 - 3.4 The issue of the 27% supplement and pension adequacy 28
 - 3.5 Minimum pension 31
 - 3.6 Other issues relevant for future reforms 32
- 4 The effects of the 2018 Pension Reform 34
 - 4.1 The effects of the reform on pension adequacy 34
 - 4.2 Fiscal effects of the reform 43
 - 4.3 Other expected effects of the reform 49
 - 4.4 Pension reform in the context of the long-term development of the pension system 53
- 5 Assessment of the main challenges and opportunities for Croatia 55
- 6 Priority reform recommendations 57
 - 6.1 Preliminary activities 57
 - 6.2 Reform recommendations 58
 - 6.3 Overview of possible effects of reform recommendations 66
- 7 Cross-cutting issues and their implications for reforms 69
- 8 Proposal for strategic projects 70
- 9 **ANNEX V: Auto-enrollment – an overview of experiences** 85
 - 9.1 V.2. Definition and concepts** 86
 - 9.2 V.3. What can the findings from the relevant studies tell us about auto-enrollment?**
..... 87
 - 9.3 V.4. Examples** 91

Introduction

This document has been prepared¹ to offer analytical support to the preparation of reform policies in the field of the pension system over the next ten years, aimed at improving pension adequacy, but also preserving the fiscal and social sustainability of the system. It has been designed as a supporting document in the process of preparation of the National Development Strategy of the Republic of Croatia until 2030 (NDS) in the part relating to pension policy. It firstly gives a short overview of trends in pension benefit provisions in the EU, followed by an analysis of the situation in Croatia through an overview of the key indicators of the pension system. The focus is on pension adequacy, starting from the situation before the 2018 pension reform and projections of the expected post reform trends. This analysis forms the basis for identification of the key challenges and opportunities for the future development of the pension system. Policy proposals are also given for short, medium- and long-term measures. Finally, the broader context of measures is described, outside the pension system itself, which could have an impact on future pensions. Possible strategic projects are also presented to support long-term improvements to pension adequacy in Croatia.

The 2018 pension reform will have a significant impact on the proposed pension policy within the framework of the National Development Strategy. In September 2018 the Ministry of Labor and the Pension System opened a public debate about the set of amendments to key laws regulating the pension system in Croatia: The Pension Insurance Act (PIA), The Mandatory Pension Funds Act, The Voluntary Pension Funds Act, The Pension Insurance Companies Act, The Act on Supplements to Pensions Earned pursuant to the Pension Insurance Act, and The Extended Service Period Act. Following certain amendments, this set of laws was adopted by the Croatian Parliament on 7 December 2018. Most of the amendments and new measures entered into force on 1 January 2019. The pension reform brings about significant changes that are discussed in this report. This document will comment on the expected effects of these pension measures, consider them in the long-term perspective, and propose measures for the further development of the pension system.

¹ The report has been prepared by Danijel Nestić (Institute of Economics, Zagreb) for the needs of the World Bank.

Summary

Overview of trends in pension benefit provision in the EU and Croatia

- Croatia has been following the basic reform trends in the EU with the focus on pension adequacy more recently
 - Public pension scheme in Croatia has remained strongly dependent on budget transfers; pension adequacy has continued to deteriorate
 - Although slowly extending, the working life duration in Croatia has remained short, the second shortest in the EU
 - The second pillar, mandatory privately managed fully-funded scheme, has generated adequate yields in the accumulation phase; the pension payment phase has remained almost non-existent
 - The third (voluntary) pension pillar is stable, but its coverage is low
-

Since the end of the last century numerous reforms have been undertaken of pension systems in the EU. Their scope varies from country to country. During and immediately after the recession which followed the 2007-2008 financial crisis the reforms were particularly focused on strengthening the financial sustainability of the pension systems. More recently, driven by the economic recovery and diminishing fiscal pressure, the focus of the reforms has turned towards increased concern for pension adequacy.

Croatia has been following the basic reform trends in the EU, but in financial terms the system has remained strongly dependent on budget transfers, while pension adequacy has continued to deteriorate. The share of public pension expenditure in Croatia has stabilized over the last ten years at the level of slightly over 10% of the GDP, with fluctuations depending on the cyclical status of the economy (from 9.5% in 2007 to 11.6% in 2015). According to the *2018 Ageing Report*, public pension expenditure in Croatia should decline in future. The most relevant factor with an impact on the future decline in the share of public pension expenditures in the GDP is a decrease in the future relative amount of pensions, that is, the replacement rate.

Although slowly extending, the working life duration in Croatia has remained short, the second shortest in the EU. That is one of the key challenges facing the Croatian pension system. Widely used early retirement options result in low pension adequacy. Approximately 45% of the new old-age pension beneficiaries in Croatia used one of the possibilities for early retirement in 2017. In addition, pensions regulated by special legislation most often enable early retirement under more favorable conditions than general legislation. These pensions account for a significant number of pensions, both in terms of the number of beneficiaries and the total pension bill paid.

The second pension pillar, that is, the mandatory privately managed fully-funded scheme, has generated adequate yields in the accumulation phase. The pension payment phase has remained almost non-existent due to policy choice that has created favorable opt-out option for voluntary two-pillar participants. The third pension pillar (voluntary pension funds) is stable, but its potential for increasing the adequacy of future pensions is very limited because of its low coverage.

- The 2018 reform extended the pension supplement to multi-pillar participants closing thereby most of the pension benefit gap between PAYG-only and multi-pillar participants
 - Despite an acceleration of the increase in the legal retirement age prescribed by the reform, there are many options left for early retirement; the reform has not substantially increased incentives for a prolonged work life
 - The reform is assessed to slow down long-term trend of a declining pension replacement rate, but it will not stop it
 - Opt-out option for the second pillar at retirement offered by the 2018 reform will provide short-term fiscal gains, but at the expense of uncertainty and instability of the multi-pillar pension system design, and reduced potential of the second pillar to provide higher future pensions for all
 - There were no substantial changes in the accelerated service period scheme
 - Net fiscal effect of the reform could be moderately negative in the initial years, positive in medium-term, and increasingly negative after 2036
-

Croatia conducted wide-ranging pension reform in 2018 involving numerous amendments to six laws regulating the pension system. The reform extended the pension supplement and activated opt-out option at retirement for all second pillar participants. It accelerated the increase in the legal retirement age, changed decrement scheme for early retirement, increased increment for the later retirement and broadened options for work in retirement while retaining pension benefit. The reform increased the minimum pension point and introduced additional service period for parents. Changes in the second pillar pension funds legislation include lower fees, relaxed but more detailed prescription of investment policy, and extended supervision. The similar stance was taken for the regulation of the third pillar funds. Annuity payments for the second pillar participants now can also be provided by the public annuity company established by the Croatian Pension Insurance Institute. Fee structure of annuity companies is changed and investment policy somewhat relaxed. One-off withdrawal of a part of second-pillar pension savings is allowed at retirement. Second pillar annuities should now be inflation-indexed.

Extension of the pension supplement to multi-pillar participants should close most the pension benefit gap between PAYG-only and multi-pillar participants. Previously, insured persons from the second pillar did not have the right to the pension supplement paid from the first pillar. Thereby the amounts of two-pillar (mixed) pensions have been significantly increased and in 2019 they will be at a similar level to one-pillar pensions ie. pensions of those insured solely in the public PAYG scheme.

Despite an acceleration of the increase in the legal retirement age to 67 years of age by 2033, the reform has left many options for early retirement. The reform has not substantially increased incentives for a prolonged work life. It is therefore hard to expect an increase in the future pension adequacy on that basis. Also, there were no substantial changes in the accelerated service period scheme.

The reform is assessed to slow down long-term trend of a declining pension replacement rate, but it will not stop it. Projections based on several hypothetical cases of insured persons show that stabilization of the replacement rate is possible only with notable extension of career. The replacement rate for two-pillar pensions will be preserved after 2027 with the increase in the statutory retirement age and after the second pillar enters its mature phase and starts to pay more substantial pension benefits. Generally, in periods when working life is significantly prolonged and the retirement age raised (which is in particular expected for women in the next 15 years), an increase in the replacement rate may occur.

The replacement rate of one-pillar pensions for fixed careers will decrease in future, which will have significant implications for minimum pension beneficiaries.

Opt-out option for the second pillar at retirement offered by the 2018 reform will provide short-term fiscal gains, but at the expense of uncertainty and instability of the multi-pillar pension system design. The choice between the one-pillar and the two-pillar pension will not be straightforward for majority of insured persons. The calculation of the first pension, which would be the key criterion in this choice, will not necessarily unambiguously answer the question of which pension is more favorable, because the indexation rules for first and second pillar pensions are different. In addition, option of taking a withdrawal of 15% of pension savings from the second pillar at time of retirement with an aliquot decrease in the pension benefit (annuity) is possible only for insured persons with higher wages, and only if they opt for a two-pillar pension. According to our rough estimate, in the first years after the reform approximately 70% of future pensioners who were insured by both mandatory pension pillars will choose one-pillar pensions as the more favorable option, but over time this share would decrease to approximately 50% in 2030, and below 30% in 2045. The different structure of pensioners who will choose one or the other type of pension may lead to a deterioration in the credibility of the pension system as a whole and weaken it in the long-run.

Net fiscal effect of the reform could be moderately negative in the initial years, positive in medium-term, and increasingly negative after 2036. This indicates potentially risky fiscal trends in the long-term and the need for further reforms. The positive fiscal effects stem from the changes in the Pension Insurance Act (primarily from the accelerated increase of the retirement age), and from the transfer of funds from the second to the first pillar for all those who in the moment of retirement choose a one-pillar pension. This second factor means that increased current expenditure of the public pension scheme due to extension of the pension supplement, the increase in the minimum pension and the introduction of an additional service period for parents is financed by increasing future pension liability. As these transfers are likely to decrease over time, and reform-induced expenditure will continue to grow, this will in the long-run lead to the more substantial growth of public pension expenditure.

Main challenges and opportunities for Croatia

The following main challenges and opportunities for the pension system in Croatia have been identified:

Challenges

- Low and declining pension adequacy
- Instability of the existing multi-pillar design
- Short working periods
- High share of pensions determined according to special legislation
- Financial risks linked to the need for permanent budget transfers
- Low employment rate
- Demographic trends

Opportunities

- Stabilization of current and expected future pension-to-GDP ratios
- Established and relatively well-functioning key institutions of the multi-pillar system

- Experience in work with funded pension schemes

Priority reform recommendations

- Tighten early retirement conditions and increase pension decrement rates for early retirement
 - Link the statutory retirement age to life expectancy for the period after accomplishing the current reform plan
 - Abolish the opt-out option for the second pillar and equalize the pension supplement rate to 27% for all service years
 - Correct minimum pension formula to ensure that minimum pension beneficiaries in two-pillar regime are as well-off as beneficiaries of one-pillar regime
 - Introduce zero pillar (national pension) scheme for senior citizens without pension benefits, preferably subject to income and means testing
 - Depending on the long-term fiscal considerations, design a more favorable scheme for pension valorization and pension indexation
 - Improve the institutional setup of the second pillar to facilitate a more active asset management for pension funds and an integration of accumulation and pension payment phases
 - Strengthen the third pension pillar, consider introduction of auto-enrolment with an opt-out option
 - Limit the coverage of the accelerated service period scheme
 - Ensure the convergence of pension benefits under special regulations towards the general regime
-

Given demographic and fiscal constraints, the only way to afford more generous pension benefits in Croatia is to increase the working life duration. If Croatia remains with one of the shortest working periods it will have to reduce pension benefits in order to be fiscally sustainable. It wouldn't be possible to make the pension system more generous without addressing the short working period.

Requirements for early retirement must be tightened as well as the pension decrement rate in that case. An appropriate increase in the retirement age for early retirement must be considered, that is, the difference in comparison with the statutory retirement age must be shortened, and the requirement related to the service period must be increased. The Government should consider abolition of the status of long-term insured person that entitle such person to old-age pension before legal retirement age without any decrement of the benefit. If not, the retirement age and required service period for granting the status of the long-term insured person must be increased by at least two years, compared with the current situation. In order to provide better incentives for longer work, it is necessary to increase pension decrement in the case of early retirement, at least to an actuary neutral level on the basis of independent actuary calculations. The statutory retirement age should be linked to life expectancy.

The opt-out option for the second pillar should be abolished and the pension supplement equalized to 27% for all service years. In that case entire cohorts of two-pillar participants will be faced with the same retirement conditions that will improve coherence and stability of the pension system. In case the opt-out option is abolished, minimum pension formula should be corrected to ensure that future two-pillar pensions of insured persons with the right to the minimum pension are not lower than comparable one-pillar pensions.

Zero-pillar pension (national pension) should be introduced for elderly persons without the right to insurance-based pensions, preferably subject to income and means testing. Its introduction should be based on a thorough analysis and evaluation of compatibility with the existing system of social

protection. It is highly recommended to apply an income and means test in order to increase the efficiency and ensure larger resources for the poor.

Depending on the long-term fiscal considerations, design a more favorable scheme for pension valorization and pension indexation. Carefully assess the current system of pension benefit adjustments (valorization and indexation at the same rate) and, fiscal costs, make it more favorable for beneficiaries. Consider the option whereby the valorization and indexation of pensions are linked to the growth of the wage bill. Consider the option to separate pension valorization formula (calculation of the value of points in determination of the first pension) from pension indexation formula (rate of change of pensions in payment) for all new pensioners. In that case actual pension value will be set at different level in case of valorization than in case of pension indexation. One of the best international practices includes valorization 100% with wage growth and indexation 100% with inflation.

It is necessary to continue work on improvement of the institutional organization of the second pillar enable more active management of pension fund assets and an integration of accumulation and pension payment phases. With a view to strengthening the third pillar and its stronger impact on future pension adequacy for the broadest possible cohort of pensioners, it is desirable to introduce system of automatic enrolment with opting out in combination with fiscal stimulus and public education measures.

Another comprehensive reform of the system of pension rights related to extended service period is required to make it in line with the most up-to-date findings of occupational medicine and the best international practice is proposed. A convergence of pension entitlements according to special legislation towards the entitlements provided by the general system should be ensured.

All the proposed reforms primarily target an increase in pension adequacy in the long-run. The projections show that the combination of reforms, subject to reasonable parameters, may provide such an improvement. The fiscal effects of the proposed measures may be balanced, or leading to tolerable increase in expenditure, if reasonably designed. The expected effects on the cost of labor and net wages are neutral for most reform proposals, while their impact on inequality and poverty among pensioners is either positive or neutral.

Pension Adequacy and Proposals for Improvements

1 Overview of trends in the field of pensions in the EU

Faced with the increasing challenges of the ageing population, already in the 1990's the EU Member States started comprehensive reforms of the pension system in order to make it fiscally sustainable and to preserve pension adequacy. The ageing of the population is the result of, on the one hand, a decrease in the birth rate, and on the other hand, increased longevity. Over time, this is reflected in a decrease in the share of the prime age population and an increase in the share of the elderly population. In pay-as-you-go pension systems (PAYG) in which current employees finance current payment of pensions by paying taxes (pension contributions), this represents a serious problem. In the absence of reform, the relative decrease in current in-payments in relation to rising current out-payments leads to the rapid growth of fiscal pressure. The standard PAYG systems are also systems of defined benefits (DB), where the pension benefit is determined in advance on the basis of legislation. Usually, it depends on the period spent in pension insurance (service period) and the wage (as the basis from which contributions were paid), and, as a rule, it does not depend on the current economic situation, the number of employed persons, or the total of current contributions being paid. Although systems do exist which in some way include these factors in pension formulas, this is not the case in most countries, including Croatia. Therefore, reforms have been undertaken and their first step was to make the PAYG system financially sustainable. Additional challenges to the pension systems emerge from new forms of work and employment. It is more and more difficult to tax these activities and to ensure regular payment of mandatory pension contributions sufficient for protecting pension adequacy. Therefore, individual pension schemes are increasingly being developed and personal responsibility encouraged for the provision of adequate revenues in old age.

Since the end of the last century, numerous reforms of pension systems have been undertaken in the EU. Their scope varies from country to country. In some Member States (MS), fundamental (systemic) changes occurred, while in others parametric adjustments to the existing system were undertaken. In some Central and East European countries, including Croatia, mandatory fully-funded pension schemes were introduced and “multi-pillar” pension systems were established. Parametric reforms within the existing PAYG systems have included an increase in the statutory retirement age, linking it to the increase in life expectancy, discouragement or abolishment of early retirement, changes to pension formulas and pension valorization and indexation formulas, introduction of sustainability factors and closer links between pensions paid out and contributions paid in. Some reform measures were aimed at increasing the level of pension adequacy, by strengthening the minimum pension entitlements and social benefits for the elderly on the one hand, and by tax incentives for voluntary pension savings on the other.

During and immediately after the recession which followed the 2007-2008 financial crisis, the reforms were particularly focused on strengthening the financial sustainability of pension systems. Reform efforts to increase the effective retirement age were continued and additionally strengthened.

This was done through an increase in the statutory retirement age and an increase in the minimum contributions period to be entitled to a old-age pension, by tightening requirements for early retirement (through an increase in the minimum age and service period, and other requirements), by a more substantial decrease in the early retirement pensions, increase in pensions in the case of a later retirement, but also by widening the possibilities to work and maintain pension benefits.

Around 2015, driven by the economic recovery and diminishing fiscal pressure, the focus of the reforms turned somewhat towards increased concern for the adequacy of pensions.² Although measures for ensuring the long-term financial sustainability of the system continue to be implemented, more and more measures are aimed at improving the adequacy of pensions. Accordingly, more attention is being paid to pensioners receiving extremely low pensions, and more favorable mechanisms for indexation of pensions are being (re)introduced. Namely, during the recession indexation was frozen in some countries, or it was made much less favorable.

After 2015 reforms of supplementary pension schemes, such as occupational pension schemes and voluntary private pension savings were intensified. The reforms in Belgium, Denmark, Estonia, France, Germany, Ireland and Slovenia were heading in that direction. As stated in the *Pension Adequacy Report 2018* these were mostly improvements to the existing schemes with a view to increasing their scope (the number of insured persons) and increasing their adequacy (the amounts of savings and pensions). Although the measures for development of additional pension schemes differ from country to country, they are mainly directed towards strengthening the mandatory character of those schemes for some groups of workers, automatic enrolment with opting-out, tax and fiscal incentives, and raising awareness of different options for saving for old age.

One of the significant innovations aimed at strengthening future pension adequacy relates to automatic enrolment with opting-out. The United Kingdom went farthest in this direction. In 2012 it introduced the employer's obligation to automatically enroll certain groups of workers in supplementary pension insurance, where workers may opt-out from that scheme. Soon the obligation of auto-enrolment was extended to a broader circle of employers and workers. This measure resulted in a substantial increase in the scope of supplemental professional pension insurance, to as high as 68% in 2016 (*Pension Adequacy Report 2018*). The extension of this measure to an even broader cohort of workers is currently being considered. Ireland and Poland also plan to introduce auto-enrolment schemes. The source of the success of this measure in increasing the scope of supplementary pension schemes lays in financial incentives for those who remain in the scheme after auto-enrolment, by supplementing the contributions paid by the employees by funds paid by the employer, or, in some cases, by the state. A tax incentive to remain enrolled is also possible. If employees leave the scheme they lose the opportunity to have their employer or the state pay part of the contribution. The other source of success is related more to human behavior, i.e. sluggishness of decision making in an uncertain environment. Accordingly, most workers will not take any administrative effort to request a dis-enrolment or exit from the scheme unless they are sure in their decision. Research shows that auto-enrolment with an opt-out option results in a larger number of enrolled members than the “opt-in” option, whereby entry to the scheme is exclusively by voluntary enrolment. Auto-enrolment could be interesting for Croatia as a mechanism aimed at increasing pension savings. However, the key for its success is to ensure a rather large coverage, because if it is reserved only for those with highest wages, it will have no public support or broader impact on the adequacy of pensions. International experience shows that both outcomes are possible, broad

² European Commission and Social Protection Committee (2018), *The 2018 Pension Adequacy Report: current and future income adequacy in old age in the EU, Volume I*; p. 99. To simplify and facilitate identification, this publication will hereinafter be referred to as the “Pension Adequacy Report 2018”.

coverage and limited high-income coverage, but it also reveals efforts and policies, such as fiscal stimulus and public education, to proactively affect the process.

The focus of pension adequacy requires the development of adequate indicators of adequacy to measure the progress. The *Pension Adequacy Report 2018* observes three aspects of pension adequacy: a) poverty protection; b) income maintenance and c) pension duration. As regards the first aspect of adequacy, protection from poverty, a larger number of indicators is discussed, such as the risk of poverty, material deprivation and the depth of poverty of the elderly, and the like. The second aspect of adequacy considers a measure whereby pension replaces income earned by employment. In this case replacement rates are observed, which are most frequently defined as the ratio of the first pension over the last wage in cases of different career paths. The third aspect observes the expected length of the pension payment period and is compared with the length of working life, that is, the period of payment of pension contributions.

Croatia has been following the basic reform trends in EU, but in financial terms the system has remained strongly dependent on budget transfers while the degree of pension adequacy continues to decrease. This situation requires additional reforms which will manage budget expenditures in a sustainable manner, but also ensure an improvement in pension adequacy. The situation in Croatia and this challenging reform task, with a special focus on pension adequacy, are discussed below.

2 Overview of trends in Croatia

Croatia, like most EU countries faced with the problems of an ageing population, has undertaken serious reform interventions in its pension system over the last 20 years. The systemic pension reform started by the enactment of the Pension Insurance Act of 1998, whereby the foundations were laid for transition from a system exclusively based on public PAYG system to what is called a multi-pillar system. By the implementation of the second and third pension pillars in 2002 foundation was laid for the present-day system. The system has been changed and upgraded by a series of subsequent parametric changes, often not in a consistent direction.³

2.1 Fiscal sustainability

Overall, the pension system has been brought under fiscal control, although it still contains significant financial disbalances. Accordingly, HRK 37.7 billion (10.0% GDP) were allocated for payment of pensions in 2017, of which HRK 21.1 billion came from payments of pension insurance contributions (56% of pensions paid), while the rest was financed from budget revenues. Payments from the budget to the account of the Croatian Pension Insurance Institute are formally covered by financing obligations based on special legislation. Thus, these funds are paid on the basis of the legislation on the HRK 100 and 6% pension supplements; on the basis of the transition cost of the introduction of the second pension pillar; for pensions earned on the basis of special legislation under more favorable conditions; for the increase in pensions aimed at removing the differences between pensions earned in different periods; and for the increase in pensions on the basis of the Pension Supplement Act.⁴ This situation points to the high dependency of pensions on general budget revenues and intensifies the frequent political debates and interventions in the pension system.

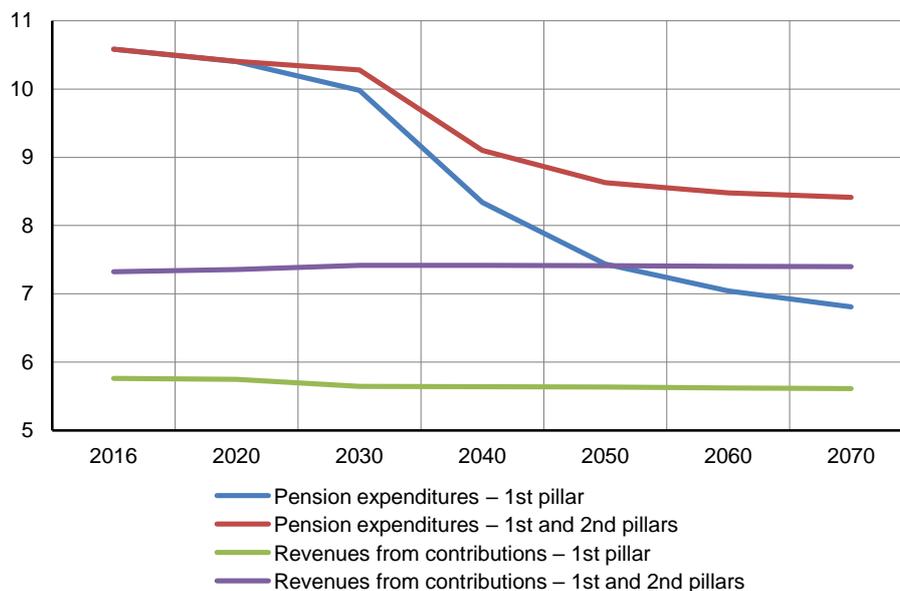
The share of public pension expenditure in Croatia has stabilized over the last ten years at the level of slightly more than 10% of the GDP, with fluctuations depending on the cyclical position of the economy (from 9.5% in 2007 to 11.6% in 2015). The number of pensioners receiving pensions has been growing slowly since 2010. Accordingly, the 1.20 million of that time had increased to 1.23 million by 2017. At the same time the share of the average pension paid on the basis of general legislation in the average net wage decreased from 40.5% to 38.2%. The decrease in the pension-to-wage ratio is the result of both indexation of pensions which are lower than wage growth, and of the changes to the structure of beneficiaries, with older beneficiaries dying (they used to receive higher pensions), and new pensioners with somewhat lower pensions entering the system.

³ Basic description of the system can be found in Croatian Pension Insurance Institute (2017) “Croatia: Country fiche on pensions projections”, available at https://ec.europa.eu/info/sites/info/files/economy-finance/final_country_fiche_hr.pdf, while for the critical review of the past reforms see, for example, Vukorepa (2015), “Lost between Sustainability and Adequacy: Critical Analysis of the Croatian Pension System’s Parametric Reform”, *Revija za socijalnu politiku*, 22, 3, pp. 279-308. <http://www.rsp.hr/ojs2/index.php/rsp/article/viewFile/1307/1306>. On the importance of the second pension pillar in Croatia including estimation of the effects of the 2014 modification in basic pension formula see Potočnjak Ž. and I. Vukorepa (2018), “Drugi mirovinski stup – prijepori i moguća poboljšanja”, *Zbornik susret pravnika- Opatija 2018.*, pp. 231-271. (Second Pension Pillar – Debates and Possible Improvements).

⁴ HZMO “Izvešće o radu i poslovanju Hrvatskog zavoda za mirovinsko osiguranje za 2017” (The Report on the Work and Business Operations of the Croatian Insurance Fund for 2017), HZMO, June 2018.

According to the EU's 2018 Ageing Report, public pension expenditure in Croatia should decline in the future.⁵ Figure 1 shows that public pension expenditure could decrease from the present 10.6% of the GDP to 10% in 2030, and even more intensively after that to 7% in 2060 and 6.8% in 2070. These projections were made under the assumption of maintaining the legislation enacted at the end of 2017, and they do not include the effects of the 2018 reform. The greater projected decrease in pension expenditure after 2030 is the consequence of the entry of the second pillar into its mature stage when it should be paying out pensions to most new pensioners in Croatia, while the first pillar would pay the basic pension according to the current pension formula. Pursuant to the legislation before the 2018 reform, the projected second pillar expenditure would gradually grow to reach 0.8% of the GDP in 2040, and 1.6% of the GDP in 2070. The total pension expenditure would amount to 8.4% of the GDP in 2070.

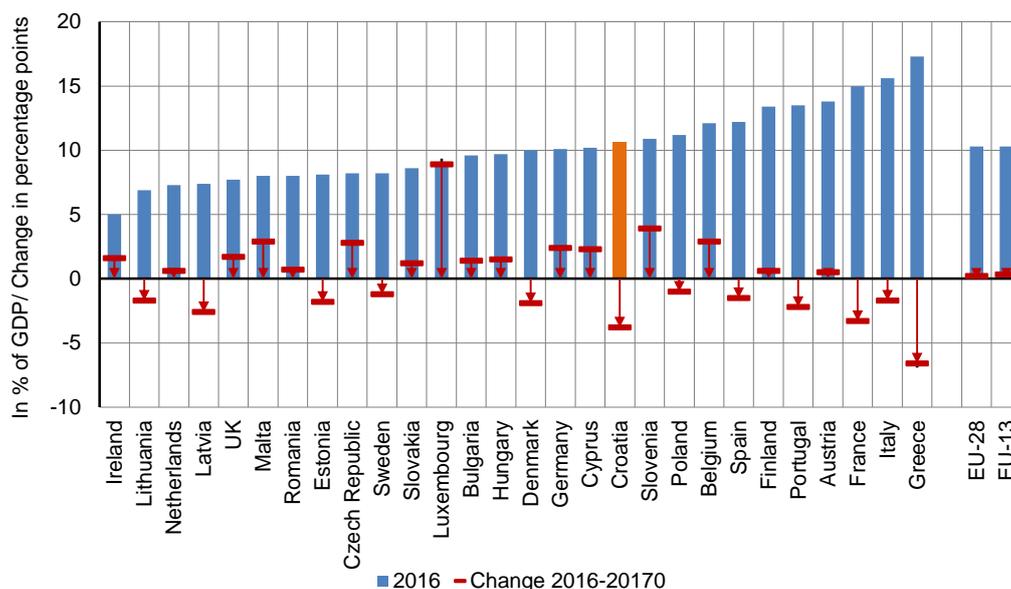
Figure 1: Projections of pension expenditure and revenues from contributions, 2016 – 2070.



Source: Illustration based on data from the Ageing Report 2018.

⁵ European Commission (2018), The 2018 Ageing Report: Economic and Budgetary Projections for the EU Member States (2016-2070), *European Economy Institutional Paper 079*, May 2018. This publication will hereinafter be referred to as the “Ageing Report 2018”

Figure 2: The share of gross pension expenditure in the GDP in 2016, and the change of the share 2016 – 2070.



Note: Data for EU-28 (all EU MS) and EU-13 (MS which joined the EU 2004-2013) were received as non-weighted averages per MS

Source: Illustration based on data from the Ageing Report 2018.

Despite the decrease in public pension expenditure, the revenues from pension insurance contributions will continue to be insufficient to cover all pension expenditures over a long period of time. According to these projections, the first pillar will still lack 1.2% of the GDP to cover all expenditures in 2070. However, it should be noted that expenditure for pensions from the first pillar also includes expenditure for pensions subject to special legislation for which funds are provided through a budget transfer, so that it is not necessary for contribution revenues to cover all expenditure, but only that which is based on payment of contributions.

Gross pension expenditures amounting to 10.6% GDP in 2016 are slightly above the EU average. Figure 2 shows that 17 MS had lower expenditures than Croatia in 2016. The average of all EU MS was 10.3% of the GDP and the new EU MS (EU-13) average was 9.0%. However, projections indicate that public pension expenditure in Croatia, measured by the share in the GDP, will be substantially lowered by 2070. One of the key factors that led to such decrease is the activation of the second pension pillar in annuity provisions. The public system's obligation to pay pensions will decrease on this basis, that is, its obligation will be to pay only the basic pension to most future pensioners. The expected decrease in public expenditure in Croatia is the largest, after Greece, in the EU.⁶

⁶The Ageing Report 2018 projections are based on pension legislation in force before the 2018 reform. The projection of the share of pension expenditures by 2040, with the inclusion of the effects of the 2018 reform is shown in Figure 24. A comparison with Figure 1 shows that the basic direction will be maintained over the next 20 years. Accordingly, the results presented here are still valid in terms of the basic trends they indicate. It can be expected that in 2019 Croatia will prepare new set of long-term projections including the effects of the 2018 reform.

Box 1: Decomposition of the share of pension expenditures in GDP

The share of pension expenditures in GDP may be decomposed in order to analyze the key factors behind the observed changes:

$$\frac{\text{Pension expenditure}}{\text{GDP}} = \frac{\text{Population 65+}}{\text{Population 20-64}} \times \frac{\text{Total number of pensioners (pensions)}}{\text{Population 65+}} \\ \times \frac{\text{Average pension}}{\frac{\text{GDP}}{\text{Hours of work 20-74}}} \times \frac{\text{Population 20-64}}{\text{Hours of work 20-74}}$$

That is:

Pension expenditures/GDP = Dependency ratio × Coverage ratio × Benefit ratio × Labor market effects/intensity

The effects of the labor market/work intensity may further be decomposed to the following components:

$$\frac{\text{Population 20-64}}{\text{Hours of work 20-74}} = \frac{\text{Population 20-64}}{\text{Employed 20-64}} \times \frac{\text{Employed 20-64}}{\text{Hours of work 20-64}} \times \frac{\text{Hours of work 20-64}}{\text{Hours of work 20-74}}$$

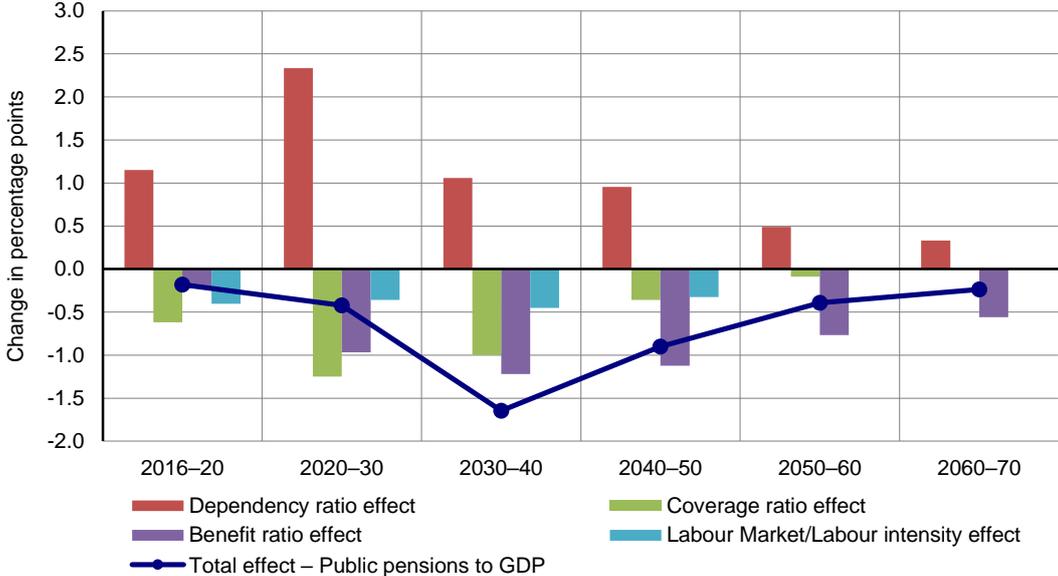
Labor market effects/work intensity = 1 / Employment rate × 1 / Work intensity × 1 / Career extension

Source: Ageing Report 2018, p. 77.

Despite the pressure on the growth of public pension expenditure from unfavorable demographic trends, other factors such as more favorable trends on the labor market and the results of reforms already undertaken should, by their intensity, overcome the effects of the ageing population and make a decrease in future expenditure possible. The decomposition of the change in the share of public pension expenditure in the GDP shows which factors are behind the projected trends (Box 1).⁷ Figure 3 shows that demographic changes, ie. the increasing dependency ratio (population 65+ / population aged 20-64) lead to increases in pension expenditure. If everything else had remained unchanged, the share of pension expenditures in the GDP would have increased by 2.3 percentage points in the 2020-2030 period. Although with a slightly weaker impact in later periods, demographic trends will continue to exert pressure on the increase in expenditures. Other key factors led to a relative decrease in pension expenditure in the projections. Accordingly pension coverage ratio (number of pensioners / 65+ population) would decrease due to the expected decrease in the number of pensions earned at ages below 65, and, consequently, led to slower inflow of new pension payments. This is the result of the reform measures already undertaken, such as the rise in the retirement age, the tightening of requirements for disability pensions, and substantially lower number of early retirement pensions pursuant to special legislation. The expected trends on the labor market, primarily the increase in the employment rate and the extension of the working life, will also lead to a decrease in future pension expenditure. Although the results are based on pension legislation in force before the 2018 reform, it is reasonably to believe that the basic trends have remained the same after the reform.

⁷ The decomposition of the change of the share of pension expenditures in GDP is explained at more length in the *Ageing Report 2018* (European Commission, 2018; p 77) (https://ec.europa.eu/info/sites/info/files/economy-finance/ip079_en.pdf).

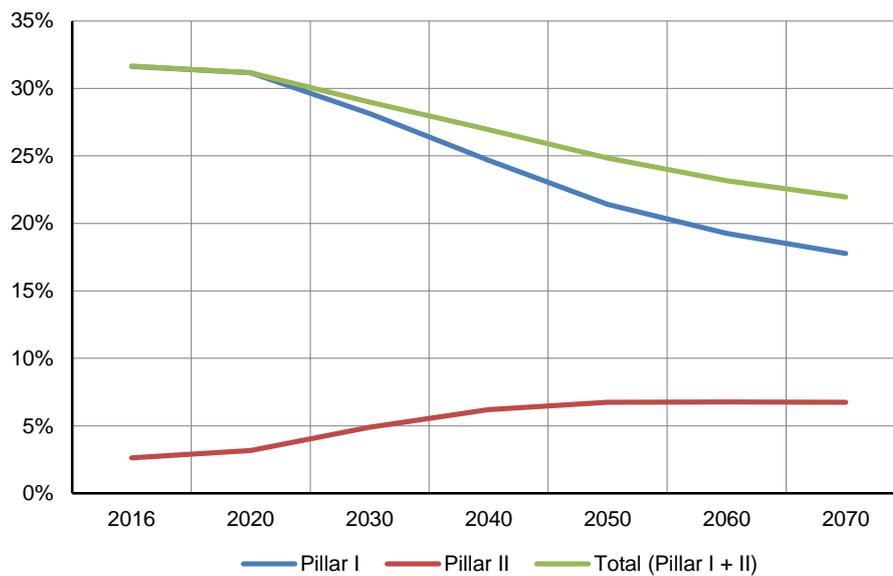
Figure 3: Decomposition of the change in the share of public pension expenditure in the GDP in 2016-2070 by subperiods (in percentage points of the share in the GDP)



Source: Illustration based on data from the Ageing Report 2018.

The most relevant factor which leads to a future decrease in the share of public pension expenditure in GDP is the fall in the relative pensions (the benefit ratio effect). This is clearly shown in Figure 3. Benefit ratio is the average wage/GDP per hour of the work ratio, where the nominator is the measure of work productivity and, according to the assumptions, its trends are the same as the trends in average wages. Accordingly, it may be asserted that the effect of declining benefit ratio is the result of the decrease in the ratio between average gross pensions and average gross wages. The decrease in that ratio for first pillar pensions from 32% in 2016 to 18% in 2070 (Figure 4) is rather strong. Partially it is the result of the fact that, pursuant to the 2017 legislation, in future the first pillar would mostly pay out basic pensions for persons insured by both pension pillars, unlike now when it pays the entire pension benefit. A part of future pensions would be paid from the second pillar. However, even the sum of first and second pillar pensions would be substantially decreased in comparison with the average wage. Accordingly, they would fall to 22% of the average gross wage by 2070. It is true that given the higher taxation of gross wages compared with the taxation of gross pensions, the net pension/net wage ratio would be higher, but the trend would remain the same. The second main reason for the decrease in the pension/wage ratio is the method of valorization and indexation of pensions, which in Croatia is guided by a formula which depends on inflation and wage growth (the variable formula 70-30; 30-70, depending on what is more favorable for pensioners), where the expected result is a pension adjustment rate lower than wage growth (valorization and indexation are subject of the same rule). The second important reason is the 27% pension supplement from the first pillar, to which persons insured by both pension pillars born in 1962 or later are not entitled, pursuant to the legislation in force when the projections were made. More space will be dedicated to this question in the following chapters, as well as to the impact of the 2018 reform on the pension-to-wage ratio.

Figure 4: The projection of the average gross pension and average gross salary ratio, 2016-2070.



Note: Projections subject to pension legislation before the 2018 reform.
Source: Illustration based on data from the Ageing Report 2018.

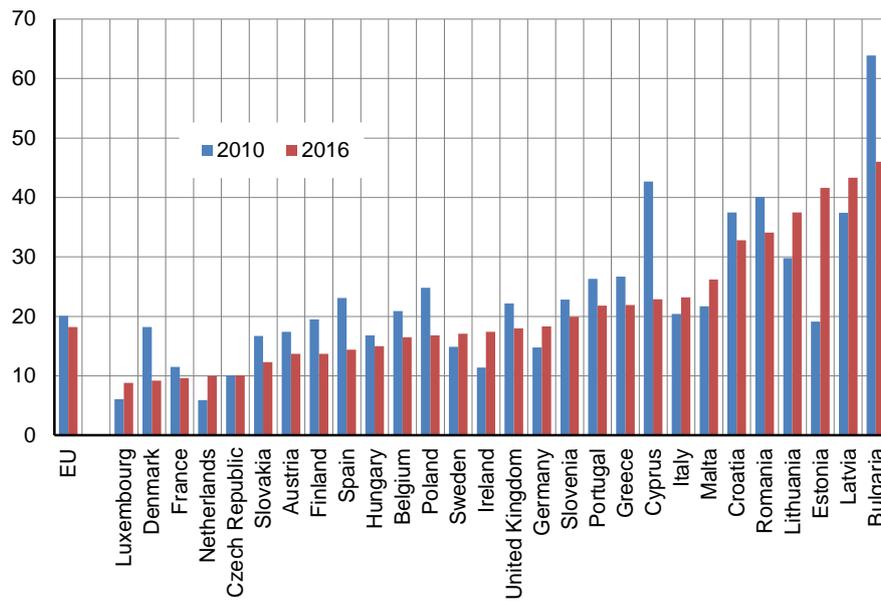
2.2 Pension adequacy

The projections from the *Ageing Report 2018* show that the Croatian pension system will face a decrease in future public pension expenditure, but this decrease will occur along with a substantial decrease in the relative pensions. This decrease could have significant social implications, and accordingly the attention of economic and social policy actors should be focused on the issue of pension adequacy. The question of pension adequacy must be discussed on the basis of facts and evidence. Therefore, it is appropriate to consider the three dimensions of adequacy that are also considered in the Pension Adequacy Report 2018: a) poverty protection; b) income maintenance and c) pension duration.

At-risk-of-poverty or social exclusion rate in Croatia for persons over 65 years of age is among the highest in the EU. With a rate of 32.6% in 2016, Croatia had the sixth highest at-risk-of-poverty or social exclusion rate in the EU (Figure 5).⁸ If the elderly population is broken down according to their work status, as given in Figure 6, it may be seen that other inactive persons, that is, persons who do not have any income from work or a pension, are exposed to the greatest risk in Croatia. This indicates the need to focus social policy on this group of elderly persons.

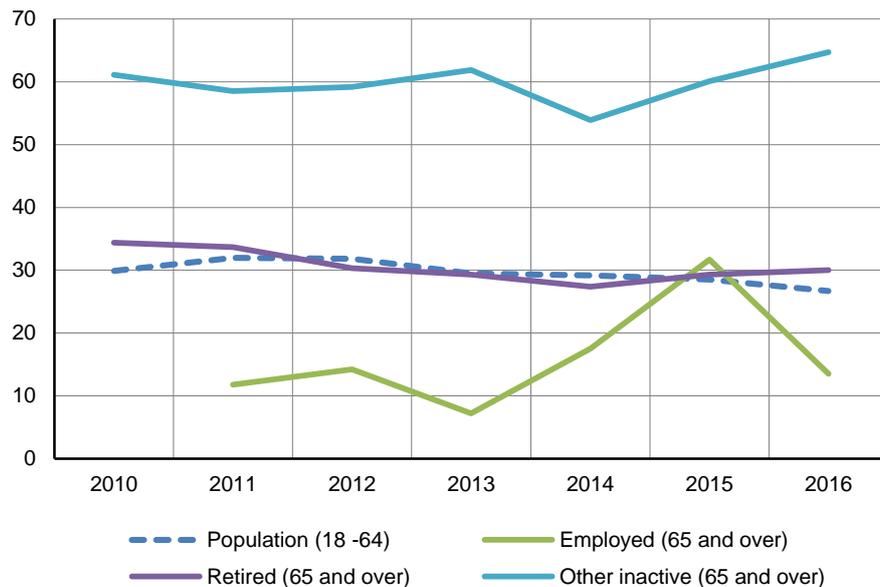
⁸ The poverty and social exclusion risk rate is the share in the population of persons who are exposed to poverty risk or who are seriously materially deprived, or who live in households with very low work intensity. See more about this definition at [https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:At_risk_of_poverty_or_social_exclusion_\(AROE\)](https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:At_risk_of_poverty_or_social_exclusion_(AROE))

Figure 5: At-risk-of-poverty or social exclusion rate in the EU in 2016.



Source: Eurostat.

Figure 6: At-risk-of-poverty or social exclusion rate in Croatia, 2010-2016

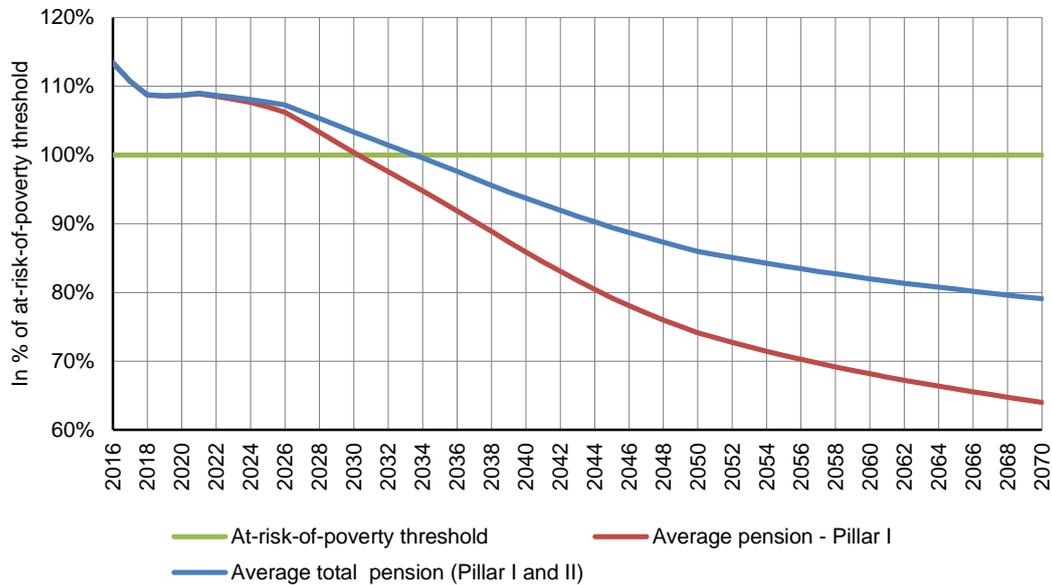


Source: Eurostat

Employed elderly persons have a substantially lower poverty/social exclusion rate than pensioners or younger adults in general. In this sense, policies encouraging employment at an older age obviously have significant potential to decrease poverty and social exclusion of the elderly. In Croatia, in 2016 the at-risk-of-poverty or social exclusion rate was higher for 65+ pensioners than for the adult population below 65 years of age. However, the difference is not large, and during recession years (2012-2014) it was occasionally even lower. This shows that the pension system offers a certain degree of social protection to elderly persons. However, other indicators show that the elderly population is nevertheless in a less favorable material situation than the average population. Accordingly, the at-

risk-of-poverty rate (monetary poverty) for elderly persons (65+) was 26.5%, in contrast to the 19.9% rate for general population in 2016.

Figure 7: The projection of the average pension and at-risk-of-poverty threshold ratio for a single person household in Croatia, 2016 – 2070 (in %)



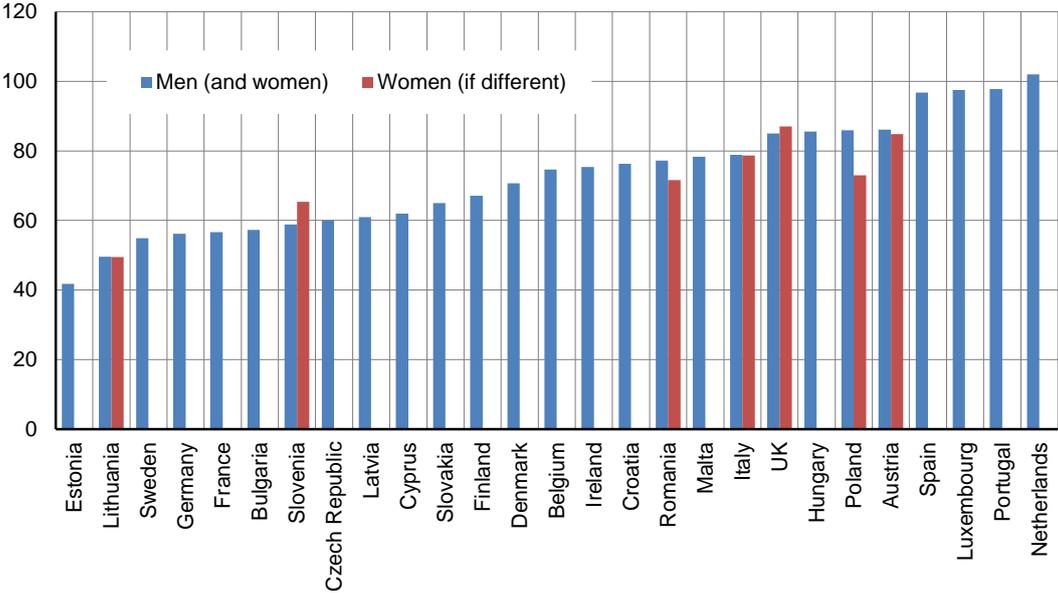
Note: The projection is subject to the assumption of an increase in the at-risk-of-poverty threshold in 2016 by the same rate as the GDP growth per capita.

Source: Author's estimate on the basis of the projection of pension and GDP trends from the *Ageing Report 2018*.

The projected pension trends show that the question of the poverty of pensioners in Croatia could escalate in the future. The projections of pensions from the Ageing Report 2018 prepared under the assumption that the 2017 pension legislation will remain in force, and under the assumption that the monetary amount of the at-risk-of-poverty threshold will increase in the future by the same rate as the projected GDP growth per capita, show that the amount of the average pension may fall below the poverty threshold for a single household in around 2035, and that by 2070 the average pension could decrease to 80% of that poverty threshold. The greater expected decrease in the ratio during the initial years is a consequence of the more substantial projected growth in GDP, income and the poverty threshold, while average pensions will grow by lower rates.

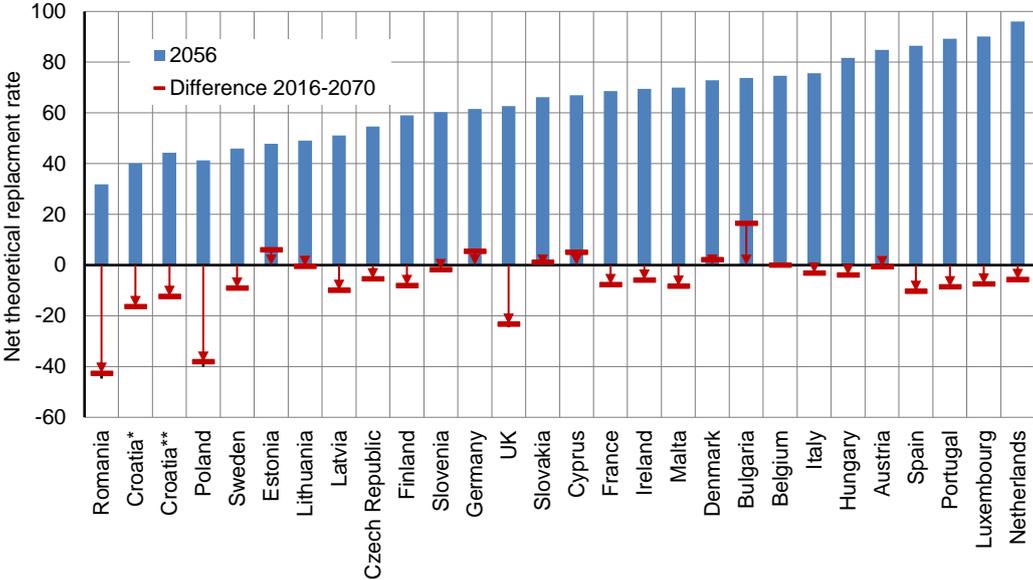
The other important aspect of pension adequacy is the extent to which pensions make up for the loss of income from work in the case of retirement. At the moment of retirement, one form of income (wage, earnings) is replaced by another form (pension). In this sense we talk about the replacement rate. Most frequently the replacement rate is defined as the share of the first pension in the last wage. The European Commission defined it in the same way in the publication Pension Adequacy Report 2018, and it will be also defined in the same way in the calculations presented in this document. Here replacement rates are calculated for pensioners with different careers in terms of their retirement age, the length of service, and, where relevant, also in terms of their sex and other characteristics. The replacement rate may be defined as a gross rate, if gross wages and gross pensions are compared or as a net rate if both wages and pensions are expressed in their net amount, after taxation. In many MS, pensions are more favorably taxed than wages, so the net rates are probably better indicators of changes in welfare at the moment of retirement than the gross rates. However, in case of long-term projections, the gross and net rates indicate the same trends.

Figure 8: Net theoretical replacement rate in 2016 (40 years of uninterrupted service period before the statutory retirement age, average wage)



Source: Illustration on the basis of data from the *Pension Adequacy Report 2018*.

Figure 9: Net theoretical replacement rate, 2056 and the change in relation to 2016 (40 years of uninterrupted service period before the statutory retirement age, average wage)



Notes: * Croatia in 2056, according to the legislation before the 2018 reform ** Croatia in 2056 according to the legislation after the 2018 reform (two-pillar pension). For MS where the replacement rate in 2056 is different for men and women (Poland, Romania and Slovenia), their average is shown. The difference in the rate between 2016 and 2056 is based on the difference between the average rates for men and women.

Source: Illustration based on data from the *Pension Adequacy Report 2018* and the author's calculations.

In 2016 Croatia had one of the lowest net replacement rates in the EU. The projections pursuant to the pension legislation after the 2018 reform show that by 2056 the rate will be the third lowest in EU. Figure 8 shows the comparable net replacement rates for EU MS from the *Pension Adequacy Report 2018* in a hypothetical case (this is why such rates are called theoretical) of a person

who retires with 40 years of service at the statutory retirement age in 2016, having previously received an average wage over their entire working life. In Croatia, in 2016 the first net pension of such a person would amount to 56.6% of the last net wage, where in that case there is no difference between women and men. This is the fifth lowest rate in the EU. The replacement rate for a person with an identical career is estimated for 2056. According to the legislation in force before the 2018 reform, after 40 years, by 2056 the replacement rate in Croatia could have decreased by 16.4 percentage units and amount to 40.2% for the chosen hypothetical person. After the 2018 reform, the expected net replacement rate in 2056 amounts to 44.3%, which is 12.3 percentage points less than in 2016. Thereby Croatia would have the third lowest net replacement rate in the EU. Romania and Poland would have a lower rate. Although the details of the comparison may depend on the selected careers of the hypothetical persons, the data previously presented from the Ageing Report 2018 on the average replacement rate (Figure 4) show that this is a systemic problem.

2.3 Key factors affecting pension adequacy

The low replacement rate and its substantial decrease in the future require determined reaction by economic and social policy actors, aimed at correcting this trend. The first step is to identify the root causes of these trends. We will consider four factors which have to be in the focus of reforms aimed at improving pension adequacy:

- I) the relatively short careers of pensioners
- II) the unfavorable ratio between insured (employed) persons and pensioners
- III) the valorization and indexation of pensions
- IV) the treatment of the pension supplement to the first pillar pensions

The first two factors are not exclusively linked to pension policies and cannot be easily changed in the short term, but pension policies can nevertheless have a substantial impact on them. The other two factors are the consequence of the design of the pension system itself. They can be changed in the short term, but they have long-term implications for the budget and the fiscal sustainability of the system.

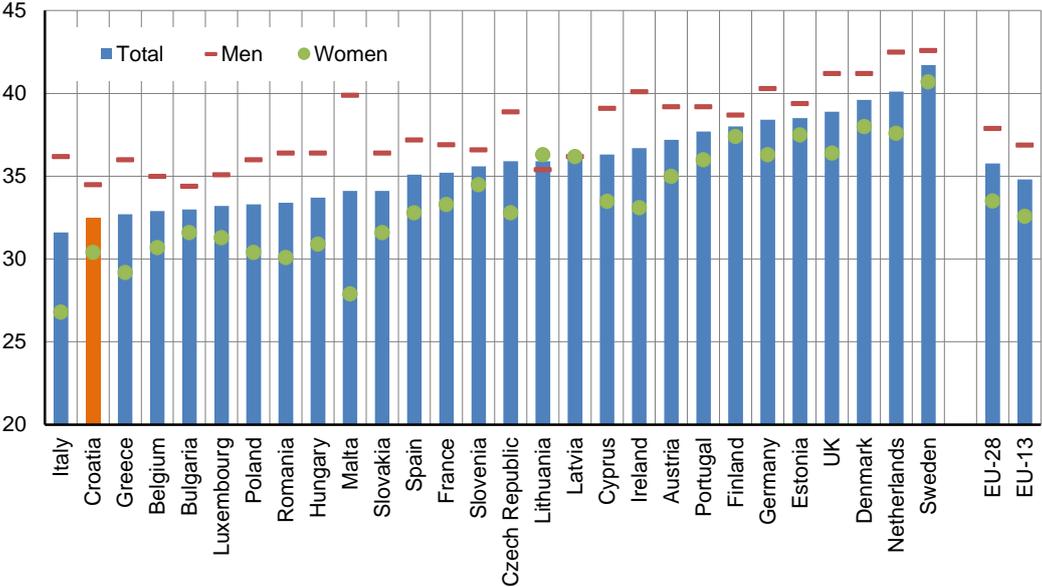
One of the key challenges facing the Croatian pension system is short duration of working life compared, in particular, with the duration of retirement. According to the data from the Croatian Pension Insurance Institute, the average contribution period of current pensioners who earned their pension pursuant to general legislation was 30 years and 4 months (32 years for men and 29 years for women), while the average pension payment period for old age pensions was 20 years and 11 months.⁹ The contribution period of new pensioners in 2017 was about two years longer than the average for all pensioners, and amounted to 32 years and 4 months (33 years and 3 months for men and 31 years and 7 months for women), which indicates a trend of the gradual extension of working life, which is, *inter alia*, the consequence of the increase in the statutory retirement age in the 1999-2008 period, and additionally for women after 2010. The average age of the new old-age pension beneficiaries was 62

⁹ HZMO (2018), “Statističke informacije Hrvatskog zavoda za mirovinsko osiguranje” (*Statistics by the Croatian Pension Insurance Institute*), no. 4/2017.

years and 4 months in 2017. Duration of working life is therefore relatively short compared to the expected duration of retirement.

The working life in Croatia is the second shortest in EU. Eurostat's estimates which illustrate this are shown in Figure 10. In contrast to the administrative data previously mentioned for Croatia, the data in Figure 10 are based on the expected working life of a person 15 years of age, and they are comparable for all EU MS, so they have somewhat different values. The estimate of the expected working life is based on the demographic data from Eurostat and data on activity rates. Average duration of working life of 32.5 years (34.5 for men and 30.4 for women) is substantially lower in Croatia than the EU-28 average of 35.8 years and the new MS EU-13 average of 34.8 years.

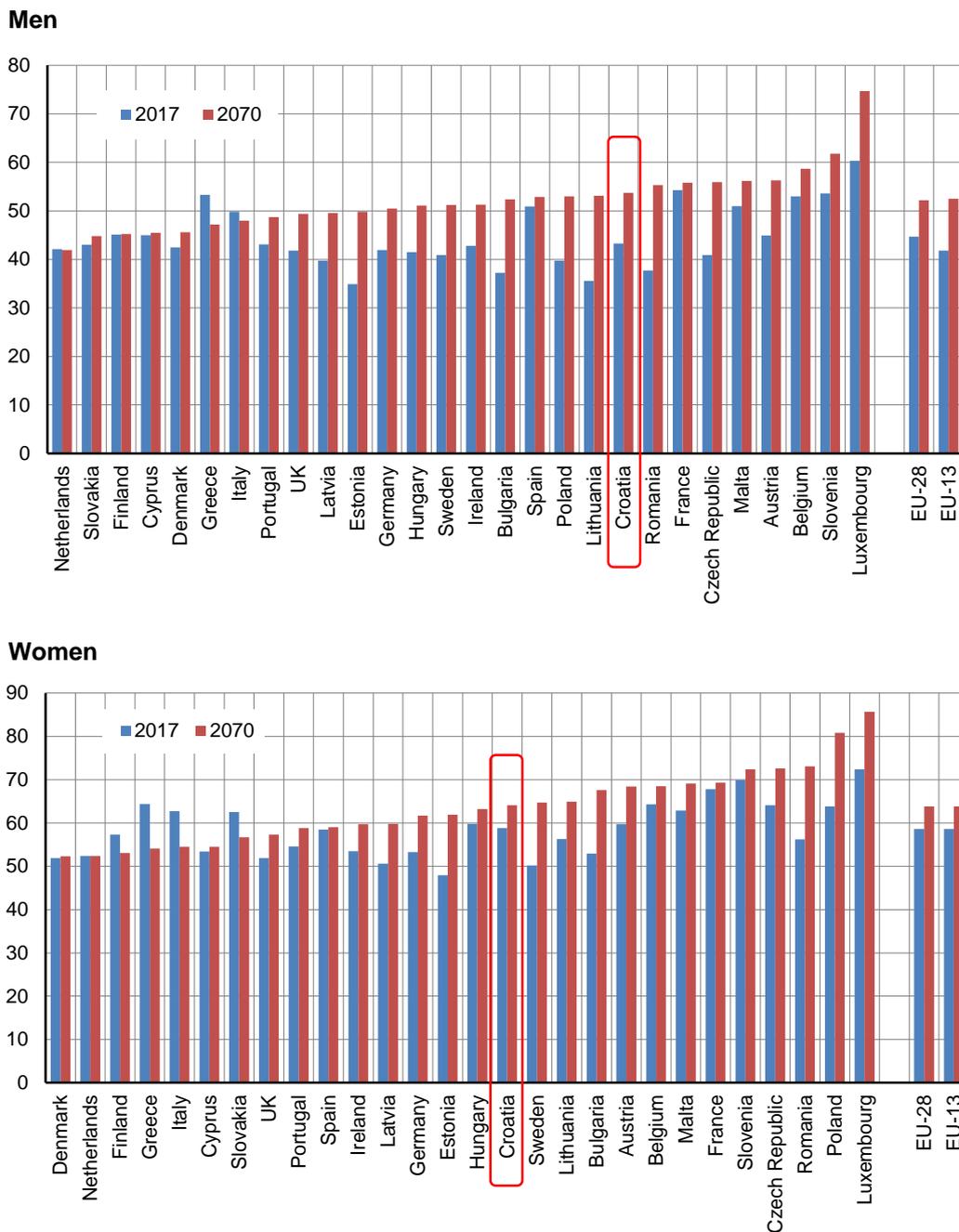
Figure 10: Duration of working life in the EU, 2017



Source: Eurostat.

Duration of retirement as a share of average working career in Croatia is one of the highest in the EU. *Ageing Report 2018* reports that the ratio between the duration of retirement and average duration of working life in Croatia is 43% for men and 59% for women in 2017 (Figure 11). While this ratio is slightly lower for men than the EU-28 average, it is slightly higher than the European average for women. In relation to the new EU MS (EU-13), Croatian pensioners spend relatively more time retired in relation to their working career. In the vast majority of MS, including Croatia, an increase in the relative duration of retirement is expected by 2070, despite the increase in the statutory retirement age and more stringent criteria for early retirement, which were the components of the reforms in many MS. It can therefore be said that it is expected that advantages of the increase in life expectancy in the world today will be distributed on the one hand to extension of working life and on the other hand to the retirement period. Here, the ratio between duration of retirement and duration of working life should increase by 2070. This is also true for Croatia, with the statutory increase in the retirement age to 67 years by 2033, according to the pension legislation after the 2018 reform. The *Ageing Report 2018* forecasts for Croatia an increase in the pension payment period between 2017 and 2040 by 1.5 years for men and 0.2 years for women. This means that even the substantial increase in the retirement age for women regulated by law, as the consequence of harmonization of retirement requirements for women and men, and the increase in the general retirement age from 65 to 67 are more than compensated for by the increase in life expectancy.

Figure 11: Duration of retirement as a share of average working career (in %)



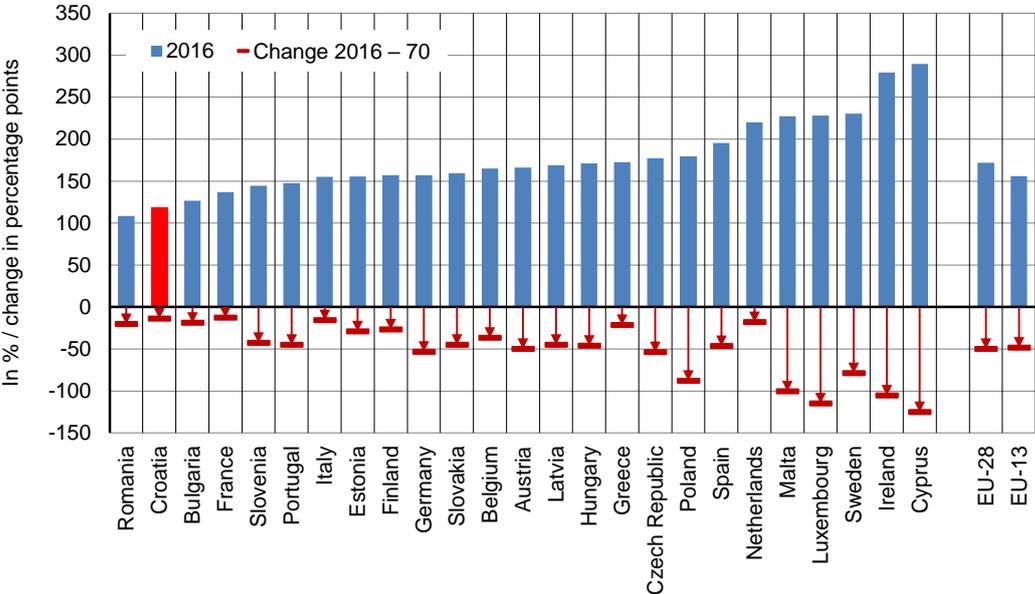
Notes: Ranked by the size of the ratio in 2070. The data for EU-28 (all EU MS) and EU-13 (MS which joined EU in 2004-2013) were obtained as non-weighted averages per MS. Source: Ageing Report 2018.

Early retirement also leads to a short working life and the low pension adequacy in Croatia. Approximately 45% of the new old-age pension beneficiaries in Croatia in 2017 used one of the possibilities for early retirement. There were 8,308 or approximately 29% early retirement pensions of the total of 28,591 new old-age pensions in 2017 (without pensions determined pursuant to international treaties). Although they had a contribution period longer than the average, their average age was 60 years and 9 months for men and 57 years and 8 months for women. A relatively large number of new “old age pensions for the long-term insured”, 4,525 of them, may be added to group of early

retirement pensions. The old age pension for the long-term insured can be acquired with 60 years of age with 41+ years of contribution without applying the pension decrement as in the case of standard early retirement, which is why in official data this pension is not treated as an early retirement pension but an old age pension. However, this is *de facto* a case of early retirement. In total, 45% of the new old-age pensions were approved before the statutory retirement age. Such a high percentage of early retirement, at a relatively low age, deepens the problems in the pension system and requires change. Obviously, the requirements for early retirement are too lenient. In Croatia early retirement is possible 5 years before the statutory retirement age. In addition, by the end of 2018 variable factors were also applied to the early retirement pension decrement, depending on the service period, ranging from 6% to 20.4% per year.

Croatia has a very unfavorable support ratio (number of workers per retiree) in the public pension system, which is not only the consequence of unfavorable demographic situation. Namely, as shown in Figure 13, according to the demographic dependency ratio (population 65+ in over the prime age population, 20-65 years) in 2016 Croatia was the MS with the eleventh largest ratio in the EU (32%), while the support ratio in the public pension system (workers/pensioners) was then the lowest in the EU after Romania (Figure 12). Eurostat's projections show that in all EU MS the demographic dependency ratio will increase. In Croatia it will increase by an additional 29 percentage units by 2070 to amount to 61%. With such a ratio Croatia would be the MS with the ninth largest dependency ratio in the EU. The support ratio could, according to some estimates, decrease in all EU MS, which means that there would be fewer and fewer workers (insured persons) in relation to the number of pensioners. The reforms undertaken in the EU aimed at slowing down entry into retirement and increasing the employment rate, are an attempt to keep this ratio as high as possible. The low support ratio is a problem for public pension systems based on a PAYG system, because the increasingly small number of prime age generation (contributors) must finance pensions for an increasingly large number of pensioners.

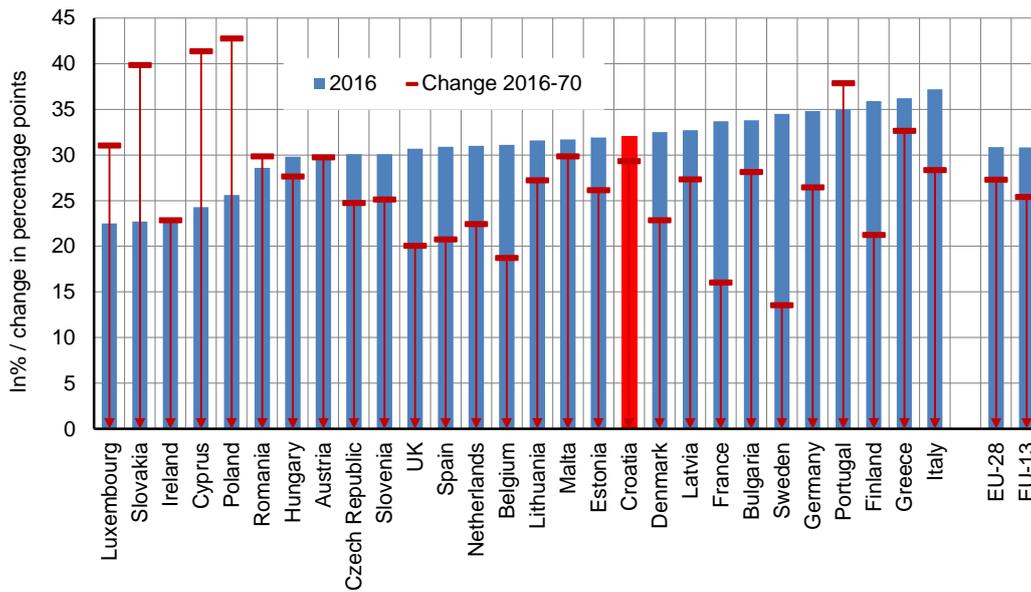
Figure 12: Support ratio of the public pension system (workers/pensioners)



Notes: Ranked by the size of ratios in 2016. The data for EU-28 (all EU MS) and EU-13 (MS which joined the EU in 2004-2013) were obtained as non-weighted averages per MS.

Source: Ageing Report 2018.

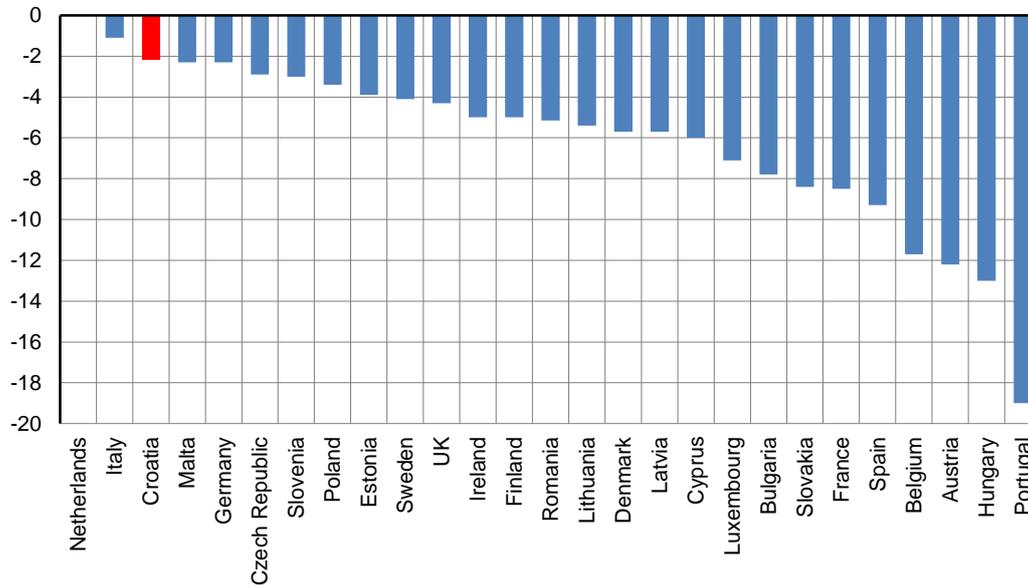
Figure 13 Demographic dependency ratio (65+ population / (20-64), in %



Notes: Ranked by the size of ratios in 2016. The data for EU-28 (all EU MS) and EU-13 (MS which joined the EU in 2004-2013) were obtained as non-weighted averages per MS.

Source: Ageing Report 2018.

Figure 14: The difference in the net theoretical replacement rate, 10 years after receipt of the first pension in 2056 (40 years of uninterrupted service period before the statutory retirement age, average wage)



Source: The illustration is based on data from the *Pension Adequacy Report 2018*

Pension indexation in Croatia, in comparison with other EU MS, protects paid pensions from loss of value during payment period relatively well. As shown in Figure 14, the decrease in the replacement rate during ten years of pension payment in Croatia is among the lowest in the EU. The effects of pension indexation are an important element for estimation of pension adequacy, because the replacement rate as defined in this document (first pension/last wage) indicates only the relative value

of the first pension. However, inflation, the growth of average wages in a MS and an increase in the average standard of living usually occur over time. Pension indexation should ensure that pensions do not suffer from these trends. In the Netherlands, the increase in pensions is linked to the increase in wages, and accordingly the replacement rate remains unchanged. In all other MS, the replacement rate is decreasing, the most in Portugal. However, the initial replacement rate has to be taken into account when considering the effects of indexation. In Croatia, initial replacement rate in 2056 is expected to be one of the lowest in the EU (Figure 9).

Future pension adequacy in Croatia is dependent on the solution to the issue of the pension supplement to the first pillar pensions, to which pensioners were entitled who were only insured in first pillar, in the amount of 27% of the pension determined pursuant to the pension formula. See more on the pension supplement and pension formula in Box 2, and on the pension formula applied in Croatia in Box 3. The resolution of the pension supplement issue will play one of the key roles in the structure of the future pension system in Croatia. Therefore, it deserves to be given more space in our considerations.

Box 2: Pension supplement to first pillar pensions

The Act on the Supplement to the Pensions Earned pursuant to the Pension Insurance Act (OG 79/07), enacted and implemented at the end of 2007, stipulated the payment of a supplement in the rate of 4%-27% to the entire amount of the first pillar pension, where the actual rate depended on the year of retirement. This supplement was introduced as an answer to the increasingly lower pensions for new pensioners resulting from the gradual increase in the accounting period for assessment of the average wage (average point value) in the pension formula. The accounting period increased from the best 10 consecutive years to the entire career. It was stipulated that the supplement rate increases with the increase in the year in which the first pension was determined. It is 4% for pensions earned in 1999, and 27% for pensions earned in 2010 and later. However, the key difficulty with the pension supplement stems from the statutory provision whereby only persons insured in the first pillar only are entitled to it, while persons insured in both pillars are not. This provision is problematic, because the “two-pillar beneficiaries” were equally hit by the increase in the accounting period, and in particular because before the 2002 reform they were paying the same contributions to the first pillar as the “one-pillar beneficiaries” (20% of the gross wage), and after the 2002 reform, they were paying three quarters of their total pension contributions to the first pillar (15% to the first and 5% to the second pillar).

Payment of two-pillar pensions to persons insured in both pension pillars, which consisted of the basic pension from the first pillar and annuities from the second pillar, started in 2006. It was noticed already then that they were lower than pensions for comparable careers of persons insured in the first pillar only. These were the pensions of “voluntary two-pillar beneficiaries”. After the introduction of the pension supplement for “one-pillar beneficiaries” in 2007 this difference became even more obvious and as the number of two-pillar pensions increased, there was the pressure to resolve this problem.

The problem of sizable difference in amount of a “one-pillar” and a “two-pillar” pensions was temporarily resolved in 2011, when statutory amendments enabled persons who voluntarily opted for the combined pension insurance to choose, at the moment of retirement, whether they wanted to receive a pension according to the rules for one-pillar pension beneficiaries or a combined pension from both pillars. If they chose the rules for “one-pillar” pensioners, their pension savings from the second pillar were transferred to the state budget. The difference in the amount of pensions was such that at the moment of retirement the vast majority of “voluntary second pillar beneficiaries” chose to receive “one-pillar” pensions. By mid-2018 only 300 of approximately 16 thousand such persons accepted a combined pension from the first and second pillars (according to the data from the presentation by the Ministry of Labor and Pension System “Comprehensive Pension Reform” of 31 July 2018).

The choice of receiving one-pillar pension was not, however, envisaged for the mandatory two pillar beneficiaries, that is, for all the insured persons born in 1962 and later. In 2019 these persons will start to become eligible for pensions, and if this question had not been resolved in the 2018 reform, their pensions would have been substantially lower than the one-pillar pensions subject to identical parameters (age, sex, service period, wage). The number of mandatory two-pillar pensioners who will become entitled to pensions in 2019 will be very low but it will grow over time, starting with early retirement of women, then early retirement of men, and since 2027 mandatory second pillar beneficiaries will be entitled for old-age pensions.

The calculation of a first pillar pension may be presented in the form of the following pension formula:

$$\text{Pension benefit} = \text{Personal points} * \text{Pension factor} * \text{Actual pension value} * \text{Supplement factor}$$

where:

$$\text{Personal points} = \text{Insurance period} * \text{Average point value} * \text{Initial factor} * \text{Basic pension factor}$$

As regards personal points, the average point value is acquired by adding together all annual personal age/average wage ratios and by dividing them by the pension insurance period. In other words, this is the average of the wage of an insured person during their working life in relation to the average wage in the country. The initial factor determines a decrease or an increase in pension in the case of early or late retirement. For retirement at the statutory age it is 1. For early old-age retirement, after the 2018 reform, the starting factor is decreased by 0.3% for each month of retirement before the statutory age (in the case of retirement 5 years before the statutory age by 18%, that is, it takes the value of 0.82). Before the reform, the decrease depended on insurance period. The basic pension factor is given the value 1, except in the case of two-pillar insured persons who opt for a pension from both pillars. For them, for the period after the introduction of the second pillar (1 January 2002) this factor is given a value equal to the ratio between the contribution rate which is paid into the first pillar and the total contribution rate (currently 15/20, that is, 3/4). In the pension formula the pension factor depends on the type of pension. It is given value 1 for old-age pensions. Other values are determined for disability and survivor's pensions. The actual value of the pension is the monthly amount of the pension for one personal point. It is determined by the HZMO, and this is the value which is subject to indexation twice a year. Before 2018 the pension supplement factor was 1.27 for persons insured in the first pillar only, and 1 for persons insured in both mandatory pension pillars. The 2018 reform extended the entitlement to the supplement for persons insured in both pension pillars. For persons who opt to receive pensions from both pillars, the basic

pension factor for their service period until 1 January 2002 is 1.27, and for their service period after that it is set at 1.2025. It is worth noting that for persons who will receive a pension from both pillars the basic pension factor and the supplement factor differ for the period before as compared to the period after 1 January 2002. Accordingly the calculation of their pension from the first pillar consists of two parts, one for the period before and the other for the period after the introduction of the second pillar.

The minimum pension formula:

$$\text{Minimum pension} = \text{Insurance period} * \text{Initial factor} * \text{Pension factor} * \text{Actual value of minimum pension} * \text{Basic pension factor}$$

The actual value of the minimum pension is the monthly amount of the pension the insured person is entitled to for each year of insurance. The 2018 reform determined the actual value of the minimum pension at the level of 100% of the actual value of the pension from the general formula (before the reform 97%). This value is indexed in the same manner as the actual value of the pension from the general formula. It is worth noting that the supplement factor is not applied to the minimum pension.

2.4 The issue of the 27% supplement and pension adequacy

Three groups of insured persons can be identified in mandatory pension insurance:

- a) persons insured in the first pillar only (“one-pillar beneficiaries”) - these are the persons who at the moment of the introduction of the second pension pillar at the beginning of 2002 were 50+ years of age or were between 40 and 50 years of age and voluntarily chose to be insured only in the first pillar
- b) persons who voluntarily chose insurance in the first and second pillars - these are the persons who were between 40-50 years of age at the moment of the introduction of the second pillar (persons born between 1952-1961) and who then chose insurance in both mandatory pension pillars (“voluntary two-pillar beneficiaries”)
- c) persons who are, pursuant to the law, subject to mandatory insurance in both pension pillars - persons who at the moment of the introduction of the second pillar were under 40 years of age, that is, persons born in 1962 or later (“mandatory two-pillar beneficiaries”).

A comparison of pension benefits pursuant to the legislation in force in 2018 shows that two-pillar pensions are substantially lower than one-pillar pensions for comparable careers, and this difference did not occur due to the inefficiency of the second pillar. The main reason for this difference lies, for most insured persons, in the 27% pension supplement to first pillar pensions which only “one-pillar beneficiaries” are entitled. For insured persons with lower wages the difference also occurs due to the minimum pension which ensures the threshold of pensions in the first pillar, while there is no minimum pension in the second pillar. For example, according to the pre-2018 reform regulation, a woman who takes early retirement in 2019 and who meets the first conditions (57 years and 3 months of age and 32 years and 3 months of service period), and who, over an uninterrupted working life, received an average wage, would receive an 18% lower two-pillar pension than the pension she would receive, having met the same conditions, on the basis of the rules for pensions paid from the first pillar alone.¹⁰ Some may perceive this result as a failure in the design and functioning of the second pillar, although the main reasons for this difference can be found in the regulation of the first pillar. Despite the need to improve the second pillar, which will be discussed later, second pillar performance

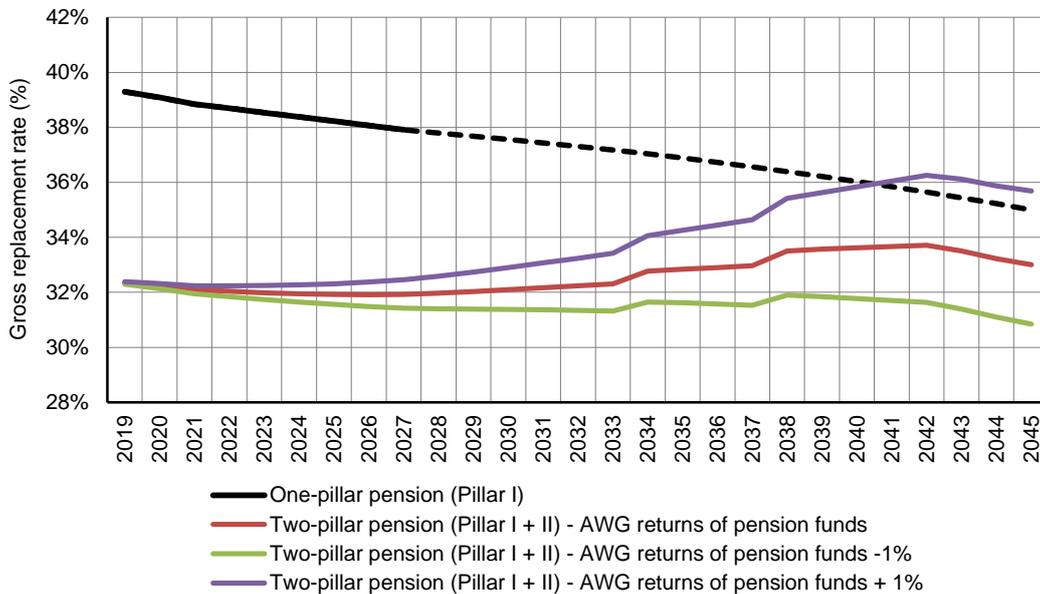
¹⁰ Concrete calculations of pensions in support of these arguments using the hypothetical example of a woman who takes early old-age retirement having met the first conditions for age and insurance period in 2019, having earned during her working life a wage in the amount of 100% and 40% of the average for Croatia, are presented in Annex 1.

is of lesser importance for an explanation of the difference. Namely, in the accumulation stage of pension savings, the second pillar funds generated an average annual rate of return of approximately 6% nominally (the average growth of mandatory pension funds' accounting units (MIREX)) from the beginning of 2002 until the end of 2017, which is about 4 percentage points above inflation and more than two percentage points above the average wage growth.

Long term projections based on the pre-2018 reform legislation show that without additional measures, the pension gap between first and second pillar beneficiaries will probably not be closed in the next 20-25 years, and possibly not even over a much longer time period. As an illustration of the effects of the status-quo scenario on pensions, we shall consider the example of a man with 40 years' service period who retires at the statutory age having earned a wage at the level of the average wage for Croatia.¹¹ The results are shown in Figure 15. Only persons born before 1962 will be entitled to a one-pillar pension subject to the legislation in force in 2018. All those born in 1962 and later have mandatory insurance in the two-pillar system, and, according to the pre-2018 reform legislation, will receive a two-pillar pension. Without the reform, in 2019 the chosen hypothetical person would receive a two-pillar (mixed) pension 18% lower than a one-pillar pension. Due to the valorization and indexation formula, the one-pillar pension has a tendency towards a continuous fall in the gross replacement rate, from 39% in 2019 to 35% in 2045. Although the two-pillar pension would have a growing gross replacement rate after 2033, mainly due to the increase in the statutory retirement age, it would still be lower than the one-pillar pensions for many years.

¹¹This example seeks to demonstrate the expected trends of one-pillar and two-pillar pensions in the future before 2018 reform, with as few other factors as possible having an impact on them. This is why an example is given of a man with a fixed service period. If a woman had been taken as an example, subject to the application of the rules prior to the 2018 reform, it would also have been necessary to include the calculation of the increase in the statutory retirement age by 3 months a year up to 2030, which would have a substantial impact on the results, because second pillar pensions are determined depending on the actual age based on actuary calculations. The statutory retirement age for men will not change until 2030, but due to the gradual increase in the statutory retirement age from 65 to 67 this will still have some impact on the results in the 2030-2038 period, due to the slightly more favorable first pillar pensions.

Figure 15: The gross replacement rate (first pension/last wage), for men with an average wage, statutory retirement age, with a service period of 40 years, subject to legislation in place in 2018, with different return rates in the second pillar.



Note: Subject to pension legislation as of 2018. Real wage and funds' return trends are included in the projections up until 2017, inclusive, as well as the present RMOD annuities for individual pension. The trends of inflation, wage growth and pension funds' return for the 2018-2045 period were taken from the European Commission (*Ageing Report 2018*).

Source: Author's projections.

The pension fund return rates may have a substantial impact on the second pillar pensions. However, under legislation in place before the 2018 reform not even returns above the AWG-expected rates can result in closing the gap between one-pillar and two-pillar pensions over the next twenty years. During preparation of the 2018 Ageing Report, the Ageing Working Group (AWG) used the assumption of a real gross return rate of approximately 2.3% in the 2018-2021 period. It would then gradually increase to 3% in 2025 and stay at that level after that. We projected replacement rates for total two-pillar pensions with the pension fund returns of one percentage point above and below the Working Group's assumption (Figure 15). With the pension funds 'return rate of one percentage point above the basic variant (on average approximately 4% in real terms) and given the macroeconomic assumptions, a pensioner with a long working career, with average earnings retired at statutory retirement age would face the gap between the one-pillar and two-pillar pensions that would not close until 2040. However, in the case of lower returns (around 2% in real terms) and baseline returns (around 3% in real terms as in the AWG scenario), much more time would be needed to close the gap, and the closing of the gap would perhaps not cover at all for persons starting their first employment today, who will retire in about 40 years.

Given the size of the gap between one and two-pillar pensions and the long time needed to close it, it was necessary to undertake decisive and consistent reform measures in order to close the gap and bring different generations of pensioners into equal positions. Early retirement for women who had mandatory insurance in both pillars may be taken since 2019. If nothing is done, they would receive substantially lower pensions than previous generations. The resolution of the question of this gap is one of the main components of the pension reform prepared by the Ministry of Labor and Pension System and adopted in December 2018 by the Croatian Parliament.

2.5 Minimum pension

According to the current regulation in Croatia, the minimum pension depends on the years of service. It is reduced in the case of early retirement, and it does not depend on the income or assets of the pension beneficiary or their household. Such a regulation leads to identical pension for identical years of service and retirement age, for all those whose gross wage during their working life was below 75% of the (national) average gross wage. This feature may give some push for the grey economy. The “envelope” payments are still practiced by some employers where a part of the wage, usually that above the minimum wage, is paid as “cash-in-hand”. Although this is a serious tax fraud, it is hard to eradicate this practice if workers accept it. And they seem to have no strong incentive to reject it and confront with the employer. If a worker is registered as receiving a minimum wage (currently slightly above 40% of the average wage), and he is paid the rest as “cash-in-hand”, in the end she/he will receive an identical pension as a person who is registered as receiving 70% of the average wage and possibly higher total remuneration. This undesired effect will be much weaker in the case of two-pillar pensions, because part of the pension paid from the second pillar is based on actual contributions into the second pillar, so accordingly a higher registered wage will also mean a higher pension and a greater incentive to workers to request legal payments, including pension contribution, for the full amount of their wage.

More than one third of new pensioners receive the minimum pension, more precisely their pension includes the top-up amount to reach prescribed minimum pension. In the first nine months of 2018 the minimum pension was received by 35% of new pensioners. At the end of 2017 there was a total of 239,630 beneficiaries of the minimum pension, which amounts to 21% of pensions granted pursuant to general legislation. If we add to this number the beneficiaries of similar instruments which existed prior the enactment of the minimum pension legislation in 1999 (the protective supplement and the minimum pension) and if the minimum pension beneficiaries pursuant to the Act on the Rights of Croatian Homeland War Veterans and their Family Members are added to this, then approximately 25% of the total number of pensioners receive some form of the minimum pension. The minimum pension beneficiaries have substantially fewer years of service than other pension beneficiaries who receive pensions according to general legislation, which is confirmed by administrative data.¹² The average years of service of persons who retired subject to the Pension Insurance Act in the first nine months of 2018 was approximately 32 years and 8 months, while the average service period of new minimum pension beneficiaries was 29 years. The average service period of all minimum pension beneficiaries was 26 years and 6 months.

For persons receiving very low wages, pensions based on earnings make up less than one half of the pension paid on the basis of minimum pension legislation. In these cases, the larger part of the pension (top-up amount) is paid as a social transfer although it is not officially considered part of the social security system, but the result of the application of the principle of solidarity within the general pension system. For example, pursuant to the legislation after the 2018 reform, a female pensioner who will take early retirement, having met the first conditions and having earned a wage throughout her working life at the level of 40% of the average wage, will receive approximately one half of the expected one-pillar pension as a top-up amount based on the legislation on the minimum pension. In addition, approximately 10% of her pension is the 27% supplement, where the funds for the payment of the supplement are directly allocated from the state budget and paid to the Croatian Pension Institute’s

¹²HZMO's statistics, October 2018

account.¹³ Approximately HRK 1.6 billion will be paid in 2018 as top-up amounts for reaching the minimum pension. In the following years this amount will be even higher, due to the increase in the actual value of the minimum pension as part of the 2018 reform.¹⁴

Official data on minimum pension beneficiaries do not include all minimum pension beneficiaries pursuant to Article 31, Paragraph 3 of the Act on the Rights of Croatian Homeland War Veterans and their Family Members. Namely, Croatian Homeland War veterans are entitled to a pension in the minimum amount of 45% of the average net wage, under condition that they served in military units for at least 100 days, and this percentage increases with the length of their service. HZMO's statistics shows the number of beneficiaries of these pensions only in cases when they do not meet the minimum waiting period under general legislation (they do not have at least 15 years of contribution/service). There were 1007 such beneficiaries at the end of September 2018. Their average contribution period was 6 years and 11 months, and the average pension was HRK 2,939. However, the number of beneficiaries who qualify for old-age pension under general legislation use this form of minimum pension as more beneficial for them than their regular old-age pension. These cases are not reported in the official statistics. According to our estimates their number could be substantial, exceeding 35 thousand. These beneficiaries are not mentioned as minimum pension beneficiaries. It is difficult to estimate how many such pensions may be expected in the future. Namely, on the basis of general rules, Homeland War veterans may receive old-age pensions higher than this minimum pension, and therefore will not claim the minimum pension. Some of them may acquire more favorable pensions on other grounds or will die before they meet the conditions for retirement.

2.6 Other issues relevant for future reforms

Pensions regulated by special legislation account for a significant proportion of pensions, both in terms of the number of beneficiaries and the total pension bill paid. At the end of 2017, there were 174,901 beneficiaries of these pensions, which is 14.2% of the total number of pensioners. HRK 5.2 billion was allocated for pensions subject to special legislation in 2017 (13.9% of the total pension expenditure). Pension insurance obligations which occur through the recognition and determination of pensions subject to special legislation and under favorable conditions are financed from the budget. Although these expenditures are substantial, it seems that these are not precisely calculated but only roughly estimated. These pensions have a component based on merit, but they also have a component which is based on payment of contributions over the period of employment. It is possible and also necessary to determine precisely in each individual case which part of the pension is “covered” by contributions, and which part is based on merit. Such precise calculations should replace the current estimates. This would be the basis for requesting budget transfers and for better formulation of future policies in that area. It is also important for the sake of transparency and trust in the first pillar.

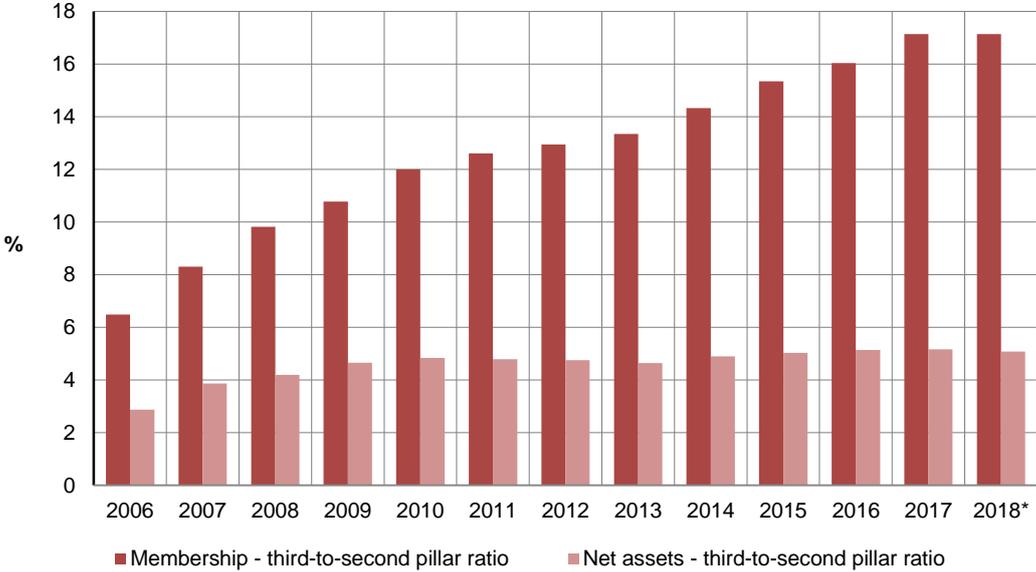
The third pension pillar is stable but its potential for increasing the adequacy of future pensions is very limited. At the end of October 2018 voluntary pension schemes had almost 330 thousand members, and they managed almost HRK 5 billion of assets (1.3% of the GDP). Since second

¹³ See the calculations in Table D2 in the Annex

¹⁴ The total top-up amount is estimated on the basis of data from the HZMO's Statistics of October 2018 on the average monthly top-up amount of HRK 534 for 247 thousand minimum pension beneficiaries in September 2018. The product of the average top-up amount and the number of beneficiaries, times 12 months, gives the estimated annual top-up amount.

pillar membership is mandatory for all born in 1962 and later, the second pillar is a good reference point for consideration of the development of the third pillar. The number of third pillar fund members has grown faster than membership of the second pillar. Accordingly, the ratio between third and second pillar membership has grown from 6.5% in 2006 to 17% in 2017 (Figure 16). The net assets of the third pillar funds have maintained a relatively stable ratio over the assets of the second pillar funds in recent years, even with a slight increase (from 4.7% in 2009 to 5.2% in 2017). However, the net assets of the second pillar would be higher than observed but the legal obligation to transfer savings of military and police forces from pension funds to state budget during 2014 and 2015 reduced its value. Open voluntary pension funds dominate the third pillar, with 290 thousand members and over HRK 4 billion net assets in October 2018. Closed funds, as a form of collective voluntary pension scheme, have relatively small coverage (40 thousand members) and show the under-representation of this form of pension savings in Croatia. There are few third pillar pension beneficiaries who are paid pensions at this moment. At the end of September 2018 their number was 10,388.

Figure 16: Membership and assets of third pillar pension funds in relation to the second pillar



Note: Both open and closed voluntary pension funds are included in the third pillar.
 Source: HANFA (Monthly report, October 2018).

3 The effects of the 2018 Pension Reform

The 2018 Pension Reform consists of amendments to six laws as a combination of administrative, parametric and systemic changes.¹⁵ As administrative changes we see changes which do not have any substantial effect on pension benefits, or which do not essentially change the way the entire pension system functions. These are, for example, the more precise regulation of the business operations of pension funds and their harmonization with EU Directives, or proposed changes to the lists of jobs and occupations subject to extended service period rules, whereby the jobs which no longer exist have been removed from the list. Parametric changes are those which change the numerical values affecting thereby the amount of pensions, but do not change the way the pension system functions. Numerous changes have been made in that segment and they will have a significant impact on future pension adequacy and financial sustainability of the pension system. These changes include acceleration of increase in the statutory retirement age, changes in the pension increase or decrement rate in the case of early or late retirement and increase in the minimum pension for each year of service. Finally, the third set of changes, the systemic changes, will have a substantial impact on the functioning of the pension system as a whole, where it may, but need not have, a substantial impact on pension adequacy or sustainability in the short term, but will probably have a substantial impact in the long term. Primarily, this refers to extension of the entitlement to the pension supplement to persons insured in both pension pillars, and introduction of the option to choose the more favorable pension between the one-pillar and the two-pillar pension at time of retirement.

3.1 The effects of the reform on pension adequacy

The estimates of the effects of the reform package on the pension adequacy is illustrated in the parallel projections of gross replacement rate for the one-pillar and two-pillar pensions for hypothetical pensioners. Although we could engage in consideration of a large number of options depending on the careers and the time of retirement, for the sake of a better focus on the main effects, two hypothetical cases have been chosen which could illustrate well these effects:

- The first hypothetical case - a woman, taking early retirement after reaching the first conditions of age and service period; assumed to have right to additional service period for one child
- The second hypothetical case - a man, retired at statutory retirement age after 40 years of uninterrupted service period, without additional service period for children.

We presume in both cases that these hypothetical persons received wages at the level of the average wage in Croatia throughout their entire working life. It is worth noting that after the harmonization of the statutory age for men and women in 2027, sex will no longer be important for determining pensions. Then, the projected replacement rates will be equal for men and women.¹⁶ The difference between the

¹⁵ An overview of key changes may be seen in Annex II.

¹⁶ Women will acquire the right to an additional service period for children much more often than men, but this option is also open for men, so that sex *per se* will not be the cause of differences in pensions between women and men.

first and the second case will be based on the retirement age and service period. The assumed amount of the wage is the same in both cases.

One of the elements of the reform whose effect is difficult to project is the annuity (pension) from the second pillar on the basis of the savings accumulated in pension funds. Namely, the reform has changed obligation of annuity provider to index annuities (pensions) from the second pillar in the same manner as pension in payments are indexed in the first pillar (i.e. to wage wage growth and inflation). After the reform, annuities have to be indexed to inflation. In addition to this change, some other elements affecting the calculation of the annuity appeared such are new regulatory restrictions of the calculated rate of return on technical reserves and new mortality tables. Accordingly, Raiffeisen MOD (RMOD), the sole annuity provider in Croatia i.e. the only pension insurance company registered to provide annuities from the second and third pillars, has already announced changes to their annuity calculations. It is expected that switch to annuity indexation to inflation should result in a higher first pension from the second pillar and a lower increase in pensions during the payment period. However, the decrease in the expected return rate and the increase in life expectancy could lead to a decrease in the annuity. Due to these unknown factors, we decided to show the projection results in two variants. The first variant assumes maintenance of current annuity payment formula used by RMODE, and the second variant has been drawn up under the assumption of a 10% increase in the initial annuity (first pension) due to changes in the existing payment formula. An additional assumption is made in both variants to account for an increase in life expectancy. We assume that annuity payment formula will be modified in 2026 and 2040, whereby the annuity factors will slide for one year.¹⁷

The projections show that, primarily due to the extension of the right to the supplement, the 2018 reform will substantially increase the amount of two-pillar pensions and bring them to a level similar to the level of one-pillar pensions already in 2019. The extension of the right to the supplement to insured persons from both pension pillars, and the introduction of the possibility to choose between these two types of pensions, has resolved the problem of the pension gap between one-pillar and two-pillar insured persons, that is, between the generations born before and after 1962. The results of long-term projections of the gross replacement rate for the hypothetical man with a old-age pension and working career of 40 years confirm this (Figure 17, Panel a), as well as the hypothetical example of a woman who retires early, having met the first conditions (Figure 17, Panel b). Both one-pillar and the mixed (two-pillar) pensions are higher than the mixed pension before the reform. This means that the two-pillar insured persons will be in a more favorable position after the reform.¹⁸

The 2018 reform will slow down the long term decrease in the replacement rate, but it will not stop it, except in the case of the more substantial prolongation of working life. Replacement rates in our hypothetical cases of insured persons leads to this conclusion. Figure 17, Panel a), with the projections using the example of the old-age pension for a man with 40 years of service period, shows that in the next ten years the replacement rate for a new pensioner would decrease regardless whether he receives a one-pillar or a two-pillar pension. The expected valorization and indexation of the actual value of the pension by a rate lower than wage growth leads to a decrease in the future replacement rate. This is the key factor in the falling replacement rate for one-pillar pensions, and also a very important

¹⁷ It is assumed, for example, that the annuity calculation currently valid for retirement at 65 years of age will be applied for retirement at age of 66 years after 2026, and at age of 67 years from 2040.

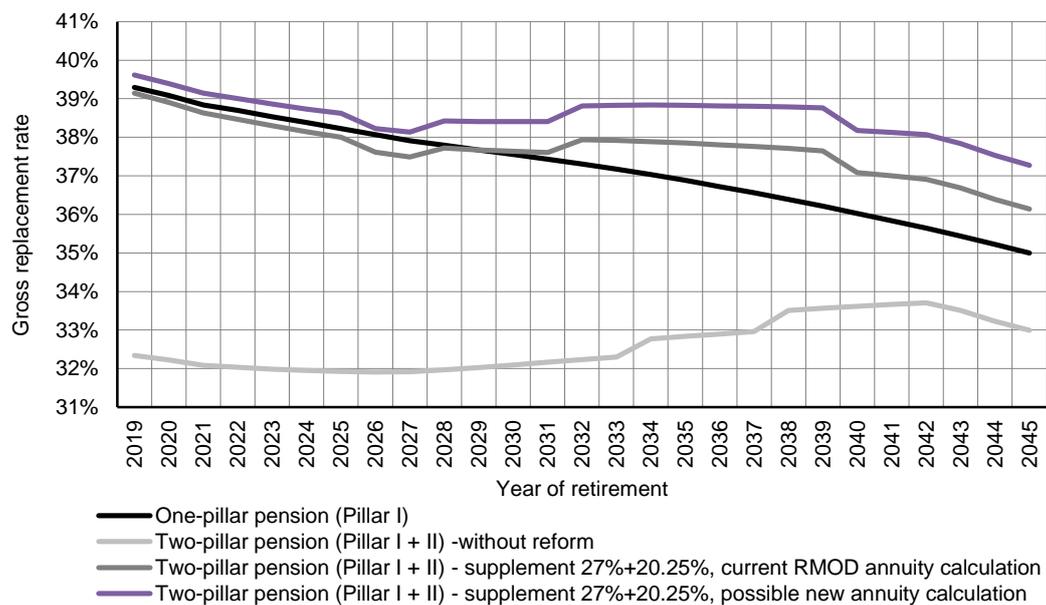
¹⁸ However, the pension supplement rate for the period after 2002 is not the same for one-pillar (27%) and two-pillar (20.25%) pensions. Along with the possibility of choice of pension, this creates certain short- and long-term imbalances and opens the question of the fairness of this solution. This will be discussed in more detail later (parts 3.3 and 3.4). In this part we are focused on the description of the expected impact of the reform on pension adequacy.

factor for two-pillar pensions. In addition, the gradual decrease in the average pension supplement rate is important element in determination of two-pillar pensions, due to the longer service period in the reformed (two-pillar) system and higher share of a second pillar pension in total pension benefit in situation of a lower supplement rate (20,25%) for service period in the reformed system.

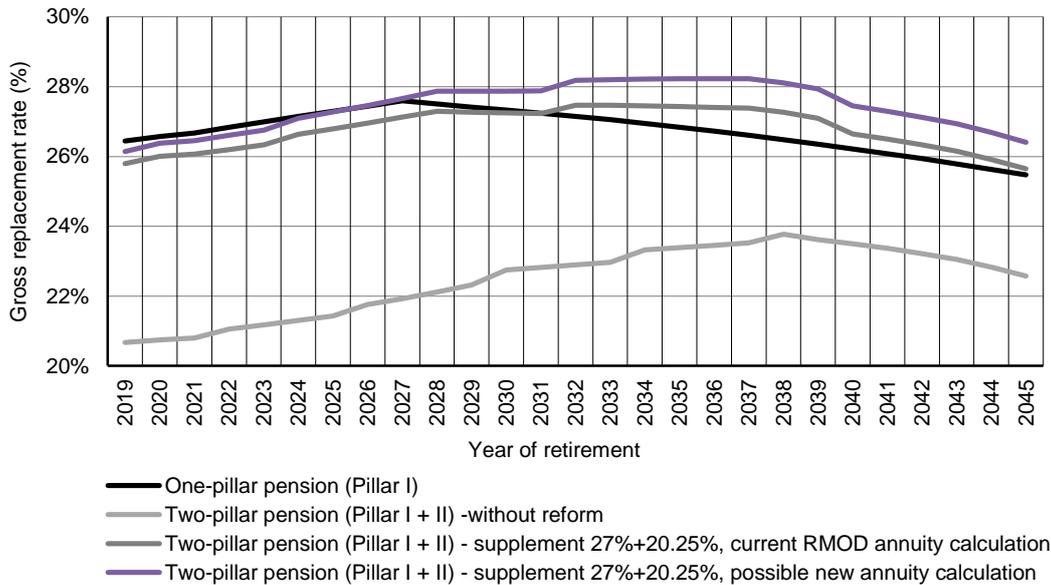
According to our projections, in the next ten years the negative effects of indexation and declining average supplement rate on the replacement rate will not be compensated for by the growth in second pillar pension funds' returns. The projections show that after 2032 the replacement ratio will stabilize nevertheless, but only for two-pillar pensions, and only due to the growth of the second pillar pensions. It is expected that second pillar pensions will grow due to the increasing retirement age, which, due to the application of actuarial rules, results in higher two-pillar pensions, and also due to second pillar returns above the average wage growth. At that time, these two factors will manage to compensate the expected decrease in the first pillar replacement rate that will happen due to pension valorization and indexation below wage growth. A new decrease in the replacement rate for two-pillar pensions may be expected after 2040, due to the continuation of the decrease in the first pillar replacement rate. It will no longer be possible to compensate for it by increases in second pillar pensions due to the lower expected future return rates and the anticipated future corrections of annuity calculation rules to account for higher life expectancy. The anticipated longer life expectancy will, in the conditions of an unchanged retirement age, result in a lower pension benefit in line with the actuarial calculations applied to annuity (second pillar pension) determination.

Figure 17: Projection of the gross replacement rate before and after the 2018 reform.

a) man, with an average wage, old-age pension at the statutory age, with 40 years of service



b) woman with average wage, early retirement, first conditions for age and service period fulfilled, added service period for one child



Note: The projections include the actual wage and pension funds' returns up to 2017. The existing RMOD annuity calculations for a second pillar individual pension and the assumed new annuity calculation rules (the existing one increased by 10%) will presumably be corrected in 2026 and 2040. For the period of 2018-2045, projections for inflation, wage growth and pension funds' returns are taken from the European Commission's projections (*Ageing Report 2018*).

Source: Author's projections.

The expected prolongation of working life and the increase in the retirement age for women will have a positive impact on the adequacy of their pensions over the next 20 years. An illustration of this impact on future replacement rate trends is given in Figure 17, Panel b), using the example of early old-age retirement subject to the first conditions of service period and age. The accelerated increase in the minimum age service period required for early retirement of women that are enacted in the 2018 reform, are the main reasons why their replacement rates will be higher in future than in 2019. Namely, the lowest early retirement age for women increases from 57 years and 4 months in 2019, to 62 years up by 2033, while the minimum required service period for early retirement will rise from 32 years and 4 months to 35 years. The longer service period will ensure a longer period of contribution payments and higher pension savings, and, consequently, higher first and second pillar pensions. The increase in the retirement age will also lead to higher second pillar pensions due to actuary calculations resulting in higher pensions at a later age. As this second factor, i.e. the impact of rising age that is parallel with rising legal retirement age, is lacking in one-pillar pensions, and due to the indexation of pensions by a rate lower than the wage growth rate, the replacement rate for one-pillar pension will start to decrease after 2027, that is, as soon as the growth of the minimum required service period stops. It is worth noting that in the observed hypothetical case of early retirement with minimum conditions of service period, we can see a lower decrement rate (penalization) of pensions after the reform compared with the pre-reform situation. The decrement is now 18.0% for 5 years' early retirement, while it was 20.4% before the reform. This decrement is lower than the actuary one used in the second pillar. However, as regards early retirement with a service period longer than the prescribed minimum, the reform brought an increase in the pension decrement rate. That will lead in these cases to a decrease in the replacement rate of future early retirement pensions in relation to present-day early retirement pensions, unless the service period is increased. For example, in the case of the retirement of a woman 3 years before the statutory limit, with 37 years' service and an average wage, without an added parental service period,

the projected gross replacement rate for a one-pillar pension in 2018 is, pursuant to the earlier legislation, 33.4%. After the reform, it will be 32.4% in 2019 and will fall to 29.7% in 2040.

The replacement rate for one-pillar pensions will decrease in the future, which will have significant implications for minimum pension beneficiaries. The gross replacement rate in the case of a one-pillar pension in 2019 would be 61.9% (the first pension in relation to the last wage) for a hypothetical man with 40 years' service and a lifelong average wage at the level of 60% of the national average wage in Croatia. In 2040 it would be 51.6%. Given the present parameters of the proposed 2018 pension reform, such one-pillar pension will still be more favorable than the two-pillar one. That indicates an anticipated relative deterioration of the material position of minimum pension beneficiaries in relation to the average employee.

Over the next ten years, one-pillar and two-pillar pensions will be determined in similar amounts. It will be difficult for most insured persons to choose which of these two pension types is a more favorable for them. It should be mentioned that the calculation of the first pension (information that will be presented to future retirees in the moment when they have to choose the pension type to receive) will not necessarily give an unambiguous answer as to which pension is more favorable. Namely, the pension indexation rules are different for these two pension types and the same may be expected for resulting rates of adjustment. In regular economic circumstances, the indexation rate will be higher (more favorable) for one-pillar pensions than for two-pillar pensions.¹⁹ Therefore the first two-pillar pension should be somewhat higher than the one-pillar pension in order to be deemed more favorable over a longer period. In the case of equal amounts, one-pillar pensions may be considered more favorable because they are expected to grow faster in the future than two-pillar pensions. Anticipated levels of one-pillar and two-pillar pensions in the future for various wage levels are shown in Figures 18, 19 and 20.

The choice of a more favorable pension (a one-pillar or two-pillar pension) significantly depends on the amount of the wage over the working life, due to the minimum pension, which exists in the first pillar only. The minimum pension in Croatia is defined as the product of the service period and a certain value of pension for each year of service (Box 2). In the case of early retirement, the initial factor (the decrement rate) is applied to the minimum pension, as to all other pensions. For two-pillar beneficiaries, for the period of service after 2002, the amount of the minimum pension which they can receive from the first pillar is decreased by the basic pension factor, that is, by the ratio between the contributions paid to the first pillar in relation to the total contributions (three quarters at this moment). Since no minimum pension is prescribed for second pillar pensions, the institute of minimum pension top-up pensions in the one-pillar system to a larger degree than in the two-pillar system.

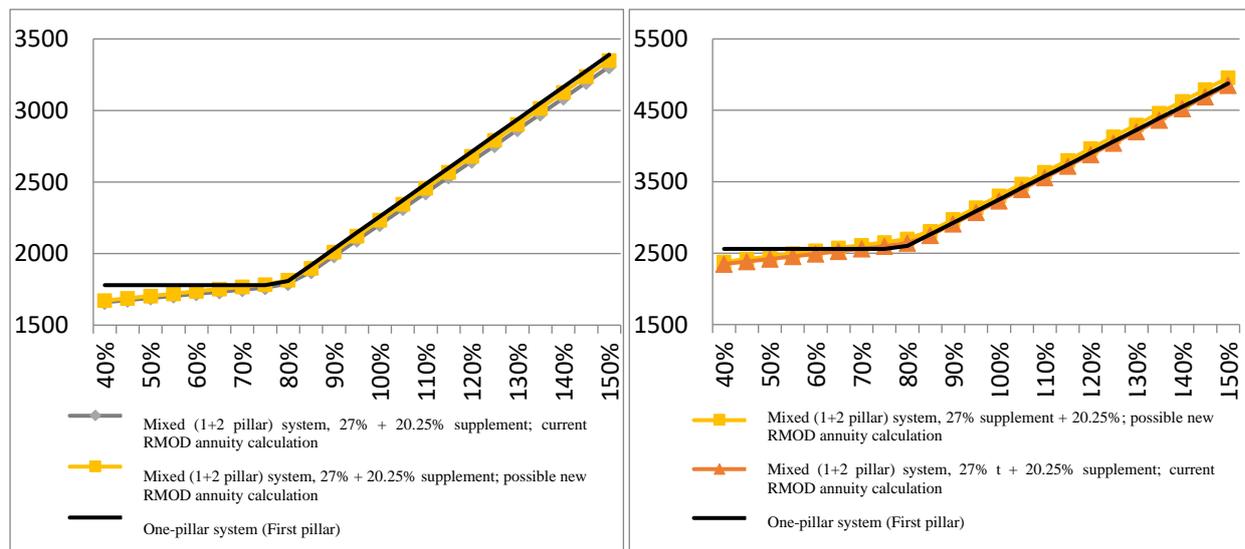
In 2019, after the reform, for insured persons receiving less than 70% of the average wage the one-pillar pension will be unambiguously more favorable, even if the new, more favorable annuity calculation applies for the second pillar pension. Figure 18, left Panel, shows this through the example of a woman with early retirement in 2019, with the minimum conditions of age and service period fulfilled. Figure 20, left Panel, shows the results for a man who retires in 2019 at the statutory age and with 40 years of service.

¹⁹During payment period, the first pillar pension is indexed by wage growth and inflation (70% to wages and 30% to inflation, or vice versa if resulted in a higher rate). However, in the case of two-pillar pensions, the part of the pension from the first pillar is indexed by above rule, while the part of the pension from the second pillar is indexed with inflation rate, which is, in regular economic circumstances lower than wage growth. This is why pensions from the first pillar alone (one-pillar pensions) are expected to have a more favorable indexation rate than two-pillar pensions.

For most beneficiaries insured in both pension pillars who will retire in 2019, the amount of the first pension could be slightly higher for the one-pillar pension than for the two-pillar pension. In the hypothetical case examined above of early retirement for women who fulfilled the first conditions but with an additional service period for one child (Figure 18, Panel a), the first two-pillar pension will be slightly lower than the one-pillar pension regardless whether the current annuity calculation for the second pillar pension is used, or an updated calculation which results in 10% higher pensions from the second pillar. A very similar result is obtained for women in the case of old-age retirement at statutory age.²⁰ In that case it can be expected that in 2019 the vast majority of women will choose payment of a one-pillar pension because its future indexation will be more favorable than the indexation of the two-pillar pension. However, it may also be expected that some women, those receiving high wages who meet the statutory conditions for taking a one-off cash payment in amount of 15% of their pension savings account in the second pillar at the moment of retirement, will nevertheless opt for a two-pillar pension. In that case their second pillar pension will be decreased by that percentage, and so the total pension, that is the replacement rate, will be lower than the one presented on our graphs. For men in the case of old-age retirement at the statutory age (Figure 19, Panel a), a two-pillar pension, subject to the current annuity calculations, will be marginally lower or subject to a new annuity calculation, marginally higher than a one-pillar pension. However, in that case, given the anticipated higher indexation rate of one-pillar pensions, it seems that the majority could chose a one-pillar pension as the more favorable. However, for those with higher wages, who, pursuant to the 2018 reform, are entitled to a one-off cash payment of up to 15% of the saved amount from the second pillar, this opportunity will perhaps prevail and lead them to choose a two-pillar (mixed) pension.

Figure 18: The amount of the first pension in 2019 and 2029 depending on wages throughout working life - a woman, early retirement with the minimum age and service period conditions met, an additional service period for one child, monthly, current prices

a) 2019 (age 57 years 4 months; service period 32 years 4 months) b) 2029 (age 60 years 8 months; service period 35 years)



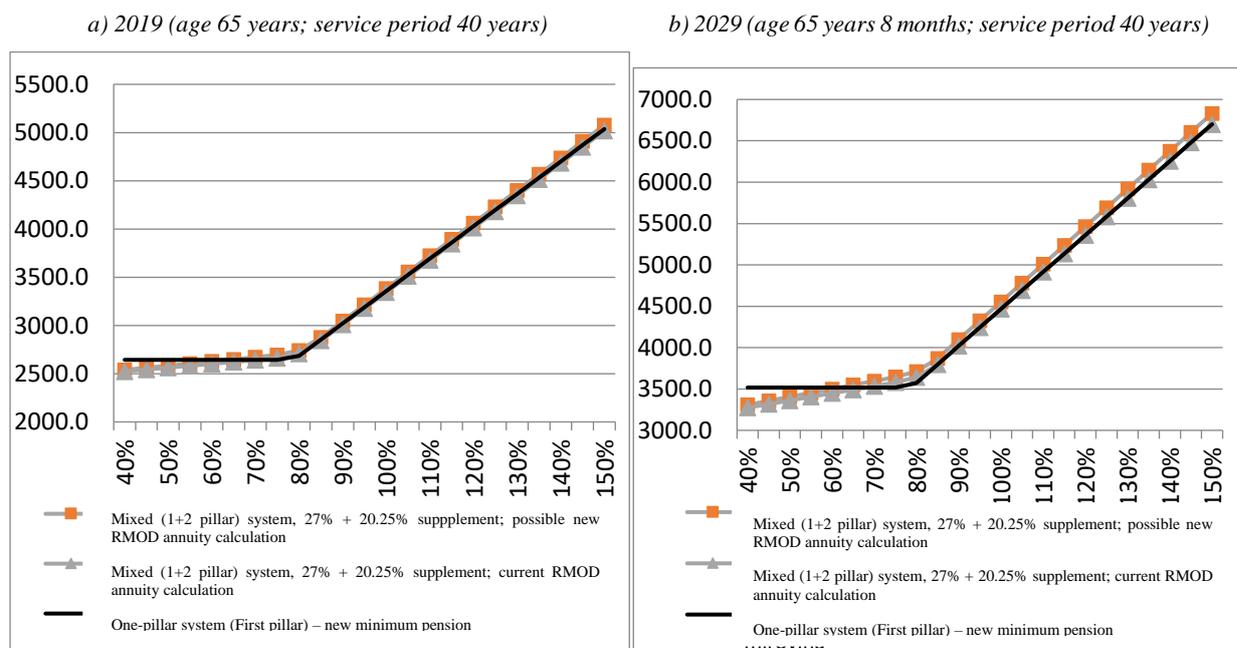
²⁰ The calculations and illustrations may be obtained from the author upon request.

Note: The projections include the actual wage and pension funds' returns up to 2017. The existing RMOD annuity calculations for a second pillar individual pension and the assumed new annuity calculation rules (the existing one increased by 10%) will presumably be corrected in 2026 and 2040. For the period of 2018-2045, projections for inflation, wage growth and pension funds' returns are taken from the European Commission's projections (*Ageing Report 2018*).

Source: Author's projections

These results lead to the conclusion that majority of women insured in both pension pillars will choose a one-pillar pension in the first years of the application of the reform. This is particularly the case for women entitled for additional parental service periods. The same may be expected for minimum pension beneficiaries and those who, due to low pensions, do not meet the conditions for the one-off 15% payment in cash from the second pillar. The situation will be similar for men, although the attractiveness of the one-pillar pension will be slightly lower than for women because men will use the additional parental service period less frequently. Men will probably choose a two-pillar pension more often than women, since they have somewhat higher wages and since more of them will be entitled to a one-off payment from the pension savings account.

Figure 19: The amount of the first pension in 2019 and 2029 depending on wages during the working life - a man, taking old-age retirement at the statutory age with 40 years of service, without an additional parental service period, monthly, current prices



Note: The projections include the actual wage and pension funds' returns up to 2017. The existing RMOD annuity calculations for a second pillar individual pension and the assumed new annuity calculation rules (the existing one increased by 10%) will presumably be corrected in 2026 and 2040. For the period of 2018-2045, projections for inflation, wage growth and pension funds' returns are taken from the European Commission's projections (*Ageing Report 2018*).

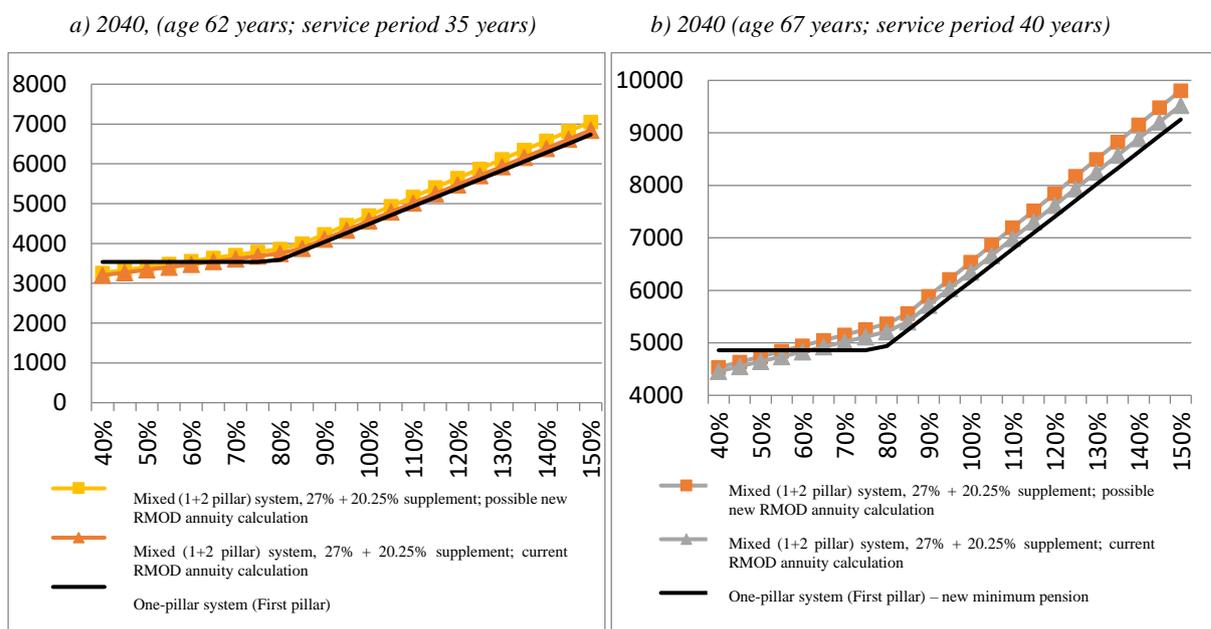
Source: Author's projections

Over time, more and more pensioners are expected to opt for the two-pillar pension. Figures 18 and 19, panel b) which show the projected amount of pensions in 2029 show that in the case of a assumed new annuity calculation of second pillar pensions, the first two-pillar pension could be higher than the first one-pillar pension in the hypothetical cases observed. However, in projection including the current annuity calculation, the first one-pillar pension will remain higher. However, even if the first

two-pillar pension is higher, this does not mean that it is more favorable for a pensioner, because it might turn out that after a certain number of years of payment, the one-pillar pension becomes higher due to the more favorable indexation.²¹ The choice of the more favorable pension type will be additionally more difficult due to the possibility of the one-off payment of part of the second pillar savings. However, as time passes, the attractiveness of the two-pillar pensions should increase, and accordingly in 2040 (Figure 20) the one-pillar pension will be more favorable only for those who used to earn 60% or less of the national average throughout their working life. However, in the case of early retirement (Figure 20, panel a), the projections show the minor advantage of the two-pillar pension. It is lower than in the case of a regular old-age pension (panel b) because the first pillar uses lower pension decrement factors for early retirement than the actuarially neutral factors, which increases the attractiveness of the first pillar pension.

According to a rough estimate, in the first years after the reform approximately 70% of future pensioners who were insured in both mandatory pension pillars could choose one-pillar pensions as the more favorable option, but over time this share would decrease to approximately 50% in 2030, and to below 30% in 2045. The estimate is based on the parameters of the system after the 2018 reform and is sensitive to the projection assumptions, *inter alia* the annuity calculation of second pillar pensions, which will be offered by pension insurance companies, either the existing one (RMOD), or any new private or state-owned company.

Figure 20: The amount of the first pension dependent on wages during working life in 2040 - early retirement with the first conditions met of age and service period, and old-age pension at the statutory age with 40 years of service period, without an additional service period for parents, monthly, current prices



Note: The projections include the actual wage and pension funds' returns up to 2017. The existing RMOD annuity calculations for a second pillar individual pension and the assumed new annuity calculation rules (the existing one increased by 10%) will presumably be corrected in 2026 and 2040. For the period of 2018-2045,

²¹ Our projections taking macroeconomic assumptions from the 2018 Ageing Report and implementing new pension indexation rules, show that in the hypothetical case with new annuity calculation, the initial advantage of two-pillar pensions in 2029 will be lost after 8 years of payments for women and 10 years for men, except for the minimum pensions.

projections for inflation, wage growth and pension funds' returns are taken from the European Commission's projections (*Ageing Report 2018*).

Source: Author's projections

Any future change in key parameters of the system will have an impact on the future choice of the more favorable pension, but it can also change the assessment made in previous years. Namely, all additional advantages which would be related only to the first pillar pensions will be more beneficial for one-pillar pensions than two-pillar pensions. This will then lead to an increased attractiveness of one-pillar pensions. This is what has already happened in cases where a pension decrement rate for early retirement in the first pillar is lower than an actuarial neutral rate applied by the second pillar and in cases without pension decrement for early retirement of long-term insured persons. The same effect has the addition of a service period for mothers (parents) in calculation of the first pillar pension. The possible future introduction of a more favorable indexation for pensions paid from the first pillar would also make the one-pillar pension more attractive compared to the two-pillar pension. Therefore, comparison of the benefit levels for two pension types presented above is subject to a high uncertainty. The choice of the more favorable pension in this environment, given the long pension payment period, will be an extremely difficult decision for every future pensioner and it is difficult to expect that they will be aware of all the possible consequences of their choice.²²

For an estimate of the effects of the reform on pension adequacy (replacement rate), it would be more appropriate to project average replacement rate calculated over for all new pensioners retired in given year, before and after the 2018 reform, not only for the selected hypothetical cases. However, the calculation of the average replacement rate would require careful modeling of the entire pension system, which is beyond the time frame and ambitions of this report. This average growth rate essentially depends on the impact of the reform on the duration of working life of future pensioners and how broadly certain advantages are used, such as the additional service period for parents, pension advantages for Homeland War veterans, extension of service period for certain occupations and similar. The quantitative estimate of these effects requires a much more complex analysis than the one envisaged within this study. The effects of the reform on average pension adequacy will, among other, depend on the type of pension which citizens will choose (early retirement; old-age retirement, pensions for long-term insured persons, survivor's pensions, disability pensions), on the choice between one-pillar and two-pillar pensions, and entitlements to a partial one-off payment of savings from the second pillar. However, we believe that presentation of hypothetical cases provides a rather good basis for conclusions on the possible effects of the 2018 reform on future pension adequacy in Croatia.

The 2018 reform has not significantly increased incentives for prolongation of working life and it is hard to expect that future pension adequacy would increase on that basis. Although the effects of the reform on the duration of working life are difficult to predict, because some elements of the reform are conducive to staying longer in employment, but others push in the opposite direction, it seems that the long-term effect will be small, and that a vast space still exists for early retirement. The acceleration of the increase in the statutory retirement age will probably also accelerate the increase in the contribution period. However, after the end of the transition period, after 2033, there will be no new incentives for extension of working life, while those in place are rather weak. The spread of the legal possibility to work and receive full pension will probably result in an increase in the length of contribution period, but it will increase after retirement, and with a probably mild overall effect. An increase in the pension benefit in the case of later retirement is a clear incentive for longer work.

²²For more on the anticipated consequences of this for the further development of the pension system and on policy recommendations, see parts 3.4 and 5.2.

However, numerous options for retirement before the statutory age still exist. One option is for long-term insured persons who can already receive a pension without any decrement at 60 years of age (61 years after 2027). Despite the mild tightening of conditions to be qualified for long-term insured persons in terms of the contribution period (contribution period does not take into account extended service period and similar additions to the service period anymore), this will have a mild impact overall on the incentives for increasing duration of working life. Although the additional parental service period does not have any impact on the entitlement to a pension, it has an impact on the amount of the pension and may also compensate for part of the loss due to the decrement in the case of early retirement, and therefore be conducive to earlier retirement. The potentially strongest motivation aimed at dissimulating early retirement is the degree of pension decrement (penalization). However, the effects of the reform are doubtful in this respect.

The effects of the new system of penalization of early retirement on incentives for prolongation of working life could be neglectable or even negative. The pension decrement in the case of early retirement is set at 0.3% for each month of early retirement. Before the reform, for 2019, this decrement rate was planned for women with a service period between 35 years and 3 months and 37 years, and for men with a service period between 37 and 38 years while the decrement rate was lower (milder) for those with a longer service period and higher (more stringent) for those with a shorter service period.²³ According to the HZMO's data, the average service period of new beneficiaries of early old-age retirement in the first nine months of 2018 was 36 years and 3 months for women and 37 years and 11 months for men. This would mean that the new system of pension decrements could on average be almost the same as before the reform, that is, it is not on average more stringent than the previous system. However, it could therefore be conducive to early retirement for those with a shorter service period and somewhat dissimulating for those with a longer service period. Furthermore, the 0.3% monthly decrement for first pillar pensions, that is, 3.6% annually, is in most cases lower (more lenient) than the actuary decrement used by the RMOD when calculating second pillar pensions. Although the difference is not large, it becomes more visible in the case of retirement at an older age.²⁴ Increase in the first pillar pension by 0.34% for each month of retirement after the statutory age is lower than increase in the second pillar pension. Also, in annuity calculations the RMOD takes the years of age reached into account (it does not include months), which is another although relatively minor factor making the first pillar pension decrement milder than decrement used in the second pillar. All this indicates that the reform failed to create sufficient incentives for prolongation of working life, which could result in a lack of its positive effect on pension adequacy.

3.2 Fiscal effects of the reform

The high number of changes brought by the reform of 2018 requires a comprehensive analysis of fiscal effects, specifically the impact on the public pension system's revenues and expenditures. The Labor and Pension System Ministry and the Croatian Health Insurance Institute have conscientiously taken on this task and prepared a fiscal impact assessment up to 2040 for all key changes

²³ The decrement rate before the reform was decreasing with the contribution period with the scale of 0,34%; 0,32%, 0,30%, 0,25%, 0,15%, and 0,10% for each month of retirement before statutory age.

²⁴ According to the annuity calculations, for those retiring at 60 years of age, pension will be by 18.5 % lower than if they retired at 65 year of age (in the first pillar, after the reform, 18%). The pension decrement in the second pillar in the case of the retirement at 62 years of age in relation to the pension received at 65 years of age is 11.9% (10.8 % in the first pillar).

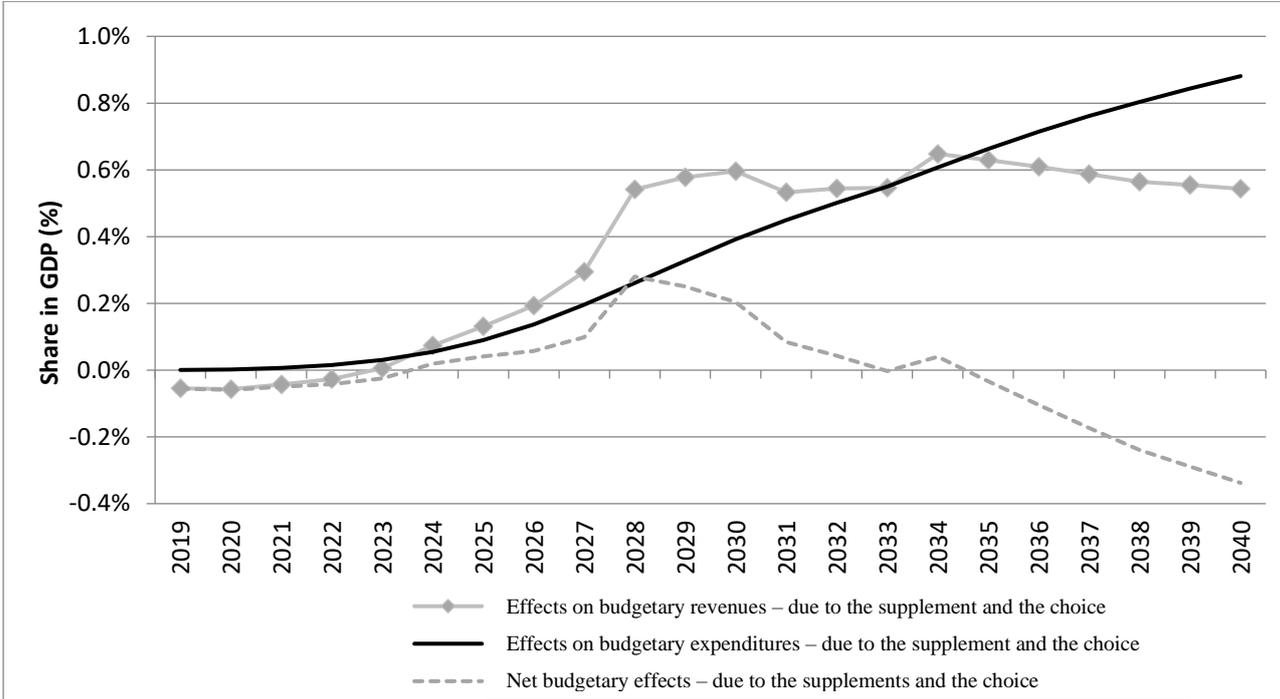
brought by reform. Even though it would be beneficial to view fiscal cost trends in later years and complete the computations with an estimate of the implicit pension debt trends,²⁵ the presented official projections up to 2040 clearly indicate the key fiscal effects of the 2018 reform.

Extension of the pension supplements to retirees mandatory insured in both pension pillars and allowing for a choice between one-pillar and two-pillar pensions are measures that will have significant long-term fiscal implications. Figure 21 shows that public pension system's revenues and expenditures are expected to grow gradually due to the reform, wherein peak effect on revenues is anticipated at around 2034, after which it will gradually decline, while effect on expenditures will be increasing throughout the period under observation until 2040. Namely, due to the relatively small number of "mandatory two-pillar beneficiaries" who will retire in the next 7 to 8 years, the fiscal impact of their retirement according to new regulations will be relatively modest. Pursuant to regulation before the reform, "voluntary two-pillar beneficiaries" could have returned to the first pillar and received a 27% supplement, and transfer their savings to the state budget, which a significant majority of them did. Other option for them was to receive two-pillar pension but without the supplement. After the reform, they can still choose between such a return to one-pillar pension and two-pillar pensions. But now, if they choose two-pillar pensions, they are entitled to a 27% supplement for the period prior to the establishment of the second pillar and 20.25% for the period thereafter, and their savings in this case will not be paid into the state budget, but rather into a pension insurance company. Since "voluntary two-pillar participants" have higher-than-average salaries, they will opt for the two-pillar pension in a somewhat higher proportion than the "mandatory two-pillar participants" who have got the same choice in the reform. Thus, their savings will no longer be paid into the budget as was the case before the reform, so budgetary revenues will decline by almost HRK 300 million already in 2019, and even more in subsequent years. But at the same time the first "mandatory two-pillar beneficiaries" will emerge, and in the initial years they will opt for one-pillar pensions in a high percentage and transfer funds into the budget, thereby reducing this initial revenue shortfall.²⁶ Over time, the initial deficit due to "voluntary two-pillar beneficiaries" will be replaced by increased revenues due to the continually growing number of "mandatory two-pillar beneficiaries" who will choose one-pillar pensions.

²⁵ On the implicit pension debt see the example in Holzmann, Palacios and Zvinieni (2004) "Implicit pension debt: issues, measurement and scope in international perspective," Social Protection Discussion Paper no. 403. Washington, DC: World Bank (<http://documents.worldbank.org/curated/en/947731468762352221/Implicit-pension-debt-issues-measurement-and-scope-in-international-perspective>). A variant of pension debt estimation was recently introduced by Eurostat in the form of accrued-to-date liabilities (ADL) with data for 2015 for most of the EU countries.

²⁶ The Croatian Pension Insurance Institute's budget is formally a part of the central state budget.

Figure 21: Fiscal impacts of the 2018 reform due to extension of the pension supplement and allowing the choice of pensions (annual change in revenues and expenditures in comparison to the situation without reform, as % of GDP)



Source: Worksheets of the Croatian Pension Insurance Institute.

The reform’s effects on future budgetary revenue trends will be strongly contingent upon the total number of two-pillar participants who will retire and opt for one-pillar pensions. This number depends on impact of the reform on the effective retirement age, as well as the attractiveness of the two-pillar pension in relation to the one-pillar pension. According to the projections, between 2027 and 2033, the inflow of new retirees will slow down due to the raised statutory retirement age for both women and men, while second-pillar pensions will become increasingly attractive in the meantime, so the growth of transfers from the second to the first pillar will cease and budgetary revenues will decline. It is assumed that by 2040 over 60% of new retirees will choose two-pillar old-age pensions. As to budgetary expenditures, they will increase to pay for the pension supplement that is in order to disburse whole pensions increased by the full supplements for all who chose one-pillar pensions, and due to disbursement of first-pillar pension supplements for those who choose second-pillar pensions. As the number of second-pillar participants who retire grows, so too will expenditures grow. The net impact of extension of the right to supplements and allowing a choice between one-pillar and two pillar pension will be slightly negative in the initial years, tangibly positive between 2027 and 2033 (during the time when retirement age is raised for all) with its peak of approximately 0.3% of GDP in 2028, but thereafter a period of increasingly negative net effects will ensue, to 0.35% of GDP in 2040. This negative trend should be expected to continue in subsequent years.

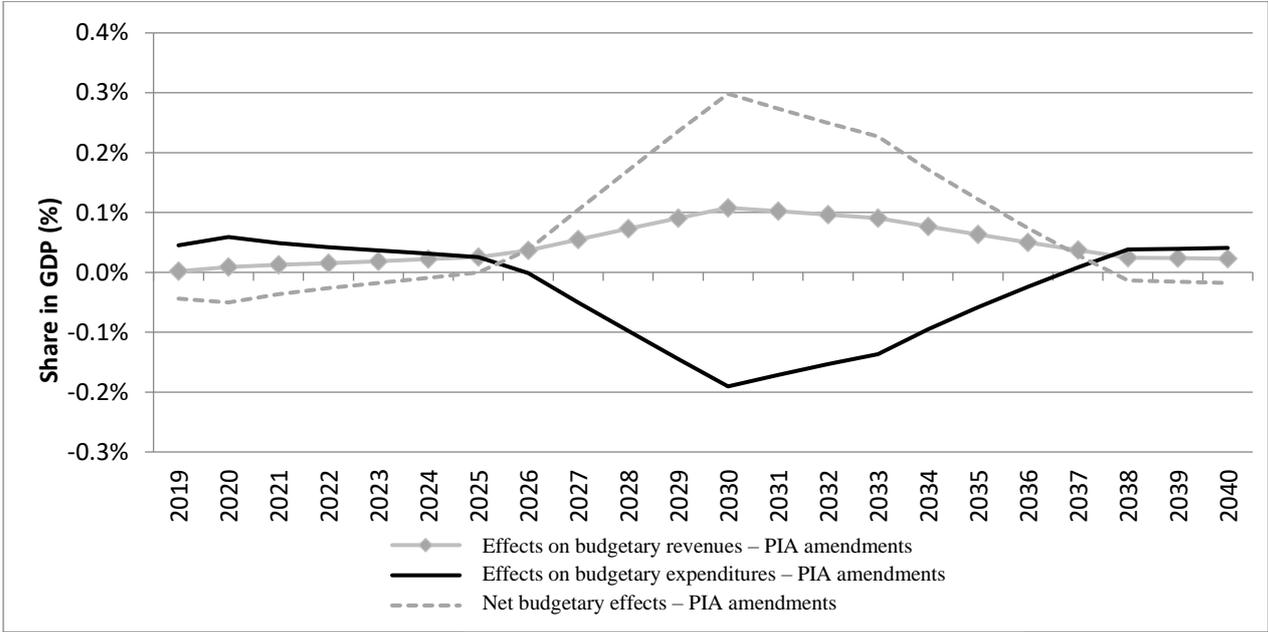
In essence, the cost of extending the right to the pension supplements to beneficiaries insured in both pillars in the first roughly 20 years will be financed by the transfer of saved funds from the second pillar into the state budget. Thereafter the net budgetary costs will grow boisterously due to the anticipated reduction of new transfers into the budget. Even though the total annual cash flow (current revenues minus current expenditures) will be positive until 2035 (except for moderately negative flows in the first 5-6 years of the reform) due to the pension supplement extension, new liabilities will be created, and they must be financed. It may be said that the cost of this component of

the reform has been passed forward to the future. For it is clear that the extension of the supplement incurs costs and that financing sources must be secured. Financing of the supplements will initially be secured from several sources (budgetary revenues, cost savings based on other reform segments and revenues from the transfer of second-pillar savings), but over time the central budget will bear the predominant financing burden. Projected trends will depend considerably on the selection of one-pillar or two-pillar pensions by future retirees, and this will in turn depend significantly on return rates and the success of work of the second pension pillar. In case of second-pillar returns higher than those expected by projections, it may occur that growing numbers of beneficiaries will opt for a two-pillar pensions when given a choice, which will then reduce budgetary revenues and expenditures, and the opposite in case of lower-than-expected returns.

Projections show that the net fiscal effects of changes brought by the Pension Insurance Act in the initial years of application will be moderately negative, then noticeably positive between 2027 and 2038, and then again slightly negative thereafter (Figure 22). Among the numerous changes brought by the Pension Insurance Act (PIA), the accelerated rise of the statutory retirement age will have the largest fiscal impact. Due to a slowdown in the inflow of new retirees in the transition period and a longer working life and consequently higher pension contributions paid to the budget, this effect will be positive in that period. But after that, at the end of the 2030s, the positive fiscal effects will practically disappear. The remaining measures incorporated into the projection of the impact of changes of the law are: i) new decrement rate in case of early retirement of 0.3% per month (moderately positive net budgetary effect); ii) higher bonus in case of later retirement of 0.34% per month (negligible net fiscal effect); iii) increase in the minimum pension of 3.13% (negative net effect); iv) changes in the criteria for the long-time insured who have right to early retirement without decrement (moderately positive net effect); v) expansion of rights to work while receiving a pension (slightly negative fiscal effect); vi) simplification of the pension indexation formula (slightly negative effect) vi) additional contribution period of 6 months per child applied in determination of pension benefit (sizable and increasingly negative net fiscal effect).

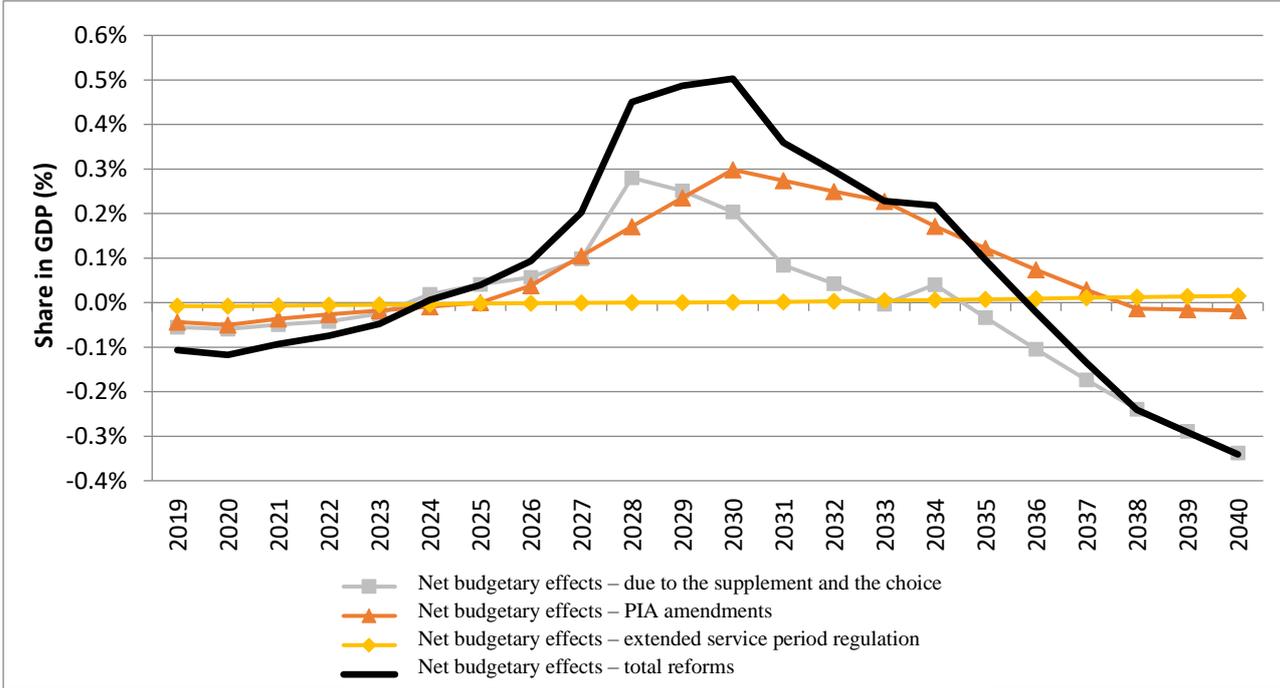
Projections show that the net fiscal effect of the entire 2018 pension reform package in the initial years may be moderately negative, then turned to the positive zone and grow until about 2030, after which expenditures will continue to grow, and the net fiscal effect will become negative in 2036 with a tendency for the negative effects to increase. Figure 23 shows how these trends were influenced by amendments to the PIA, extension of the right to the pension supplements, choice of the pension type, and the new law on insurance with extended service period. Since there were little substantial changes in the system of extended service period, the fiscal effects of these changes are small.

Figure 22: Fiscal impact the 2018 reform due to amendments to the Pension Insurance Act (annual change in revenues and expenditures in comparison to the status prior to reform, as % of GDP)



Source: Worksheets of the Croatian Pension Insurance Institute.

Figure 23: Net fiscal impact of 2018 reform by key reform elements (as % of GDP)

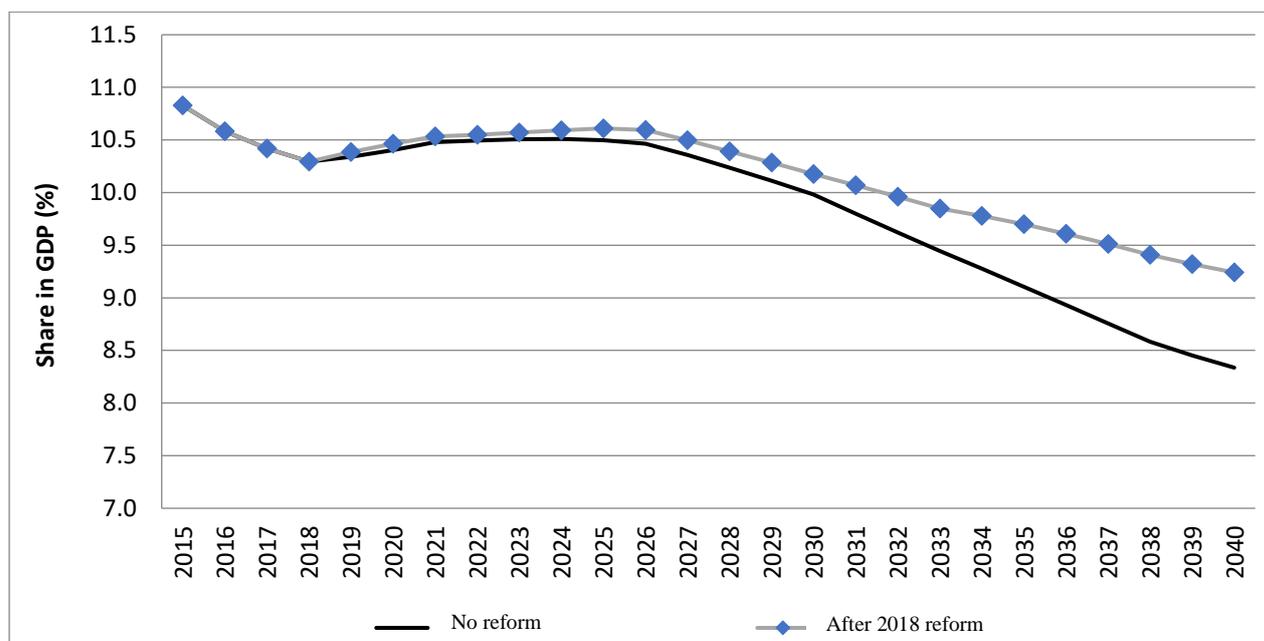


Source: Worksheets of the Croatian Pension Insurance Institute.

The fiscal effects of the 2018 reform does not constitute a threat to the pension system’s fiscal sustainability in the medium term. Even after including the impact of the 2018 reform, the estimate of total expenditures on pensions measured as a share of GDP indicates their decline until 2040, from approximately 10.5% in 2017 to 9.2% in 2040 (Figure 24).

However, the projected fiscal impact of the reform at the end of the projection horizon, after 2035, indicates potentially risky fiscal trends over the long term and the need for further reforms. Figures 21-23 show loss of positive fiscal effects of the PIA in this period, and a continuous growth of fiscal costs due to extension of the pension supplements and pension plan choice. The new reform undertakings that would influence these trends should be conceived within the framework of the National Development Strategy for the 2020-2030 period.

Figure 24: Expenditure projection for first-pillar pensions – before and after the reform (as % of GDP)



Source: *The 2018 Ageing Report* for public expenditures prior to reforms; Worksheets of the Croatian Pension Insurance Institute for additional expenditures tied to the 2018 reform.

An estimate of the change in implicit pension debt due to the 2018 pension reform would ideally complement the indicators on current fiscal effects, but such an estimate has not, unfortunately, been prepared. The implicit pension debt is an indicator of current value of assumed liabilities for payment of future pensions. For example, by assuming savings from the second pillar, a liability to disburse life-long pensions according to the rules which apply in the first pillar appears in the state budget. In the year in which the transfer of savings is conducted, the budget will have a current surplus, because the amount of savings is higher than the added pension liabilities in that year. But the payment liability extends over a long period. The estimate of the current value of newly-emergent liabilities represents the increase in the implicit pension debt. Even though at the end of November 2018 the Croatian Bureau of Statistics released an estimate of pension rights according the Eurostat methodology (ADL estimate) which in the case of first-pillar pension insurance was HRK 807 billion at the end of 2015 (238% of GDP), additional computations of the impact of reforms on these rights were not done. However, by applying a somewhat different estimate model, we have independently estimated the change in future liabilities due to a part of the pension reform. The impact of extension of rights to the pension supplement and the option for using pensions according to the rules only for the first pillar was estimated. It has been estimated that in 2040 the liabilities for future first-pillar pension payments will be over 11% of GDP based on all preceding takeovers of second-pillar pension

savings.²⁷ Thus, even though the total cumulative net fiscal impact of extension of the supplement and allowing choice of pension type will be close to neutral up to 2040, considerable liabilities will remain in that year. Considerable future liabilities were created, i.e., the implicit debt increased, due to other measures which at first glance had a limited fiscal impact in a single year but were significant over the long run. This above all pertains to the added contribution period for parenthood and the increased minimum pension. It would certainly be useful to prepare an estimate of the implicit debt for pensions before and after the reform, either by applying the ADL calculation or by using some other computation model.

3.3 Other expected effects of the reform

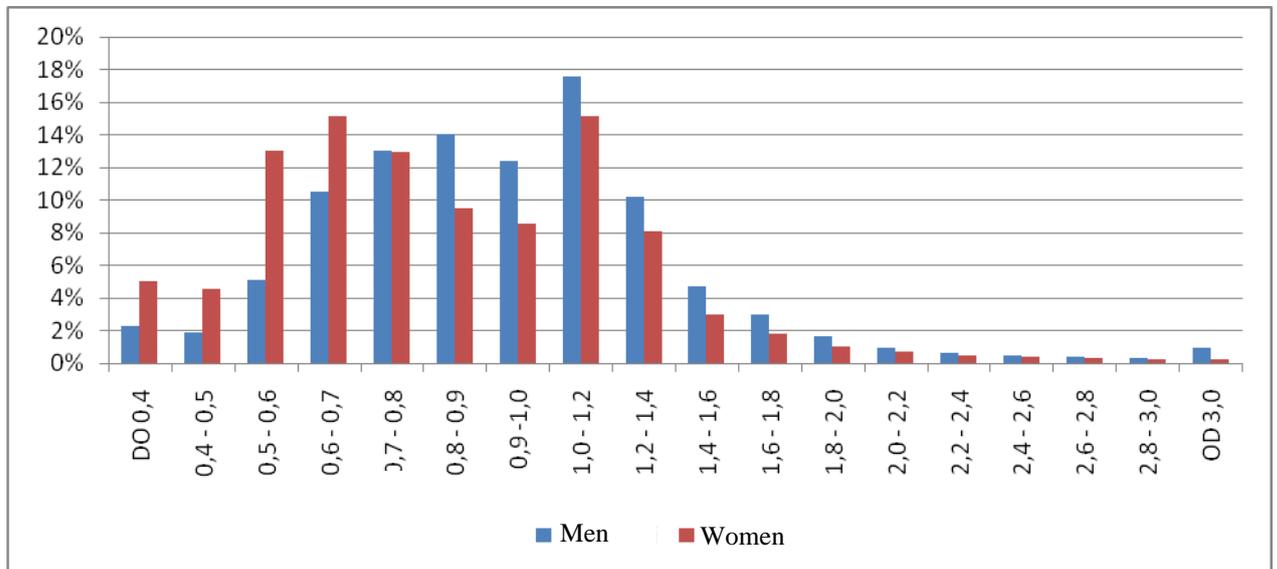
Increase in the minimum pension may lead to a notable increase in the number of its beneficiaries. The distribution of average value points for new 2017 pensioners, i.e. the distribution of their average lifelong wage expressed relative to the average wage in Croatia (Figure 25), will help us to assess the possible effect of increasing the unit amount of the minimum pension by 3.13%. Before the reform, the minimum pension was received by all those whose average value point was lower than 0.7635; after the reform, it will be received by all those who are below 0.7874. Based on the distribution as presented below, we estimate that approximately 36% of new pensioners were eligible to receive the minimum pension before the reform, whereas approximately 40% of new pensioners would be eligible to receive it after the reform.

Increased coverage of the minimum pension will reduce the pension gender gap, but will also discourage the payment of pension contributions, with an uncertain impact on the level of pensioner poverty. Due to differences in average value points for men and women, it follows that – after the reform – about 50% of women and 30% of men will receive the minimum pension. Lower average value points among women as a result of their lower wages warrant their larger coverage by the minimum pension. Since minimum pension beneficiaries will find the one-pillar pension more favorable than the two-pillar pension, we expect that women in general will opt for the one-pillar pension at a much higher rate. Increasing the unit amount of the minimum pension will have positive effects on the adequacy of pensions for minimum wage earners. However, the effect on pensioner poverty is not clear because being a minimum wage earner does not necessarily mean being poor. These people or their household members may also have other sources of income. Anyway, positive effect on the poorest pensioners is likely to be found to some extent. On the other hand, the minimum pension in its present form discourages people from reporting the full amounts of their wages in their tax returns in those sectors and with those employers who otherwise tend to declare lower wages or pay a part of wages as cash-in-hand, which is more often the case in the construction sector, hospitality industry, personal services, etc. Specifically, all insured individuals whose gross wage during their working life amounted

²⁷ Two remarks are noteworthy in this estimate. First, the computation of future liabilities did not include liabilities to pay pensions for beneficiaries who could exercise the right to a pension increased by the supplement in the coming years in compliance with contributions paid up to that point, but rather only liabilities for retirees at the time. This means that the narrowest possible notion of implicit debt was applied, and it is noted here only to illustrate the need to observe reforms in light of the creation of future liabilities, and not only through current pension system trends. The second remark pertains to the use of the discount factor, which is equal to the rate of anticipated nominal GDP growth in future years according to projections from the *Ageing Report 2018*. This rate in these projections was slightly less than 4% and less than the discount factor which Eurostat uses when computing ADL (5% in the basic variant).

to less than 78.7% of the average gross wage in Croatia will now receive an identical pension for identical years of service.

Figure 25: Distribution of average value points for new pensioners in 2017



Note: The table covers new old-age pension beneficiaries in 2017, including early retirement pension beneficiaries, but excluding pension beneficiaries under international agreements. The average value point is the average ratio of individual wage to the average wage in Croatia throughout the contributory period.

Source: Worksheets of the Croatian Pension Institute.

The option to withdraw 15% of savings accumulated under the second pillar as a one-off payment at the time of retirement for those who opt for the two-pillar pension scheme could be an important factor for the choice of pension type, but this option is limited only to those with relatively high pensions. Specifically, one-off payment is an option only for those whose “basic old-age pension or basic early retirement pension under the pay-as-you-go system is 15% higher than the minimum pension according to the Pension Insurance Act.” In the eligibility assessment, the basic pension probably includes the supplement, although the Act makes no clear reference thereto. If the basic pension includes the pension supplement, it follows that persons eligible for one-off payment will be those with average value points amounting to slightly above 1.0. Based on these calculations and the distribution of average value points in 2017, we estimate that some 35-40% of pensioners (two-pillar participants) will be eligible for such one-off payment next few years. Our calculations also show that the required average value points will rise in the future and will reach 1.25 in 2040. If distribution of value points remains the same as in 2017 (Figure 25), that would mean that only around 20% of pensioners, those with the highest wages during the working career, would be entitled to one-off payment in 2040.

The option to one-off withdrawal of 15% of savings accumulated under the second pillar at the moment of retirement will decrease future second-pillar pension benefits and is contrary to the proclaimed pension policy objective to improve pension adequacy. The problem of myopia (short-sightedness) when making decisions with long-term consequences is well-known in the literature. Short-term benefits are very appealing, notwithstanding long-term risks. This is why public policies try to address that problem. The option of one-off payment may have some short-term justification in terms of building trust in the second pillar in a situation where most of the two-pillar participants are expected to choose the one-pillar pension. However, the question of confidence in the second pillar needs to be

solved by other tools and measures. Therefore, consideration should be given to abolishing one-off payment with a view to improving pension adequacy, regardless of the fact that eligibility for this option will only be limited to those with higher pensions and that it will probably have no bearing on old-age poverty.²⁸ Yet, it will have bearing on public pressures for budget interventions to support the pension system because of low pensions. Notwithstanding the decision on that matter, as soon as this option comes to be implemented, statistical indicators on pensions should be clearly communicated to highlight the effect of the one-off payment on the average pension level by distinguishing full pensions from those where one-off payments were made.

The effects on parenthood decisions of increasing contribution period in pension calculations by adding 6 months for each child will be marginal, although they may signal the government's care for parents. By design, this measure shows that it is much less of a pronatalist incentive than a sort of compensation for income lost as a result of parenthood. As a consequence of supporting parents by adding to their contribution period, an increase in their pension levels will depend on their wage levels during their working lives. Those with higher wages will receive higher increase in pension for each child. Also, those who opt for the one-pillar pension will see a higher increase in their pension levels than those with two-pillar pensions. Those who settle for early retirement will receive less than those who choose to wait for full retirement age. Stronger pronatalist effects would surely be achieved by supporting parents at the time when they are making their decision about parenthood or when they incur additional costs to raise their children. Still, this measure may reduce some of the gender pension gap because it will predominantly be used by women.

The pension supplement rate on the first pillar pension for pensioners who opt for the two-pillar pension is 20.25% for their insured period after January 1, 2002, which is a compromise solution that brings down fiscal costs but lacks any appropriate grounding. This percentage has been derived by applying the basic pension factor to the 27% supplement rate, which is granted to all other pensioners. However, the basic pension factor is already applied when calculating the basic pension (see Box 2), which means that this factor is applied twice when calculating the pension plus the supplement, for which there is no reason whatsoever. This creates a situation where first-pillar pensions differ depending on whether someone has opted for the one-pillar or two-pillar pension scheme, and this difference is greater than that in paid-in contributions.²⁹ However, such a solution is more cost-efficient from the budget perspective.

Even after the reform, there remains substantial room and sufficient motives to retire before statutory retirement age. In Croatia, early retirement is possible 5 years prior to the statutory retirement age, subject to relatively generous years-of-service requirements, and the old-age pension can be used by those with long contributory periods as soon as they reach 60 years of age (61 years from 2027) and 41 years of service without any reduction in benefits. While there are some EU countries whose pension

²⁸ One should note, however, that pensioners with short careers and relatively high wages in that period will be entitled for making a one-off withdrawal in spite of their low pension benefits in absolute terms. Conditions for one-off withdrawal are, *de facto*, related to the average value point (i.e. average wage) and not to the pension benefit level. In general, these two things are correlated, but the career length is also important, and it is not taken into account in entitlement conditions in the current regulation.

²⁹ To illustrate, we can compare pension amounts for two persons with identical careers for the contributory period after January 1, 2002, where both persons were insured under both pillars. The person who chose the one-pillar pension will receive the full pension amount increased by a 27% supplement, whereas the person who opted for the two-pillar pension will receive a basic pension equal to $\frac{3}{4}$ of the full pension amount (which corresponds exactly to the payment of $\frac{3}{4}$ of total pension contributions). However, on such reduced basic pension, he/she will receive a supplement of $27\% \cdot \frac{3}{4}$ – i.e. 20.25% – which means that his/her basic pension together with the supplement will amount to 71% of the full pension amount received by the other person, although he/she paid 75% of his/her contributions for that period into the first pillar.

systems recognize the status of long-term contributors who are eligible for early retirement without benefit reduction (apart from Croatia, this option is offered by another six EU countries), their retirement age and years-of-service requirements are much more stringent. In Germany, for instance, early retirement is possible at the age 63 and with 45 years of service. In Portugal, it is possible to retire at the age of 60, but with 46 years of service. The Netherlands requires 50 years of service if one wishes to retire before the age of 65.5. Croatia is most comparable to Greece, where long-term contributors may retire at the age of 62 and with 40 years of service. Similarly, many countries have limited the possibility of early retirement to two or three years prior to the statutory retirement age (Germany, Italy, Belgium, the Czech Republic, Finland), and some do not even offer this option (Ireland, the Netherlands, the UK, Poland and Hungary, where the latter two countries have the statutory retirement age lower than Croatia). As already shown, the new pension decrement (penalty) factor in case of early retirement has been set below the actuarially neutral level and is not much more stringent than that used in the earlier. Given short years of service and low pension adequacy in Croatia, the early retirement criteria will definitely have to be tightened in future.

A number of changes in the third-pillar legislation will have questionable effects on the attractiveness of its use as an old-age savings tool. Although the possibility of pension payments (annuity provision) has been extended to insurance companies and the ceiling amount for the payment of provisional benefits has been somewhat increased (accelerated withdrawal of up to HRK 100,000, but over a minimum of 5 years), there are several factors which restrict the disbursement of funds payment and it seems that they may discourage individual participation in the third pillar. Thus, it is no longer possible to disburse the total amount of accumulated savings if such sum is lower than HRK 10,000, and third-pillar pension benefits can now be used starting from the age of 55 rather than 50 as earlier. While both of these measures may be justified in their attempt to establish the third-pillar as part of the pension system designed to secure old-age funding over a longer period, the question is whether this was the right course of action in a stage where the third pillar is still relatively underdeveloped. The effects of these changes will need to be followed up. In case the development of the third pillar slackens, new measures will have to be designed to reinforce it.

The Mandatory Pension Insurance Funds Act brings a number of novelties, but it has not introduced any substantial changes in the way the second pillar works in the accumulation phase. Fees for fund management companies have been reduced, with additional restrictions for the largest companies; the limits on certain types of investment have been expanded and new types of investment have been allowed; younger insured individuals are, by default, assigned to higher-risk fund categories; finally, additional provisions have been introduced to regulate conflict of interest. It is unclear whether these changes will suffice to ensure stronger market competition among funds, the entry of new funds to the market and increase in fund returns.

Amendments to the Pension Insurance Companies Act bring several significant changes that will bear on the market of pension payments (annuity provision) from the second and third pillars. These primarily include a new indexation of second-pillar pensions and the possibility for the HZMO to establish its own pension insurance company and organize the payment of pensions from funded pillars. Of particular importance is the decision that pension indexation should only be pegged to inflation rather than both inflation and wages, as it was before, which will improve risk management. Investment possibilities have been expanded, while fund manager fees have been limited and changed. These changes may lead to some growth in pension funds' returns. The reform has opened the possibility for the Croatian Pension Insurance Institute to establish its own pension insurance company, which is announced to happen in a short while. However, it is disputable whether the key institution of the public PAYG pension system should engage in the second-pillar annuity payment business. Firstly, the payment of annuities is a complex insurance service and the question is whether

such specific skills should be built in an institution which operates as part of the public PAYG system, especially in circumstance where the development of the second pillar was partly motivated by the efforts to reduce political influence on that component of the pension system. Secondly, the question is whether it will be possible to ensure fair market competition between one public and one private pension insurance company (or more private companies in future) and avoid the spillover of operating costs to the parent institution, i.e. the HZMO, in order to show that the public company is more cost-efficient. There also remains the question of conflict of interest when it comes to the public company's investment activities. Political influence on the public company's operations could be significant despite control by the Croatian Financial Services Supervisory Agency (HANFA).

Opening additional room for individuals to work while receiving pension is a sound move in circumstances where the working life is short, and many industries suffer from labor shortages. However, the effects of these reform measures on the labor market and retirement decisions should be analyzed with due care and, possibly, corrected if it turns out that they encourage earlier retirement or expose the working-age population to unfair competition. This problem is particularly acute when it comes to early retirement with the possibility to work up to half the full-time hours. Especially this is the case of military and police personnel who retire very early under favorable conditions, and now they can continue to work full-time, while at the same time receiving half of their pension benefits, which is a practice much more favorable than that in most European countries.

3.4 Pension reform in the context of the long-term development of the pension system

The effects of the reform on pension adequacy and pension system sustainability seem to be favorable in the short run. Indeed, it has resolved the problem of a significant pension gap for mandatory second-pillar beneficiaries, which would occur if nothing had been done about the pension supplement. This will enhance pension adequacy compared to the situation projected under the no-reform scenario. Accelerating the rise of the statutory retirement age will probably fuel a longer working life, especially for women who will also be subject to increased minimum years of service for early retirement. This will also lead to a longer contributory period and delayed retirement. As a result of the foregoing, and thanks to the option to return to the first pillar at the time of retirement (i.e. to choose one-pillar pension) and transfer savings from the second pillar to the state budget, the reform will incur very low fiscal costs in its initial years and, in the medium term, it will even generate significant budget surpluses.

In the long run, however, the 2018 reform will fail to stop the further decline of pension adequacy, its fiscal costs will grow, and it will increase implicit pension debt and potentially weaken confidence in the existing pension system. The presented adequacy and fiscal cost projections show that there will be problems over the long haul. Furthermore, opening the choice between the one-pillar and two pillar pension schemes has a number of potential negative implications for the development of the pension system. One of them pertains to the public focus on the choice of the more advantageous pension in individual cases. Such a judgment will be made more difficult by the supplement model which results in similar amounts of both pension types for most of the future pensioners. In that context, the amount of the first pension will not be completely relevant to assessing which pension is more favorable due to different pension indexation outcomes for these two pension types. Each subsequent change in first-pillar indexation (or, generally, all measures that will only bear on the amount of the first-pillar pension, but not on that under the second pillar) will also affect all those

who will have chosen their pension type earlier. Constant comparisons and calculations of different alternatives whose outcomes will change over time are not good for the stability and transparency of the pension system. This will create pressure to rectify unexpected outcomes. All this may turn the focus of action away from the key objective of enhancing the level of pension adequacy and toward comparing pensions between different groups and generations of pensioners.

Differences in the structure of pensioners who will opt for one or the other pension type may compromise the integrity of the existing pension. Based on the presented projections, we can anticipate that the first-pillar pension will be chosen by people of less means (who received lower wages during their working and will receive lower pension benefits). Much more often than not, they will include women and persons going into early retirement. Two-pillar pensions could mostly be chosen by people who earned above-average wages during their working. In addition, these persons will have the option to withdraw 15% of their second-pillar savings by way of a one-off payment. This will certainly raise questions about the purpose of the second pillar if the returns it has generated benefit only wealthier individuals who are, on top of that, entitled to one-off payment at the time of their retirement. This could sow discord among future pensioners who would have divergent interests around future reforms. Confidence in such a system may also be undermined due the fact that everyone bears the transition cost of introducing the second pillar while its benefits can only be enjoyed by those with higher pensions.

Offering a choice between pension types is a risky reform option. In the long run, however, it may undermine the system, which is also suggested by the findings of a pension system analysis made within the EU technical assistance framework. The EU-financed study carried out as part of the European Commission's technical assistance initiative known as the Structural Reform Support Service (SRSS) addressed the development of Croatia's pension system, with special emphasis on the mandatory funded pension scheme.³⁰ The key highlights of this important study are presented in Annex III. The study splendidly identifies the challenges facing the development of the second and third pension pillars in Croatia and their correlation with the first pillar. The study suggests giving up the option of choice and expanding the 27% supplement to cover all insured individuals. Accordingly, the solution implemented under the 2018 reform can perhaps be understood as a temporary change in fiscally challenging times but thought should definitely be given to different options for further development of the pension system. These options will be considered for the National Development Strategy.

³⁰Beier Research & Edward Palmer Consulting (2018), "Fourth and Final Report: Proposals for reform of the Croatian pension system with special emphasis on its 2nd and 3rd pillar."

4 Assessment of the main challenges and opportunities for Croatia

- **Based on the earlier discussion, the key challenges can be identified as follows:**

- i) **Low pension adequacy**

- Current and future pension adequacy in Croatia is relatively low along all of the three dimensions analyzed in the *Pension Adequacy Report 2018*: poverty among the elderly population is relatively high, the replacement rate is low, and working life is short. The main challenge in the pension reform area is still the need to stop negative trends and improve pension adequacy.

- ii) **Stabilization of the existing multi-pillar pension system design**

- The present concept of the pension system organized in three pillars allows for increasing pension adequacy and ensured fiscal sustainability, but to achieve this, efforts are needed to resolve identified imbalances, build confidence in the system's conceptual solutions, communicate its advantages and opportunities, and eliminate constant threats of drastic changes in the system's design, such as abolishing the second pillar.

- iii) **Short working life**

- Not only do short years of service compromise the system's fiscal sustainability due to a short contributory period, they also impair pension adequacy and undermine the system's stability in the context of an aging population. Increasing the duration of the average working career is prerequisite to increasing pension adequacy.

- iv) **High share of pensions regulated by special legislation**

- In Croatia's pension system of social insurance, there is a relatively high share of pension benefits determined under special regulations. While their share will partly be declining simply by lapse of time (pensions of former Yugoslav People's Army personnel, political prisoners, members of parliament, miners, etc.), there remains the challenge of managing this segment of the pension system both in terms of costs and with regard to developing an integrated pension system which ensures equal rights for all.

- v) **Financial risks related to the need for constant budget transfers**

- Current transfers from the budget to the pension system have several different legal grounds and their amounts are defined quite clearly, but to some of them are estimated only tentatively and subject to changes. This creates an impression that the pension system has access to an unlimited source of funds and that it suffices to strongly lobby for additional budget funds, and they will be readily allocated. This weakens the motivation to take sustainable, albeit sometimes unpleasant, reform initiatives (e.g. to rise statutory retirement age) Therefore, there remains the challenge of limiting budget transfers to only several forms, with clear legal grounds and fully measurable amounts.

- vi) **Low employment rate**

- A low employment rate is a challenge faced by practically all economic and social policies in Croatia. Should there be no improvement, this will have significant negative consequences for the pension system as well.

- vii) **Demographic trends**

- Negative demographic trends (aging population, low birth rates) pose a special challenge for the pension system and require its adjustments to this situation, which cannot be changed in the short run. The task of measures and policies in other areas will be to improve or reverse birth rates and prepare broader adjustments of the economy to an increasing number of senior citizens.
- **Main opportunities for further development are recognized in the following:**
 - i) **Achieved fiscal stability**
 - According to the current situation and presented projections, there is no immediate threat of significant growth in pension expenditure in the future, although some problems may occur in the long run. Therefore, fiscal space needs to be used in the short and medium term to create and implement responsible reforms aimed at enhancing pension adequacy, while maintaining fiscal stability.
 - ii) **Established and relatively well-functioning key system institutions**
 - Croatia has a pension system organized in three pillars and its earlier reforms have established all of the key system institutions, including the second- and third-pillar institutions, which function relatively well, although there is room to improve their functioning through further reforms.
 - iii) **Experience of previous work with fully-funded pension schemes**
 - Both the public and key stakeholders of fully-funded pension schemes have experience with the operation of these schemes and that experience can serve as a platform on which to build further development of the system and confidence in it.

5 Priority reform recommendations

- **Measures/reform recommendations can be derived from the identified challenges and opportunities, which all should rest on the following key tenets:**
 - i) The key long-term goal of pension system reforms in Croatia should be to enhance pension adequacy, while maintaining fiscal sustainability.
 - ii) The three-pillar pension system offers the greatest potential for achieving the aforementioned goal.
 - iii) The first pillar should act as the backbone of stability and social security, ensuring pensions for all subject to equal conditions.
 - iv) The second pillar, organized as a mandatory fully-funded scheme, should provide a sufficiently secure source of future pensions, which – with appropriate risk exposure – needs to ensure a faster growth of pension benefits, i.e. an increased level of pension adequacy.
 - v) The third pillar (voluntary fully funded scheme) constitutes an additional source of income for the elderly, which needs to be strengthened and its coverage increased so that it can make a higher contribution to enhancing pension adequacy for as wide an array of future pensioners as possible.
 - vi) Efforts are needed to ensure transparency in the implementation of measures, with clearly defined objectives and reform motives and a clear documentation of expected consequences, all with a view to command the widest possible public support for reforms.

5.1 Preliminary activities

Very soon, but no longer than two years from now, efforts should be made to carry out a thorough assessment of the 2018 reform effects based on actual trends and figures in order to provide a platform for further reforms. The 2018 pension reform was very extensive, with numerous changes and multiple effects. Despite all efforts to assess these effects and make them a basis for further reforms, some of them are difficult or impossible to anticipate, and there is always a possibility of unexpected outcomes. The assessment of reform effects should focus on replacement rate trends, average working career and the number of those taking various forms of early retirement. It is also necessary to ensure follow-up on the number of those receiving their pension benefits under special regulations, with special emphasis on accelerated retirement plans, as well as the frequency of using one-pillar and two-pillar pension schemes. Should it be found that the 2018 measures in some segments depart from the expectations or have failed to contribute to achieving their goals, they will need to be rectified or designed anew, including both short- and long-term measures.

In order to make it possible to assess the effects of the 2018 reform, reporting of pension statistics should be upgraded. First, from the perspective of developing the multi-pillar pension system, special statistical indicators should be prepared for three categories of beneficiaries: (i) those who were only insured under the first pillar; (ii) those who were insured under both mandatory pillars, but have opted to receive their benefits in keeping with the rules as if they had been insured under the first pillar only, and (iii) those who were insured under both mandatory pillars and have chosen to receive their benefits from both of them. Efforts are also needed to ensure the clear and transparent disclosure of statistics about pensions paid from the second pillar (the number of beneficiaries, the pension types they have chosen, information about one-off payment entitlements exercised at the time of retirement, pension levels, average levels of savings accumulated by the time of retirement, amounts of funds

transferred to the budget, etc.). The National Statistics Bureau should allow wider access to data about income and standard of living among pensioners in order to make it possible to better assess of poverty trends and, if required, design special research studies to this end (and/or find resources to carry out these research efforts within the research community). One of the fundamental tasks of any pension system is to protect people from old-age poverty, which is why statistical follow-up should pay special attention to that issue.³¹

Statistical indicators on the pension system should preferably be accompanied by implicit pension debt estimates. This indicator which shows the level of future commitments can be designed based on the methodology required by Eurostat (i.e. accrued-to-date liabilities– ADL), but also by applying other methodologies that make this calculation more complete. As part of reporting for Eurostat purposes, the plan is to make pension entitlement estimates every three years by using the ADL method. Since this is important for Croatia, it would be advisable to update calculations yearly or at least before implementing the reforms.

In order to better monitor the status of pension system development, it would be advisable to introduce the requirement to prepare Annual Pension System Report. Such report would maintain the focus of the public and policy-makers on the pension system and its required reforms, ensure the monitoring of key trends, and prepare necessary analyses. Each report would need to be prepared by an independent institution or the Central Registry of Insured Persons (“REGOS”) in order to facilitate a critical and impartial review of all system elements. This would not be a report like the HZMO Annual Report, which only contains figures on the operations of the first pillar. The HZMO is the key institution of the pension system, but it does not cover all of its segments and is dedicated to strengthening the first pillar. Therefore, a report which would cover the entire system should preferably be prepared by an independent institution.

5.2 Reform recommendations

The reform recommendations under the National Development Strategy for the 2020-2030 have been set forth based on an analysis of the state of the pension system and the expected effects of the 2018 reform, as presented above.

Given demographic and fiscal constraints, the only way to afford more generous pension benefits in Croatia is to increase the working life duration. If Croatia remains with one of the shortest working periods it will have to reduce pension benefits in order to be fiscally sustainable.³² It wouldn't be possible to make the pension system more generous without addressing the short working period.

It is necessary to further tighten early retirement conditions and increase pension decrements for early retirement. In this context, consideration should be given to an appropriate increase in the minimum early retirement age, that is, to reducing the difference in relation to the statutory age (for

³¹ The lack of appropriate data about income levels, income distribution and poverty, which would make it possible to assess poverty and deprivation among the elderly population, has also been highlighted in the study by Beier Research & Edward Palmer Consulting (2018; p. 50.), “Fourth and Final Report: Proposals for reform of the Croatian pension system with special emphasis on its 2nd and 3rd pillar.”

³² The same choice either to raise the retirement age or to reduce pension benefits is present in most of European countries, as documented in World Bank (2014), “The Inverting Pyramid: Pension System Facing Demographic Challenges in Europe and Central Asia”.

example, to three years from five years now) and raising the service period requirement (for example, to 37 years from 35 years now). Consideration should also be given to abolishing the status of long-term contributors or, at the very least, increase both the age and service period requirements for old-age pension eligibility of long-term contributors by at least two years compared to the current conditions, because the past situation has led to a large number of pensioners using this early retirement option without benefit decrement. This should lead to extended years of service and higher pension benefits in future. To improve incentives for a longer working life, it is necessary to increase the degree of pension decrements in case of early retirement, at least to the actuarially neutral level by using independent actuarial calculations as a basis. Decrements can be tightened up ever more in order to achieve the desired effects. Similarly, it is necessary to increase benefit bonuses for work after the statutory retirement age because, according to our estimates, the current bonus is below the actuarially neutral level. If the analysis of effects of the option to work after early retirement and receive pension benefit shows that it creates motivation for early retirement or causes unfair competition, the possibility of such work needs to be limited by the number of hours and/or by paying a part of the pension in inverse proportion to working hours (a higher proportion of the pension combined with work for a lower proportion of full-time working hours; half of the pension combined with work for half-time working hours).

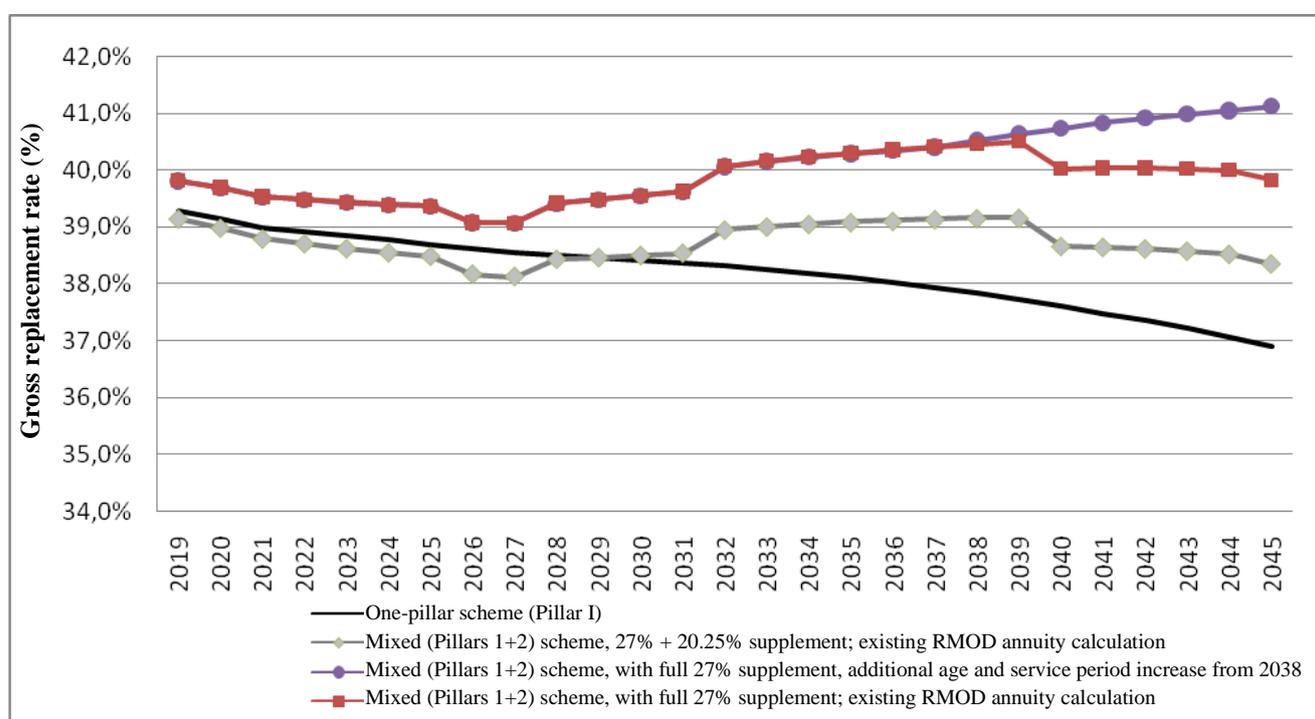
The statutory retirement age needs to be linked to life expectancy for the period after the implementation of the current reform plan to rise the statutory retirement age. Such solutions already exist in a number of countries, making it possible to replicate good practice examples. This does not necessarily mean that increases in the statutory age should exactly reflect increases in life expectancy. Indeed, the former should be lower than the latter so that the benefits of longer life expectancy can be distributed between increasing people's working life and increasing their pension payout period. Even if introducing a life expectancy adjustment factor does not come as the first policy choice in the implementation of reforms, it should nonetheless be included in the pension formula so as to strengthen the building blocks of the first pillar's financial sustainability.

Due to the previously discussed risks posed to the pension system's future stability by the option of choice between different pension types, it is suggested that this option should be abolished as soon as possible, while increasing the basic pension supplement rate from the current 20.25% to 27% The option of choice may be understood as an effort to provide a short-term solution for the issue of supplement with limited fiscal costs. However, it creates system instability and shifts the burden of supplement payment to future generations. Also, with the second pillar getting closer to the stage of maturity and with an increasing number of pension beneficiaries who were insured under both pillars, it would be advisable to further strengthen the two-pillar system by ensuring that all two-pillar contributors receive two-pillar pensions. By abolishing the option of choice, whole new generations of pensioners would have equal interests in improving the pension system's functioning. First- and second-pillar reforms, as well as all of the other reform initiatives, would affect them more or less equally, which would ensure greater system stability. To minimize or even fully avoid situations where future pensioners would suffer losses due to the mandatory nature of the two-pillar pension scheme, as compared to one-pillar scheme, efforts should be made to concurrently increase the basic pension supplement from its present level of 20.25% to 27%, which is also justified from the perspective of ensuring equal rights for all pension beneficiaries.

Compensatory measures should ensure that minimum wage earners receive two-pillar benefits which will not be lower than one-pillar benefits in case the option of choice is abolished. One way to achieve this is to calculate the amounts of one-pillar and two-pillar benefits for each insured individual whose wage stands below 70% of Croatia's average wage at the time of retirement and provide that, wherever the one-pillar pension exceeds the two-pillar one, the difference is added to the

basic pension amount. Another way would be to set in advance a compensatory amount for insured individuals with wages below 70% of the average wage, depending on the pension type (statutory old-age or early retirement pension) and, possibly, years of service. In both cases, it is possible to ensure that most of the two-pillar participants with low wages receive a pension which would, at the very least, be equal to that they would receive had they been insured under the first pillar only. While such an approach generates certain short-term fiscal costs (see the discussion below), it is more equitable from the intergenerational perspective because the current pension costs are taken on by the present generation of contributors and tax payers instead of shifting the costs to the future generations as in the current situation with choice of the pension type.

Figure 26: Gross replacement rates (first gross pension benefit/last gross wage) subject to different reforms depending on the statutory retirement age, expected service period and pension supplement rate (for a man receiving the average wage and retiring at the statutory age with rising service period starting from 40 years of service in 2019)



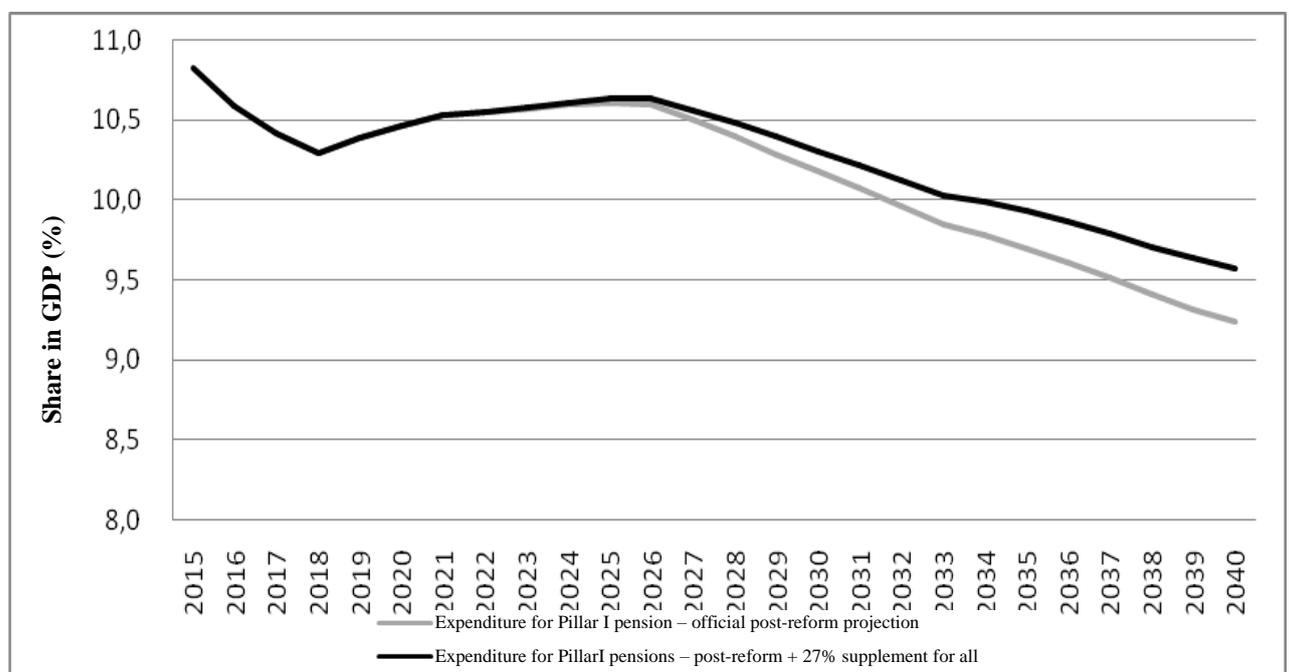
Notes: In case of the one-pillar and mixed (two-pillar) pension schemes with a 27% +20.25% supplement as well as the mixed pension scheme with the full supplement of 27%, the assumption is that the service period will increase by one month each year over the entire forecasting horizon. In addition to the 27% supplement, the broadest reform package provides for 3-month increments in the statutory retirement age from 2038 to 2041 (until it reaches 68 years of age) and, consequently, an additional increase in the service period by another month each year starting from 2038. In all of the projections, actual wage and fund return trends have been factored in up to 2017. RMOD's existing annuity calculations for individual second-pillar pension benefits are assumed to be adjusted in 2026 and 2040. The inflation, wage growth and pension fund return in the period from 2018 to 2045 have been taken from projections made by the European Commission (*Ageing Report 2018*).

Source: Author's projections.

Abolishing the option of choice and increasing the supplement rate, with adjustments made for minimum pension benefits and growing years of service, may ensure that future pension adequacy is improved at an acceptable fiscal cost. To achieve this, efforts are needed to concurrently implement the aforementioned measures, especially those aimed at extending people's working life. The effects of the proposed measures on future pension adequacy can be presented through gross replacement rate projections in the hypothetical case of a man who receives the average wage, has 40 years of service

and retires at the statutory age starting from 2019, but subject to the additional assumption that the measures have succeeded in bringing about an increase in the service period (Figure 26). The projections show that increasing the supplement rate on the basic pension to 27%, along with raising the service period by one month each year until the end of the forecasting period, can lead to growing replacement rates after 2027 and raise them to a level higher than that achievable with a 20.25% supplement.³³ However, toward the end of the forecasting period, i.e., after 2040, the replacement rates show a downward trend. This is because of the expected adjustment to the second-pillar pension and the indexation of the first-pillar pension, which is lower than the wage growth. In order to avoid it, additional reforms will have to be undertaken to increase the service period, such as the aforementioned statutory age increase and early retirement disincentives. Figure 26 shows also the outcome in another hypothetical case, with the additional assumption of the statutory retirement age increasing from 67 to 68 years between 2038 and 2041 as well as the service period growing by two months each year after 2038. This reform package succeeds in ensuring a continued growth of the replacement rate even during the 2040s (Figure 26 – purple line with round markers).

Figure 27: Projection of first-pillar pension expenditure – effects of the basic pension supplement increase to 27% (as % of GDP)



Source: *The 2018 Ageing Report* for public pension expenditure in the no-reform scenario; Worksheets of the Croatian Pension Institute for additional expenditure related to the 2018 reform; author's estimates for extending the 27% supplement to the basic pension.

The fiscal costs of the presented reform package mostly stem from increasing the supplement and abolishing the option of choice between different pension types. Figure 27 shows trends in additional budget expenditure caused by the increased supplement. Toward the end of the forecasting horizon, it amounts to approximately 0.3% of GDP and, as such, it should not compromise fiscal stability. However, total net effects on the budget would be stronger because, as a result of abolishing

³³ In a similar hypothetical case, but without the assumption of an increase in the service period, the replacement rates begin to decline as early as after 2033, that is, as soon as the statutory retirement rate stops to grow (Figure 17(a)). This shows that increase in the service period has a strong effect on future replacement rates.

the option of choice, there would no longer be any transfer of accumulated savings to the budget for those who would opt for the one-pillar pension. With the regulation in place, transfers are expected to reach their peak around 2034, when they could amount to 0.65% of GDP. By abolishing the pension choice option, the budget would be left without those funds. The maximum net fiscal effect of this measure would thus be some 1% of GDP around 2035. In that case, however, the burden on future generation would be significantly relieved because there would be no new obligations for full pensions for those returning from the two-pillar insurance scheme to one-pillar benefits. In other words, this would significantly reduce the implicit pension debt. Furthermore, if efforts are made in parallel to rise the statutory retirement age and curb early retirement, this will have positive effects on the budget, because of which such a measure package might be fiscally sustainable in the longer run.³⁴

Following an in-depth analysis and assessment of compatibility with the existing social protection system, a zero pillar (national pension) scheme for senior citizens without pension benefits should be introduced, preferably subject to income and means testing to limit its fiscal costs. The launch of such a zero pillar has already been envisaged in the Social Welfare Strategy for Senior Citizens in the Republic of Croatia for the period from 2017 to 2020. However, the decision on that matter will not be easy because similar safeguards for senior citizens already exist. The social welfare system provides for entitlement to a guaranteed minimum benefit (GMB) which for a person who lives single, is incapacitated for work (as are, by legal definition, all those aged 65 and over) and has no other income amounts to HRK 920. The minimum pension for 15 years of service is approximately HRK 950. The national pension should somehow find its place between these two instruments, which seems to be a relatively narrow slot. It can be, however, combined with changes to the minimum pension scheme, whereby the minimum pension coverage should be reduced, but its social protection function would be preserved. Thought can also be given to a parallel reduction/abolishment of restrictions regarding the minimum service period of 15 years as a pension eligibility requirement, but this option would be risky in terms of its effects on incentives for legal work. Concerning the zero pillar (i.e. national pension) schemes, a couple of options are worth considering:

- Increasing GMB for those older than 67 (eligibility of the social/national pension should, preferably, become effective at least a year or two after the statutory retirement age)
- Introducing a national pension for senior citizens of low means –it would be probably more natural to assign the administration of this benefit to social welfare centers, i.e. under the competence of the ministry in charge of social welfare, because there is no need to encumber the HZMO with income and means testing when social welfare centers are already performing this task. To tackle the issue of stigmatization, for each person who reaches, for example, 67 years of age and is not eligible to receive insurance-based pension benefits social welfare centers could, on an *ex officio* basis, calculate the amount of the national pension to which he/she is entitled according to their records and then simply invite him/her to confirm the accuracy of such records.

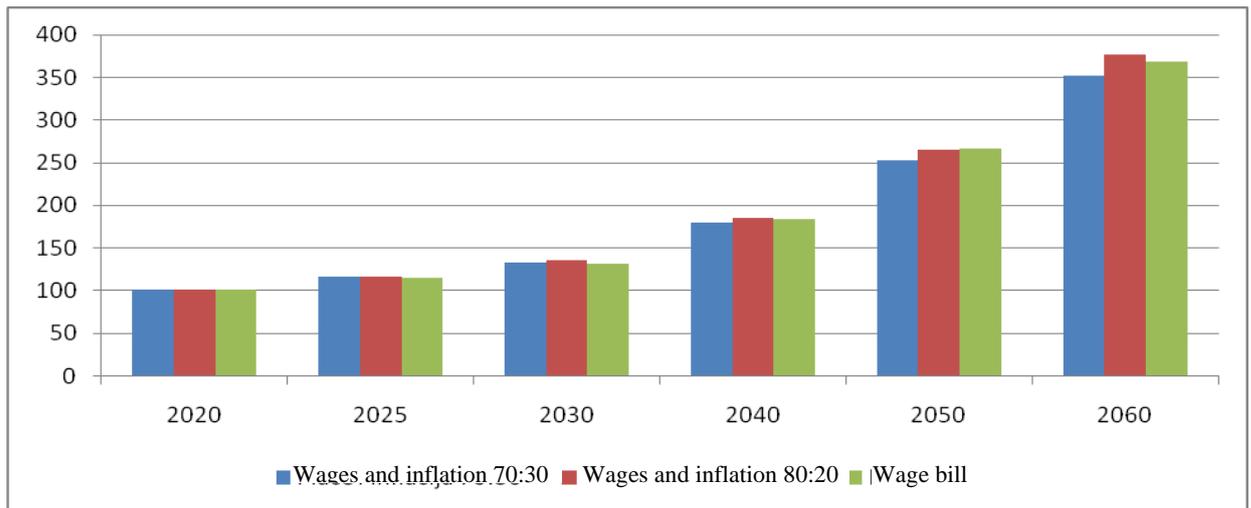
The pension adjustment (valorization and indexation) system should be considered with due care and, depending on the long-term fiscal position, make it more favorable for beneficiaries. Specifically, this option directly weighs on the budget and, as a result, can by no means be considered in isolation from other reforms. Only once the potential of other measures is harnessed, efforts can be undertaken to address changes in the adjustment model and achieve a proper effect on future pension adequacy without jeopardizing fiscal stability. One option is to modify the existing formula by adjusting

³⁴ We should not forget that, according to HZMO's projections, the 2018 reform has growing negative fiscal effects from 2037 onward.

a higher portion to wage growth. For example, instead of an adjustment formula in a proportion of 70:30 or 30:70 with wage growth and inflation, whichever is more favorable for pensioners; consideration should also be given to the 80:20 option. A second option is to link pension valorization and indexation to other parameters, where the total wage bill change appears to be one of the acceptable solutions. The wage bill will reflect both average wage growth and changes in employment levels, as well as demographic trends, which would introduce a kind of corrective mechanism for pension levels relative to demographic trends. To prevent pension benefits from declining in times of recession, a freeze on the level of pension benefits can be stipulated to be in effect until wage bill recover, i.e. goes up relative to the pre-freeze situation. Possible effects of these two options are presented in Figure 28. In the long run, the option of increasing the adjustment rate to 80:20 with wages and inflation yields a higher pension growth than adjustment in relation to the wage bill, but adjustment linked to the wage bill would generate higher growth than the present adjustment model. A third option is to separate pension valorization (point value calculation when determining the first pension) from pension indexation (pension adjustment for benefits in payment) for new pensioners by determining different actual pension values for these two functions. Under this option, pension valorization would imply adjustment 100% with wage growth, whereas pension indexation for benefits in payment would be 100% with price increases. In this way, the first pension could be much higher than that paid heretofore, but during the payment period, it would then grow more slowly than with the present adjustment formula. In conceptual terms, this solution can be justified on a number of grounds. Specifically, during their working lives, insured individuals contribute to the growth of the economy and the growth of wages, so that it makes sense to translate their merits for the past wage growth into the amount of their first pension in full proportion. However, once they retire they no longer take an active part in wage growth, so that it makes sense to adjust their pension benefits to price increases in order to preserve their purchase power. This is also a solution which is, with minor modifications, applied in many countries. One of the modifications pertains to adjusting the pensions currently paid out to inflation plus some factor of economic performance, such as BDP or wage growth when times are good. Depending on its design, the third option could be cost-neutral in the long run compared to the current situation. However, its advantage is in that its costs are less exposed to the risk of growing longevity. Under this option, indexation for the existing pensioners could remain subject to the present conditions or be linked to the wage bill growth. It seems that the shift to adjustment linked to the wage bill would have an appropriate effect and provide a good automatic correction mechanism for economic and demographic trends. A similar effect could also be produced by the third option, subject to a careful design of initial values and possible modification of indexation by ensuring that, in addition to inflation, it also includes a “bonus” economic performance factor. The long-term fiscal costs of more favorable adjustment are indeed significant because they grow as time goes by.³⁵

³⁵ Cost effects can be illustrated by calculations using actual figures, but assuming that the current, a relatively high wage growth rate will be maintained. If we assume that average wages will grow at a rate of 4.5%, with inflation standing at 1.5% over the next three years, then replacing the current 70:30 indexation formula linked to average wage growth and inflation with the 80:20 would lead to additional costs amounting to some HRK 115 million in the first year, HRK 245 million in the second year and HRK 380 million in the third year of its application (all in comparison to maintaining the 70:30 formula). With a lower wage growth rate, costs would be somewhat lower, but would still progressively grow as time goes by. The current indexation has substantial costs anyway, a total of about HRK 1.3 billion (0.3% of GDP) will be allocated due to pension indexation in 2018.

Figure 28: Effects of different indexation formulas on the actual pension value (2020=100)



Note: Calculations based on wage, inflation and employment growth projections from the Ageing Report 2018.

Source: Author's calculations.

Further efforts are needed to improve the institutional setup of the second pillar and facilitate more active asset management for pension funds. Useful suggestions on how to reform the second pillar have been presented in the study “Fourth and Final Report: Proposals for reform of the Croatian pension system with special emphasis on its 2nd and 3rd pillar” by Beier Research & Edward Palmer Consulting (2018) (key findings are presented in Annex III). With regard to pension funds investment policy, the paper suggests that the legal framework should be less detailed in terms of specific asset classes in which funds invest their money and to shift focus on controlling investment risk. For example, investment restrictions could be fully or mostly lifted for Category A funds and significantly reduced for Category B, which could even be converted to mixed funds. Further relaxation is possible for investment in asset classes other than stocks and bonds, but subject to special controls in case of real estate, infrastructural projects and alternative asset classes.³⁶ In order to reinforce the second pillar, it is advisable to integrate the accumulation and payout phases in the second pillar (i.e., to enable pension funds to pay out pension benefits), which would facilitate portfolio modeling and market risk reduction. In Beier Research & Edward Palmer Consulting’s study (2018), such a proposal is described as preferred to the option of setting up a public pension payment agency, particularly in view of increasing cost efficiency in the payment of second-pillar pension benefits.

In order to reinforce the third pillar and strengthen its effect on future pension adequacy for as many pensioners as possible, it would be advisable to introduce auto-enrolment with the opt-out possibility. This would be a quasi-mandatory system where some or all of the employers would be obliged to automatically enroll their employees into a fund where employees themselves would pay a part of their contributions out of their wages, but which would be matched by payments from employers and the government. In case an employee has no wish to participate in such a scheme, he/she may opt out, but then he/she forfeits his/her right to match-funding. This option can be organized as part of the third pillar or can be designed under a special sub-account in the second pillar. The countries applying this measure have reached rather different results, from low to rather high coverage of the scheme.

³⁶ For a summary of the pension fund investment policy, including the proposed changes, see Annex IV.

Croatia is specific in that it has a relatively strong mandatory second pillar and rather underdeveloped collective pension schemes, especially those which are a result of collective bargaining agreements. Therefore, the experiences of other countries should be looked into in more detail to avoid identified shortcomings. One option is to inaugurate this measure in the public sector, the sector that has relatively strong tradition of collective bargaining, and then to extend its mandatory application by enacting appropriate legislation, including large employers in the first place and then extending it to cover all employers, of course, subject to developing the required infrastructure. The goal is to achieve a as high coverage of this scheme as possible. Some countries were successful in that respect, but the others failed for different reasons. There is a risk that lower-wage employees may decide to opt out of this scheme to a higher extent. However, a good design can alleviate this risk. For instance, it would probably be reasonable to start with relatively low rates of contributions paid from wages so as to avoid a sharp drop in net wages (perhaps 1%), and then it could be automatically increased after a certain period. Furthermore, consideration should be accorded to the option in which a part of match-funding is defined in absolute terms (rather than as a wage percentage), if it would be more attractive for low-wage employees. Employer match-funding may be subject to a more favorable tax treatment. International experience shows that efforts and policies, such as fiscal stimulus and public education, can significantly affect the process and increase the success of auto-enrolment policy. For a summary of auto-enrolment experiences, see Annex V.

The third pension pillar needs to be strengthened in other ways, too, i.e., through reasonable tax incentives in case of collective insurance schemes as well as awareness-raising and financial literacy-building campaigns. In the early stages, the option to withdraw total savings as a one-off payment should perhaps to be offered for small amounts saved rather than withdrawing annuities.

An additional and much more extensive reform is needed to improve the accelerated retirement schemes in keeping with the latest occupational medicine insights and best international practices. In this context, pension eligibility criteria should be revised through an extended insurance period, including the pension eligibility age. Measures have to be introduced to promote longer working life (developing training and retraining programs, lifelong learning, promoting the hiring of persons with disabilities) and funding sources should be clearly defined for all of the covered categories.³⁷

Efforts are needed to ensure the convergence of pension benefits under special regulations toward those under the general regime. To this end, it is necessary to start closing some of the special regimes for new acquisitions of entitlements or to significantly limit the acquisition of new entitlements. For some of the special regimes, such as accelerated service periods for certain occupations, the acquisition of additional entitlements can be organized via the third pillar. In any case, it is necessary to separate clearly and accurately the portion of the first-pillar pension acquired under general regulations and based on contribution payments from the portion of pension benefit that is due to special regulation and should be financed from other sources. This should be accompanied by publication of key aggregate statistics. This is important because of the transparency of the public pension system. Different pension indexation should be considered for the portion acquired under general legislation as opposed to that acquired under special regulations. It should be discussed whether or not it makes sense to allow full- or part-time work to persons retired before reaching statutory age pursuant to special regulations (military and police personnel, mine clearance professionals) while maintaining their pensions, either in

³⁷ For more on this, see Chłoń-Domińczak & Tomić (2016), “Early Retirement Based on Accelerated Service Period in the Republic of Croatia – Analysis and Proposed Reforms,” a report prepared in collaboration with the World Bank for the purposes of the Labour and Pension System Ministry.

whole or in part. One option would be to be made much more rigorous conditions for such employment. A significant risk for pension system costs is posed by reopening the entitlement to war veteran disability pensions and the possibility for war veterans to receive a minimum veteran’s pension (45% or more of wages, depending on the number of days spent in the combat units), because future costs are practically unpredictable. Preferably, measures should be taken to control or curb these future costs (for example, by defining a final date by which people can become eligible for new war veterans’ disability pensions, by linking the entitlement to and the amount of the minimum pension to the pension insurance period). It would be advisable to consider setting up a special fund to finance the portion of pensions which is not covered by contributions and activating different indexation formulas for these two portions of pensions. The objective is the first pillar governed by simple and transparent rules which apply equally to all.

5.3 Overview of possible effects of reform recommendations

The proposed reforms are primarily aimed at enhancing pension adequacy over the long haul. The assessment of effects requires considerable resources, data and time and goes beyond the ambition of this report. Instead, Table 1 outlines the expected direction of reform effects on pension adequacy, the government’s fiscal position, labor costs, net wages, as well as the expected distribution effect. A positive effect on pension adequacy is visible for all of the proposed reforms, with the possible exception of reducing the coverage of the accelerated service period and the convergence of pensions under a special regulation toward those under the general system, where we expect a neutral effect as a result of probable compensatory effects in terms of a longer service period and/or growth in other pensions. We expect that fiscal savings in these cases will be used for some of the other policies with a view to enhancing pension adequacy and the final effect should be neutral.

The fiscal effects of the proposed reforms could be quite balanced, i.e. cause manageable costs as long as the reforms are reasonably designed. Some of the proposed reform have a positive fiscal effect (increased statutory age, more stringent conditions for early retirement and eligibility for an accelerated service period, the convergence of pensions toward the general regime), the others have a negative fiscal effect (increasing the supplement and abolishing the pension choice option, shifting to wage bill-based pension indexation, introducing the national pension, auto-enrolment), while a part of the reforms may be expected to have neutral effects in the long-run (shifting to wage-based valorization and price-based indexation), so that the final effect depends on the parameters of reform measures. As a rule, however, higher fiscal expenditure is in correlation with higher pension adequacy, and the reform skill is supposed to define the right balance between the goals of higher pension adequacy and protection of fiscal sustainability.

Table 1: Anticipated effects of key proposed measures

Reform	Effect on pension adequacy	Effect on the gov’t budget	Effect on labor costs	Effect on net wages	Distribution effect*
Additional increase in the statutory retirement age (linkage to life expectancy)	Positive	Positive	Neutral	Neutral	Neutral? (positive owing to reduced poverty among senior citizens)

					thanks to higher pensions)
Discouragement of early retirement	Positive	Positive	Neutral	Neutral	Neutral? (positive owing to reduced poverty among senior citizens thanks to higher pensions)
27% supplement on the entire basic pension (increase from 20.25%) and abolishing the choice of pension type	Positive	Negative	Neutral	Neutral	Negative? (can be close to neutral if compensation is given to minimum pension beneficiaries)
Introduction of the national pension	Positive	Negative	Neutral	Neutral	Positive
Indexation to the wage bill	Positive	Negative	Neutral	Neutral	Neutral
Valorization based on wages, indexation based on prices	Positive for the first pensions, close to neutral over entire retirement duration	Neutral	Neutral	Neutral	Neutral
Auto-enrolment in the third pillar, with employer and government match-funding	Positive	Negative (the government match-funds contributions, but also comes to act as an employer)	Negative (due to employer match-funding)	Negative (additional contributions are paid out of wages)	Negative/neutral if higher coverage is ensured for low wage earners)
Limiting the coverage of the accelerated service period system	Neutral (limited eligibility could be compensated by a longer service period)	Positive	Positive (negative for some occupations where higher employer contribution rates can be expected)	Neutral/positive (higher labor costs caused by increased contributions could be result in lower wage rates)	Positive (because pensions under the accelerated service period system are mostly higher than those under general legislation)
Convergence of pensions under special regulations toward those under the general regime	Neutral (slower growth in pensions under special regulations can be compensated by faster growth in other pensions)	Positive	Neutral	Neutral	Positive (because pensions under special legislation are higher than those under general legislation)

Note: *Positive distribution effect means reducing income inequality among senior citizens. When they are significant, we also highlight the expected effects on poverty.

For most of the proposed reforms, the expected effects on labor costs and net wages are neutral, while their effect on inequality and poverty among pensioners should be either positive or neutral. The risk of negative distributional effects is present when it comes to increase in the supplement rate and auto-enrolment. In the former case, the thing is that the increased rate will not bear on pensioners with minimum benefits, whereas the others would see their pensions grow. However, this can be prevented by introducing compensation measures for those with minimum pensions. In case of auto-enrolment, it may emerge that employer and government match-funding mostly benefits employees with higher wages, whereas those with lower wages could opt out of this scheme. However, a careful reform design should ensure that it brings benefit to low-wage earners as well.

6 Cross-cutting issues and their implications for reforms

In addition to reform measures from the pension policy remit, the potential to achieve improved pension adequacy while maintain fiscal stability will also come under the impact of measures and activities in other areas, which can be listed here as examples:

- measures to encourage doing business and creating “good” (highly productive) jobs (the environment for business development, competitiveness, access to loans, incentives to small and medium-sized enterprises, support for innovation, the security of property rights and contracts, etc.);
- labor market measures (increasing the extent to which work pays compared to inactivity, improving labor legislation to increase employment rates);
- fiscal policy (debt management policy, the issuance of debt instruments which would, by their maturity profile and other characteristics, suit the desirable investment policy of pension funds and pension insurance companies);
- government asset management policy (launching public-private partnership and privatization projects which could be attractive for investment by pension funds);
- financial sector (regulating the operation of pension funds and pensions insurance companies through a highly competent independent regulator, taking steps to improve the regulator’s work, considering the engagement of insurance companies in pension payment business);
- demographic challenges (emigration, low birth rates, aging population).

7 Proposal for strategic projects

To support reform efforts in the pension sector, it would be advisable to design multi-annual strategic projects which could largely be financed from EU funds, such as:

- Active aging - develop a wide spectrum of initiatives to support productive and socially useful activities for senior citizens,
- Pension-related financial literacy
- Promoting voluntary pension savings schemes

ANNEX I: Calculation of pensions for selected hypothetical cases

(according to the pension legislation after the 2018 reform)

D1: Pension for a woman who goes into early retirement in 2019 as soon as she meets her qualifying conditions (57y4m of age, 32y4m of service), with wage at 100% of Croatia's average

	Pillar I pension as per formula	Supplement to Pillar I pension	Total Pillar I pension	Pillar II pension	Total pension
One-pillar-pension (rules for those insured only under Pillar I)	1,752.27	473.11	2,225.38	-	2,225.38
- pension for service before 2002	830.97	224.36	1,055.33	-	1,055.33
- pension for service after 2002	921.29	248.75	1,170.04	-	1,170.04
Mixed system (Pillars I+II)	1,521.94	364.28	1,886.23	293.50	2,179.73
- pension for service before 2002	830.97	224.36	1,055.33	-	1,055.33
- pension for service after 2002	690.97	139.92	830.89	293.50	1,124.39

Notes: Account has been taken of real wage and pension funds returns up to 2017 as well as annuity calculation rules used by RMOD in 2018. Inflation, wage growth and pension funds return projections for 2018 and 2019 have been taken from the European Commission (Ageing Report 2018). The expected actual pension value amounts to HRK 66.09. In the case under review, the assumption is that the woman is not eligible for added years of service on account of children. Should she be eligible for that benefit, her one-pillar pension would be higher by HRK 34.41 for each child, while her two-pillar pension would be higher by HRK 24.44.

Source: author's calculation.

Table D2: Effects of the minimum pension scheme; pension for a woman who goes into early retirement in 2019 as soon as she meets her qualifying conditions (57y4m of age, 32y4m of service), with wage at 40% of Croatia's average

	Pillar I pension as per formula	Supplement to Pillar I pension	Top-up to reach the minimum pension	Total Pillar I pension	Pillar II pension	Total pension
One-pillar-pension (rules for those insured only under Pillar I)	700.91	189.24	862.11	1.752.27	-	1.752.27
- pension for service before 2002	332.39	89.74	408.84	830.97	-	830.97
- pension for service after 2002	368.52	99.50	453.28	921.29	-	921.29
Mixed system (Pillars I+II)	608.78	145.71	767.45	152.194	117.40	1,639.34
- pension for service before 2002	332.39	89.74	408.84	830.97	-	830.97
- pension for service after 2002	276.39	55.97	358.61	690.97	117.40	808.37

Note: See the notes under Table D1. If the case under review assumed eligibility for added years of service on account of children, the one-pillar pension would be higher by HRK 27.10 and two-pillar pension by HRK 20.32 for each child.

Source: author's calculation.

ANNEX II: Key changes in pension legislation in 2018

On 7 December 2018, the Croatian Parliament enacted amendments to five laws and adopted a new law which superseded its predecessor of the same name (the Extended Service Period Act). Most of the amendments will become effective as of January 1, 2019. Below is a list of key changes made in each law.

1. Pension Insurance Act

- allows the HZMO to establish a pension insurance company;
- steps up the convergence of statutory retirement age between men and women and its increment to 67 years for old-age retirement and a minimum of 62 years for early retirement;
 - steps up the alignment of statutory old-age retirement for women with that for men by increasing the former by four months a year, which means that women and men would be subject to equal age requirements by 2027 (65 years of age and a minimum of 15 years of service);

- steps up the alignment of early retirement age and service period requirements for women with those for men by increasing the former by four months a year, which means equal requirements for both women and men by 2027 (i.e. a minimum of 60 years of age and 35 years of service); and
- increases statutory age requirements for old-age and early retirement for both women and men by four months a year from 2028 to 2033, when the statutory age would reach 67 years for old-age retirement and a minimum of 62 years of age for early retirement;
- decreases the pension benefit in case of early retirement by 0.3% for each month prior to eligibility for old-age pension, regardless of the service period (previously 0.10%-0.34%, depending on the service period);
- increases the “bonus” for later retirement from 0.15% to 0.34% for each month after the statutory retirement age, subject to the minimum service period of 35 years, up to a maximum of 20.4% for retirement five or more years after the statutory age;
- preserves the entitlement of long-term contributors to retire without pension reduction at the age of 60 and with a contributory period of 41 years, but now in effective/real terms; as of January 1, 2027, this requirement will be increased to the age 61 and a service period of 41 years; the later retirement “bonus” is abolished for early retirement of long-term contributors;
- broadens the spectrum of pensioners entitled to work up to a half of full-time working hours and receive a full pension to (i) long-term contributors, (ii) early retirement pension beneficiaries, (iii) pension beneficiaries covered by the special legislation on pension insurance entitlements for active duty military personnel, police officers and authorized official persons and (iv) pension beneficiaries covered by the legislation on special pension insurance entitlements for mine clearance staff. Pension beneficiaries covered by special legislation may work full-time, while receiving their pension benefits reduced by 50%. After the lapse of a service period of at least one year they can seek the re-calculation of their pension benefit, but it will again be based on an initial factor (a pension reduction or pension increase factor for earlier or later retirement) equal to the initial factor used as the basis to determine their first pension benefit;
- provides for an increase in the minimum pension as of July 1, 2019, whereby its amount for a year of service will be determined at 100% of the actual pension value (a 3.13% increase);
- provides the option of choice between pension types for contributors who were born in 1962 or later and were mandatorily insured under both pension pillars, enabling them to choose between the two-pillar pension and the pension under rules applicable to persons who were insured under the first pillar only (where, in the latter case, they are obliged to transfer their savings from the second pillar to the state budget);
- introduces an increase in the service period for mothers or adoptive mothers by adding six months for each child born or adopted and, exceptionally, for fathers and adoptive fathers if they used a predominant part of parental leave. Such service period has no impact on pension eligibility requirements, but only bears on pension benefit determination
- simplifies the pension indexation formula; it has remained unchanged in substance, adjustment is now made on a semi-annual basis in a 70:30 or 30:70 proportion with wage growth and inflation, whichever is more favorable for beneficiaries.

2. Pension Supplements Act (pertaining to supplements earned pursuant to the Pension Insurance Act)

- provides that pension beneficiaries who were insured under both the first and second pillars are entitled to the pension supplement to first pillar pensions; the supplement rate for their service

period before the introduction of the second pillar (i.e., before 2002) is 27%, and for service period after that it is 27% multiplied by the basic pension factor (0.75), i.e. 20.25%;

- provides for an *ex officio* specification of pension supplements for pensions which are currently paid from both pillars (to those who previously chose to receive “two-pillar” pension benefits)

3. Mandatory Pension Funds Act

- decreases the maximum allowed front-end fee from its current level of 0.8%, to 0.5% of each paid-in contribution;
- decreases the management fee by limiting it to a maximum of 0.338% in 2019 and a maximum of 0.3% in 2020 and, for each subsequent year, by reducing it by 5.5% relative to its rate applicable in the preceding year, subject to a 0.27% threshold;
- limits the possibility of paying the management fee for an individual company to 20% of the total amount of management fees collected for all pension companies. In the event of any surplus in collected fees, 55% of this amount will be paid to REGOS, which will allocate these resources to all pension funds in accordance with their assets;
- provides that the “formula” used heretofore to assign beneficiaries who have failed to choose their pension fund (is now upgraded from equal distribution to each fund to adjustments of that rule by introducing the maximum risk-adjusted return criterion, whereby more beneficiaries will be assigned to funds with higher returns);
- provides that all fund members who have failed to choose their fund category are now assigned to (a higher-risk) Category A instead of Category B, and after 10 years they will be transferred to Category B unless they choose on their own to stay in Category A (the rules about transfer to Category B at least 10 years and to Category C at least five years prior to eligibility for old-age pension continue to apply);
- introduces the option of choice between pension types for fund members when they become eligible for old-age pension or early retirement based on a signed statement whereby the fund member opts for receiving benefits under both pillars (i.e. staying in the second pillar) or receiving benefits from the first pillar only, subject to transferring his/her savings to the state budget (i.e. opting out of the second pillar);
- relaxes the limits on certain types of investment (increases equity exposure) and allows investment in new asset classes (infrastructural projects within Croatia’s territory, securities and/or shares traded or offered through regulated schemes designed to raise capital to finance start-up projects);
- selection of supervisory board members for companies where the fund holds shares is limited to independent experienced experts, who cannot be in business, private or other relationship with the pension fund management company or its owners;
- the Government will appoint one supervisory board member of the pension fund management company as a representative of pension fund members to represent the members' interests;
- lays down the criteria to recognize conflict of interest

4. Voluntary Pension Funds Act

- aligns the operation of the third pillar funds with EU directives and recent provisions from other national legislation, lays down prudent investment principles, defines information disclosure requirements, and regulates supervision in greater detail;

- provides for the obligation of each pension company to invest each year a part of its revenues in building citizen financial literacy on fully-funded individual savings;
- limits the fees collected by pension companies from voluntary pension fund members by capping the management fee at a maximum of 3% per year, abolishing the up-front fee charged by pension companies to fund members, with the exit fee (at a maximum rate of 2.5%) being only paid when a fund member transfers his/her account to another fund managed by another pension company, but no longer when he/she wishes to exercise his/her entitlement to receive pension benefits;
- expands the possibility for pension funds (pension companies) to pay out provisional benefits up to a maximum of HRK 100,000 regardless of the amount of assets on the account (previously only for assets up to HRK 50,000) over a minimum period of five years;
- expands the possibility of paying third-pillar provisional benefits and life annuities to insurance companies (life insurance companies);
- allows funds to make one-off payments up to 30% of the amount held by a fund member on his/her account after he becomes eligible to receive pension benefits (it was previously possible to pay out 30% or more (even all), provided that it was less than HRK 10,000);
- provides that members may exercise their entitlements under voluntary insurance schemes (i.e. entitlements to pension benefits) no earlier than they turn 55 (previously 50)

5. Pension Insurance Companies Act

- aligns operations with EU directives;
- expands the possibility of paying third-pillar pension benefits to life insurance companies;
- shifts the minimum age for withdrawal of temporary pension benefit under voluntary pension insurance to 55 age (previously it was 50);
- sets the minimum age for the life-time third-pillar pension eligibility at 60 years (previously it was 50);
- replaces the success fee with the management fee for assets covering technical provisions at a maximum annual rate of 0.6% of total assets minus financial liabilities for assets covering technical provisions in 2019, 2020, and 2021, with a maximum fee rate for each subsequent year being decreased by 10% compared to the rate applicable in the preceding year, until the maximum rate reaches 0.3%; companies are entitled to such fee when their assets covering their technical provisions exceed 100% of the value of all current and future liabilities, which applies to both second- and third-pillar pensions;
- provides that pension adjustment (indexation) should be linked to inflation, whereby it changes the previous requirement of adjustment to wages and inflation in the same way as under the first pillar; existing second-pillar pension beneficiaries must be given the option of having their pension agreements amended to account for new indexation and new pension calculations made accordingly;
- expands the possibility of investing in infrastructural projects within Croatia's territory;
- provides that the former cost coverage fee charged by funds at 5% of transfers received from second-pillar funds will now be collected at a maximum rate of 1.5% of transfers received from second-pillar pension funds, on a one-off basis, and up to a maximum of 0.17% of transfers received each year during the pension payment period;
- aforementioned cost coverage fees are applied to payments of third-pillar pensions as well, and to direct one-off payments to company accounts made in order to pay out pension benefits;
- allows a one-off withdrawal of a part of second-pillar pension savings once the eligibility requirements are met for old-age pension or early retirement but limits it to 15% of the amount

transferred from the pension fund account to the pension insurance company account, with such withdrawal being possible only for pensioners whose basic pension benefit is at least 15% higher than the minimum pension.

6. Extended Service Period Act

- reduces the number of jobs eligible for an accelerated service period by abolishing the scheme for 43 jobs (which anyway no longer exist in Croatia) and retaining it for 52 jobs; out of a total of 11 occupations which were previously covered by the Act, one has been abolished, but two new ones have been added, which now makes a total of 12 occupations;
- introduces an accelerated service period for aircraft cabin crew;
- reduces the existing degree of service period extension for 19 jobs (slight decrease).

ANNEX III: Main conclusions from the *Analysis of the Croatian Pension System with Special Focus on the Mandatory Funded Pension Scheme* (Beier Research and Edward Palmer Consulting, 2018)

Within the framework of European Commission technical assistance, i.e., the SRSS (Structural Reform Support Service), consultants from Beier Research and Edward Palmer Consulting prepared an assessment of the functioning of the Croatian pension system with a focus on the mandatory funded pillar in order to render support to the Government in the implementation of pension reform. Ten key reform areas and the associated measures to improve the pension system are specified in the final report:

i. Labor market reform

Increasing the degree of pension adequacy will have to follow from the labor market's improved functioning, wherein the need for a longer duration of active work is stressed, while the proposed reforms include the accelerated rise of the statutory retirement age and limitation of the possibility for early retirement (the earliest qualification for retirement should be reduced to three years prior to the statutory age, with the abolishment of all special, preferred options for early retirement).

ii. Reform of investment rules for the second and third pillars

Since the regulatory framework is exceptionally detailed, it is believed that it impedes opportunities for the application of effective development of the business; it has been proposed a gradual transition from the rigid legal regulatory approach to legislation which stipulates general principles for investments and oversight procedures. Considerably higher investment abroad should be allowed, but with retention of a robust domestic component and the opening of new opportunities for investment in domestic projects. Adequate supervision must be secured by enhancing HANFA's capacity.

iii. Reform of the second pillar's design

A replacement of the current approach with A, B and C portfolios with a risk-modeling approach based on life cycle is being proposed. Also proposed are the elimination of the current system of guaranteed yields, a transition to payment of variable pensions from the second pillar instead of indexing them to wage growth and inflation, and integration of the savings phase with the pension pay-out phase by allowing pension funds to disburse pensions from the second pillar. Costs must be cut and their transparency must be increased (abolish entry and exit fees, simplify regulation of fees, empower the clearinghouse agency responsible for setting the fee structures). Direct representation of participant and/or public policy interest in pension fund management companies is also being proposed.

iv. Reform of the third pillar's design

A shift in the third pillar's focus from individual to collective (vocational) arrangements is being proposed, followed by different and stricter supervision of costs and fees, and linking the lowest age for retirement to the statutory age. The repealing of laws on lifetime

severance or supplementary pension purchase is being proposed, while, if necessary, the severance pay arrangements should be incorporated into the standard framework of operations by insurance companies.

v. Reforms to create a stronger and fairer first pillar

It has been noted that the possibility of opting out of the second pillar contradicts the principle of a simple pension system for all, undermines the future development of the second pillar and creates competition between the single- and dual-pillar systems that leads to intergenerational conflict and is destructive. Therefore, the proposal is to eliminate the possibility of opting out of the second pillar and expanding the 27% supplement to all beneficiaries. Also proposed is the abolishment of the limit of 15 service periods necessary to earn a pension with the simultaneous assurance of a supplement up to the minimum acceptable living standard with the application of means testing. In the interest of stabilizing the replacement rate and ensuring financial stability, proposed is the implementation of measures to constantly align the actual pension point value, accrual principles, valorization and indexation with longevity development and the performance of the overall economy. Valorization and indexation to wage sum growth is also being proposed.

vi. Reform of the occupational special regime arrangements

Special pension arrangements for specific occupations, which are now no longer covered by the two-pillar system (military, police, other authorized officials, workers involved in land-mine clearance) dilute the principle of a unified pension system for all. The separation of special schemes from the first pillar is being proposed, so that they are financially autonomous and transparent. A further proposal is to re-enroll the workers from these schemes into the second pillar. The exercise of special rights may be organized within a private funded occupational arrangement. (third pillar).

vii. Reform of the industrial hazard, injury and disease protection

In the interest of developing a system of incentives to improve workplace safety, the gradual transition to a system of mandatory insurance from work-related injury to be financed by employers is being proposed. Over the short term, the reduction of the list of jobs and occupations covered by the current system of increasing the insured years of service and early retirement is being proposed.

viii. Reform of the second pillar's institutional framework

It has been noted that there is a need ensure stronger custodianship of participants' interests in the second pillar and stronger coordination of communication and education efforts and better research. To this end, the formation of a clearinghouse function is being proposed. It would deal with the administrative and analytical aspects of the second pillar. One of its responsibilities would be to secure comprehensive information on pensions for all participants, prepare regular annual review and analysis of the performance and development of the second pillar. Such an institution would, in collaboration with HANFA, have a mandate to monitor costs and fees and propose changes. As an institution, it would have to be an independent and non-political body with assurances of its professionalism, transparency and accountability. Better and more detailed data on socio-economic trends should be ensured, and they must be made available for research purposes.

ix. Increasing the efficiency of the private pension market

The report emphasizes the need to expect and demand more from the private pension industry, wherein industry dynamism must be secured. It should develop and improve its competence and capacity and prepare itself for new challenges. At the same time, the appropriate resources and legal power must be secured for HANFA so that it can follow and supervise the development of the private pension market.

x. Creation of clear, consistent and stable pension policy narrative

It has been stressed that confidence and credibility are the foundations of a sound pension system, and they are fostered through the communication of clear, consistent and stable narrative on pension policy. Sound communication and information of the public are the key to securing support for reforms. Due to the observed shortcomings, the revival and update of the multi-pillar narrative is being proposed. Such narrative must be combined with the national strategy of financial literacy, awareness raising and research on pensions.

Note: Prepared on the basis of the report by Beier Research & Edward Palmer Consulting, “Fourth and Final Report: Proposals for reform of the Croatian pension system with special emphasis on its 2nd and 3rd pillar” (2018).

ANNEX IV: Overview of pension fund investment policies³⁸

IV.1. Pension fund investment policies in Croatia and comparisons to other countries

In Croatia, pension funds are, after banks, the most important financial mediators with a share of 15 percent in overall financial assets. Taking into account the high significance of pension funds in the financial system of the Republic of Croatia and the long-term nature of pension fund investments, there is a high potential for developmental investment. Still, the primary role of pension funds – securing pensions for future retirees – should not be neglected, which is why it is necessary to accord particular attention to the detection of individual investment risks.

Pension fund assets have been experiencing continual growth, due primarily to compulsory contributions, and in October 2018 they were HRK 97.7 billion, i.e., approximately 26 percent of GDP, which is the highest among the countries of Central and Eastern Europe. On the other hand, if Croatia is compared to OECD member states, pension fund assets are still below the average (51% of GDP), while pension funds in developed European states such as Denmark, Sweden and the Netherlands have assets higher than 100% of GDP.

Pension fund investment policies are rooted in the Mandatory Pension Fund Act (*Narodne novine*, 19/14, 93/15, 64/18), although significant changes were introduced by the amendments to this legislation enacted at the end of 2018. Namely, pension funds cannot conduct entirely unfettered investment policies rather the law stipulates classes of investments, as well as maximum and minimum exposure. Given the portfolio risk and the associated differing investment strategies by individual pension funds, there are three categories of mandatory pension funds. Funds in Category A have a higher possibility of investment in a higher-risk class of assets and its permitted exposure to stock markets is 55% of its assets; the permitted exposure of a Category B fund to stock markets is 35 percent of its total assets, while a Category C fund may not invest in stocks, rather it must invest in lower-risk asset types (Table IV.1). On the other hand, unlike in most other countries, in Croatia there are minimum boundaries for investment in government bonds: a Category A fund must invest a minimum of 30 percent of its assets in government bonds; a Category B fund must invest 50 percent, while this share for a Category C fund grows to 70 percent.³⁹

The structure of investments by mandatory pension funds shows that at this moment they do not invest at the existing legal limits (Table IV.2). Namely, despite the possibility of investment in a higher-risk class of assets, such as stocks, pension funds, even those in Category A do not invest up to the permitted upper limit. The reasons for this may be found in the relatively favorable criteria for investing

³⁸ The overview was prepared by Tanja Broz (Institute of Economics, Zagreb)

³⁹ Minimum boundaries are rarely set in investment regulation of pension funds. See, for example OECD Survey of Investment Regulation of Pension Funds 2018 (<http://www.oecd.org/finance/private-pensions/annualsurveyofinvestmentregulationofpensionfunds.htm>).

in domestically-issued government bonds over the preceding period, whereby pension funds could earn relatively high yields with a lesser risk than in comparison to, for example, investment in domestically-issued stocks.

Table IV.1. Legal investment possibilities for pension funds in Croatia

Asset type	Category A fund	Category B fund	Category C fund
Government bonds and money market instruments	Min. 30%	Min. 50%	Min. 70%
Government-guaranteed bonds*	Max. 30%	Max. 30%	Max. 10%
Municipal bonds and money market instruments*	Max. 30%	Max. 30%	Max. 10%
Corporate bonds and money market instruments*	Max. 50%	Max. 30%	Max. 10%
Stocks*	Max. 55%	Max. 35%	0%
UCITS funds	Max. 30%	Max. 30%	Max. 10% **
Alternative investment funds	Max. 15%	Max. 10%	0%
Deposits	Max. 20%	Max. 20%	Max. 20%
Derivatives	***	***	***
Cash	Max. 10%	Max. 5%	Max. 10%

Notes: *Taking into account indirect exposure through investment in UCITS funds and derivatives. **Provided that such investments create indirect exposure only to bonds, deposits and cash. ***Total exposure to the basic asset created through derivatives must not be greater than 30% of the net value of a pension fund's assets. Category C funds are allowed to use derivatives exclusively to attain foreign currency alignment.

Table IV.2. Structure of pension fund investments, October 2018, in %

	Category A	Category B	Category C	Total

Government bonds	46.7	68.5	86.6	69.2
Corporate bonds	3.2	1.5	3.7	1.6
Stocks	33.5	16.3	0.0	15.7
UCITS funds	8.0	6.2	1.5	6.0
Alternative investment funds	0.2	0.3	0.0	0.3
Money market instruments, cash and deposits	8.1	7.1	8.1	7.1
Receivables	0.2	0.1	0.0	0.1
<i>Of this, domestic securities and deposits</i>	<i>83.1</i>	<i>88.4</i>	<i>99.5</i>	<i>88.9</i>
<i>Share of fund categories in total assets</i>	<i>0.7</i>	<i>94.6</i>	<i>4.8</i>	<i>100.0</i>

Source: Croatian Financial Services Supervisory Agency (HANFA).

A comparison to other countries shows that pension funds in different countries follow different investment strategies (Table IV.3). Still, in most other countries, investments in bonds, money market instruments, deposits and cash encompass over half of total pension fund assets, while stocks only account for roughly fifteen percent of assets. This means that pension funds are still oriented toward investments with fixed income, while stocks, as well as alternative investment forms, such as investment in the SME sector, real estate or infrastructure projects have not yet achieved significant value in a majority of countries.

Table IV.3. Comparison of structure of pension fund investments in 2017

	Stocks	Bonds and money market instruments	Investment funds	Cash and deposits	Other
Austria (6% of GDP)	35.5	44.4		7.0	13.1
Netherlands (184.2% of GDP)	31.7	43.6		3.3	21.4
Denmark (208.4% of GDP)	25.6	29.9	4.1	2.0	38.4
Italy (9.8% of GDP)	20.1	45.0		6.2	28.8
Croatia (26% of GDP)	15.7	72.2	6.3	5.8	0.1
Sweden (90.2% of GDP)	13.9	14.5	65.2	0.9	5.4
Great Britain (105.3% of GDP)	13.1	28.0	28.5	2.1	28.3
Hungary (5.9% of GDP)	7.1	60.1	26.6	3.7	2.4
Germany (6.9% of GDP)	6.2	51.9		3.8	38.0
Slovakia (11.7% of GDP)	2.2	57.8	23.5	12.0	4.4
Slovenia (6.9% of GDP)	1.9	59.6	24.6	12.3	1.7
Czech Republic (8.8% of GDP)	0.6	76.9	2.1	19.1	1.3

Note: the shares of pension fund assets in GDP are shown in parentheses. Assets in investment funds are listed only when look-through was not available.

Source: OECD Global Pension Statistics, HANFA.

IV.2. Analysis of potential pension fund investments

Pension funds have two primary objectives. The first and most important is to ensure stable income to retirees, and the second is to participate in the development of domestic economy (Barr and Diamond, 2006; Della Croce, 2011).

To ensure the most adequate possible pensions, contributions into pension funds are vital, but so are the returns earned by a fund for the duration of the contribution period and the fees that it collects. Returns on various classes of assets over time have shown that asset classes which carry a higher risk and have a longer expected period for return of investment also offer higher returns (Jordà, et al., 2017). The achievement of higher returns not only arises from the need to ensure the highest possible pensions, but also from longer life expectancies, since pensions are computed on the basis of actual contributions into the pension fund increased by returns.

In Croatia, however, most pension fund assets are still invested in Croatian government bonds, although pursuant to current laws there is room for a different allocation of such assets. Still, under conditions of relatively high yields on domestic government bonds and the considerable instability on

stock markets, especially the domestic one, such a strategy has in fact facilitated returns for pension funds that are higher than those of their counterparts in OECD countries (OECD, 2018; HANFA, 2018). On the other hand, in anticipation of further convergence of yields on government bonds towards yields in more advanced EU members states, in case positive economic trends continue, a decline in current bond yields – and, consequently, pension fund returns – may be expected. This is why it is necessary to consider alternative investment strategies to which pension funds should turn in the future, but taking into account the risks borne by such investments and the need for diversification; and according to that appropriately adjusting the legislative framework.

In such a context, stocks and equity funds are classes of assets which should gain increased significance in pension fund investments. This is because stocks offer higher potential returns than fixed income securities, and they furthermore offer higher liquidity than securities not traded on stock exchange markets. They additionally facilitate portfolio diversification, thereby reducing risk. However, it should be borne in mind that, under the influence of global business cycle, stock returns in various countries exhibit a higher correlation, which reduces the benefits of diversification.

A class of assets that had similar return as stock investments in the past, but with less volatility, is investment in real estate (Jordà et al., 2017). Furthermore, it has been shown that the correlation between returns on real estate at the global level is lower than that of stocks, while the correlation with inflation is higher. Thus, by investing in real estate, pension funds can diversify their portfolios and derive the ensuing benefits. However, it should be recalled that real estate has lower liquidity than stocks do, especially in the downward phase of business cycles, and they are accompanied by the operating risks of management and maintenance.

Besides investments in stocks and real estate, in the future pension funds can also turn to investments in infrastructure projects and green energy, as well as small and medium-size enterprises in Croatia. Indeed, participation in the development of the domestic economy by pension funds is crucial, because it may foster higher employment and GDP growth rates, as well as a reduction of the public debt. Croatia has thus far wholeheartedly supported infrastructure projects that involve significant front-end investments and which thus have a longer expected period for return of investment, such as motorway construction, which has led to relatively high growth of public debt. There will also be a need for new infrastructure projects in the future, such as the modernization of the railroads and construction of energy distribution facilities, which will inevitably require financing outside of the state budget. Furthermore, investments in green energy, or more precisely investments in the construction of energy facilities based on renewable energy sources, are also vital for the sustainable economic development. Investments in renewables have a positive impact on the GDP growth rate, create new employment opportunities, reduce dependency on imported energy and decrease the impact of climate change (Bhattacharya et al., 2016; Meyer and Sommer, 2014). So, pension funds could facilitate the financing of infrastructure projects which require a longer time to begin turning a profit, which is why they have a harder time securing financing from the traditional banking system. Pension funds can thereby improve the effectiveness of financial intermediation (European Commission, 2017a) and directly influence development of the domestic economy. Nevertheless, even when these types of projects are involved, the primary objective of pension funds – retirement savings – should not be overlooked. The liquidity of such investments is limited, so consequently the sufficient liquidity of the pension funds themselves must be taken into account in order to ensure the timely transfer of saved funds into a pension insurance company. Finally, as in real estate investments, the operating risks in such projects are considerable, which must be taken into account in investment decision-making process.

Small and medium-sized companies constitute the predominant share in the total number of companies and they have a high number of employees. On the other hand, surveys show that small and medium-sized companies encounter considerable barriers in access to financing from banks than large

companies (ECB, 2018; CEPOR, 2017), so it is frequently asserted that such companies must seek financing sources on capital markets (European Commission, 2017b). Even though very many small companies do not manage to survive on the market, some of them could achieve considerable progress in developing technologies and products, and thus generate high returns on investment. Still, a great deal of caution should be exercised by pension funds looking to invest. Since the success of such companies is uncertain, specific knowledge and expertise is necessary to select the right investment, and thus far these qualities are limited in pension fund management companies. So, investments of this type should primarily be conducted through experienced and specialized intermediaries, in the form of venture capital and private equity funds which in Croatia are collectively known as alternative investment funds.

However, in the interest of protecting future pensioners and ensuring greater investment transparency, the involvement of other market participants with experience in such investments should be insisted upon for all classes of assets not traded on the market. In other words, if pension funds participate in the financing of a specific project with a majority share, the remaining share should be invested by a market player with the aim of better control over the implementation of investments and particularly with the objective of avoiding non-market behavior.

When formulating an investment strategy, it should be borne in mind that a preference for the domestic market in order to satisfy the developmental aspect of pension fund investments also means high exposure to just one market, which implies considerable risks, particularly during the downward phase of a business cycle. Even though pension funds in Croatia, and throughout the world, continue to invest most of their assets in domestic securities due to the customary affinity for domestic securities based on better knowledge of the domestic market, geographic diversification of investment could help in retaining stable returns. Such diversification has already been partially achieved by investment in stocks and investment funds, and in aggregate terms pension funds hold roughly the same – albeit still relatively low – shares of domestic and foreign investment in stocks and investment funds.

Geographic diversification is limited in one regard. Namely, the current legislative framework only allows investment in EU or OECD member states.⁴⁰ It would therefore be advisable to consider softening of such geographic restrictions in the future. Pension funds would then be able to directly invest in markets not as connected to the Croatian economy and take advantage of geographic diversification. Nonetheless, even when investing in markets not so closely tied to the Croatian economy and thus lesser known to pension management companies, due attention must be accorded to new potential risks, such as market liquidity, knowledge of legislative frameworks or possible sudden changes to regulations. Investments in equity funds that follow certain stock exchange indices or investments in ETFs could therefore satisfy the need for investments in other markets, but still reduce the risk of investments in individual securities. Improvements in risk management capacity should go hand in hand with pension funds wider diversification.

Besides restrictions based on asset classes, the currently valid pension fund legislation also contains a series of restrictions pertaining to exposure of an individual fund, funds from a single pension fund management company, and then implicitly exposure of all pension funds towards a single issuer, a single investment fund or a single credit institution. Even though these restrictions are complicated, currently there are still reasons for retaining them. The purpose of these restrictions is to reduce risk, which can be lucidly seen on small and insolvent markets such as Croatia's. Namely, pension fund assets are immense given the size and liquidity of the Croatian stock market. Consequently, pension funds have

⁴⁰ Still, by investing in funds which invest in markets outside of the EU or OECD, it is possible to indirectly incur exposure to these markets as well.

difficulty in moving away from individual positions, even over longer periods. Additionally, these restrictions serve as a method for market incentives or in other words for prevention of non-market conduct. Based on these restrictions, it implicitly follows that all pension funds together may acquire a certain portion of stock issues or an investment fund, but not whole, which means that other investors must participate in the remaining portion of the investment.

The previously described illiquidity and non-transparency of the domestic market are among the primary barriers to the removal of such meticulous restrictions on investments and to the use of more liberal investment strategies in which statistical methods to measure and manage risk could also be used together with the relaxation of quantitative restrictions.

IV.3. Recommendations to improve pension fund investment strategies

The primary feature of the investment restrictions imposed upon Croatian pension funds is the mandatory minimum investment in government bonds for all pension fund categories (A, B and C), which hampers the freedom of pension fund managers. These restrictions should be revised such that they are entirely eliminated for Category A funds, and considerably diminished for Category B funds. Furthermore, the lifted restrictions should push Category A funds to make higher investments in higher-risk assets classes such as stocks, which may lead to higher returns over the long term. On the other hand, Category B funds may be repurposed into mixed funds, but still with higher shares of other asset classes.

Besides this conceptual question, another vital question pertains to the freedom to invest in other classes of assets besides stocks and bonds. However, some caution should be exercised here because, even though classes of assets such as real estate and infrastructure projects promise stable returns similar to stock investments, potential problems in the execution of such projects remain such as cost control and efficiency management. Consequently, when making decisions on the expansion of permissible investments in other asset classes, it is necessary to confront the expected benefits of diversification with potential costs. Thus, investments in such projects should be carefully managed and monitored, particularly in the case of real estate. Furthermore, investments in other types of assets, such as small and medium-sized companies not traded on stock exchanges, should, as a rule, be handled by professional external consultants or alternative investment funds. This principle may also be applied to real estate investments via specialized real estate investment funds. The main issue with SMEs and real estate investments is to upgrade the current supervisory framework to risk-based supervision and to enhance the risk management capacity of pension fund management companies. Nevertheless, orientation of investment strategies towards classes of assets with variable returns does not mean that bonds and other forms of assets with fixed income should entirely disappear from pension funds. The security of such investments and their liquidity are greater, which is vital in the transition from pension fund to pension insurance company, i.e., retirement.

Finally, investments in alternative classes of assets require improving risk management in pension fund management companies, as well as higher corporate governance standards. Achieving an optimum investment strategy requires assuming only those risks which may be identified, understood and assessed, and which can be managed.

References

Barr, N. and Diamond, P. (2006), "The economics of pensions", *Oxford Review of Economic Policy*, 22 (1), pp. 15-39.

Bhattacharya, M., Paramati, S. R., Ozturk, I. and Bhattacharya, S. (2016), "The effect of renewable energy consumption on economic growth: Evidence from top 38 countries", *Applied Energy*, Vol. 162, pp. 733-741.

CEPOR (2017), Izvješće o malim i srednjim poduzećima u Hrvatskoj – 2016., <http://www.cepor.hr/wp-content/uploads/2015/04/Cepor-izvjesce-2016-HR-web.pdf>.

Della Croce, R. (2011), “Pension Funds Investment in Infrastructure: Policy Actions”, *OECD Working Papers on Finance, Insurance and Private Pensions*, No. 13.

ECB (2018), Survey on the Access to Finance of Enterprises in the euro area – April to September 2018, <https://www.ecb.europa.eu/stats/accesstofinancesofenterprises/html/ecb.safe201811.en.html#toc1>

European Commission (2017a), European Financial Stability and Integration Review, https://ec.europa.eu/info/sites/info/files/european-financial-stability-and-integration-review-2017_en.pdf.

European Commission (2017b), Addressing Information Barriers in the SME Funding Market in the Context of the Capital Markets Union, https://ec.europa.eu/info/sites/info/files/170606-sme-access-to-funding_en.pdf.

HANFA (2018), Mjesečni izvještaj (October), <https://www.hanfa.hr/publikacije/mjesecna-izvjesca/>.

Jordà, Ò, Knoll, K., Kuvshinov, D., Schularick, M. and Taylor, A. M. (2017), “The rate of return on everything, 1870–2015”, NBER Working Paper, No. 24112.

Meyer, I. and Sommer, M. W. (2014), “Employment Effects of Renewable Energy Supply – A Meta Analysis”, WWW for Europe Policy Paper, No. 12.

OECD (2018), OECD Global Pension Statistics, <http://www.oecd.org/finance/private-pensions/globalpensionstatistics.htm>.

Zakon o obveznim mirovinskim fondovima, *Narodne novine*, no. 19/14, 93/15, 64/18.

8 ANNEX V: Auto-enrollment – an overview of experiences⁴¹

V.1. Introduction

Due to the aging population and the sustainability issues of the PAYG pension systems, we can expect progressively lower pensions in the future, and in order to raise the replacement rates and improve the living standards of retirees, the funded pension schemes are being increasingly promoted. They may be mandatory or voluntary, and individual or collective. Since practices of private pension savings through (legally) compulsory contributions into private pension funds in countries in the wider region are slowly being abandoned for various reasons (Naczyk and Domonkos, 2016⁴²), increasing emphasis is being placed on voluntary retirement savings. For example, according to Jackson (2017),⁴³ the success of the emerging market in securing income in retirement increasingly depends on the success of developing powerful voluntary pension systems, particularly in economies in which coverage by mandatory retirement savings is low, i.e., in economies with notable informal sectors.

Even though the individual approach has indeed been underscored in the context of voluntary pension insurance, recently the number of advocates of the so-called collective approach has been growing. On the one hand, the individual approach requires a high degree of financial literacy, entails relatively high costs with little room to disperse risk and is oriented toward those with higher incomes, while – on the other hand – collective schemes facilitate lower administrative costs, the expansion of coverage, alleviation of regulatory burdens because employers share responsibility for investment opportunities that will be presented to employees, creation of incentives for fair allocation of assets and the opening of possibilities for matching contributions by employers or the state in order to increase future employee pensions (Rudolph, 2016a).⁴⁴

But voluntary savings also carries with it many challenges; among other things, coverage by voluntary pension insurance is rather low even in developed countries. Despite (perhaps precisely because of) tax incentives, generally those with higher incomes save, which leads to growing post-retirement inequality, while fund management costs are quite high. Rudolph (2016a) stated that the insufficient development of voluntary programs in countries in which there are mandatory funded schemes is explained by the so-called “cannibalization” of the mandatory over the voluntary schemes; however, more recent evidence suggests that the size of assets accumulated in voluntary schemes may also be a function of weaknesses in regulatory and incentive structures present in the framework for voluntary funded schemes.⁴⁵

⁴¹ Overview prepared by Iva Tomić, Institute of Economics, Zagreb.

⁴² Naczyk, M., & Domonkos, S. (2016). “The financial crisis and varieties of pension privatization reversals in Eastern Europe.” *Governance*, 29(2), 167-184.

⁴³ Jackson, R. (2017). *Voluntary Pensions in Emerging Markets: New Strategies for Meeting the Retirement Security Challenge*. Global Aging Institute. Available at: <http://www.globalaginginstitute.org/assets/client-assets/common/downloads/publications/2017-Voluntary-Pensions-in-Emerging-Markets-EN.pdf>.

⁴⁴ Rudolph, H. P. (2016a). “Building Voluntary Pension Schemes in Emerging Economies”. *World Bank Policy Research Working Paper 7779*.

⁴⁵ Even though there is no transitional deficit in voluntary savings, there is a fiscal cost in the sense of tax exemptions. Despite this, in comparison to mandatory savings in funded schemes, voluntary retirement savings are significantly more resistant to political risk (Rudolph, 2016a).

Given that employees are insufficiently informed, the conclusion is that existing incentives for voluntary retirement savings are simply not enough and that a new approach is needed. Rudolph (2016a) therefore cited among the basic incentives (stimuli) (i) so-called classical compulsion, or obligation, (ii) supply-driven or sell-side factors, which are generally oriented toward those with higher incomes and also depend on tax exemptions, (iii) so-called soft compulsion, in which the basic example he cites is automatic enrollment (or auto-enrollment) and (ii) peer pressure, i.e., an example of colleagues creating pressure for participation in (voluntary) pension savings schemes and deriving some benefits in return (an example is the 401(k) in the United States). Below more shall be said about the example of so-called soft compulsion, or auto-enrollment as a method for increasing retirement savings in voluntary pension funds. Rudolph (2016a) indeed identified soft compulsion mechanisms as the most effective method to expand voluntary retirement savings coverage among employees.

8.1 V.2. Definition and concepts

Automatic enrollment (auto-enrollment) implies a form of retirement savings in which employees automatically allocate a certain percentage of their salaries as a pension insurance contribution. Auto-enrollment does not require any activity on the part of employees nor their explicit consent to participate in a retirement savings plan. Often it is the employer who makes the decision on the percentage of salaries (the contribution rate) that will be paid into the pension fund, the percentage at which the employer will contribute to retirement savings and whether contributions will remain the same going forward. Actually, the **default option** in this case implies participation in (voluntary) retirement savings.

In principle, auto-enrollment means that the employer offers a savings plan to all employees, and then that employer is also responsible for the choice of pension program (fund) within the framework of defined contribution scheme. Employees, on the other hand, may opt out, or in cases of automatic enrollment this means a change in focus from opt-in to opt-out. Rudolph (2016a) states that systems which apply voluntary opt-outs are actually more suited to expanded coverage among blue-collar workers, but also among younger people and among more vulnerable social groups.⁴⁶

When speaking of automatic enrollment, it is essential to explain several more related terms.

Automatic escalation (auto-escalation) pertains to a situation when the contribution rate at the commencement of auto-enrollment is lower, so that potential participants do not opt out from the program right at the start. For if the initial contribution rate for employees is set (too) high, employees may overcome their complacency and opt out of participation in savings. If, however, the default contribution rate is set (too) low, more employees will remain in the program, but their own complacency will prevent any increases in the contribution rate above the default level. This suggests that the best strategy is a low initial default rate, which would automatically increase over time. Jackson (2017), for example, showed that with auto-enrollment, auto-escalation became a component of best practices at the global level (e.g. in the USA, 2/3 of those with 401(k) plans who use auto-enrollment also use auto-escalation), and he stressed that auto-escalation can help in the maximization of savings when employees are incorporated into a (voluntary) pension program.

Automatic sweeping (auto-sweeping), on the other hand, pertains to the possibility that those employees who decided to opt out from participating in voluntary retirement savings via auto-enrollment may periodically re-enroll (e.g., auto-enrollment in the UK also allows for auto-sweeping of employees who have opted out of employer plans in three-year intervals).

⁴⁶ The height of contributions in this context depends on the fiscal space, the total contributions in the economy, and the transition to a steady state) (Rudolph, 2016a).

Even though auto-enrollment is normally linked to occupational pension systems, Jackson (2017) claims that there are no reasons why the state should be able to implement it even in “personal” pension systems, i.e., with so-called independent employees, provided that these systems use or could use the existing tax infrastructure and employer salary disbursement infrastructure. Rudolph (2016a), using the example of the self-employed in Chile, furthermore showed that auto-enrollment may also function as an individual voluntary pension scheme. Additionally, even though auto-enrollment with an opt-out option is primarily being discussed in this text, there are also examples of mandatory auto-enrollment from which it is not possible to voluntarily opt out.

Although the findings from the relevant literature generally point to the success of auto-enrollment in the expansion of employee coverage by (voluntary) pension insurance, naturally many **challenges** and **threats** also exist in this case as well. This pertains, among other things, to the possibility of reduction of salaries to the detriment of pension insurance contributions which employers had previously paid in for individual employees,⁴⁷ but also to low rates of return on contributions, the possibility of early drawing of funds, early retirement, and situations when default contribution rates are set too low in all cases,⁴⁸ so despite increased coverage under (voluntary) pension plans, there is danger of inadequate pensions in the future and so forth.

Rudolph (2016a) stressed, among other things that having a predetermined investment strategy and avoiding excessively low contribution rates are vital to the success of auto-enrollment. Choi et al. (2002)⁴⁹ said that increasing the matching threshold may increase the individual contribution rate with low savings rates. In principle, given that tax incentives have not proven to be the most effective instrument for the expansion of coverage by voluntary pension insurance, certain new economic incentives have come into play, such as, for example, fixed state subsidies or matching contributions by the state (Rudolph, 2016a). Rudolph (2016a) also stressed that a pension system which only pays out a lump sum at the end of the working life cannot even be called a system of pension funds. According to him, voluntary pension systems should be able to offer an income flow after retirement for individuals and should be conducive to investments and long-lasting and also alleviate inflation risks.

8.2 V.3. What can the findings from the relevant studies tell us about auto-enrollment?

In the case of auto-enrollment, the postulates of **behavioral economics** (e.g. Thaler and Sunstein, 2008⁵⁰ or Benartzi et al., 2018⁵¹) have been applied, as this field has brought into question certain suppositions upon which individual voluntary pension programs rest. The basic characteristic of behavior-based interventions (nudging) is that they must be simple and inexpensive to avoid. For

⁴⁷ Chetty et al. (2014), for example, showed that for most people, higher pension savings due to automatic contributions do not replace other forms of savings, while in the case of state subsidies that encourage retirement savings this does not apply (Chetty, R., Friedman, J., Leth-Petersen, S., Nielsen, T. and Olsen, T. (2014). “Active vs. passive decisions and crowd-out in retirement savings accounts: evidence from Denmark”, *Quarterly Journal of Economics*, 129(3), 1141–219).

⁴⁸ Choi (2015), for example, asserted that the primary reason why employers do not choose a higher default contribution rate is the matching contribution costs they must bear.

⁴⁹ Choi, J. J., Laibson, D., Madrian, B. C., & Metrick, A. (2002). “Defined contribution pensions: Plan rules, participant choices, and the path of least resistance”, *Tax policy and the economy*, 16, 67-113.

⁵⁰ Thaler, R. H. & Sunstein, C. R. (2008). *Nudge: Improving Decisions about Health, Wealth and Happiness*. Yale University Press, New Haven.

⁵¹ Benartzi, S., Beshears, J., Milkman, K. L., Sunstein, C. R., Thaler, R. H., Shankar, M., ... & Galing, S. (2017). Should governments invest more in nudging? *Psychological science*, 28(8), 1041-1055.

example, Madrian (2012)⁵² stressed that the success of auto-enrollment in the United States is based on two basic factors: (i) that most people recognize the need for retirement income above and beyond what they will get from Social Security and therefore want to save (the level of confidence is quite essential in this context), and (ii) that automatic enrollment simplifies what individuals already want to do (e.g. introduction of an additional 10 options in the selection of investments has led to a decline in pension systems between 1.5 and 2 percentage points). Actually, auto-enrollment is effective because (i) people exhibit inertia, which favors defaults; (ii) people infer that policymakers are recommending the default option; and (iii) because defaults become reference points, which makes deviations from the defaults feel like losses (which loom larger than gains) (Benartzi et al., 2018).

In line with the above, Cribb and Emmerson (2016)⁵³ cited several mechanisms by which the introduction of automatic enrollment may increase pension participation in retirement savings programs and increase the proportion of employees saving the default minimum amount in the United Kingdom. First, with its default contribution rate and default investment allocations, auto-enrollment substantially reduces the complexity of the decision of whether to save in a pension. Second, many individuals have problem with “self-control” and often procrastinate over the decision to save a pension, which implies that individuals will not opt out of a pension when automatically enrolled (‘because they can always do it later’), but will actually continue to stay in, and at the default rates. Third, auto-enrollment may mean that the employee sees the default as an endorsement (implicit advice on the best way to proceed), either from the employer or from the government. Finally, there are some individuals who are automatically enrolled in a pension who were not previously offered a default employer contribution to their pension, so they decide not to opt out.

Similarly, Choi (2015)⁵⁴ stated the reasons why the default option in auto-enrollment functions: (i) the transaction costs involved to make a change (questionable?); (ii) the endorsement effect by employers; (iii) loss aversion, i.e., an aversion to the uncertainty outside of the default option; (iv) the default may serve as an (arbitrary) anchor (e.g. it is possible to raise contribution rates by merely mentioning an arbitrary higher rather than lower contribution amount in communications sent to employees about their retirement savings plan); (v) due to bounded rationality, individuals may consider only a subset of possible contribution rates; (vi) cognitive dissonance may influence the decision to persist in the default (“they prefer the default anyway”); and (vii) inattention or ignorance (if individuals are not aware that the default is being implemented, then they cannot opt out of it).

In an overview paper, Benartzi et al. (2018), when comparing the effectiveness of behaviorally-informed (nudging) and traditional policies (such as bans or incentives), assessed that behaviorally-informed policies are more (cost) effective than traditional policies in interventions aimed at increasing retirement savings. They have shown that although monetary incentives can generate large increases in desirable behavior, they are sometimes too expensive to create a favorable ratio of impact to cost. Behaviorally-informed policies (nudges), by contrast, can succeed because they account for intuitions, emotions and automatic decision-making processes, thus creating a high impact per amount spent. In

⁵² Madrian, B. C. (2012). “Matching contributions and savings outcomes: A behavioral economics perspective”, *NBER Working Paper 18220*.

⁵³ Cribb, J., Emmerson, C. (2016). “What happens when employers are obliged to nudge? Automatic enrolment and pension saving in the UK”, IFS Working Papers, No. W16/19, Institute for Fiscal Studies (IFS), London.

⁵⁴ Choi, J. J. (2015). “Contributions to defined contribution pension plans”, *Annual Review of Financial Economics*, 7, 161–78.

any case, these authors nonetheless concluded that behaviorally-informed policies cannot entirely supplant their traditional counterparts.

Jackson (2017), in a paper on voluntary pensions in emerging markets, also stressed the necessity of adhering to the lessons of behavioral economics in order to overcome worker inertia and short-sightedness. He furthermore stressed that although personal pensions are important, the experience of developed countries teaches that employer pensions are usually the most effective and efficient way to extend coverage to the middle class. In his recommendations, he stressed that auto-enrollment should be accompanied by minimum thresholds for employer contributions and maximum thresholds for vesting periods. Furthermore, the accompanying tax preferences should also be linked to so-called non-discrimination tests.⁵⁵

Madrian (2012), in an overview paper, suggested that even though the existence of matching contributions increases coverage and participation in savings schemes, it has a lesser impact in comparison to various non-financial incentives which, among other things, also pertains to auto-enrollment. Moreover, in her research she showed that auto-enrollment is a far more effective method to increase participation in defined contribution savings schemes, and that the greatest impact has been observed among groups with the lowest initial savings rates: the young and lower-income workers. The hypothesis that auto-enrollment expands coverage by (voluntary) retirement insurance to certain underprivileged population groups, i.e., those with lower pension savings rates, such as, for example, young people and lower-income workers who joined their employer more recently, (Cribb and Emmerson (2016) for the UK) or lower-income persons, the less-educated and members of minority groups (Burke et al. (2015) for the US).

Choi et al. (2002), in an analysis of micro-level administrative data on the 401(k) savings behavior of employees in several large US corporations that implemented changes in their 401(k)-plan design, stressed that employees most often follow the path of least resistance, i.e., “the easiest thing to do is nothing whatsoever,” which they called the passive decision. This, however, implies that employers have a great deal of influence over the savings outcomes of their employees. So, among other things they have shown that auto-enrollment dramatically raises participation rates in retirement savings, but also that the vast majority of employees accept the default contribution and investment allocation, while before auto-enrollment few employees chose to invest in these defaults. In their work, the authors have shown that employees are willing to commit to automatic schedules of slow contribution rate increases, which results in substantially higher savings rates after only a few years, and that changes in retirement savings plans without this automatic commitment component are not successful.

Butrica and Karamcheva (2015a),⁵⁶ based on a large nationally representative survey of Americans aged 50 and older from the *Health and Retirement Study*, confirmed previous findings that automatic enrollment in the United States (401(k) plans) is associated with a higher proportion of workers included in defined contribution plans; however, they have also shown that auto-enrollment is associated with a lesser likelihood of contribution payments than is the case with voluntary enrollment. On the other hand, the employers of auto-enrolled workers are more likely to contribute to their employee’ accounts than are the employers of voluntarily enrolled workers. Ultimately, the combined effect is that the retirement accounts of automatically enrolled older workers receive less than those of voluntarily enrolled workers.

⁵⁵ This essentially indicates that employee benefits cannot only be provided to highly-paid employees. Since low-paid employees are less likely to enroll in a pension plan (and thus receive an employer contribution to the pension scheme), this means that the company is failing to comply with non-discrimination tests (Cribb and Emmerson, 2016).

⁵⁶Butrica, B. A., & Karamcheva, N. S. (2015). “The relationship between automatic enrollment and DC plan contributions: Evidence from a national survey of older workers,” Center for Retirement Research at Boston College, CRR WP 2015-14.

They suggested that some of the possible ways to boost the overall contribution level among the automatically enrolled participants might be by offering a more generous employer match and by using auto-escalation. The same authors (Butrica and Karamcheva, 2015b⁵⁷), using data at the employer level from the *National Compensation Survey*, found a statistically significant negative correlation between the employer match rate and the existence of auto-enrollment. This would mean that employers who offer self-enrolled plans set a considerably lower default contribution rate than the maximum match rate, i.e., this allows them to participate in the payment of contributions for a higher number of employees without increasing total costs. This is also confirmed by findings that the total employee compensation costs or defined contribution costs do not differ between companies with auto-enrollment and those without, and there is no evidence that defined contribution costs threaten other forms of employee compensation.

Using data from the 2008 and 2010 waves of the *Health and Retirement Study* in the United States, Burke et al. (2015)⁵⁸ found large socioeconomic and health differences between individuals who are participating in their employer's defined contribution plan and those who are not. In principle, plan participants are significantly more likely to be white, married, college educated, enjoy higher incomes, be longer tenured at their current employers, and in good health, and additionally have more wealth both within and outside of retirement accounts. On the other hand, they found relatively little differences in characteristics when factoring in participation decisions; those who have chosen to opt out of participating in a plan in which they were automatically enrolled appear fairly similar to those who have elected not to participate under voluntary enrollment, though both groups appear to be largely financially unprepared for retirement. They have also shown that automatic enrollment is associated with a large increase in plan participation, and it is most effective at increasing the participation of lower income, less educated and minority individuals.

Dushi et al. (2015),⁵⁹ furthermore showed that the introduction of auto-enrollment in the United States (through so-called automatic individual retirement accounts (IRAs))⁶⁰ has considerably increased private sector employee participation in certain retirement savings plans, particularly for employees in small companies. They stress that a greater problem is that in smaller companies, employees are more rarely offered participation in retirement savings plans, given that after they are given the option of participating the participation rate is much the same for small and large companies.

Cribb and Emmerson (2016), using the example of the United Kingdom (UK), showed that from 2012 to April 2015 participation in workplace pension plans among eligible private sector employees increased by 37 percent, while membership in such retirement plans for those who were offered auto-enrollment reached 88%. Additionally, the average pension contribution rate increased, in part because employers often paid well above the default minimum. They also found substantial spillover effects of the newly-introduced policy: the pension participation rates of workers who did not have to be automatically enrolled increased by 18 percentage points. They also found that the largest effects on pension membership were seen for those with the lowest membership rates prior to auto-enrollment: the

⁵⁷Butrica, B. A., & Karamcheva, N. S. (2015). "Automatic enrollment, employer match rates, and employee compensation in 401 (k) plans", *Monthly Lab. Rev.*, 138 (1).

⁵⁸Burke, J., Hung, A. A., & Luoto, J. E. (2015). "Automatic enrollment in retirement savings vehicles", *RAND Labor & Population Working Paper*, WR-1117.

⁵⁹Dushi, I., Iams, H. M., & Lichtenstein, J. (2015). "Retirement plan coverage by firm size: an update", *Soc. Sec. Bull.*, 75(2), 41-55.

⁶⁰All companies that employ ten or more persons and which have operated for over two years and are not participating in another pension plan for their employees were obliged to offer their employees participation in automatic individual retirement accounts (IRAs) to which regular contributions would be paid via salary deductions.

young, lower-income employees and those who have joined their employer more recently. The authors nonetheless stress that these are effects that cannot be assessed by exclusively studying the voluntary introduction of automatic enrollment, given that this is an obligation of employers in the UK.

8.3 V.4. Examples

In the latest edition of its publication *Pensions at a Glance*,⁶¹ the OECD cited Italy, New Zealand, Turkey and the United Kingdom as countries that have introduced automatic enrollment (with an opt-out clause) into private pension plans at the national level. However, the results have been mixed. It is noted that since its introduction in 2007, the so-called Kiwi Saver scheme in New Zealand has achieved a coverage rate of 75%. In Italy on the other hand, since 2007 the severance pay provision (the so-called *Trattamento di Fine Rapporto*– TFR) of private sector employees is automatically paid into an occupational pension plan unless the employee makes an explicit choice to remain in the TFR regime. Despite this rule, only 20% of the working-age population is covered by a voluntary pension plan in Italy.⁶² The experience in Great Britain has been different, because coverage of the working-age population by (voluntary) pension savings increased from 34% in 2012/13 to 43% in 2015/16. However, this publication notes that proportion of self-employed who participate in (voluntary) pension plans in Great Britain is declining as they are not eligible for automatic enrollment. Finally, there is Turkey, which just introduced automatic enrollment in 2017, compelling employers with at least five employees to (automatically) enroll all employees under the age of 45 in pension plans.⁶³ Additionally, the report also states that automatic enrollment is encouraged in Canada and the United States (OECD, 2017).

García-Huitron and Ponds (2015)⁶⁴ in fact selected New Zealand's Kiwisaver, the United Kingdom's second-pillar pension plans (of which the National Employment Savings Trust/NEST is the salient reference) and the 401(k) plans in the US as examples of the induced choice model, i.e., examples which use behavioral economics to encourage participation and savings in voluntary retirement funds.

Furthermore, they (García-Huitron and Ponds, 2015) stated that the basic difference between the UK and New Zealand lies in the fact that in the first case automatic enrollment covers all of those workers who are not encompassed in any private pension insurance, while Kiwi Saver is oriented exclusively toward new employees. The second difference is in the area of contributions. In Great Britain, employer and employee contributions are gradually increased up to a minimum total contribution of 8% by the end of 2018, while in the New Zealand case there is a minimum contribution in an amount of 3% for both employers and employees in combination with a 50% matching rate provided by the state. Interestingly, neither of these countries, nor the United States, have mandatory full or at least partial annuitization, so beneficiaries in all three countries may fully pay out their pension savings at the moment of retirement.

⁶¹OECD (2017). *Pensions at a Glance 2017: OECD and G20 Indicators*. OECD Publishing, Paris. Available at: http://dx.doi.org/10.1787/pension_glance-2017-en.

⁶²Rudolph (2016a) in fact used the example of Italy to illustrate one of the most relevant “successful failures” in implementing automatic enrollment.

⁶³In January 2017 Turkey introduced automatic enrollment of all wage-earners younger than 45 into private DC pension plans. Employees will automatically contribute 3% of their gross income to private pension plans chosen by their employers. Employees can choose to opt out (within the first two months). The government will match 25% of an employee's contributions and will make an additional one-time contribution of TRY 1 000 (US\$337.73) for those who do not opt out (OECD, 2017). Rudolph (2017) stated that the opt-out rate in Turkey is about 55% and noted as a particular challenge in the Turkish example the relatively high rate of replacement in the existing pay-as-you-go system.

⁶⁴García-Huitron, M., & Ponds, E. H. (2015). “Worldwide diversity in funded pension plans: four role models on choice and participation.” Available at SSRN: <https://ssrn.com/abstract=2606616>.

Jackson (2017) additionally explained that voluntary pension plans in the United Kingdom and New Zealand are actually mandatory for employers and voluntary for employees. If the effectiveness of automatic enrollment is considered, he noted that in the period between 2007 and 2013, coverage by (voluntary) retirement savings in New Zealand has grown from 17% to 71%. Even so, he stressed that participation among existing employees who account for almost two thirds of enrollment in Kiwi Saver can generally be explained by a matching rate from the state, as well as a so-called “kickstart” subsidy that the government offered to new participants. On the other hand, since its introduction in 2012 until 2015, coverage in the UK has grown from 47% to 64%. Reform in the UK also facilitated automatic sweeping of employees who opted out of the employer plan in three-year intervals.

In his papers and presentations (2016a, 2016b,⁶⁵ 2017⁶⁶), Rudolph normally cited the United Kingdom and New Zealand, and the United States to some extent, as examples of successful automatic enrollment in retirement savings plans, while the less successful examples include Turkey and the province of Quebec in Canada; however, these are relatively newer programs and their success (or lack thereof) remains to be seen. Moreover, in his latest lecture he cited Poland and Georgia as examples of countries in which automatic enrollment in certain retirement insurance programs are being prepared, while limited automatic enrollment programs already exist in Italy, Chile,⁶⁷ Slovakia and Brazil (Rudolph, 2017). When comparing countries as well as assessments of success or failure of automatic enrollment in individual countries, Rudolph (2016a, 2016b) considered several dimensions; among other things, is automatic enrollment mandatory or voluntary, the requirement of a minimum number of employees for selecting savings plans, the permitted period for opting out; the characteristics of the default option (fund manager, investment type: conservative vs. life cycle, possibility of employees selecting individual savings plans, time of disbursement, possibilities/reasons (besides retirement) for payment of (part of) savings, whether lump sum payments are allowed; default contribution rates for employers and employees and whether there are so-called automatic escalation; and, finally, different forms of tax incentives and exemptions for (voluntary) retirement savings.⁶⁸

Automatic enrollment is one of the areas which is most scrutinized in the segment of new solutions for pension reform. The number of countries introducing it is growing, and it would be advisable for Croatia to consider its application.

⁶⁵ Rudolph, H. P. (2016b). “Increasing Voluntary Participation in Supplementary Pension Schemes.” Presentation held in Zagreb, June 17, 2016.

⁶⁶ Rudolph, H. P. (2017). “Automatic enrollment reforms: The new normal?” Presentation held in Moscow, November 9, 2017.

⁶⁷ Chile can be cited as an interesting example of automatic enrollment in the personal voluntary pension system for self-employed individuals. According to Rudolph (2016a), this example in fact offers propulsive possibilities for the development of personal voluntary pension plans with emphasis placed on the fact that something like this requires information from the tax authorities.

⁶⁸ Here two basic taxation methods may be distinguished above all: EET (Contribution Exempted, Interest earned Exempted, Withdrawals Taxed) and TEE (Contributions Taxed, Interest earned Exempted, Withdrawals Exempted), i.e., a system in which withdrawals are taxed, and a system in which contributions are taxed. Thus, the UK, USA (401k) and Canada have EET systems, while New Zealand has the TEE system (Rudolph, 2016a).