



Feasibility study - Assessment of the possibilities of using the results of the current dynamic microsimulation model of MoLSA pension system to increase public awareness of future pension entitlements

Elaborated by: Deloitte Advisory s.r.o.

Elaborated for: Ministry of Labor and Social Affairs (project VS/2018/0380)

Project VS/2018/0380 “Development of microsimulation tools for social insurance projection (DEMTOP)” has been funded with support from the European Commission. This feasibility study reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Project VS/2018/0380 Development of microsimulation tools for social insurance projection (DEMTOP) and this document has received financial support from the European Union Programme for Employment and Social Innovation “EaSI” (2014-2020). For further information please consult: <http://ec.europa.eu/social/easi> The information contained in this feasibility study does not necessarily reflect the official position of the European Commission.

May 2020

Table of Contents

1	Introduction	3
2	Executive Summary	4
3	Research of the Approaches and Respective Literature	5
4	Proposals	57
5	Recommendation of the Most Suitable Approach	111
6	Overview of Used Literature and Sources	120
	List of Tables	131
	List of Appendices	132
	List of Figures	133
	List of Abbreviations	134
	Appendices	135

1 Introduction

1.1 Purpose of the Document

The Ministry of Labor and Social Affairs in the Czech Republic (hereinafter MoLSA) is analysing possibilities of communicating their future pension value to the public. The communicated information should be personalized and communicated to the final recipient in a way that is well understood. The result of the NEMO microsimulation model can be used to prepare the communicated information. The aim of the feasibility study is therefore to explore the possibilities and to find appropriate approaches for informing the public in a comprehensible form.

As an inspiration and a basis for the proposed approaches to informing the public about future pension value, there is a research part of the study. It is dedicated to the pension question, the pension communication, the approach to providing information and communication campaigns in selected countries as well as to the general principles of public communication.

The proposed approaches take into account a requirement that the final approach to individualized communication should be in paper form. It is also important to mention that the proposed approaches on how to inform people were based on a situation that the information about the future pension value should be accessible to the wide public. Therefore, it was necessary to pay more attention to the comprehensibility of the proposed approaches for the public.

This document is a feasibility study. It covers a wide range of opportunities and explores the individual possibilities mainly from the point of view of their practical feasibility, complexity of preparation, and main advantages and disadvantages. The technical feasibility and complexity of the proposed approaches are also discussed. The aim is not to focus on one specific solution, but to present a variant design of possible approaches.

1.2 Study Structure

The main part of the study consists of three chapters (chapters 3 - 5). The first one presents research of approaches to the communication to the public in selected countries. The second one contains Deloitte's suggestions on how to inform people about future pension value and the third one brings the recommendation of the most appropriate course of action according to Deloitte.

Chapter 3 summarizes research of communication in selected countries and professional literature, has two subchapters. The first subchapter contains the approach of seven states from the point of view of pensions and overall communication to the population in this area as well as if the microsimulation model is (and possibly how is) used for finding out the future pension value. The second subchapter deals with other topics. Those are the recommended approaches to communication campaign addressed to the wide public in general as well as to communication campaign about future pension value. Lastly, one part of this subchapter is dedicated to the topic on how communication campaigns in other countries reviewed by OECD looked like.

Chapter 4 presents Deloitte's own proposals and provides six basic variants for informing the public about future entitlement to a retirement pension (all focusing on the use of the NEMO microsimulation model). Each variant provides a more detailed overview of its principle, input requirements, how to set up a microsimulation model, how to process the results, what is good practice in other countries, what is a suitable form of presentation, evaluation of the advantages and disadvantages of the variant, and an illustrative presentation of the variant by means of a model example. In addition to these six basic variants, the chapter also brings additional proposals to the variants and part of this chapter is devoted to the possibilities of presenting the acquired amount of pension.

Chapter 5 recommends the most suitable approach and deals specifically with the optimal solution for the choice of target groups, the use of appropriate variants, the design of the presentation form, and the use of the distribution channel.

2 Executive Summary

The primary aim of this feasibility study was to assess the option of using results from MoLSA's existing dynamic microsimulation model of the pension system to increase the level of public awareness about future pension value (with focus on providing information personally or through paper form).

For this assesment, there was performed a literature research and a research of relevant experience from abroad (see Chapter 3). Its main results include:

- The overall trend is to combine a paper form of presenting information with a web interface, as well as general strengthening of the importance of web and social media;
- Microsimulation model's results are typically not used for pesonally informing the public in the reviewed countries with the exception of Slovakia;
- For a good communication campaign, it is crucial to define target groups correctly and to choose suitable information and its presentation forms according to these target groups. It is also important to complete the information by explaining the effects on the individual.

Furthermore, the study contains a description of possible approaches to determine the future amount of pension and the form of its presentation, including their evaluation in terms of implementation complexity and usefulness of information obtained by them along with technical description of how to use the NEMO model to obtain the necessary values. Individual variants are possible to bind to additional proposals. These additional proposals extend the basic information with other useful information and are introduced in Chapter 4.2. At the end of this chapter, we also examine the possibilities of including the development of economic scenarios in modeling the development of the future of specific individuals.

Chapter 4.3 focuses on the determination of target groups, choice of suitable presentation form, choice of suitable distribution channels, and on the communication campaign course. While it is more appropriate to inform people shortly before retirement using paper letters and inform them about the amount of the pension in the future, for younger age groups, it is more appropriate to use current prices and mainly use internet for communication.

At the end of the feasibility study there is a Deloitte's recommendation on the most suitable approach:

1. Persons over the age of 60 will receive a completely individual indication of the future amount of the pension for various potential retirement dates.
2. Younger persons should be divided according to their age, income and the work history or according to other possible important variables. All persons from the same group will receive the same information. This time we will express the expected amount of the pension in current prices.
3. All information will be presented in three scenarios: optimistic, pessimistic, and neutral.
4. We recommend informing people through paper form, however, in our opinion it is suitable to create a web interface as well to supplement the information.

3 Research of the Approaches and Respective Literature

The first part of the chapter on the research of approaches, Chapter 3.1, focuses on the research of the pension systems and communication with the public in connection with pensions in several other countries. Our findings also serve as inspiration for communication proposals.

The second part, Chapter 3.2, examines available literature and other written sources concerning both communication with the public in general and communication campaigns related to pensions. Chapter 3.2.4 dedicated to successful and unsuccessful pension communication campaigns can well serve as a basis for choosing the approach for communication related to pensions.

3.1 Approaches in Other Countries

The purpose of this chapter is to research the approaches to informing citizens about their future pension entitlements used in other countries with an emphasis on determining the expected amount of future pension and the use of simulation models for the determination thereof.

A total of 7 countries were selected for the research; their list and summary of the basic characteristics are presented in Chapter 3.1.1 below.

The following areas are reviewed for each country:

1. Pension system
2. Awareness of the population in the area of pensions
3. Approach to informing the population
4. Microsimulation model and its application

For better clarity, Chapter 3.1.2 summarizes these areas and the discussion of the findings.

3.1.1 Selection of Countries

Several factors were taken into account in the selection of the countries suitable for the research, namely the similarity of the economies to the one of the Czech Republic, similarity of the pension system, quality of the pension system, quality of the communication strategy on pensions, geographical location of the country, and existence of a microsimulation model. The following 7 countries have been selected and examined in more detail:

- Slovakia
- Sweden
- Poland
- United Kingdom
- Canada
- Australia
- The Netherlands

Table 1 summarizes the factors that have been taken into account in the process of selecting the countries and compares them with the situation in the Czech Republic.

Information available on the reviewed countries does not show that the trend of informing the public information is more different for countries with less sustainable systems. Efforts to inform the population can be observed in each country, regardless of whether the system is more or less sustainable or provides citizens with greater or lesser certainties.

Table 1 : Basic summary of the parameters of selected countries

	Czech Republic	Slovakia	Sweden	Poland	United Kingdom	Canada	Australia	The Netherlands
Similarity of the economy with the Czech Republic	X	Higher	Lower	Higher	Lower	Lower	Lower	Lower
Similarity of the pension system	X	Higher	Lower	Lower	Lower	Higher	Lower	Lower
Quality of the pension system	X	The system has been reformed; however, the question of sustainability is still relevant	The system puts emphasis on sustainability; the amount of state pensions according to the economic situation of the state	The system has been reformed; however, the question of sustainability is still relevant	The system has been reformed; emphasis on the individual and their evaluation of adequacy of the state pension	Efforts to transfer responsibility to individuals and involve them in actively saving for retirement funds	One of the best systems; transition to a private system ¹	Rated as the best pension system ²
Quality of the communication strategy on pensions	X	Subject to development; emphasis on improvements	A model communication strategy for many other countries	Higher than in the Czech Republic; letters, public education / events for raising awareness	Striving for very open communication, motivating participation	Higher than in the Czech Republic; efforts to inform citizens at least partially	Successful in terms of comprehending the system; less successful in terms of the specific amount	Higher than in the Czech Republic, subject to development; great emphasis on communication

¹ According to Melbourne Mercer Global Pension Index

² According to Melbourne Mercer Global Pension Index

Geographic location	X	Neighboring country, within V4	Nordic countries representative (usually considered model example)	Neighboring country, within V4	Representative of Western Europe	Representative of North America	Representative of another continent	Representative of Western Europe
Existence of a microsimulation model	X	Yes	Yes	Yes	Yes	Yes	Yes	Yes

3.1.2 Surveyed Areas

For each reviewed country, the pension system is analyzed in more detail in order to detect similarities with and differences from the Czech pension system and thus the relevance of the method of communication in the country as an inspiration for communication in the Czech Republic.

In addition, a summary is presented of the available information on the public awareness or knowledge in the area of pensions and, as the case may be, financial literacy which is closely related to the correct understanding of the pension system.

The core chapter of the research of each country is the chapter dedicated to the method of communication on the future amount of the pension or, more generally, on the pension system and citizens' ability to influence the amount of awarded pension.

The purpose of the study is also to evaluate whether and how the outputs of the microsimulation model can be used to communicate the future amount of pension. Therefore, a chapter commenting on the country's microsimulation model used in the context of pensions is included for each country.

3.1.2.1 Pension System

The pension systems of all the reviewed countries show a similarity in the division of the system into several pillars, most often three pillars. The first pillar is usually a state pillar and the third pillar is private. The second pillar can take the form of employee funds, voluntary state pillar, etc. A brief overview of the systems for the reviewed countries is shown in Table 2 below.

Some of the countries use a so-called **hypothetical account** for each individual contributing to the state pension system, where their funds hypothetically accumulate during their time of contributing to the system, and after reaching retirement age, a significant portion of the state pension is paid from this saved amount.

As we can see in Table 2, the pension system of the Czech Republic is the only pension system with only two pillars; however, in all countries the system is a combination of state and private systems, so the principle is similar. The Slovak system is the closest to the Czech Republic. Swedish and Polish systems are similar in using the principle of hypothetical accounts. The United Kingdom, Australia and the Netherlands put much greater emphasis on individual provision – in these countries, a slightly different method of communication can be expected, with a greater emphasis on delegating responsibility for the amount of pension to individuals.

3.1.2.2 Awareness of the Population in the Area of Pensions

Degree of public awareness in a country can serve as a good indicator of whether or not the communication on pensions is effective. Unfortunately, there is no firmly defined method of measuring the awareness and education of the population in the area of pensions which would allow a meaningful comparison between the individual countries. These chapters therefore provide diverse information concerning the public knowledge in the area of the pension system, their opinions on the system, degree of participation in voluntary savings schemes, and other indicators that can serve at least to compare the success/quality of a country's communication strategy. Here, we present a brief summary of the findings:

Slovakia – Although the Slovak government is trying to improve communication on pensions, awareness in Slovakia is still not ideal – almost 20% do not even consider the topic of pensions to be an important area.

Sweden – in Sweden, surveys on the knowledge of pensions are carried out on regular basis, and a positive trend in improving the knowledge of the pension system is observed – up to 97% of Swedes have at least some knowledge (but this is self-assessment). These very good results are also supported by the fact that the Swedish system of providing information is one of the better ones and is an inspiration for many other countries.

Poland – Polish citizens are rather sceptical about pensions and more than half of them believe that the pensioners' quality of life for the younger generation will be lower. Nevertheless, there are still 40% of Poles who have never actively saved money for their pension themselves.

Table 2 : Pension systems of the reviewed countries

	Czech Republic	Slovakia	Sweden	Poland	United Kingdom	Canada	Australia	The Netherlands
1st pillar	Mandatory, PAYG, DB	Mandatory, PAYG, DB	2 parts: <u>income based</u> (PAYG, hypothetical individual accounts) and <u>premium</u> (individual investment accounts)	Mandatory, PAYG hypothetical pension accounts	State pension, mandatory, lower benefits	Level I, public (state) pension system, mandatory	State pillar, funded from taxes; only the poorer part of the population receives it	State pension, mandatory, PAYG, fixed amount of benefit according to net statutory minimum wage
2nd pillar	None	Voluntary; participation mandatory after accession to the system, individual, DC	Employee scheme, within collective agreement or voluntary pension scheme	Mandatory individual accounts, (accession voluntary; thereafter mandatory)	Employee pension, mandatory, divided into employee and employer part	Level II, pivotal, PAYG, mandatory	Individual pension accounts provided by pension funds, mandatory (for employers)	Voluntary supplementary pension schemes, pension funds
3rd pillar	Private, voluntary, pension companies	Employee scheme, mandatory for employees with high-risk occupation, otherwise voluntary	Voluntary supplementary insurance – individual	Employee pension insurance (mandatory for employers from 2019)	Private supplementary insurance, 2 types (more and less regulated), voluntary	Level III, private pensions and savings	Voluntary pension schemes – payments to pension savings accounts (3 rd pillar) or to the 2 nd pillar	Individual supplementary pension (e.g., life insurance, savings schemes) – usually with tax advantage, voluntary
Other		Christmas benefit		Personal voluntary savings scheme			Various types of benefit	

United Kingdom – UK citizens, too, are sceptical about the future of pensions and expect them to worsen. Unlike Poland, however, almost half of the British population save money for pension on a regular basis and only 5% of Brits have never saved for their retirement. This may be related to the current communication strategy of the United Kingdom – it strives to inform citizens that the state pension is low and it transfers responsibility for the financial situation in their retirement to citizens.

Canada – a survey in Canada shows that more than 60% of Canadians rate their knowledge in the area of pensions at least as average, but 36% of citizens still consider their knowledge to be insufficient. The survey also included questions on the calculation of pensions, not just the pension system mechanism, where citizens achieved a success rate of 60 to 86%.

Australia – surveys suggest that most Australians accept personal responsibility for ensuring adequate retirement income. Nevertheless, more than a third of the working population is not sufficiently aware of how much they have saved and what their retirement income might be. Australian communication strategy seems to be successful in appealing to people to accept their own responsibility for an adequate amount of pension but not so successful in the communication regarding the specific amount of pension.

The Netherlands – a survey on pension plans has shown that only 9% of Dutch have a pension plan that they implement, 38% have a plan but do not implement it, and 49% of Dutch have no plan at all. In the question of personal responsibility for the financial situation in retirement, the Dutch average 3.8 on a scale of 1 to 5 where 1 means “I don't feel responsible at all” and 5 means “I feel very responsible”.

3.1.2.3 Communication Regarding the Amount of Future Pension

As already mentioned, all of the reviewed countries are trying to work on their communication with citizens in the area of pensions. In most countries, there is (or is about to be) a process of actively informing citizens about their expected pensions, see Table 3. It does not include only the amount of state pension, but also the amount of pension coming from private products, or also a combination of state and private pension schemes, which provides the most accurate representation of the expected financial situation of citizens.

Sweden has undoubtedly one of the best communication strategies, with most countries trying to follow its Orange Envelope.

Orange Envelope

The Orange Envelope is a way of communicating the amount of their pension to the population. The concept originated in Sweden, which has been using this method since 1999 with annual frequency. Information on the public pension system is sent once a year during so-called “month of pension awareness”. According to the International Social Security Association, the original Swedish Orange Envelope has the following goals:

- Provide an annual overview of the annual settlement of state pensions
- Provide information on the amount of so-called “pension credit”
- Provide projection of national income for varying ages of individuals
- Communicate the principle that there is a direct proportion between work and pension - the longer you work, the higher your pension will be
- Encourage the population to take advantage of the full pension (i.e., including private savings plans)
- Encourage the population to search the web/Internet for other information services

The envelope itself cannot contain the entire projection because it provides information on state pensions. However, the communication contains a link to a website and a code with which the citizen logs in and subsequently sees their projection of the pension (both state and private).

Many pension companies provide their customers with an annual account statement. In Sweden, they decided to link the two pieces of information (i.e., information on private and state pension) and provide a comprehensive picture to the population. In order to achieve the greatest possible explanatory value and, above all, the highest possible benefit for the recipients, the distribution of the envelopes is associated with other activities and there are efforts to reach people through multiple channels. It does not rely on just the distribution of the envelope as such. Moreover, since the distribution of Orange

Envelopes has been in place in Sweden, an association has also been created among people that the color orange is used for things related to pensions. Sweden actually uses this association (e.g., the main color of the Swedish Pensions Agency is also orange).

Orange Envelopes similar to those in Sweden or Poland may not be used similarly on the Czech market due to the differences in the pension systems in these countries. Hypothetical accounts allow the Orange Envelope to be treated as an “account statement” which can be supplemented by a simple projection for the years to come and the expected amount of pension which is calculated from the contributions paid.

Table 4 shows which countries have introduced information method similar to the Orange Envelope.

One of the most widely used methods to get information on the future amount of pension is to use a so-called pension calculator.

Pension calculators

Pension calculators can be divided into two main categories - the calculation of retirement age and the calculation of the estimated amount of the pension benefit.

The input data entered to the calculators for calculating retirement age usually includes data on the date of birth, sex and number of children. Based on this data, the calculator will display the estimated retirement age. There are also enhanced variants which require additional data that affects the retirement age – for example, high-risk occupation, number of years/months worked when pension insurance was paid.

The second category of calculators focuses on calculating the pension benefit – usually only on the payment from the first pillar. Simpler calculators in which the current gross salary, age, insurance inception, sex and number of children are entered give an approximate result. More complex calculators usually require entering of specific gross salary for each year of insurance, but produce more accurate results. There are also official calculators where it is possible to submit a request directly with the state authority which is in charge of this area and collects specific information on each insured person. These calculators work on future calculations, so they can have various time limitations (for example, they provide information only a certain number of years before the standard retirement age).

A comparison of the use of pension calculators in the reviewed countries is shown in Table 5.

Table 3 : Communication of the amount of pension in each country

	Czech Republic	Slovakia	Sweden	Poland	United Kingdom	Canada	Australia	The Netherlands
Actively informing about the future amount of state contribution	NO	NO, in progress	YES	YES	NO	YES	NO	YES
Actively informing on the future amount of income from private products	NO	YES (primarily electronically)	YES	YES	NO	NO	NO	YES
Other types of systems of informing people on pensions	Websites of MoLSA and Czech Social Security Administration	A document is being prepared / online tool Orange Envelope	Minpension.se and modern platforms Contact Points Annual report of solvency of the state system	Modern platforms Special website Educational events	Dedicated websites and modern platforms Day of pension awareness	Government website – Government of Canada	Information seminars, specialized websites	Website at Pensioen kijker.nl

Table 4 : Informing people using personalized letters/accounts (“Orange Envelope”)

	Czech Republic	Slovakia	Sweden	Poland	United Kingdom	Canada	Australia	The Netherlands
Is there an effective system of informing people with a concept similar to the Orange Envelope?	NO	YES	YES	YES	NO	YES	NO	YES
Type of information provided	x	Only information from the 3 rd pillar; will be expanded to include more	Comprehensive information from all pillars	Information on state pension as well as private retirement savings schemes	x	Information on the 2 nd pillar (crucial for the Canadian pension system)	x	Information on state pension and employee funds
Form of provision of this information	x	Online, paper upon request	Paper, extended variant (information from all pillars) online	Paper, website planned	x	Paper	x	Paper and online

Table 5 : Calculators of the amount of pension in each country

	Czech Republic	Slovakia	Sweden	Poland	United Kingdom	Canada	Australia	The Netherlands
Official (on ministry website, etc.)	YES, on the website of the Czech Social Security Administration, also on the website of MoLSA	YES, on the website of the Social Insurance Company	More like an interactive tool, similar to a calculator – Minpension.se	YES, on the website of ZUS	YES, on government website	YES, on government website	YES, on relevant government agency website	NO, state pension is table-based (no calculator is needed)
Simplified		NO		YES	YES	YES	YES	
Complex		YES		YES	YES	YES	YES	
Information provided		Values from the 1 st pillar		Estimated pension account balance at retirement age, estimated monthly pension	Pension amount (simpler - more like an interactive tool), more accurate calculation (more complex – for people who have reached retirement)	Total state pension (level I and II of the system)	Simpler – entitlement to pension, more complex – specific amounts of pension and payments – total income in retirement	
Form demands	Excel files, tool on the Czech Social Security Administration website available only to citizens 5	More difficult, necessary to enter data for each year of pension insurance		More difficult (even the simpler variant requires information on the payments made, more	Simple variant only a few factors such as age and net salary; more complex variant – the complete	Simple, only based on average income – only indicative,	Information such as age, sex, marital status, disability, if any, income and property;	

	years before the retirement	complicated also for the uninsured years, etc.)	work history and financial situation	Difficult (large amount of information)	More detailed for more complex variant
Additional calculators	YES: determination of the retirement age, Calculation of the Christmas benefit		YES: determination of the retirement age		YES: fulfilment conditions for state pension entitlement, amount of supplementary payments, calculation of the retirement age, estimate of employer's contribution, etc.

Other interesting methods of communication

In addition to Orange Envelopes and pension calculators, there are many forms of informing citizens. These forms are primarily focused on raising awareness of the system as such, and not just on the expected situation of the individual. Various lectures and seminars are organized, some countries (e.g., Poland) organize educational/awareness events also for young people in high schools before they start working. In addition to improving the understanding of the system, the communication often aims at transferring responsibility for the financial situation in retirement to individual citizens – especially in countries where the private savings system plays an important role (e.g., United Kingdom, Australia).

A general trend is also going online. Most countries have put in place specialized websites that can contain and explain general information on the pension system, as well as the option to sign in and obtain personalized information. The websites also often offer practical information, such as how to apply for pension, how your future financial situation can be improved, etc. In addition to websites, communication on pensions extends also to other modern platforms, namely social media such as Facebook or Twitter, as well as to educational videos on YouTube. The motivation behind the move to the online environment is to reach out to the younger generations and involve citizens in the process of planning their retirement early.

In addition to the online environment, some countries (e.g., Sweden, Poland, United Kingdom or Australia) also offer individualized communication (via Internet – chat, e-mail, etc. or a personal appointment) with pension consultants. These consultants do not sell private products but rather answer the individual's questions, help him understand the system and especially their personal situation and, as the case may be, prepare a plan for the individual to pursue if he wants to improve his pension prospects.

Within the pension-related communication, the majority of institutions try to create a certain association with pensions for citizens – e.g., using a certain color (orange in Sweden or Slovakia, blue in the United Kingdom), a certain image (image of oak tree in Estonia), or another symbol (a blue car or bus in the United Kingdom that visits cities as part of the communication related to pensions) or time interval (day of pension awareness in the United Kingdom).

3.1.2.4 Microsimulation Models

Most of the reviewed countries use a microsimulation model for some of the tasks related to the pension modeling; however, using its results to inform citizens is not common. An overview of basic information on microsimulation models in the reviewed countries is shown in Table 6.

Table 6 : Microsimulation models in each country

	Czech Republic	Slovakia	Sweden	Poland	United Kingdom	Canada	Australia	The Netherlands
Is there an official microsimulation model?	YES	YES	YES	YES	YES	YES	YES	YES
Name of the microsimulation model	NEMO	Orange envelope	SESIM	Without a specific name	PENSIM2	DYNACAN	MARIA	SADNAP
According to available information, are the model outputs used for individual communication?	Not currently	YES	NO	NO	NO	NO, and there are no plans to do it	NO, but it may change after modifications	NO

3.1.3 Slovakia

3.1.3.1 Pension System

The pension system in Slovakia underwent major reform in 2003. A single-pillar system which was based on the PAYG approach was expanded into a system which is based on three pillars. Every citizen who has contributed to the pension insurance for at least 15 years and who has reached the retirement age is entitled to the old-age pension.

Three pension pillars

I. Obligatory pension insurance

It is pay-as-you-go and benefit-defined pension system. An important element here is the merit, i.e., the relationship between the amount of payments into the system and the amount of benefits provided. It is mandatory by law, but it can also be supplemented by voluntary pension insurance.

It is administered by Sociálna poisťovňa (Social Insurance Company) and it is divided into old-age and disability insurance.

II. Old-age pension savings scheme

This pillar is a capitalization system defined in terms of contributions. This means that the amount of the pension benefit depends on the contributions paid and the yield thereof. Pension management companies manage the funds – they always manage one guaranteed bond fund and one non-guaranteed equity pension fund.

Entry to the second pillar is voluntary for individuals under the age of 35, but if an individual enters the system, it becomes mandatory. Mandatory payments (18%) are distributed between the first and second pillar. The benefit paid will therefore consist of a reduced pension from the 1st pillar and pension from the 2nd pillar, the amount depends on contributions paid, on yield thereof, and on the mode of payment of benefits chosen by the individual.

III. Supplementary pension savings scheme

Entry to this pillar is mandatory for employees in high-risk occupation; it is voluntary for other employees over 18 years of age.

Contributions for employees in high-risk occupation are paid by the employer; other employees pay contributions themselves, but the employer may also pay them for them.

The payment of benefits depends on the period in which the individual entered the participation agreement and whether it includes a benefit plan.

Christmas benefit

The Christmas benefit is a solidarity benefit from the state budget. It helps raising the standard of living of low-income pensioners during Christmas time as it entails a higher financial burden.

3.1.3.2 Awareness of the Population in the Area of Pensions

According to a representative survey Focus for Nadácia Partners³, up to 62% of Slovaks in productive age have no retirement savings plan. Up to 49% of respondents are not interested in long-term savings plans; and for the remaining 51% the average amount saved is EUR 64 a month. If we take a look at the specific pension products, 27% of respondents said that they participate in the 2nd pillar and 13% in

³ <https://www.nadaciapartners.sk/detail/slovaci-mozu-mat-svajciarsky-dochodok-ak-prekonaju-strach-z-investovania-a-podielovych-fondov-9>

the 3rd pillar. As the main reason, more than half of the respondents stated that they did not have sufficient funds, 12% of Slovaks fully rely on the state, and 19% do not consider this area important.

3.1.3.3 Approach to Informing People

On its website⁴, the Ministry of Labor, Social Affairs and Family in Slovakia (MoLSAR) publishes information on the changes and any modifications to the pension system on regular basis. Slovaks can also find a summary there of what the current structure of the system looks like, with detailed description of all the pillars.

In Slovakia, it is also possible to look at **pension calculators**. Official calculators can be found on the website of Sociálna poisťovňa⁵ which is in charge of pensions in the 1st pillar in Slovakia. We find both basic types of calculators there – calculator for the retirement age, as well as the one for the amount of pension benefit awarded. There is also the Christmas benefit calculator which is typical for Slovakia. The pension benefit calculator is one of the more complicated ones where you need to enter specific data for each year of pension insurance, and, likewise, everyone can make an estimate of the average annual real income growth (from 0.1% to 8%). The result only covers the 1st pillar.

MoLSAR is committed to raising people's awareness of their pension entitlements. Changes concerning the 3rd pillar that came into force on 1 January 2019 were only the first step. All participants of the 3rd pillar will always receive detailed personal account statements at the beginning of the year as part of supplementary pension savings scheme. These account statements are provided and distributed by the so-called supplementary pension companies (there are four of them in Slovakia) for their clients. They will include not only a summary of the amount saved but also an estimated amount of future supplementary pension at the time of retirement, as well as a breakdown of payments for the last 12 months or information on the monthly amount of pension in terms of inflation and the expected amount of future supplementary old-age pension in the next 10 years. The distribution thereof is automatic - primarily in electronic form; it will be necessary to request distribution in paper form. In addition to the account statements sent, each supplementary pension company has an opportunity to use online user access for its clients (accessible through login), where an individual can update their information and request an account statement at any time.

Since each supplementary pension company provides account statements to its clients, there is no single format of this statement (however, as mentioned above, there is a mandatory information that the statement must contain). To get an idea of what such account statement from the third pillar in Slovakia looks like, we can see Appendix 4 where an account statement from AXA is attached for illustration.

At this time, an amendment to the act was also approved⁶, aimed at helping to raise awareness of the 2nd pillar, and as a result two important documents shall be developed – “*Personal account statement and statement of estimated pension benefits of the participant*” (**Appendix 1:** Appendix 1) and “*Personal account statement and statement of pension benefits of the benefit recipient*” (Appendix 2). Based on this information, information on the expected retirement age and forecasts of the amount accumulated at the time of retirement will be available to everyone (the calculation takes into account estimated inflation and yield), as well as the amount of the expected pension. The accumulated amount is displayed in 3 scenarios in the future value and supplemented by an equivalent amount in the present value. The result should be a single document – the so-called **Orange Envelope** – in which people should obtain comprehensive information on their future pension.

In 2018 the proposal to inform pension insurance participants through an Orange Envelope – the internet platform⁷ was approved that has been in place since 2019 – that is, only for the third pillar for the time being. The basic form of the statement is electronic, but if the particular insurance participant is interested, the information can also be sent in paper form. This way, people will get an overview of their current situation, and given the same regular contributions also the future forecast.

⁴ <https://www.employment.gov.sk/sk/>

⁵ <https://www.socpoist.sk/kalkulacky-nwq/64985s>

⁶ https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2019/411/20200101#priloha.priloha-priloha_c_1_k_opatreniu_c_411_2019_z_z

⁷ <https://www.oranzovaobalka.sk/web/sk/>

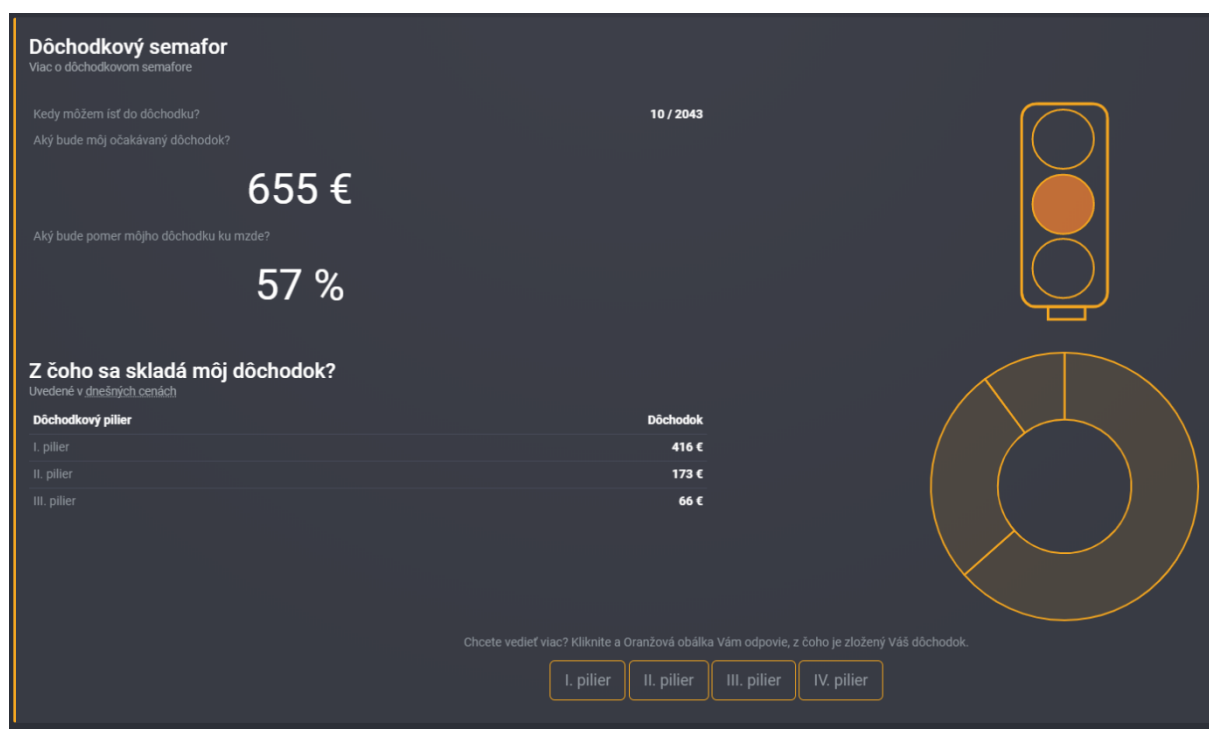
MoLSAR plans to make this information available for state pensions – the first pillar in the future. After this comprehensive disclosure of information, the individual will receive summarized information on all three pillars and, at the same time, the age of his retirement. However, representatives of Slovakia draw attention to the fact that the final recipients of the communicated message must not be forgotten – it must be comprehensible to all the recipients, not only to people with high financial literacy, as it is intended to the entire population of the Slovak Republic, and therefore, it is important to refine the form and information communicated. **According to a representative of the National Bank of Slovakia, it is sufficient to provide the recipients with two basic pieces of information – the retirement age expected based on the legislation and demographic projections and the amount of future pension (expressed in present value).** Of course, additional and more detailed information will also be included in the account statement, but the basic message should be clear and easy to understand. Another option will be to search for information on a dedicated website that is implemented as a project of the University of Matej Bela and others.

The form of basic pension information can be seen on *Figure 1: Basic information on pension on the website named oranzovaobalka.sk*. Only the basic information is displayed, namely:

- When does the individual retire;
- What is the expected pension;
- What is the benefit ratio (pension/income).

The expected amount of pension is also divided into pillars, and this division is shown on a simple pie chart. To complete the information we added a picture of a traffic light which summarizes and graphically represents the overall situation (green – good to red – poor). It is planned to display all communicated information as a number supplemented by verbal explanations and illustrated on a simple graph. The graphics, text, and selection of appropriate information are currently under development, and testing is underway in collaboration with the Faculty of Behavioral Studies.

Figure 1: Basic information on pension on the website named oranzovaobalka.sk



In addition, the individual can click and look at each pillar in detail. The website oranzovaobalka.sk⁸ shows a model example (on a real person with “average” parameters) to provide an idea of what the information looks like. As part of the state pension (i.e., the first pillar), the individual can see how many

⁸ oranzovaobalka.sk

years he has worked to date, how much he contributes to the pension insurance on a monthly basis, what his retirement age is, and what amount of pension he can expect. The amounts are then explained in more detail (see Appendix 3).

For the time being, this application works in beta version and upon receiving the login information, each individual can log in this application to see the calculations made for their specific situation.

As for the beta version, information is constantly being collected and the application is improved based on user input. The microsimulation model provides the results presented to individuals.

The concept of the Orange Envelope website⁹ in Slovakia has evolved as a result of systematic university research that is also applicable in practical life. The research behind the Orange Envelope is a combination of several areas – public, pension, regulatory policy, finance, investing, personal finance, wealth management and behavioral economics. The Orange Envelope includes, among other things, individual projection of pension entitlements, monitoring of savings and its impact, and helps citizens to find a suitable distribution of their savings.

This is the way to communicate to citizens their entitlement to retirement. The objective is to inform citizens about their situation specifically and try to avoid any unpleasant surprises right before retirement. This is a form of prevention with regard to securing an individual for old age.

3.1.3.4 Expected Amount of Pension and Use of Simulation Models

In Slovakia, a proposal to create a microsimulation model of the pension system was created in 2014. It has been determined that its main objective is to create the prerequisites for better set-up of the pension system and decision making process related to the changes thereto. The model is working with a retirement value estimation from state secured and pay-as-you-go 1st pillar, pension fund 2nd pillar, employers fund 3rd pillar and the 4th pillar as a long-term investment savings. The microsimulation model is currently used as a tool for the calculation of the amount of pension for individuals using the Orange Envelope application. Calculations are performed based on 4 modules – demographic module, macroeconomic module, module of status parameters of the individuals, and policy module.

It is an open dynamic microsimulation model with a dynamically aging population – it means that the model monitors individuals with similar status over time and subjects them to aging, labor market risks, random economic developments, and the pension policy rules. Each of the above-mentioned four modules takes into account different parameters, as one can see on *Figure 2: Microsimulation model of the Orange Envelope of the Slovak Republic*.

Detailed documentation on the works of the Orange Envelope is in preparation and shall be published in spring of 2020.

The individual status parameter model contains empirical cross-sectional data from the Statistical Office of the Slovak Republic in order to create a single “simulation” account for each individual in the given cohort which is determined by statuses such as:

- Age
- Education
- Type of economic activity
- Manifestation whether the person already receives old-age pension
- Number of years of postponement of retirement from the time the person became entitled to old-age pension
- Number of years when parental allowance was received
- Manifestation whether the person is a participant of the old-age pension savings system
- Number of years postponing savings from the accession to labor market
- Savings strategy (distribution of savings between index and bond fund)

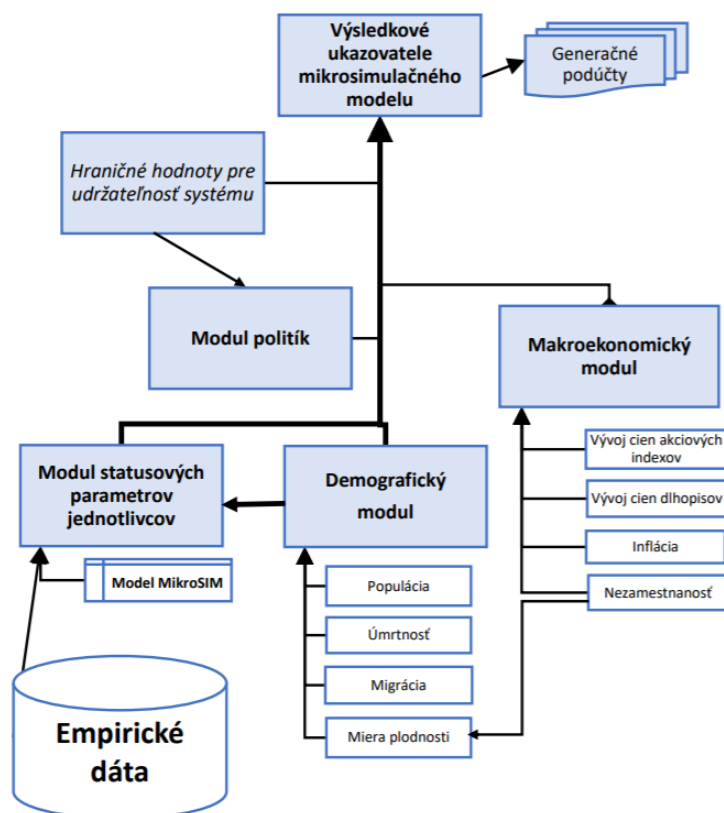
⁹ <https://www.oranzovaobalka.sk/web/sk/>

The microsimulation model is connected to the Orange Envelope platform and its aim is to calculate results that are provided to the end-user in real-time. Initial problems with calculation time were solved by appropriate cohort assignments and the use of predicted results. However, the specific procedure is, for the time being, the know-how of the creators of the Orange Envelope. As mentioned above, the documentation describing the functioning is currently not available. However, here we summarize at least a short description of the functioning described by one of the founders of the Orange Envelope.

When the user enters the platform, he has to fill in basic information – date of birth, income, commencement of employment date, or education. The next step there is a connection with Sociálna poisťovňa where information about career of the user is transferred. According to these inputs the user is assigned to cohort – so called data cube. The tool then obtains the results for the persons in the relevant data cube (calculating for each person many times to make the sample wide enough), selects the 10%, 50% and 90% quantiles and presents them to the user. According to the fact that the model works with legislation, political and economic development, there are scenarios presented – the optimistic scenario (90% quantile that represents the pension under current legislation), sustainable (50% quantile, represents the pension in changing systems) and non-deficit (10% quantile, represents the amount of pension for which funds will be realistically available).

Unfortunately, the detailed functioning of the calculation is currently not fully available, but it can be expected that the prepared documentation will provide the required information.

Figure 2: Microsimulation model of the Orange Envelope of the Slovak Republic



3.1.4 Sweden

3.1.4.1 Pension System

The Swedish pension system underwent a major reform in 1998 and the first pensions under the new system were paid out in 2001. The most important change was the covariant of benefit-defined old-age insurance to a system of pension insurance with personal accounts. In order for the system to be

sustainable, it includes a so-called balancing mechanism which contributes to its sustainability despite the demographic changes, economic crises, etc. In practice, this is a principle of dependence of the benefit paid on the total value of contributions in the system (which may lead to lower payments, for example in a period of crisis). The system is merit-based, but there is also a guaranteed minimum pension which is paid from the state budget.

The payment of national old-age pensions and provision of both general and specific information related to pensions is facilitated in Sweden by the “Swedish Pension Agency”.

The entire system is based on three pillars:

I. Obligatory pension insurance

This pillar is the main retirement income, though for most Swedes not the only one. It is divided into two parts – income and premium pension.

The income-based pillar is a PAYG system and takes most of the contributions which are subsequently transferred to hypothetical individual accounts.

The premium pillar takes a smaller portion of the payments to individual investment accounts (premium pension). The state is only an administrator, the choice of funds is up to each pension insurance participant. Employees can change their investment decisions at any time, and if they do not want to manage them themselves, they can use a special fund set up by the government. Premiums can be collected from the age of 61 either by a single withdrawal or by transfer to the traditional pension insurance account.

II. Employee pension

Approximately 90% of working Swedes participate in the 2nd pillar. It is usually defined by a collective agreement covering an employee within a defined group. The employer may offer employees who are not covered by any collective agreement a voluntary pension plan. This pillar is particularly significant for people with higher income.

III. Voluntary supplementary pension insurance

Participation in this pillar is voluntary and is used by more than 50% of Swedes. It is an individual supplementary insurance with capital funding.

3.1.4.2 Awareness of the Population in the Area of Pensions

Swedish Pension Agency conducts annual surveys on population awareness. The surveys are related to distributed Orange Envelope and focus on the trust that people have in the Swedish Pension Agency and the local pension system as a whole, or monitor the cognizance of pensions in general. Collected survey results later serve as a basis for assessment of effectiveness of communicated information in Sweden.

What is interesting, for example, is that over time, more and more citizens rate their knowledge of the pension system as good. Approximately half of working people and pensioners find the Swedish pension system easy to understand, and the number of people who find it complicated and difficult to understand decreases over time. In 2010, the system was evaluated as complicated and difficult to understand by 41% of working people and 33% of pensioners. In 2018, it was only 21% of working people and 20% of pensioners.

Another fairly high percentage is reported for at least some knowledge of pensions – 97% of Swedes have this knowledge. Approximately 25% of the population have such knowledge which is a prerequisite for active decision-making on pension issues. Moreover, about 49% of the population have at least an understanding of the concepts and specific terms associated with pensions. Based on these figures, the Swedish Pension Agency can subsequently modify its communication to the population.

3.1.4.3 Approach to Informing People

Sweden's communication toward the population is quite sophisticated. As mentioned above, Sweden was the first country to introduce the concept of so-called **Orange Envelope** in 1999, which was adopted also by some other countries over time. The Orange Envelope is sent to residents every year. It includes information on mandatory pension insurance (i.e., for income-based and premium pension). If an individual wants comprehensive information on how high his pension will be in the future, he has to log in via a special website where the amount of pension from all pillars is simulated. The envelope is beneficial in providing comprehensive information to the recipients – it does not provide information only on state pension, but also on the employee pension and, if applicable, the voluntary pension insurance. In addition, Sweden has managed to create an association across the society: Orange Envelope = matters related to pensions – for example, this color is linked also to the basic color of the Swedish Pensions Agency. The distribution of the Orange Envelope is also linked to further steps towards public regarding the communication of pensions. The distribution is therefore not one separate event, but it is accompanied by other activities and people are also contacted during this period through other communication channels – e.g., contact points where a person can come and discuss their retirement projections with the person in charge.

The Orange Envelope is shown in Appendix 4. An annual solvency report of the state system named “Orange Report” is also published annually in Sweden. This document describes the financial situation of the state part of the pension system in a particular year, shows how the system did at the end of the previous year, and illustrates three possible scenarios of future development. The report is comprehensive, it also shows developments compared to previous years, explains how the local pension system is designed, including how pensions are calculated, how much money has come into the system and how much has left the system, and what the overall situation of the system is.

Another way of pension communication to the public, which is quite popular among Swedes, is through the website Minpension.se¹⁰ In 2018, approximately 50% of individuals used this website as their main source of information on pensions – Sweden takes advantage of this fact and the website has therefore become a determinant for other communication channels. If we look at the use of communication channels in terms of age, the Minpension.se website is mainly used by the younger generation. According to statistics, for people over 55 years of age, the preferred option is still the Orange Envelope. The website is interconnected with other platforms such as blog, Facebook or Instagram. Minpension.se was created as a joint project of the government and pension funds. Interestingly, the projection here counts on how much an individual has been saving for retirement, how long he will still work, but it also takes into account the estimated return on investment in pensions or shows forecasts of Swedish economy as a whole. At the same time, one can change assumptions and see how the amount of his pension changes with changing assumptions.

The projection considers factors that may affect the future of the individual – e.g., income, age, how long he has worked, etc. Of course, there is always some degree of uncertainty in the prediction, but the closer the individual is to retirement, the more accurate the forecast is.

Now a little more detail about the forecast of the amount of pension. For this purpose, information is collected from individual pension companies the individual lists when registering on the website – the forecast is

Figure 3: An example of the description of the production of a forecast for the visitors of the Minpension website

What is a forecast?

In order to produce the pension forecast, information such as myPension is collected from your pension companies and the information you may have registered yourself. Based on that, we estimate the pension at future times. The forecast is no promise or guarantee.

The data that is collected creates a linear trend (see graph below) where we include factors that can affect your future pension, for example salary, age and how long you have worked.

There is always a degree of uncertainty in a forecast. The closer you are to the pension, the safer the forecast.

The forecast on myPension may differ from the one you received from your pension company. This may be due to the fact that, in some cases, myPension calculates standard values. When minPension has the company's own values or when the companies themselves calculate the amount, the forecast becomes more secure. Information on a general pension on minPension is provided by the Pensions Agency. The respective pension insurance shows who made the calculation.

Basis for the forecast

Note that the pension forecast is an estimate based on assumptions. The forecast is not an exact indication of the size of your future pension.

The forecast is based on the assumptions stated and is calculated using today's monetary value.

¹⁰ <https://www.minpension.se/>

subsequently made based on this information. *Figure 3: An example of the description of the production of a forecast for the visitors of the Minpension website* shows how this process is explained to the visitors of the website at Minpension.se

3.1.4.4 Microsimulation Model and its Utilization

Sweden uses a dynamic microsimulation model which has been developed by Swedish Ministry of Finance in cooperation with the local universities. Originally, it was used as a tool for evaluating state education contributions in 1997. After two years, however, its use is directed to pension purposes, evaluation of financial sustainability of the Swedish pension system specifically. As a result, the model has become a model that can be used for a broad spectrum of analyses.

According to the official website¹¹ dedicated to the microsimulation model, it has been used for:

- Modeling budget estimates of student grants and loans
- Long-run forecasts of pension expenditures for long-term surveys
- Calculation of replacement ratios, etc. in the new pension system
- Life-cycle analysis
- Analysis of the financial stability of the new pension system
- Analysis of the aging population, health care, housing, etc.
- Pension projections for EU EPC Working Group on Ageing Populations and Sustainability (AWG)
- Analysis of the future needs for health care and care for the elderly
- Analysis of future pensioners' economic standards
- Analysis of the funded premium pension system and effects on the income distribution
- Long-run effects of tobacco prevention
- Analysis of pension-related age limits

3.1.5 Poland

3.1.5.1 Pension System

According to the website money.pl, the pension system in Poland is divided into two mandatory pillars and the third voluntary pillar of employment pension plans. In addition to these three, there is a personal voluntary savings plan, sometimes also referred to as the fourth pillar. There is also a minimum pension paid out of the budget to those insured individuals who would not have reached it even after the first and second pillar payments were combined. The state also subsidizes pensions for specific groups of population (such as farmers, police, judges, etc.) where both the benefits and contributions are flat-rate sums amounting to approximately half the average of public pension benefits.

In Poland, retirement is emphatically a right, not an obligation. After reaching the universal retirement age – 65 years for men and 60 years for women – it is up to every person, whether he wants to exercise this right immediately or later because of his desire to continue working. The important thing is that the later you retire, the higher the pension will be.

¹¹ <http://www.sesim.org/>

The entire system is based on three pillars:

I. Public pensions

The first pillar is the main and most important pillar in Poland. It is a PAYG system where payments of the payers are deposited on hypothetical accounts and the resulting retirement benefit depends solely on the contributions collected during life. The Social Security Institution (Zakład Ubezpieczeń Społecznych – ZUS) then manage the pension plans.

II. Obligatory individual accounts

Accession to the second pillar is voluntary, but participation is compulsory for all who are already members. These are open pension funds, which are independent legal entities and are created and managed by private pension companies – an association of pension funds. Each company can manage two funds – one with a higher share of capital investment and one that is more conservative.

In 2011, the Polish government approved a reduction in the contribution to the second pillar from 7.3% to 2.92% (the difference was transferred to the 1st pillar), which put into question the profitability of the whole 2nd pillar. In 2014, citizens were forced to choose whether they wanted to stay in the second pillar or transfer everything to the first pillar.

III. Voluntary employment pensions

This pillar comprises occupational (employment) pension insurance. During 2019, there has been a substantial change in it as it became mandatory for employers, but participation remained voluntary for employees. There is quite a lot of freedom in terms of investment, but all investments must be in Poland. The employer negotiates specific conditions with employees (through intermediaries or trade unions).

3.1.5.2 Awareness of the Population in the Area of Pensions

According to the Aegon Center report which was based on the cooperation of Transamerica Center for Retirement Studies (USA) and Instituto de Longevidade Mongeral Aegon (Brazil), 55% of Poles believe that future generations of pensioners will be worse off than current pensioners. If we look at the expected pension benefits, more than half (56%) of the expected income should come, according to Poles, from the state, 21% expect it to come from the employer, and 24% should be covered by personal savings and investments. More than a third of Poles (35%) believe that taxes should be increased to cover higher social security costs. Here we can also see the connection with the fact that only 21% of the population in Poland regularly saves for their retirement, 26% save occasionally, 12% have been saving but currently are not saving, and 40% have never been saving.

The Financial Supervision Commission provides information on the current performance of the open pension funds. It publishes regular monthly, quarterly and annual reports on the financial condition of these funds on its website.

3.1.5.3 Approach to Informing People

The state authority responsible for the pension system in Poland is the Ministry of Labor and Social Policy (Ministerstwo Rodziny Pracy i Polityki Społecznej – MRPIPS). In addition to the website,¹² the ministry communicates with the citizens also using official profiles of modern platforms such as Facebook¹³, Instagram¹⁴, Twitter¹⁵ and YouTube channels¹⁶. The messages on these social networks are related not only to the area of pensions but general social policy issues. Here, you can find information on news and changes in legislation, as well as information on interesting events which take place in cooperation with MRPIPS, on current spending in different areas, and much more. These

¹² <https://www.gov.pl/web/rodzina>

¹³ <https://www.facebook.com/mrpipsRP/>

¹⁴ https://www.instagram.com/mrpips_gov_pl/

¹⁵ https://twitter.com/MRPIPS_GOV_PL

¹⁶ <https://www.youtube.com/user/MPiPSRP/videos>

channels serve as a comprehensive source of information on social policy in Poland and are provided in a very simple and understandable form. They often try to explain specific information using one picture/chart/video to make it accessible to every Polish citizen (see Appendix 5).

MRPIPS has also developed and manages a website¹⁷ which was created for questions focusing on pension issues. This website primarily serves as a simple guide to understanding what pension is, what are the basic conditions to pension entitlement, how to apply for it – it is a general site providing relevant general information.

Another important source of information is the Social Security Institution – Zakład Ubezpieczeń Społecznych – ZUS. It is generally perceived as the best and most comprehensive channel for obtaining information on pensions in Poland. ZUS is involved in many different activities to promote awareness of pensions. On its website,¹⁸ you can also find very thorough information describing how to apply for a pension, as well as information on all legislation changes and how they affect the population.

You can find two **pension calculators** on the ZUS website¹⁹ to calculate the pension benefit. In the simplified version, an individual can enter the basic personal data (date of birth, sex) and information on the payments to the system that the individual has made (their amount, how much he has already paid, how much he has paid in the last year), the retirement age and the year in which the individual started to contribute to the system, current income, and the percentage of the average income in the future (which everyone can choose). The result then shows the estimated pension account balance at the retirement age and the estimated monthly pension.

In the second calculator, an individual should enter more specific data (for example, including zero income for years when the person was not insured) and, of course, the results should be more accurate. Unfortunately, probably due to some technical error, the simplified variant will open after clicking the link to the more complex calculator.

Another large group of ZUS activities includes educational events. These include, for example, training focusing on information about pensions in general, who is entitled to pension, how pensions are calculated – ZUS is trying to raise general awareness of the pension system. This category includes also the project named "Retirement – the future in your hands" (Emerytura – twoja przyszłość w twoich rękach) which has been in place since 2013. As part of the program, high school presentations are held to broadcast information on how the pension system works in Poland among young people who have not yet entered the labor market. During the first 5 years, 229,000 students participated in the program.

ZUS also sends an annual report on the balance of the insured individual's account. This letter (an alternative to the **Orange Envelope**) is sent to anyone who has ever paid social insurance contributions – even if it was just one zloty. It provides information on the overall balance of the pension account. The first page shows the contributions that an individual has paid for each month of the last year. The next page of the letter also shows the amount that the individual has saved in private pension funds (as a sub-account). It also presents the hypothetical amounts of the pension benefit. The first one says what the pension benefit would look like if the insured person stopped working on the last day of the previous year and retired. The second one calculates the pension while maintaining the same amount of contributions until the retirement age – here quite simple – the amount of the contributions collected is divided by the estimated life expectancy. Typically, it is approximately 18 years or 216 - 220 months. Both of these options are also available in the variant with the sub-account calculated. The last page contains explanations of all terms that appear in the letter or are related to the pension issue, so that the content is as clear as possible. An example of the ZUS letter is shown in Appendix 6.

ZUS also has a network of pension advisors that primarily serves to explain the situation to individuals – what their pension might look like, including advice on how to improve their pension prospects – but it is not used for the sale of specific services and supplementary insurance products.

¹⁷ <http://www.emerytura.gov.pl/>

¹⁸ <https://www.zus.pl/>

¹⁹ <https://www.zus.pl/swiadczenia/emerytury/kalkulatory-emerytalne/emerytura-na-nowych-zasadach/kalkulator-emerytalny-prognozowana-emerytura>

In 2019, the government in Poland approved a project to create a single online database in which information will be collected from all three pillars, including the prospects for the possible future pension. The entire service should be available online (also via mobile app) and should be functional in 3 years.

3.1.5.4 Microsimulation Model and its Utilization

The pension system microsimulation model was created in Poland in cooperation with ZUS and Deloitte in 2014. In 2016, there were minor legislative changes that were not reflected in the model. As this model is no longer up-to-date, it is used only for internal purposes of the government and ministries, and the information from it is not used for individual communication on pensions.

3.1.6 United Kingdom

3.1.6.1 Pension System

The whole system underwent a reform in 2000 in order to raise the retirement age and to find balance between men and women. Retirement age in the UK is 65 years, and if Brits wish to retire early, they must count on zero state support until they reach the age of 65. It is possible to apply for pension from an individual savings plan within respective terms and conditions. The United Kingdom is generally promoting the state pensions as the basis, while trying to put a huge emphasis on the need for each individual to consider whether the income is sufficient for him (and if not, to think how to increase his future pension).

Three pillars of the pension system

I. State pension

The state pension is paid out of contributions that are automatically deducted from the income and paid as a national insurance contribution. The pension from the first pillar is paid by the government, and it is necessary to contribute to the system for 35 years in order to receive the full benefit. Pensioners in the UK can expect one of the lowest state pensions, equivalent to 29% of their previous income.

II. Employee pension

The second pillar is defined as employee contributions. It became obligatory in 2012 and the contribution to this pillar is divided into employee and employer part. There is also a government-determined minimum amount thereof. There is a so-called “pot” into which the contributions are put – in the event of a change of employment, the employee may decide to transfer it to the new employer or leave it with the original employer and continue contributing there.

III. Private supplementary pension insurance

Private supplementary pension insurance schemes in the UK are divided into two types – the first is more regulated by the state and the second one is more liberal and gives individuals greater opportunity to influence their investments. Investments in the third pillar are supported by various tax advantages to motivate the British to participate as much as possible.

3.1.6.2 Awareness of the Population in the Area of Pensions

In the UK, 59% of the population believe that future generations of retirees will be worse off than current ones. The British expect 40% of their pension benefits to come from the state, 34% expect it to come from the employer, and 26% should be covered by their own savings and investments. Almost half of the British (45%) are used to save regularly, another 21% save at least occasionally. The remaining 34% currently do not save, while 13% had been saving but now have stopped, 16% plan to start saving, and only 5% of the British have neither been saving in the past nor plan to start.

3.1.6.3 Approach to Informing People

There is a great deal of effort in the UK to inform citizens about pensions and their future prospects in general. As the state pension is one of the lowest in terms of the ratio between its amount and the previous income, the emphasis is on communicating to individuals to think about how high pension they would like to receive and how they could approach it. The state pension presents itself as a good basis, with an emphasis on further savings to ensure that the British maintain their standard of living even after retiring from work.

On its website²⁰, the British Government dedicated a whole section to state and employee pensions with an emphasis on a detailed explanation of what each of these areas means. It has also created or supports many other websites that focus on pension issues in a less official and more user-friendly form. The first one is called “Get to know your pension”²¹ which has the following motto: “Will the retirement you get, be the retirement you want?” – for pictures see Appendix 7. It provides basic information and guidance on how to prepare for retirement, emphasizing that the state pension is of a certain amount and it is up to each British to consider if this is sufficient for him. Pension Wise²² provides more comprehensive information on the pension system for citizens over 50 years of age so that they understand their own pension plan. In order to approach a wide spectrum of residents, they respond to various trends of events – for example international day of Star Wars (article: Star Wars: The light and the dark side of pensions).

The most comprehensive website dedicated to pensions is the Pension Advisory Service²³. Here, all areas that deal with pensions are explained in detail but in a user-friendly manner. It is possible to contact it by e-mail, phone, or via online chat. The last website we would like to introduce is the Money Advice Service²⁴. The government also sets up this site, but its focus is to increase financial literacy in society in general. One entire section is dedicated to pensions.

All of the above-mentioned sites also have their channels in the social media (Facebook, Instagram, Twitter, YouTube) where they try to inform in an even more user-friendly way about pensions and all things related.

Another activity that seeks to communicate the importance of preparing for retirement is the Pension Awareness Day which was announced in the UK to be on 15 September. The symbol of this activity is blue color and blue car/bus with which the Pension Geeks tour different cities. It is a project that links government and industry with a clear goal – to make the British to take concrete steps towards their retirement savings (or at least start thinking about them).

In addition, most quality British newspapers (Sunday Times, Guardian, Sunday Telegraph) have a section on finance that regularly informs the public about changes and innovations in the pension system and answers readers' questions about the pension system. Another media company that deals with pensions is the BBC, especially as part of its Moneybox radio show.

There are multiple variants of **pension calculators** on the official government site²⁵. The simplest calculator is one to calculate the retirement age, where people only enter the date of birth and sex. There are two official calculators to calculate the retirement age. The simple version²⁶ (accessible from yourpension.gov.uk and moneyadvice.service.org.uk) is a basic calculator where the first step is to fill in the date of birth, sex and age at which an individual would like to retire; the second step is to enter the net income and pension amount that the individual would like to achieve. Other data entered includes other retirement savings plans and employee savings plans which the individual has. The result is shown at the expected retirement age and also at an older age (so that you can see the increase if the individual continues working longer). There is also an option to change on an axis the amount of pension that an

²⁰ <https://www.gov.uk/browse/working/state-pension>

²¹ <https://www.yourpension.gov.uk/>

²² <https://www.pensionwise.gov.uk/en>

²³ <https://www.pensionsadvisoryservice.org.uk/>

²⁴ <https://www.moneyadvice.service.org.uk/en>

²⁵ <https://www.gov.uk/>

²⁶ <https://www.yourpension.gov.uk/pension-calculator/>

individual would like, the retirement age, the income, and also other indicators so that the individual can see how these changes can impact the estimated pension.

The more complicated version²⁷ is only available to people who have already earned the national pension. Large amount of data about the individual and, if applicable, his partner is filled out – basic demographic data (date of birth, in which part of the UK he lives, etc.), information on how he lives (rental, ownership, etc.), whether he receives any benefits (for example, housing allowance for the disabled) or pensions (for example veteran pension), information on supplementary pension insurance, how much has been saved, including on his personal account. The result, which is then displayed to the individual, should be a very accurate forecast of the pension to which the individual is already entitled at that time (if everything is filled in correctly). There is also a link on how to apply for a pension (with information that this is the only way for the individual to receive an exact amount)

3.1.6.4 Microsimulation Model and its Utilization

For pension related issues, the United Kingdom uses a pension model named PENSIM2 whose purpose is, according to Li and O'Donoghue, to estimate the future distribution of income in order to analyze the distributional effects of changes in pension policy (Li, O'Donoghue 2013). This model was used, for example, in the design of the pension reform and was a very important tool that the government used in its decision making. In the official section of communication and news on the government website²⁸, we were unable to find a single message to the public informing about the utilization of a microsimulation model and its outputs for individual provision of information to the public.

There is also an institution named The Pension Policy Institute (PPI) in the United Kingdom. Here they work with three types of models: individual model (which, however, works with hypothetical individuals or couples, not specific ones), aggregated model, and distribution model. These models, however, do not serve to present information on the specific amounts of pensions, but rather are used for further analysis and discussion with institutions.

3.1.7 Canada

3.1.7.1 Pension System

Canada's public pension system consists of the first and second state levels of the system and subsequently the third private level. All citizens are advised that the state pension is not there to meet all their financial needs – on the contrary, it should provide a certain base or, more precisely, a supplement to the income from the third level of the system. All levels of the pension system are described in more detail below

Pension system levels

I. Old Age Security (OAS)

Old Age Security is the first level. If an individual reaches the statutory age of 65, he is paid on the basis of this level of monthly pension. It is Canada's largest public pension scheme. At the same time, it is necessary to meet the condition of staying in Canada for at least 10 years after the individual has reached the age of 18 years. The specific amount of the allowance is dependent on the number of years spent in Canada after the individual's 18th birthday. In general, an individual who has lived in Canada for 40 years will be entitled to the full pension from this level.

II. Canadian Pension Plan (CPP)

This is the second level and at the same time the core level of the entire Canadian system. CPP uses the PAYG principle. Employees, employers and self-employed contribute to it. Everyone who has contributed to this level is paid a monthly pension after reaching 65 years of age (but from the age of 60

²⁷ <https://pensioncreditcalculator.dwp.gov.uk/pension-credit-calculator.php?new>

²⁸ www.gov.uk

years, a person has an option to retire – in such case, the individual's pension is reduced = similar to early retirement). Conversely, if a person decides to receive funds from this level at the age of over 65 years, his entitlement gradually increases. Disability and survivors' pensions are also paid from this level. It applies to the whole of Canada except Quebec which has an equivalent level established with its own conditions and rules. Pensions are paid to people who have worked and contributed to this level. Earnings throughout the person's career are taken into account in the calculation. Contributions to this level are managed by an institution named "The Canada Revenue Agency (CRA)" and are kept separate from other tax revenue of the state. In general, every individual who has contributed to CPP can expect allowance approximately 25% of earnings from which he was paying contributions to CPP.

III. Private pensions and savings

This is the third level, which is completely on a voluntary basis. If an individual opts for it, he and his employer contribute to it – often the individual contributes a certain percentage of their salary and the employer contributes the same amount, or at least a portion of it. Funds from each individual account are then invested according to the individual's risk profile. At a specified age, an individual can receive the full amount accumulated at once (his contributions, employer contributions, and the net income of the account) or receive it as a rent

3.1.7.2 Awareness of the Population in the Area of Pensions

A survey was conducted in Canada which found that 61% of Canadians rated their knowledge about pensions at least as average. According to the survey, approximately 23% of the local population have above-average knowledge of this issue, while 36% of people perceive their knowledge as insufficient. One of the sub-questions in the survey was also to find out if people understand the calculations (not just the mechanism), and for these questions the success rate ranged from 60% to 86%.

A survey conducted by the Canadian Statistical Office showed that families in general are on the edge of insufficient savings for future pensions. The local statistical office selected all families for whom their calculated pension did not amount to 60% of the family's income before retirement. Based on the findings, it was concluded that approximately 24% of families whose members are approaching retirement age are at risk of having insufficient retirement income and will therefore not be able to maintain their current standard of living.

3.1.7.3 Approach to Informing People

As the main means of communication to citizens, the Canadian pension plan uses the so-called "Statement of Contributions" (SOC) which provides information about the contributions to the second level (CPP) annually. The obligation to send SOC has been regulated by law in Canada since 1996. This document informs each citizen what his pension calculation basis income is, and the citizen can see his contributions. This information is divided according to individual years and an estimate of what their pension will be is denoted.

This is an individualized document. If a person is over the age of 30, the document shows him his estimated pension as well as the estimated potential disability or survivor's pension. For SOC recipients who are over 30 years of age the message contains information on their contribution, income counting towards their pension amount, the potential pension in case of disability or potential survivors' pension.

For recipients aged 18 - 29, the communication only provides information on their contribution, earnings counting towards their pension amount.

Based on the information communicated in this document every citizen can make informed decisions about their pension plans (how much and where to save money for retirement).

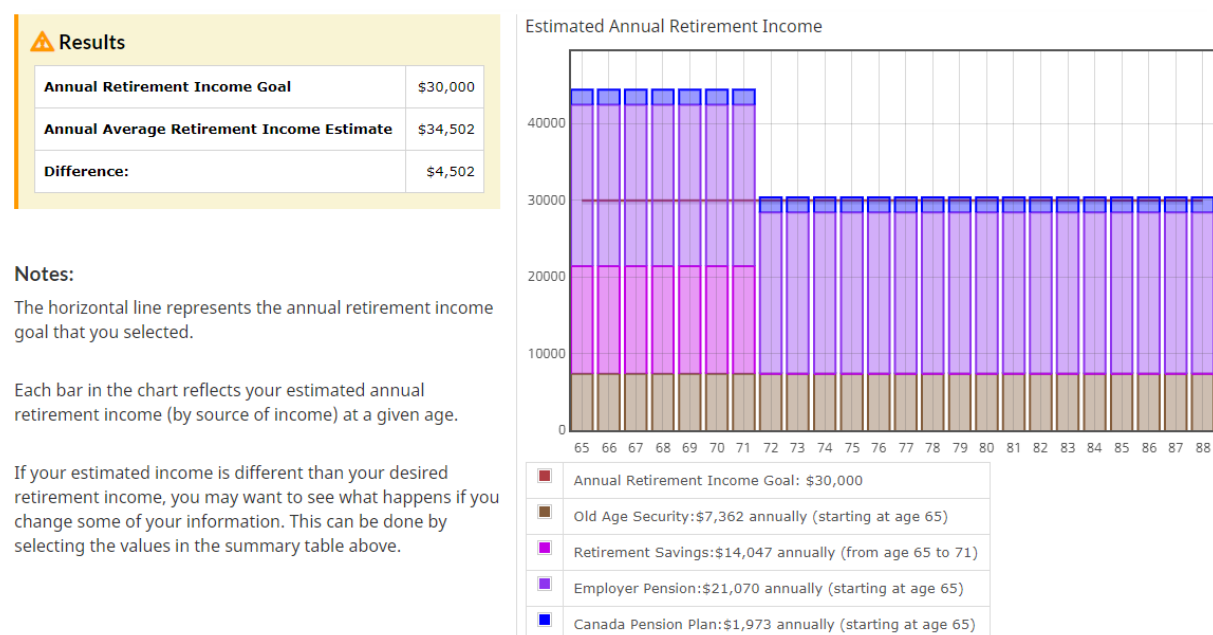
On the website of Canada's government,²⁹ there is also an option to use an online **retirement income calculator**³⁰. The total state pension (i.e., from the first and second level) is calculated based on the information provided. Possible voluntary private savings for retirement are not included here. However, it is important to have all the necessary documents and one has to enter the information manually in various steps. The official website states that the time required for entering information and calculating is approximately 30 minutes. On the other hand, it is possible to have the calculation performed based on the average income if you do not have the necessary documents at hand (at least to get a general idea – but the informative value for a particular person is not very high). After the individual answers a series of questions, he is shown the estimate of his future amount of pension and all his future pension contributions are included here.

In addition to an illustrative chart, there is also an overview table where an individual can see what his entitlements are for his future pension, how much he will approximately receive, and what the GAP, if any, is (positive or negative). For more details, see **Chyba! N enalezen zdroj odkazů.** and **Figure 5: Graphical representation of the amount and structure of the pension on the website of the Canadian Government.**

Figure 4: Overview of information on the amount of pension on the website of the Canadian Government

Summary of the information provided on February 11, 2020				
General Information	Date of Birth:	July 1983	Annual Retirement Income Goal:	\$30,000
	Life Expectancy:	88	Current Annual Income:	\$41,000
	Gender:	F		
Canada Pension Plan (CPP)	Receiving at Age:	65	CPP Annual Pension:	\$1,973
	Average PRB Annual Pension	N/A		
Employer Pension	Defined Contribution Plan			
	Receiving at Age:	65	Employer Annual Pension:	\$21,070
	Employer Contribution:	\$2,000	Your Contribution:	\$5,000
Retirement Savings	RRSP			
	Current Value:	\$8,000		
	Annual Contributions:	\$1,500		
	Annual Income:	\$14,048		
	Receiving at age:	65		
	Ending at Age:	71		
	Annual Rate of Return Until Retirement:	5.0 %		
Annual Rate of Return in Retirement:	4.0 %			
Other Income	N/A			
Old Age Security (OAS)	OAS Age Eligibility:	65	OAS Pension:	\$7,362
	Receiving at Age:	65	Years lived in Canada:	at least 40

Figure 5: Graphical representation of the amount and structure of the pension on the website of the Canadian Government



3.1.7.4 Microsimulation Model and its Utilization

Canada uses a dynamic microsimulation model, DYNACAN, in connection with the pension system, which was developed by the Canadian government primarily to analyze the proposals to amend the

²⁹ <https://www.canada.ca/en/employment-social-development/programs/pension-plan.html>

³⁰ <https://www.canada.ca/en/services/benefits/publicpensions/cpp/retirement-income-calculator.html>

Canadian Pension Plan (CPP). DYNACAN was developed as a result of a five-year effort and is now being used to explain the financial implications for individuals and their families on the proposals of the policy of CPP. The model simulates basic demographic and economic situations which are reflected in the amount of pension.

The model is primarily used for the CPP policy and, as the case may be, subsequently also for other policies where income can be used. Nevertheless, it is not accessible (and there are currently no plans to allow such use) for users outside the Canadian government.

3.1.8 Australia

3.1.8.1 Pension System

According to Melbourne Mercer Global Pension Index, Australia has one of the best pension systems in the world. Australia started a gradual transition to a private pension security system in 1992 and now the pension system consists of three pillars. The first pillar is a public system paid from government revenue (Age Pension) and serves as a basis for people who could not or were unable to save enough money during their working life. The second pillar is represented by mandatory employee plans (Superannuation guarantee). The third pillar is voluntary private pension plan (voluntary Superannuation contributions).

Three pillars of the pension system

I. Age Pension

It is the state pension system and the first pillar of the Australian pension system. This pillar is public, tax-funded, operates on a non-contributory basis and serves as the primary support for paying out income to people who have reached the retirement age. The age limit is currently set to 66, but will increase to 67 years in the coming years. Only people meeting the criteria of age, income test, property ownership and residing in Australia are eligible for this type of pension. If a pensioner exceeds a certain value of the property, the pension will be reduced or entirely denied. This pension works as a basis for people who have not been able to save enough money during their lifetime and cannot be claimed by everyone – people who have higher income and more property than the set limit are not entitled to this pension. In addition to Age Pension, seniors may be entitled to health assistance, assistance with rent, medical products and other living expenses. In 2018, 62% of all pensioners were entitled to the maximum possible and non-reduced pension.

II. Superannuation guarantee

The second pillar is the backbone of the Australian pension system and consists of individual pension accounts provided by pension funds. In 2002, a transitional period ended, during which all employees in Australia paid 9% of gross salary to the pension fund; in 2013 and 2014, it was increased to 9.5%, and from 2021 to 2027, the percentage is supposed to increase up to 12%. The pension fund collects and invests the money and will later pay the pension. Currently, this main pillar is funded by compulsory employers' contribution 9.5% of the employee's gross salary and this payment is mandatory if the monthly salary reaches AUD 450. Contributions in the second pillar are paid to pension funds, which are most often managed by a particular employer, but many contributions go to the funds of industrial associations, the public sector, or financial institutions. These employee contributions are subject to tax deductions for all employers. Approximately 77% of the population between ages of 15 and 64 have at least one superannuation account.

III. Superannuation contributions

The third pillar takes the form of voluntary pension plans. Contributions in this third pillar can be paid both to the third pillar itself in the form of Retirement Savings Accounts, and to the second pillar funds.

The amount of the contribution is voluntary and the contributions are supported by tax advantage and, up to a defined income, also by a state contribution.

3.1.8.2 Awareness of the Population in the Area of Pensions

Global Retirement Reality Report 2018 shows that Australians of all ages accept personal responsibility for ensuring adequate retirement income. Perceptions of pensions have shifted from a benefit provided by the state to accumulation of money for old age, and the perception of the second pillar as a 'deferred income' undoubtedly helped change the perception of retirement for Australians for the better, especially in comparison with European countries, where expectations from the state contribution are still very high.

Although Australians understand that they have personal responsibility for their pension, most people are not optimistic about their retirement. The study shows that only one in five working people feels optimistic or happy about their retirement financial situation.

If people who have recently retired should give some advice to working people, most often they would advise that they should engage in early retirement planning, start saving sooner, or more. Only 21% would focus on other priorities.

The study also showed that 35% of the working population has no or very little awareness of how much they have saved and only 43% knew how their savings were invested. As the age of respondents increased, awareness increased.

The 2017 project named "*Work, Care, Health and Retirement: Ageing Agendas*" shows that 87% of the respondents from the sample said that their employer was contributing to their pension. Approximately a third (32% of men and 35% of women) stated that they contribute also themselves and voluntarily. A question was also asked within the project, how the government and politicians could improve the transition from work to retirement and how to better prepare for retirement. Many people focused on uncertainty and instability in relation to the benefits and costs of the superannuation and on constant changes to the rules on contributions.

3.1.8.3 Approach to Informing People

A government agency, Services Australia, offers Australian citizens options of retirement planning and information seminars on savings planning and understanding both Superannuation and Age Pension. These seminars are free of charge and take place in different places in Australia, there is also the possibility to arrange a personal meeting or arrange a phone call with an advisor. The seminars are designed primarily for people who want to learn how to prepare for retirement and understand all the options they have. The seminars can focus on understanding the likely financial situation after retirement while providing information on a range of strategies to prepare for retirement.

Official websites contain several different **pension calculators**. The official website Centrelink³¹ (a government agency set up at national level to provide services to people in need of social security payments) includes a calculator named "Payment and Service finder"³² which helps to find and estimate the pension, plus also other benefits that the person may be entitled to. The candidate enters into the calculator his data such as age, sex, marital status and situation, disability, if any, amount of income and property value and so on. The calculator then evaluates which payments or services the candidate might be entitled to. If the calculator evaluates that a candidate might be entitled to the Age Pension, it is followed by a more detailed analysis of the income and assets of the person concerned and his partner, and then the calculator makes the estimate based on the income and assets entered in the previous section. Before the results are displayed, the candidate is informed that the estimate provided does not take into account all the circumstances that could affect the candidate's pension amount and that the estimate does not guarantee a payment of that amount – the result should therefore serve as a tool for better guidance. The result of the calculation is simply displayed as an amount awarded from

³¹ <https://www.centrelink.gov.au/>

³² https://www.centrelink.gov.au/custsite_pfe/pymtfinderest/paymentFinderEstimatorPage.jsf?wec-appid=pymtfinderest&wec-locale=en_US%2C#stay

the pension system or the amount that the candidate could collect in form of an annuity, see *Figure 6: Presentation of the result of the Australian pension calculator*.

If a person does not meet the age criterion of eligibility to the Age Pension, the calculator will not offer the Age Pension; it will only offer the allowance to which the person might be entitled. After clicking *learn more*, it refers to a website³³ containing information on the Age Pension.

Figure 6: Presentation of the result of the Australian pension calculator

Your possible rates for Age Pension are:

Age Pension:	\$593.00 per fortnight
Energy Supplement:	\$10.60 per fortnight
Pension Supplement:	\$51.90 per fortnight

Total estimate from Centrelink: \$655.50
per fortnight

The website³⁴ offers a calculator which calculates the size of the employer's contribution to the super funds when you enter your income; it is necessary to choose the period for which we want the results and then just add the amount of income; the income is to be filled out individually for the quarter. It displays the amounts paid by the employer for each quarter and their total sum.

The website³⁵ super and retirement calculator offers about 7 calculators linked to pensions. For example, the calculation of the retirement age and the age at which you will be able to get money from the Super Fund, to estimate the amount of your retirement, up to an estimate of the amount paid in retirement, an estimate of the employer's contribution, or an estimate of the Super Fund account balance, including the option of entering voluntary contributions.

Here you can also find the so-called retirement planner which, based on information on age, income, preferred retirement age, status, amount of savings and allowance under occupational pensions, the amount of voluntary contributions and the planned periods without employment, if any, provides an estimate of the pension for each retirement year and distribution by origin of the income. The candidate can see the amount indicating the amount of the annual pension and the distribution of pension sources for each year, which is shown in the chart (see *Figure 7: Graphical representation of the pension amount development on moneysmart.gov.au* *Figure 7: Graphical representation of the pension amount*).

Below the resulting amounts calculated by the calculator, one can see, for example, a note that the results are displayed in today's dollars, which means that they are adjusted for inflation. The calculation assumes a year-on-year increase of 2% due to rising cost of living (CPI inflation) and additional 1.2% because of the increased living costs. The inflation rate used for the calculation can be changed in the advanced settings of the calculator. In addition, the calculator shows a warning, for example, that it is only a model, not a forecast, and the results are based on the limited information that the person provided. It is only a model, not necessarily a true prediction of the future situation.

³³ https://www.humanservices.gov.au/individuals/services/centrelink/age-pension?utm_campaign=eea-pf&utm_content=claiming&utm_medium=web-application&utm_source=eea

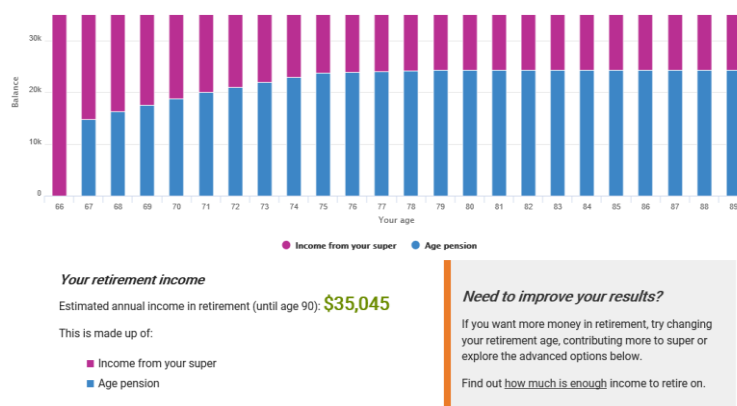
³⁴ <https://www.ato.gov.au/calculators-and-tools/estimate-my-super/>

³⁵ <https://www.moneysmart.gov.au/tools-and-resources/calculators-and-apps>

One can check whether the employer indeed pays contributions to the super fund using the MyGov³⁶ application in which it is possible to trace the amount paid by the employer if you open an account.

The MoneySmart³⁷ website dedicates an entire section to retirement and to the super funds. You can find the above-mentioned calculators there, information on retirement, or even a manual named Super decisions³⁸ where you can learn, among other things, how to deal with situations where your employer does not contribute properly to your super funds.

Figure 7: Graphical representation of the pension amount development on moneysmart.gov.au



3.1.8.4 Microsimulation Model and its Utilization

The microsimulation model is used for internal purposes only, it is not public.

The Treasury currently has a project which is supposed to significantly improve the capability of detailed modeling of retirement income in Australia. The Model of Australian Retirement Incomes and Assets (MARIA) is a long-term dynamic microsimulation model of the Australian pension system. Once it is fully operational, it will provide an estimate of old-age pension expenditure, the managed pension super funds and the adequacy of the retirement income of the entire population, even in the medium term. It will also enable detailed distribution analysis of both the current and hypothetical set-up of the pension system.

The new model MARIA of the Treasury aims to provide new and beneficial knowledge of an important and difficult area. By applying dynamic microsimulation and using the unique outline of Australian individuals created by combining de-identified administrative and survey data, this model offers a wealth of valuable knowledge that can shed new light on the challenges of the retirement policy.

3.1.9 The Netherlands

3.1.9.1 Pension System

According to Melbourne Mercer Global Pension Index, the Netherlands, together with Denmark, has the best pension system in the world.

The whole system consists of three pillars – the first public pillar in the form of state pensions, the second pillar in the form of private employee plans and the third pillar – voluntary supplementary pension plans.

Three pillars of the pension system

I. State pension system

Everyone living or working in the Netherlands creates this pension under the old-age pension law (AOW - Algemene Ouderdomswet). Anyone currently working in the Netherlands contributes to this pension system. When this pension was introduced, the retirement age was set at 65, and the age is currently rising; people born after 31 December 1958 will retire at 67 years at least, but the exact retirement age will always be determined five years in advance and will be linked to life expectancy. For example, the

³⁶ <https://my.gov.au/LoginServices/main/login?execution=e1s1>

³⁷ <https://www.moneysmart.gov.au/superannuation-and-retirement>

³⁸ <https://www.moneysmart.gov.au/media/555121/super-decisions.pdf>

retirement age calculator³⁹ states that a person born in 2000 would retire at the age of 69.5 years, provided, however, that this figure is definitely not final and is likely to change, and the final figure will be ascertained not before 5 years prior to retirement. State pension is provided by the Social Insurance Bank ([Sociale Verzekeringsbank](https://www.svb.nl/en/aow-pension/aow-pension-age/your-aow-pension-age)) and constitutes a PAYG system. The amount of the pension benefit is derived from the change in the net statutory minimum wage, which is increased twice a year in the Netherlands. The amount of the benefit is not related to the amount of the individual's income; it is rather determined on a flat-rate basis. Married couples receive 50% of the minimum wage, pensioners living alone receive 70% of the minimum wage. The basic benefit is increased by 2% of full value for each year the working individual has lived or worked in the Netherlands.

II. Voluntary supplementary pension plans

In the second pillar, most employees create a supplementary pension through their employer. This pension system is usually managed by a pension fund or an insurance company, with contributions being paid by both the employee and the employer. The pension fund invests the contributions from employers and employees in, for example, real estate or bonds and uses the accumulated money in the future to pay pensions. The second pillar is referred to as one of the best developed occupational pension plans in Europe.

Under Dutch law, companies and pension funds are strictly separated; pension funds are legally and financially independent of the companies. Pensions are funded from contributions paid by their members and by the return on investment of those contributions. Most of the money in retirement pension funds in the Netherlands is managed by pension funds; there are three types of pension funds: industrial funds (they work for entire sectors such as public administration, construction, hotels, etc.), corporate funds (company funds, for one company or corporation), and pension funds for independent professionals (such as doctors and dentists).

Pension funds act as non-profit organizations and do not form part of the company. Therefore, pension funds will not be directly affected if the company gets into financial difficulties. According to a study named "The Dutch Pension System an overview of the key aspects", more than 90% of employees belong to a pension fund under the 2nd pillar. At the end of 2008, there were about 600 pension funds in the Netherlands. Three quarters of employees are in an industrial pension fund; the largest fund in the country has more than 1 million active members and invested capital more than EUR 150 billion. At the end of 2008, pension funds managed capital in total amount of approximately EUR 600 billion. The contribution rate is 17.9% of the employee's gross salary (collected within the income tax)).

III. Individual supplementary pension

The third pillar is an individual supplementary pension that people use as a supplement to the first two pillars. People can get this supplementary pension savings plan, for example, through life insurance or bank savings. People can use the money saved in this way, for example, for early retirement or as addition to their pension under the first and second pillar. Self-employed individuals often create their own pension in this way. This way of saving money is usually subject to tax advantage.

3.1.9.2 Awareness of the Population in the Area of Pensions

A study named The New Social Contract: a blueprint for retirement in the 21st century (The Aegon Retirement Readiness Survey 2018) was published in 2018, examining the answers of respondents from 15 countries, including the Netherlands. For example, the study looked at the forecast of the living standards of today's working people compared to current pensioners – 55% of people think that they will be worse off in retirement than the current pensioners, 27% think they will be on the same level, 9% think that they will be better off, and 9% don't know. Regarding their future income, 40% of people rely on state income, 37% on their employer, and 22% on their own savings and investments. It is encouraging, according to the study, that almost half (47%) of working people around the world say they would probably take advantage of the possibility of their employer automatically raising the amount of

³⁹ <https://www.svb.nl/en/aow-pension/aow-pension-age/your-aow-pension-age>

contribution to their pension plan by a certain percentage each year. In the Netherlands, this threshold would be, according to the respondents' wishes, 7.4%.

On average, the Dutch expect their financial demands in retirement to be 72% of their current earnings. In the Netherlands, only 9% of people have a retirement plan that they implement, while 38% have a plan but it is not implemented, almost half, 49% of people have no plan and 5% of people said they do not know. On the scale from 1 to 5 where 1 means "I don't feel responsible at all" and 5 "I feel very responsible", the average result in the Netherlands is 3.8 (average of the surveyed countries being 4.04).

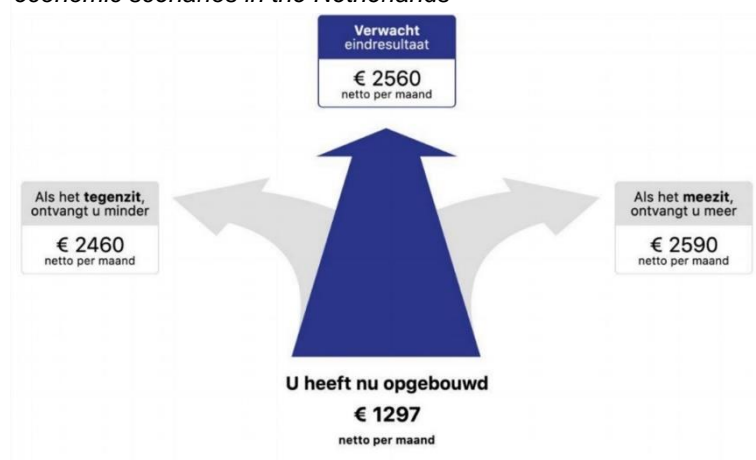
The study entitled Pension Communication in the Netherlands and Other Countries reviewed the impact of the introduction of the online pension register. Here, people can easily find information about their pension in the first and second pillar, i.e., in particular the amount they can expect in the future if they remain in their current job until retirement age. Pension communication became a topic when it turned out that knowledge about pensions was low in the Netherlands. After the introduction of the online pension register in 2011 and the obligation to distribute the UPO envelopes (which are supposed to raise awareness of pensions among residents or of the amount they can expect after retirement, see below) in 2008, the pension-awareness index was calculated, which was measured in the period between 2009 and 2011 and showed no improvement in pension awareness. A study based on empirical research has shown that the annual provision of an overview of pensions has little positive effect on the knowledge or awareness of pensions. However, awareness of pensions in the Netherlands is low, and this has not changed over the three years, despite the introduction of a uniform pension overview. The second major finding of the study is that knowledge of pensions has a positive effect on active decision making on pensions.

3.1.9.3 Approach to Informing People

One of the forms of informing citizens about the future amount of pensions is the so-called **UPO – Uniform Pension Overview**. This is an A4 envelope that is delivered by mail to everyone who works and saves money into the fund (2nd pillar). It is often compared to the **Orange Envelope** that is distributed in Sweden. This letter contains information on how much the employee has saved up so far in the fund; how much money he should save if he continues to work the same way; from which part of the income the pension is derived (if everything is OK with the employer's contribution); A factor (= the amount by which the pension was increased for one calendar year; this is an important amount for people who have not yet retired; this amount should be used when calculating the tax). The purpose of this document is to unify the information that individuals receive independently of the fund they use. All information from this letter should also be available online at mijnpensioenoverzicht.nl, see below. The structure of the letter is clearly defined and should correspond to the structure in the online overview. An example of UPO is provided in Appendix 8.

UPO and the pension register should provide information on future income in three scenarios: realistic, optimistic and pessimistic, which should explicitly imply that future retirement income is uncertain. This was due to the fact that at present pensions in the second tier are riskier than they used to be. The Dutch pension system has developed a uniform method for calculating the amounts of the three possible scenarios for different pension plans. The calculations are based on no less than 2000 different economic scenarios (namely, yield and interest rate curve developments). The median is considered to be an expected or realistic scenario; the pessimistic one is based on the lower 5% of the results and the optimistic one on the top 5%. These results will be communicated through an image,

Figure 8: Presentation of pension amount pension for various economic scenarios in the Netherlands



see Figure 8: Presentation of pension amount pension for various economic scenarios in the Netherlands.

On the website of Social Insurance Bank⁴⁰ (SVB) it is possible to learn how high the state pension is for people living alone and for people living with a partner. The values change every 6 months (minimum wage increases every 6 months). The website also offers a calculator⁴¹ which calculates the expected retirement age when you enter the year of birth.

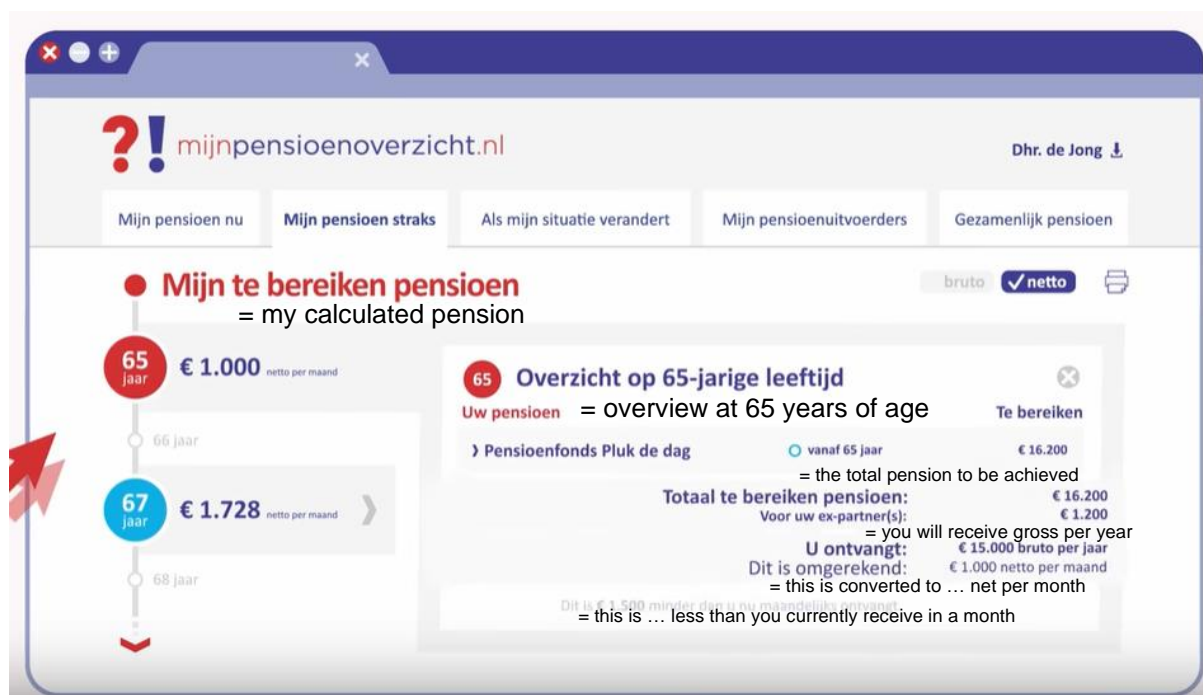
SVB can approximately tell you what pension you should expect, or you can sign in My SVB and request a calculation of a pension tailored to your specific situation. This sign-in requires DigiD (DigiD is a platform for identity management which government institutions in the Netherlands can use to verify residents' identity on the Internet).

On the website "My pension overview"⁴² you can also sign in using DigiD. After logging in at mijnpensioenoverzicht.nl within the section entitled *What is your life situation* you will first see which pension providers collect your data. To calculate your state pension, you need to specify whether you have a partner or not. It is also possible to fill in the box with current income, then you can find out the difference between the current and future income.

Click "View my pension overview" shows what the person accumulated in the AOW (state) pension and in the employee pension fund. The structure of future pension can be seen in more detail and it is possible to switch from net per month to gross per year (net/gross). The graphical representation can be seen in the picture below.

It shows results for several possible ages; for the selected age, the total income per year, per month, and the difference in income from the current situation of the individual, as shown in Figure 9: *View the amount of pension for different retirement times*.

Figure 9: View the amount of pension for different retirement times



When you click the "Change in My Situation" tab, you find information on life changes that could affect the pension. It includes the following possible scenarios: death, early or postponed retirement, loss of employment, taking up a new employment, incapacity for work, cohabitation, marriage, children, divorce, etc. When you visit the first tab, you can see how much the survivors would receive in the event of death;

⁴⁰ https://www.svb.nl/int/en/aow/hoogete_aow/bedragen/index.jsp

⁴¹ <https://www.svb.nl/en/aow-pension/aow-pension-age/your-aow-pension-age>

⁴² <https://www.mijnpensioenoverzicht.nl/>

for others, the amount of pension is calculated under a given scenario (e.g., if an individual ceases to work before reaching retirement age, or if he continues to work longer).

Furthermore, you can find information on how to secure yourself for old age (for example, information on bank savings, insurance, mortgage repayment...). The *My pension providers* tab contains all important contacts; for questions there is a contact link. All information provided on this website can be easily saved or printed.

Since 2016, information has been provided also through Pensioen 1-2-3 which provides general information about the pension fund. Pensioen 1-2-3 is part of the Pension Communication Act and since its adoption, insurance companies and pension companies must use Pensioen 1-2-3. The difference between UPO and Pensioen 1-2-3 is that UPO provides the exact amounts of money people save in their fund and Pensioen 1-2-3 provides general information on the pension system and pension fund. Pensioen 1-2-3 is divided into 3 layers, which work best in digital form; in the first layer, one can only learn the basic information about the pension system and, via individual icons and headings, it is possible to get to the second and third layer if the person decides that he wants to know more. The first layer contains only the most important information that can be read in 5 minutes, the second layer analyzes the information from the first layer in more detail and should take 30 minutes to study, and the third layer contains documents such as various regulations or statutes.

The website Pensioenkijker⁴³ offers important information about pensions in more comprehensive manner so that people think about and understand their pensions. It is divided into 3 tabs – I am saving for retirement, I am nearing retirement, and I am already retired. Each tab contains information that should be relevant to the particular group. This website was created in collaboration with many institutions, including the Ministry of Social Affairs and Employment, Pension Association, Social Insurance Bank, Association of Insurers, etc.

3.1.9.4 Microsimulation Model and its Utilization

SADNAP (Social Affairs Department of the Netherlands Ageing and Pensions model) is being developed to calculate the financial and economic impact of population aging and to cope with population aging. This model uses a dataset of Dutch payments to the state pension system and entitlement to state and private pensions. SADNAP has been used since 2007 to determine the forecast of government expenditure on pensions and to analyze the budget implications.

3.2 Options and Form of Presentation of Communication to the Public (Professional Sources)

The first part of this chapter is dedicated to general communication with the public, especially to communication of the amount of pension. The second subchapter summarizes the theory of communication campaigns concerning pension systems. The third subchapter presents the results of some studies dealing with communication in the area of pensions and presentation of the future amount of pensions. The final chapter presents examples of successful and unsuccessful communication campaigns related to the pension system or the amount of pensions that took place in various countries of the world.

3.2.1 Communication with the Public in General

3.2.1.1 Communication Campaign

As such, a marketing campaign can have many different goals. Zamazalová (2010) states that the proper definition of the communication objectives is the basis for drawing up the entire communication plan and all its phases. Karlíček states that the goal of the vast majority of communication campaigns is the induction of some desirable behavior – increasing sales, choosing a certain political party; in the context of pension issues, this may be, for example, the purchase of supplementary pension insurance. Another equally important goal is to increase brand awareness, which means recognizing the brand as

⁴³ <https://pensioenkijker.nl/>

such, but also linking it to specific products or activities it carries. Last but not least, we can also include establishment of specific market or market expansion. Establishing market is precisely the goal of most awareness campaigns, where the focus is not a specific product, but rather motivation to engage in certain desired behavior (such as vaccination, or towards pensions, for example, the invitation to begin saving earlier on) (Karlíček and Král 2011).

These objectives must depend on the strategic objectives of the particular institution. This should be defined as the state that the institution wants to achieve in certain timeframe. It is also very important that this objective is set to allow for qualitative or quantitative measurement (Zamazalová 2010). Thus, also as a condition which this institution should achieve or at least approach at the end of the campaign. The specific goals should be based on the SMART principle (Specific, Measurable, Agreed, Realistic and Timed), (Karlíček and Král 2011).

Karlíček and Král (2011), however, emphasize that no marketing communication can be successful unless a quality product is behind it – in fact, in such case it can also be counterproductive. A quality product can mean specific goods for which we want to increase sales, a political party's program, and a supplementary pension insurance scheme.

Karlíček (2018) claims that the market should never be considered in its entirety in terms of a marketing communication campaign. The market can be segmented according to four basic criteria. The first is the division by age, sex, income, education, etc. – i.e., according to general demographic characteristics. Another option is geographical division. The third option is psychological segmentation with division primarily by lifestyle, values and similar criteria. The last one is behavioral segmentation which is characterized by the way people behave towards the product (for example, expected utility, usage, readiness to buy, etc.).

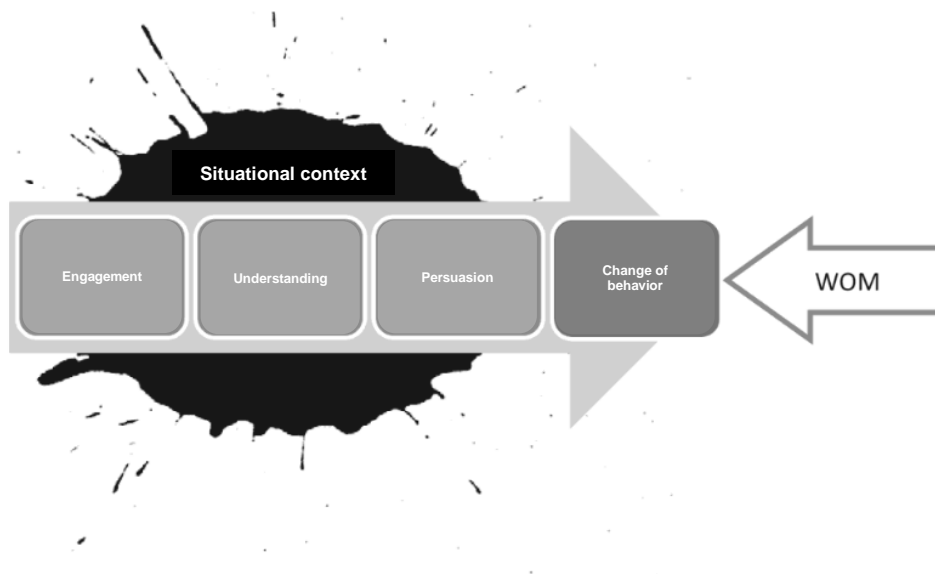
Another important factor that affects impact of a given marketing communication campaign is its **timing**. When timing your campaign, you need to determine the intensity of your campaign over time. There are two main approaches – continuous (the same level of communication the whole time) and variable intensity (intensive communication in some months and zero communication in other months), and combinations thereof (smaller continuous campaign with greater intensity in selected periods). Another important timing factor is general seasonality – both in terms of product and its suitability and in terms of the budget (for example, in certain months advertising in the media is very expensive), (Karlíček and Král 2011).

Marketing message is divided into three parts. The first is the message itself, the second is the means by which the message is delivered to the target group, and the last is the situational context. It is important that the message has a meaning for the target group, what exactly we want to convey to the target group. The vehicle – i.e., medium we choose is crucial in terms of the availability of the message (for example, if the target group does not use public transport, advertisements in the metro will not suffice). The situational context may weaken (for example, advertisements are presented to the target group when they are in a hurry) or strengthen the message (for example, in a waiting room where the target group can get bored), (Karlíček and Král 2011).

Communication campaign phases

Effective communication itself is divided into five **basic phases** which are engagement, understanding, persuasion, change of attitudes and behavior and the so-called WOM – word-of-mouth marketing, (Karlíček 2016). Zamazalová (2010) summarizes that a marketing campaign informs the target group about products, must convince them of their exceptionality, and shape their attitude towards the institution. The five phases according to Karlíček and Král (2011) are:

Figure 10: Communication campaign phases



I. Engagement

People today are continuously overwhelmed by a huge amount of advertising and other messages (so-called marketing smog), and it is therefore very difficult to **engage** the target group. It is therefore necessary to come up with creative solutions to convey the message. The stimuli can be entertaining or useful to be more attractive. Furthermore, there are efforts to come up with various new and novel ways (for example, handing out free samples was very successful in the early 1990s in the Czech Republic). There is also **so-called guerilla marketing** which is characterized by very unconventional forms at low cost (for example, the campaign for www.skoly.cz where blue-collar workers in Prague wore T-shirts with the words "I should have learned better"). During the campaign, it is important that it stays interesting and does not lose its appeal the entire time and it is necessary to change ideas in various ways. In the phase of engagement, it is necessary to be aware of two negative phenomena that can affect the entire campaign. The first is obtrusiveness and repetition, which in the worst cases can cause aversion to the product concerned. The second one is the so-called vampire effect – i.e., that the form itself is so appealing that it draws all the attention (for example, promotion using a very attractive model that will help you remember the advertisement, but not the product).

II. Understanding

Another equally important phase is **understanding**. Failure to understand a message is a very frequent phenomenon. Karlíček and Král (2011) cite studies suggesting that up to 45% of commercials were unable to deliver messages to the target audience, and after 10 minutes of watching them, as many as 35% of respondents were unable to identify the brand communicated in the commercial. For a message to be understood, it is necessary that the target group is able and willing to accept the message in the given context. From this point of view, we can identify two basic obstacles (or errors). The first one is a language that can be too complex, poorly chosen, as well as technically difficult to read (small font, inappropriate colors, etc.). The second is an overly creative solution that does not show the message clearly, which prevents it from being understood. It is therefore ideal to choose a message which is as simple as possible and try to convey it in the most pleasant way possible. A very appropriate option seems to be that the institution develops its own unique style of communication, which is then used on long-term basis and consistently, where a glimpse of the message is sufficient and it is immediately clear who presents it.

III. Persuasion

The most important moment of marketing communication is **persuasion**. In this section, Karlíček and Král (2011) refer to the Elaboration Likelihood Model. This model says that if the target group is highly

engaged in the area in question, it will think about the content and if it evokes agreeing thoughts, it is very likely to persuade the group in the long term, and the behavior of this group will actually change. On the other hand, a group for which the product is not so interesting, often focuses more on the formal aspect of the message (i.e., who is saying it and how he is saying it), and if there is persuasion, it is usually short-lived. It is therefore possible to conclude, that if the target group is highly interested, it is necessary to emphasize the content of the message and strong arguments, while where the assumption is the opposite, it is necessary to focus on the form of the communication.

It is also necessary to take into account that people make decisions based on either rational or emotional arguments. Both are very effective – rational arguments because they are based on solid facts, emotional arguments because they use varying emotions – for example fear. According to research, the most effective campaign in this case is one inducing fear and giving specific instructions on how to deal with the situation.

The involvement of experts as well as celebrities also has positive impact. Here we talk about the so-called testimonials, being recommendations given by a publicly known person as well as by an ordinary citizen and recommending a certain product or behavior. They emphasize how it has helped that individual. Here we can see a strong effect, since people tend to observe and imitate the actions of others since childhood.

IV. Change of Behavior and the WOM Effect

The outcome of a successful marketing communication campaign should be a **change of behavior** towards a defined communication goal. The WOM effect (**word-of-mouth marketing**) is a secondary action of the campaign. It is statistically proven that most people (70%) inform about 2 - 3 individuals in their neighborhood about their experience. Only 13% of this share convey negative experience which tends to spread more quickly, as people tend to pass on negative experience to more people.

3.2.1.2 Methods of Communication / Communication Mix

A communication mix is a collection of all the tools that a given institution uses for communication. The resulting mix always depends on the goal of the campaign, the target group, and the budget. Zamazalová (2010) divides communication as such into primary communication – communication spread by designated means with a set goal – and secondary communication – this includes all actions of the institution, as they speak to the public as well.

PR and the media

PR is defined as a set of techniques and activities whose primary objective is to influence opinion. It seeks to determine and model how a given public institution is perceived by the public or a selected target group. If PR is active and able to work well with journalists, it allows for own direction and desirable toning of events (Ftorek 2006). PR communication should be directed internally – towards the managers of the organization so that they try to adapt the behavior of the organization toward third parties/stakeholders – as well as externally – i.e., influencing public opinion toward the organization (Karlíček and Král 2011).

Today, the main tool used by PR to communicate with the public is mass media. It is crucial that the information conveyed by the PR is credible, professional and interesting to attract the interest of journalists (Ftorek 2006 and Karlíček 2016).

PR people use a number of tools which are grouped into a so-called “press kit”. The first example is a press release. It should approximate the issuing institution in terms of facts and opinions. Mostly, it takes the form of news that allows journalists to take over its entire passages without much intervention, allowing the institution to spread its “worldview” in a very simple and mass form (Ftorek 2006). Another option is holding a press conference. It is a traditional tool that can convey a message to a large number of journalists at once, increasing the chances of covering a wider range of media (Ftorek 2006). A more unconventional form that also serves to establish relationships and a more interactive form of information transfer is a press trip. It is a reporting trip of journalists who specialize in the topic concerned. The costs are usually borne by the institution, which can bring ethical dilemmas (Ftorek 2006). Other forms of

communication with the media, and thus the public, include various receptions, seminars and lectures, business breakfasts, etc. (Ftorek 2006).

There are also PR practices that can be described as deceptive, for example astroturfing. It creates a false impression and convinces opinion leaders (such as editor-in-chiefs) that a certain topic is of interest to the public. In practice, there is a disproportionate increase in the number of e-mails, phone calls, etc. on a certain topic over a short period of time and it appears to be from a large number of people, but in reality, they are created by PR staff (Ftorek 2006). Another similar practice is spin doctoring. This term describes strongly misleading and manipulative methods, where a certain idea is promoted, regardless of context, and bad news is delayed until journalists have another interesting agenda, or it is significantly downplayed (Ftorek 2006).

It is important to realize that it is always the journalist who gives the message the final form. Journalists themselves claim that about half of PR reports contain no newsworthy information, in fact, 40% of them contain misleading and 21% even false information (Karlíček 2016).

Online marketing

Online marketing and online communication are becoming an increasingly important component of the communication mix today. It enters all areas and affects all of them. According to Karlíček (2016), its positives can be summarized as follows:

- Precise targeting
- Personalization
- Interactivity
- Multimedia content
- Easily measurable effectiveness
- Relatively low costs

We will now take a closer look at the two basic means of online communication. The first one is **websites**. Here, too, great emphasis is placed on identifying the goal – whether it is communication with stakeholders, sales or acquisition of new clients, or brand building. At the same time, it is necessary to streamline the website focus toward determined target group, because the content appeal for this group and the ability to direct them to the desired action are necessary to fulfil the communication goals.

Several criteria need to be met to make a website effective: attractive and compelling content, easy web search (using keywords, relevant links), simple use (control, clarity and orientation) and appropriate design (great importance for general brand perception).

The second crucial means of online marketing is **online social media** (such as Facebook, LinkedIn, YouTube, etc.). These online applications give users the ability to build informal networks and share a variety of content (both personal and general). Institutions have the opportunity to inform about various events, create marketing contests, strengthen their brand name – it is a very powerful and effective PR tool. Again, the rule is that there is crucial content that must be of interest to the target audience and, at the same time, corresponds to the communication goals. An added dimension is that this content should be easily and readily shared among users. If the informative content cannot be spread spontaneously, there is also a widely used option of paid advertising. To keep your content interesting in the long term, you need to update it regularly and add new posts/videos/photos, etc. Last but not least, social media serve as an element of customer care, which means that it is necessary to answer questions on regular basis, not to delete negative and critical posts, and to maintain open communication with followers.

Direct marketing

It is one of the main pillars of communication campaigns because it enables precise targeting, great tailoring of messages to a specific individual and prompts immediate reactions of the individuals. It is based on three basic groups of tools:

- Internet – direct e-mailing
- Contacting by phone
- Mail and courier services

Campaigns often target narrower groups of people or even individuals (with the exception of direct e-mailing). This makes it possible to significantly adapt the marketing message, but requires detailed knowledge of the target group. Direct marketing tries to create an immediate reaction ("call to action"), therefore, the message must be sufficiently urgent and the response required must be very simple, because if the reaction does not occur immediately, it is very unlikely that it will ever occur (Karlíček 2016).

Other important elements of the communication mix, which are primarily focused on sales, include **advertising** and **personal sales**. Advertising is an impersonal form of marketing communication that serves to address a large number of people and its primary objectives include increasing profit, turnover (mostly by sales support), (Zamazalová 2010). Personal sales are based on direct customer contact and immediate feedback.

3.2.2 Communication Related to Pension Systems

Communication about pensions and pension systems has certain specifics, so we will now direct our focus there, specifically. Every communication activity should always verify the need of the recipient – what are their demands and expectations. Pension communication campaigns often have the problem that people are not interested in the subject. Therefore, it is always better to communicate information to people in such a manner that it has a concrete impact on the individual, rather than trying to explain the whole complexity of the pension system.

The first step before the start of the campaign should be a survey of existing campaigns, case studies or publications with the same or similar goal.

As such, campaigns can be run on their own or as part of a broader program (e.g., to increase financial literacy in the country, etc.). Based on available studies, specific areas are defined that should not be forgotten during the preparation of and during such communication campaign. Otherwise, this can have a significant negative impact on overall success. The individual influencing factors and phases of communication regarding pensions will now be discussed in more detail.

3.2.2.1 Requirements that a Successful Campaign Should Meet

Main goal

The most important aspect of any retirement campaign is the setting of the goal(s). Proper and clear goals are the basis for a well-planned campaign and consequently a well-run campaign. Based on a study conducted by OECD (2013), which addresses different communication campaigns on pensions across different countries of the world, the most common goals for the campaigns are, as follows:

- Build a public consensus on the need for reform
- Increase public awareness and knowledge about changes in the pension system
- Explain to an individual how his pension decision can affect his future amount of pension (and thus preserve his standard of living, etc.)
- Strengthen trust in the institutions leading the pension reform within society
- Encourage both employers and employees to make active and informed decisions
- Encourage certain behavior among population – e.g., join a new, voluntary system; increase their voluntary contributions; postpone their retirement

What do we want to communicate?

Another element that affects the communication campaign is whether we want to communicate the entire pension system as a whole, or only a certain part thereof, or perhaps some very specific message related to pensions. The duration of the whole campaign will depend on what exactly we want to communicate – if we want to communicate the whole system, it is necessary, logically, to spend much more time on the whole campaign (given the amount and complexity of the information communicated). On the other hand, if we only want to communicate a specific message, the actual course of the campaign is less time-consuming.

Target group(s)

It is very important to set the target group of the whole campaign correctly (and with sufficient distinction). This is a step that will subsequently influence a large part of the planning of the whole campaign – this is the basis on which we choose how to communicate (what specific tools we choose). A common mistake here is that the target group or target groups are poorly defined. Consequently, communication goes amiss and the range benefits of the campaign falter.

It is far more beneficial to divide the group of people we want to address into smaller and more homogeneous groups, because if we have large differences among individuals, the communication campaign cannot be properly targeted.

As an example, we can take a group of young people up to 26 years of age to whom a different information will be relevant than to those who are over 50 years of age and will retire much sooner – and thus different information should be communicated to them.

Consequently, the information channels are selected and used to inform the defined groups. Depending on the channels we choose, the segment we address well varies (e.g., primarily television for the older generation, primarily social media for the younger generation, etc.).

Clarify who will organize the campaign

At the beginning, it is also important to clarify who will organize the campaign – whether it will be solely the state, the private sector, or the cooperation between the two. Cooperation is crucial, especially when the private sector is part of the new system setup (e.g., it will then offer products/services that support the new pension system).

During this phase, the campaign organizer should identify the key stakeholders of the entire campaign, define the relationships among them, and coordinate their interests with those of the entire campaign.

Timeframe

Pension communication campaigns can have precisely defined timing (e.g., over a period of 6 months) – this is usually the case when a specific message/reform, etc. is communicated. Where the goals are more general (e.g., efforts to improve overall awareness of the pension system), the campaign is long-term, with certain milestones that have precise timeframe.

Budget

An essential part of the planning of communication campaigns is financial coverage. The amount of funds available for the campaign largely affects the number of target groups we are able to address and the mode or intensity of the campaign. Of course, the larger the population (and therefore the more target groups we have), the more financially demanding the campaign will be.

3.2.2.2 Types of Communication Campaigns

In this chapter we will provide more detailed information on two basic types of communication campaigns that the OECD distinguishes in its report (2013). **Communication of pension reforms (which are usually mandatory for the population)**

The government can take two positions here - the goal may be to persuade as many people as possible to voluntarily join the new system (before it becomes mandatory). In this case, therefore, the state is interested in convincing its residents that the change is beneficial for them and the state wants the population to see the benefit for themselves, identify with it and voluntarily switch to the new system. Therefore, it is the state's primary interest that people should be aware of the new reform, should accept it, and build their trust in the new system.

Regarding the timeframe, this kind of campaign tends to be quite firmly linked to the timeframe of the reform – specifically it is directed to the period when awareness of the new system is being built (often before the approval and implementation) and then during the first few years of the new system. In other

words, the campaigns are focused on the period when the individual can still decide to join the system voluntarily – the period for their own decision.

The campaign is typically divided into stages according to the specific phase of the pension reform. First, the campaign's goal is to build awareness and trust (during the phase of the approval and pre-implementation of the reform). Subsequently (at the stage when the actual effectiveness of the reform is approaching), the campaign will focus more on communication of the impact on individuals, etc.

As this concerns pension reforms, the communication is usually in the hands of state institutions or the state delegates this communication to specialized agencies. However, given the frequent controversy of the reforms and their complexity, it is more common for the campaign to remain in the hands of state institutions.

Communication on longer-term goals/changes in the population stance

A frequent example here might be to try to persuade people to become more involved in a voluntary pension system or, for example, efforts to improve knowledge and understanding of the pension system as a whole, but also to improve knowledge about all pension products and options how to save money for your own pension. Generally speaking, there is an effort to improve the financial literacy of the population.

Given the objective of such a campaign, we cannot clearly determine the timeframe of a campaign – often it is a really a long process. Of course, this may not always be the case; there are examples of relatively short campaigns, but it is a minority of the cases.

This kind of communication tends to be much more related to and driven by the private sector – e.g., pension companies.

3.2.2.3 Monitoring and Evaluating the Campaign

According to OECD (2013), organizers should always bear in mind that evaluation of the campaign results is extremely important in communication campaigns. It is often neglected and campaign organizers do not want to invest their money there. However, even in campaigns with a small budget, saving money on evaluation is not advisable. The second and fairly common problem is that when a decision is made to carry out an evaluation, it occurs at the very end. However, it is very important to evaluate continuously as such evaluation allows for timely plan adjustments and swaying of the final result.

Before the campaign

Before the campaign as such starts, it is important to perform relevant monitoring. It shall provide us with an idea of the current situation of the campaign targets – what are their barriers to understanding the message, whether they differ significantly from each other and will need to be divided into smaller groups, or whether our target recipients are sufficiently homogeneous and no further segmentation is needed.

This step is indeed crucial, since many communication campaigns have proved to be unsuccessful precisely because they were run on a very general basis – failed to reach the target recipients, persuade and explain the importance, etc. All this is precisely because the target groups were not correctly defined and were not correctly targeted. Individuals then do not see the importance of the new things/product/system and how they benefit from them (in other words, they do not understand why they should start behaving differently and change their stance/activities regarding pensions).

During the campaign

Evaluation of a running campaign provides insight as to whether or not the current communication campaign is successful. In order to draw such conclusions, we need to recognize the changes that have occurred as a result of the campaign. In other words, it is necessary to have a good overview of situation before the campaign and to compare it with the continuous monitoring of the ongoing communication campaign. As a second aspect, it is important to be able to distinguish which changes compared to the

original situation have happened even without the communication campaign and which are strictly the result of targeted efforts.

Quantitative and qualitative methods are used for the evaluation process. Examples of items to be tracked for each method are provided below – specific indicators are then chosen according to the campaign goal.

Examples of quantitative measurement:

- Response rates of websites and call centers
- Number of new voluntarily participating individuals
- The amount of voluntary monthly contribution to the individual's system
- Number of individuals who have voluntarily joined the new voluntary system
- Number of individuals who postponed their retirement

Examples of qualitative measurement:

- Focus groups
- Personal interviews
- Follow-up interviews

3.2.2.4 Summary of Basic Recommendations

The OECD report (2013) on pension communication campaigns, emphasizes the following basic recommendations which should be followed for a successful communication campaign.

- Any changes or major messages call for a specific communication campaign
- Clear and measurable objectives drive successful campaigns
- Sufficient attention should also be paid to the evaluation process (also continuously)
- Special access to groups that are less accessible
- Phase the campaign to avoid multiple messages, prevent actions before explanation, etc.
- Handle well the cooperation between state organizations and the private sector
- Have a well thought-out strategy, which communication channels we choose
- Ensure engagement – good results of the road shows, seminars, workshops, etc.
- Budget as a means of effective campaign management
- It should also not be forgotten that, during the campaign, general financial literacy of the population and its improvement should be pursued.

3.2.3 Importance of Comprehensible Communication

Comprehensibility of the modes of communication of the amount of pensions

The most important thing is to determine the purpose of the communication and to build the whole campaign on the basis of that purpose to achieve this goal. Prast (2015) defines the difference between knowledge and awareness. According to him, it is crucial to realize that knowledge alone is not enough because it is passive and does not motivate individuals to take any action. Prast (2015) believes that a meaningful goal of the pension communication is better preparation for retirement and mainly elimination of the risk of expectation of inadequately high pension. This is in line with the attitude of the Dutch Authority for the Financial Markets which stresses that mere information on the amount of the pension is not sufficient. Therefore, it is always necessary to provide an overall picture of the situation – i.e., whether the given amount of pension will be adequate for individuals and what steps, if any, should be taken to make it adequate. Simple information about the amount of pension is usually not comprehensible and it is necessary to focus on improving communication if we want to make people better prepared for retirement and reduce the risk of inadequate future pension amounts. It is important

to realize that people usually have an idea of the standard of living they would like to have when they retire, but only few people know what income is required to achieve it.

Another study that looks at the comprehensibility of pension information in general is *"Is Information Overrated?"* (Prast H., Teppa F., Smits A.). The authors present empirical evidence that a communication strategy based on information does not help people with their retirement decisions – even if the information is presented in a very simple form, broadcasted through the relevant media and tailored to the individual. Everywhere in the world, there are efforts to inform about pension systems, risks and rights through retirement communication, information, financial education and transparency of the system. And precisely because there is a presumption that well informed people will make optimal decisions, these ideal decisions are very difficult for individuals, even if they have some financial education. The authors further summarize that most studies that tried to find some link between information and subsequent actions failed.

Financial literacy and its relation to pension planning

There is a lot of research illustrating the link between financial literacy and understanding of pension information. They usually show a positive correlation between the two. Below we present some examples.

The first one is a study by Alessie, Rooij and Lusardi (2011). It focuses on the relationship of financial education and preparation for retirement in the Netherlands. During the research, they found that there was a big gap between the expected level of pensions and actual retirement income. Most participants in this research tended to overestimate the income they will receive. Furthermore, relationship to financial literacy was shown – the higher it was, the smaller the gap between expected and actual retirement income. People with minimal financial literacy expected unrealistically high pensions. This very low financial literacy has also proved to go hand in hand with low literacy in general.

Similar conclusions on the interconnection of financial literacy and pension planning can be found in a study named *"(Lack of) Pension Knowledge"* (2013) which focuses on the Irish population over 50 years of age which is included in a supplementary pension insurance and their knowledge of the pension system. There is a presumption that since these individuals were involved in supplementary pension insurance plan, they should have better awareness of the pension system, and questions were also aimed at payments from the supplementary savings scheme. The survey has shown that two-thirds do not know what their pension will be and how it will be paid – less educated groups of the population were worse off in terms of awareness. The authors offer two policy solutions. The first one is a more specific campaign – i.e., to convey relevant information in a relevant way to certain groups. The reason is that some groups are more vulnerable than others (for example, women, women in rural areas), it would therefore be good to target awareness campaigns more specifically to them. In addition, they summarize studies from the US showing that campaigns to increase financial literacy for employees tend to be the most effective and usually have direct impact on the change of behavior.

The second one is to extend the mandatory elements in pension systems. The pension system is based on the assumption that the individual should take more responsibility for his future pension. It is based on the classical economic model which states that if we have a rational well-informed individual who knows the pension system, he will make the optimal decision about his future pension. In practice, however, this area is too extensive and complex and contains many options, due to which this assumption does not work. Expanding mandatory elements and limiting choice can help individuals in this complex area.

Another study from the US is by R. L. Clark (2006). First, he summarizes several studies from which he draws two conclusions. The first is that after completing some financial education, individuals often reassess their retirement and savings plans. The second conclusion is that, in general, education by the employer can increase the involvement of individuals in retirement savings plans, while the most effective method seems to be organizing seminars at the workplace.

Other examples of studies

Brüggen, Rohde and Broeke (2013) also deal with the presentation of information on the future amount of pension. According to them, the main goal of retirement communication is to bring a very distant future closer so that the individual is able to imagine himself as a pensioner. This communication should

make the individual think about whether the presented amount of pension fulfills his vision of the future standard of living, and if not, it should motivate him to change behavior. The authors focused on the projection of the future self, which they presented either as a future in which an individual can hope (“hoped for”) or of which an individual can be afraid (“feared for”). They created these visual projections in 3 scenarios – general, social and material (Appendix 9). The authors see the potential in using these projections in mass communication or as an attachment to periodical letters that are sent as information on the individual's pension account balances. So far, two pre-tests and one pilot study have been carried out that confirm this eventuality.

3.2.4 Examples of Pension Communication Campaigns

We will now show selected examples of pension communication campaigns and a brief evaluation thereof, which is presented in the study conducted by OECD (2012) named Lessons from National Pensions Communication Campaigns.

Denmark

The communication campaign focused on promotion of the “PensionsInfo” website. This website was introduced as early as 1999, but in 2007 (when the communication campaign took place), it was greatly amended, including a new design of the website⁴⁴. PensionsInfo collects real-time pension-related information on individuals through the website. An overview of the information obtained is then provided by the pension providers of each individual and shows the estimated pension to which one will be entitled in the future (under real conditions, with inflation included). The aim of the website is not to direct individuals to a certain behavior, but rather to provide them with a comprehensive and meaningful information about their pension entitlement. Without logging in, only average value modeling is possible, the amounts are not “personalized”. It is possible to arrange an appointment with a pension intermediary through the website.

The budget for launching the site was EUR 5 million, an additional approximately EUR 10 million is needed to develop the website, and the subsequent annual costs are estimated at EUR 1.5 million.

The main objective of the campaign was to increase the general awareness and awareness of the target groups. This objective was supposed to be achieved by increasing traffic on the new website by 25%,

Figure 11: Information overview of pension on „PensionsInfo“ website

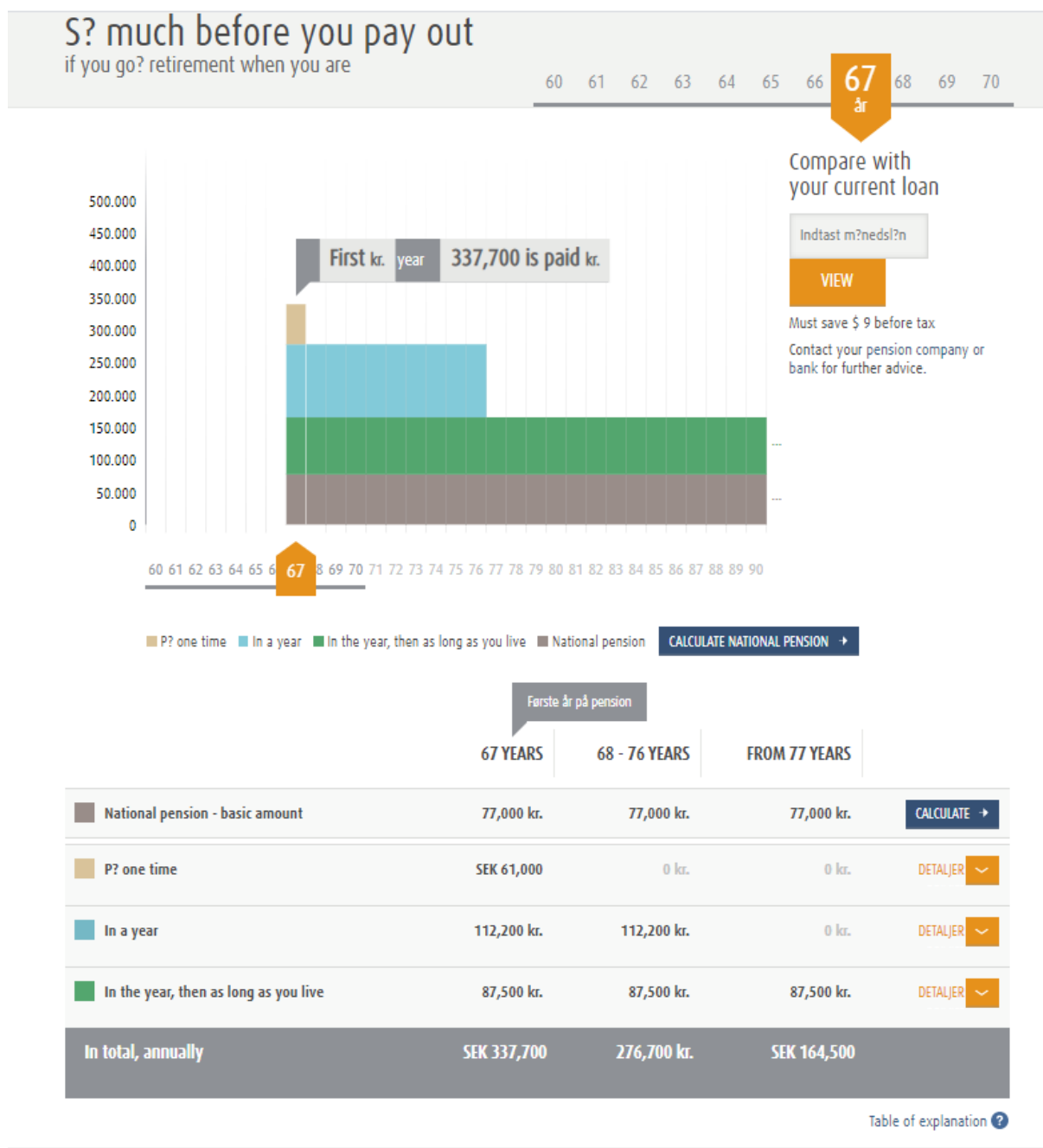


⁴⁴ <https://www.pensionsinfo.dk/Borgerservice/velkommen.html>

while attracting more representatives of diverse groups to the website (including women and working people with basic education).

In this case, the objective has been fulfilled – the increase in the website traffic was even higher than the target – 30% in total. At the same time, partial surveys of user satisfaction are carried out every year and the functionality of the website is adjusted based on these surveys. The situation was somewhat worse for the second partial objective – the most frequent users of the website are still educated men.

Figure 12: Example of pension structure on the “PensionsInfo” website



Ireland

In 2003, Ireland introduced Pension Retirement Savings Accounts. This is a personal retirement plan provided by authorized providers. Participation was voluntary, but changed to mandatory in 2014. Consequently, a campaign was launched in 2003 - 2008 to raise awareness of the program and, at the same time, to raise level of financial literacy of their population to facilitate their retirement planning and retirement security.

Target groups were defined as young people aged 25 - 39, women, graduates (before getting their first job), workers from sectors with historically lower pensions in Ireland (e.g., agriculture, health care) and international participants in the Irish labor market.

Since the target groups were so diverse, the communication channels corresponded to that. Television, radio, cinema, press, posters or internet banners were used for communication. Information and education programs have started in schools and several special articles for newspapers or school programs have been written. In Ireland, there is generally a very large group of people listening to the radio, so with this in mind, much attention has been paid to communication via radio. But of course, communication took place also via television because it is the easiest way to address as many people as possible. Special advertising spots were deployed in the important part of the campaign (e.g., during the "National Pension Action Week" or during the tax return submission period). On the other hand, cinema was primarily used to address young people, because young people no longer watch television so much.

The total budget has amounted to EUR 4.5 million over the six years.

Although it was primarily a campaign organized by the state, there was cooperation with other institutions such as trade unions, national libraries, women's associations, etc.

The campaign as a whole has been evaluated as successful – awareness of pensions in Ireland has increased from approximately 60% in 2003 to 87% in 2007. At the same time, the percentage of people with voluntary pension insurance increased from 58% for people between 35 and 65 years of age to 61%. However, the Irish Government does not consider such an increase sufficient because higher goals have been set.

USA

In the United States, a campaign called "Saving Matters – Retirement Savings Education Campaign" began in 1995. The aim is, as the name already suggests, to raise general awareness of pension savings, inform the target groups, and change people's behavior (in other words, to get them to start retirement savings themselves).

The target groups for this campaign are the working population – in particular young working people, working people before retirement, women, or minority groups in the labor market.

Since this is an ongoing campaign, it is not possible to determine exactly the total amount of costs; however, USD 375,000 is spent on this communication every year.

The communication takes place primarily on a specialized portal where people can find relevant publications, interactive tools, calculators, videos. The entire content can be further distributed and the campaign works together with more than 70 partners and various institutions to maximize the information spread. Various seminars and workshops are organized. In addition, there are "contact points" across the US where experts are available to help with questions and explanations for working people and employers.

The success of the campaign is monitored not only through website traffic, but also through the number of questions received (whether by phone, in writing or electronically), the number of publications distributed, or through personal surveys and focus groups.

Especially online tools, printed materials and personal meetings with people (i.e., seminars and meetings) are evaluated as very effective in the campaign. Recently there has also been a significant increase in the importance of social media. With respect to the multicultural nation, which the United States undoubtedly is, the challenge was to address such a diverse population, even with limited

resources, establish the right strategic partnerships with other institutions, and come up with culturally and linguistically relevant variants of materials.

Estonia

Estonia introduced a new system in 2002 which is mandatory for all people born after 1982 (all new labor market participants were therefore obliged to join the system). People born between 1942 and 1982 could make a decision and join the system in the period between 2002 and 2010. No one can voluntarily join after 2010.

From the above information, it is clear that the communication campaign was very different for both groups. There was a completely different message for each of the groups – one group had no choice and joining was mandatory, while the other group could decide for a limited time whether to join.

The total budget of the campaign was EEK 150,000.

The whole campaign was time-limited – it lasted 6 months during which the PR campaign ran on television (e.g., interviews with experts were broadcast in selected programs), on the radio, printed media, and websites. At the same time, roadshows were organized for the employees of specialized call centers were prepared to answer people's questions. The campaign also has its "symbol" – it used an oak tree (e.g., the roots represent the 3 pension pillars).

The success of the campaign was evaluated by the number of interactions with the call center, attendance at the roadshows, or through face-to-face interviews. After the campaign, 43% said they knew about the new system, 14% said they knew enough, and 21% said they did not know much. During the first year, around 200,000 people voluntarily joined the system, and the following year it was another 150,000 people. In total, this represented approximately 45% of the total population that could voluntarily join.

The organizers see the success of the campaign primarily as a result of cooperation with pension funds (it was also linked with the logo). Here we see a beautiful example of how the two participants worked together – the pension funds waited with their own campaign until the official campaign of the state has ended (mainly to prevent confusion of people).

Hungary

Hungary has tried to carry out a successful campaign to explain to individuals why they should join the new system. However, the original communication campaign did not really work, so a new campaign was launched after a few years. The original campaign took place in the 1990s and was aimed at all working people. This group was not further subdivided and was treated as homogeneous. The result was that people did not understand what the new system would bring them and why they should join it. Another crucial point was that the results of pension funds were not sufficiently published and communicated, and people therefore did not trust and did not want to switch from their existing funds to new ones.

The second campaign, launched in 2008, was designed to change the negative perception of the public while improving its overall awareness of pensions. At the same time, Hungary tried to use the findings of the first, unsuccessful campaign, to its benefit. The recipients were divided into smaller groups and each was treated individually, so that the campaign could be of significance. Specially created brochures, which were attached to the daily press for one week, became the main means of communication – therefore, a large part of households were addressed, creating an opportunity to inform them about the current government steps and forthcoming changes. At the same time, an Internet platform was created during the campaign as a place to discuss the topic. The aim was to be able to communicate effectively to the public while avoiding unwanted misunderstandings. The total cost of this campaign, which started in 2008, was HUF 28.5 million.

This campaign managed to increase the specialized website traffic and, according to respective surveys, managed to improve public awareness of pensions in Hungary through printed brochures.

Mexico

There has been a long-term campaign in Mexico since 1997 with a goal to raise awareness of the reforms, explain how pensions (both public and private) are funded, and support working people in making relevant decisions. Interestingly, this is a campaign where the state and private sectors (pension companies) work together.

The campaign also works with its own slogans such as: “Get involved today and not tomorrow when it’s too late.” or “The choice you make today will dictate the size of your pension tomorrow.” Since this is a continuous campaign, the total cost cannot be quantified, but approximately USD 2.8 million is spent each year.

The objective, of course, is to raise awareness of pensions in general among the population, but the campaign specifically targets the working population and young working people.

The media used for the communication include mainly the Internet and other media channels such as television, radio, newspapers, billboards, etc. Direct contact with the residents is not neglected either – representatives of the local regulator organize discussions in schools, universities, employers, labor fairs, but also in shopping centers, etc. Each year there is personal contact with approximately 6 million Mexicans.

Campaign success is measured through website traffic, calls to specialized call centers, number of chats or via focus groups.

The problem is that most Mexicans still do not have sufficient awareness of pensions. Approximately 90% of people do not deal with it because the compulsory contribution is deducted directly from their income prior to pay day – approximately 85% of people are therefore primarily interested in the fact that they are entitled to a pension, how high it is, etc. Despite the fact that the campaign has been running in Mexico for some time, its funding is very limited and insufficient for such a large population. For this reason, it is not possible to get into the regions so much and explain the complex topic of pensions.

Italy

Italy has set up a communication campaign to promote the introduction of the new system and raise general awareness of it since 2008; the campaign was organized during January - June 2007 and targeted all private sector employees.

It is also interesting that the campaign management was entrusted to a specialized PR agency. It was communicated through a specialized website, television, radio, printed materials, call centers, public events, etc. Different sets of these tools were used for different target groups.

Italy did not conduct any research before the campaign itself and the campaign was monitored internally through website traffic, call center calls, number of people watching the TV spots or listening to radio programs.

During the campaign, about 70% of the population was made aware of the new situation and total costs reached EUR 17 million. Looking back, the campaign is evaluated as quite successful, but it implies facts that the organizers take as suggestions on how to approach the campaign better next time. Specifically, it concerns e.g., better and more precise definition of objectives (can be divided into several sub-objectives), better prepare the evaluation system and the methods used, better coordination among stakeholders involved in the communication campaign.

New Zealand

Between 2007 and 2009, there was a campaign in the New Zealand to inform about the local pension system called KiwiSaver and to improve the financial literacy of its new members. In 2009, the existing members also joined within the follow-up phase. The target group was primarily all working people, but with a special focus on those with lower financial literacy. The budget of the first phase was NZD 2 million.

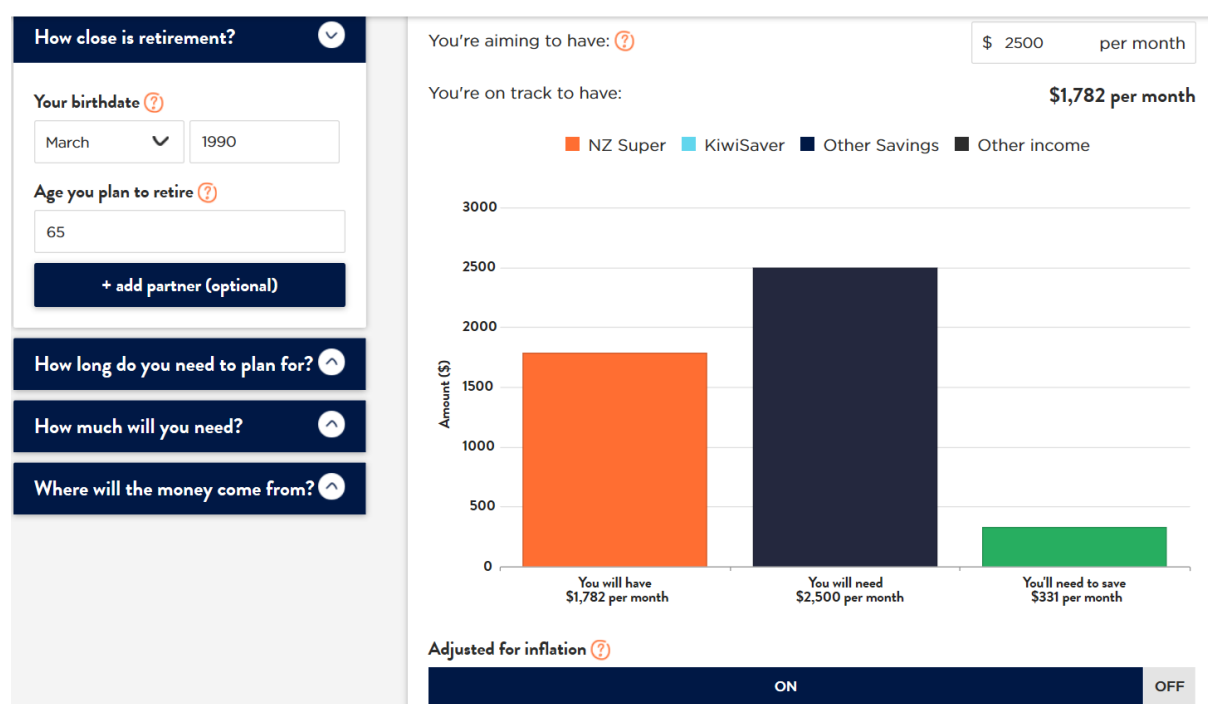
The campaign focused mainly on providing information about KiwiSaver (an option of private retirement savings) and the citizens could then decide whether this was the way for them and whether it could help them meet their retirement goals and, as the case may be, whether they can afford to participate in it.

The specialized website⁴⁵ offers a calculator where an individual fills in information about himself such as the date of birth, when he expects to retire (the same for the partner if he also wants to include them in the calculation), what is his estimated life expectancy, how much he will need as his monthly annuity according to his retirement needs, what other income and savings he has, including how much he would like to spend on the optional retirement savings through KiwiSaver. On the basis of this data, the individual is shown a chart where he sees how much he will receive in the state pension, what income will come from KiwiSaver, how much will be the requirement for finances in retirement, and what the potential negative GAP is (see *Figure 13: Comparison of the amount of pension and the amount needed for living on a specialized website*).

In addition to the website, there were various seminars (there were more of them – always depending on the specific topic) and they gradually led participants through the different aspects of financial planning. Other “traditional” media such as television have been used to a much lesser extent.

As for the success of the communication campaign, New Zealand carried out an initial survey before the campaign started so that the organizers would know what the starting situation was. A similar survey was conducted at the end of the campaign period. For example, in 2007 before the campaign, the percentage of people interested in this topic was 28% of the total working population. This number increased to 40% in 2008. The other partial indicators are also evaluated by the organizers as successful. In fact, in a post-campaign survey, 81% of the population said that the website and the KiwiSaver brand helped with the issue of their financial resources.

Figure 13: Comparison of the amount of pension and the amount needed for living on a specialized website



Singapore

In 2009, a campaign was launched to explain the possible impacts of a system change on its members. The whole campaign was divided into three periods. The first one was the most intensive and lasted from September to December 2009. The second phase was focused on moderate impact and lasted from January 2010 to June 2012. The last third phase sought intensive impact and lasted from July to

⁴⁵ <https://sorted.org.nz/tools/retirement-planner>

December 2012. At the same time, all of these phases were complementing the ongoing program to improve financial literacy.

Until 2013, joining the system was voluntary. Then it became mandatory for residents over 55 years of age and with earnings above a certain amount. These people – i.e., people between the ages of 55 and 60 with required minimum earnings – were the main segment targeted. It remained voluntary for others, but there was still an effort to convince them to join the new system.

The total budget for all phases was SGD 3.79 million (and most of it was spent on phase 1 and phase 2).

The first phase, since its aim was to address the broadest possible audience, was mainly implemented through the media, including newspapers, where special articles were published or through publication of brochures. The second phase was implemented through printed variants of publications, communications via e-mail, call centers or websites. The third phase had not yet taken place at the time the study was written, but there were plans for activities such as road shows, seminars, meetings with people, etc.

A survey was conducted before the campaign, which revealed that people demand that the pension system be fair, flexible and affordable and, at the same time, run by a trustworthy administrator. In other words, they want easy-to-understand information and explanations.

4 Proposals

In this chapter, we mainly pay attention to proposals, 6 in total, created by us to determine the expected pension value for individuals, and forming the largest part of this chapter. These proposals reflect demands on the use of the microsimulation model as well as best practices in other countries which we dealt with in more detail in Chapter 3 – Research part. It is also important to mention that it is not common to use the microsimulation model as a tool for future pension value determination. It is common practice in most countries to calculate the amount of income based pension on a classical calculator for one fixed scenario of future development and using already known facts about the individual.

Within each of our proposals, which are based on the use of a microsimulation model, we took a closer look at the design principle as a whole, defined the necessary inputs for successful simulation as well as setting up and using the NEMO model along with how to process the results. In addition to this more technical side of things, we also looked at the possibility of a suitable form of presentation or (if possible) introduction of a good practice from another country where a similar proposal already works. At the end of each subchapter, we evaluated its advantages and disadvantages for each proposal as well as illustrated a model example of the use of the proposal.

Another part of Chapter 4 is dedicated to additional proposals. It contains a proposal of what information should be communicated together with the basic information and a form it should have. This additional information can help individuals with an understanding of their situation. We elaborate in more detail the communication of information regarding the retirement age, private pension savings, the pension value under certain specific scenarios, or information on the paid pension insurance. Within each of these additional proposals there is a description of its principle, the necessary inputs, or the output. Furthermore, information on good practice in other countries, evaluation of advantages and disadvantages as well as a model example of the use of the additional proposal. There is also discussed the use of different economic scenarios in calculating the expected amount of income using a microsimulation model.

Following the previous parts, the next part of Chapter 4 is dedicated to the topic of how to present information (both from the point of view of target groups, forms of presentation, and various distribution channels) focusing on the terms of the division of the population into age groups and the importance of realizing the differences between these groups.

Final part of Chapter 4 contains summary and complex evaluation of all the proposals described in previous sections of the chapter. However, this is not a Deloitte recommendation of specific suitable use. Chapter 5 is dedicated to this recommendation.

4.1 Variant Proposal of Approaches to Determining the Pension Amount Using a Microsimulation Model

The microsimulation model makes it possible to simulate the life paths of each individual, i.e., including the development of the entire population, and the related income and expenditure of the pension system. As a result, it is possible to obtain a distribution of the value of pensions which contains more information than the calculation of the value of the individual's pension solely according to the formula for fixed parameters (i.e., calculation based on calculator principles for one fixed scenario).

Although the outputs of the microsimulation model are used in the world more for internal government needs to model changes and the possible impacts of these changes, it is possible to use the outputs to inform individuals about their expected pension values.

6 possible variants of using the microsimulation model and its outputs to inform the population are described below. These are the following variants:

- *Variant 1:* Group of Individuals with Similar Parameters
- *Variant 2:* Non-anonymized Simulation for a Specific Individual

- *Variant 3:* Online Tool Performing Simulation on Demand
- *Variant 4:* Online Tool Assigning Prepared Results from the Model to an Individual
- *Variant 5:* Taking into Account the Amount of Funds of the Pension System
- *Variant 6:* Calculation on the Basis of a Fixed Scenario

For each variant, the main principle, technical implementation (the required inputs, settings, and use of the NEMO model and processing of the results), suitable form of presentation, use of a similar approach, in other countries, and the advantages and disadvantages of the proposed variant are discussed.

For better understanding, an example of application of the respective variant is included in each chapter.

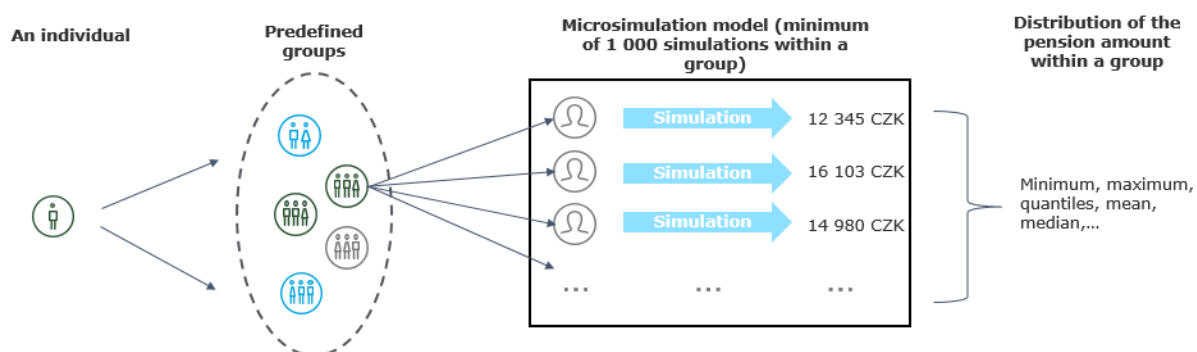
4.1.1 Variant 1: Group of Individuals with Similar Parameters

Variant 1 assigns the individual to a predefined group. The group contains a sufficient number of life path simulations and the results of the assigned group are presented to the individual. The advantage of this approach is that dividing the population into groups will save time during the simulation itself. The fact that it is not a fully individual approach with respect to the particular individual, but we look at him through an assigned group, may be perceived as a disadvantage. Since this variant can be based on the data already available to MoLSA, paper-based information seems to be an optimal way of communicating information.

4.1.1.1 Principle

The values about the future amount of pensions for each individual, when using Variant 1, are obtained using values from the simulation of pensions of a certain predefined group. These groups are selected so that each individual can be assigned to one of them based on the selected parameters. The microsimulation model is run as many times as is necessary to obtain an adequate sample of data. Pensions are monitored within individual groups. It is also possible to work with distribution, minimum, maximum, median, average, intervals, etc. within the group.

Figure 14: Graphic presentation of the principle of Variant 1



4.1.1.2 Options of the Pre-Defined Groups

Each individual within the population is assigned to a certain group according to predefined parameters such as age, sex, income, education, etc. The granularity of the groups may vary. Depending on their availability, the options for selecting parameters defining groups are divided into three approaches:

- 1) Approach 1: Division into groups according to parameters that are currently available to MoLSA:
The easiest approach to group division is such that MoLSA is able to do on the basis of data which is currently available for particular individuals and which is used in the microsimulation model (i.e., sex, age, years worked and assessment base). The advantage of this setting is that no further modifications to the model and the need to add more data are expected. The question remains in this case whether the informative value with such a general division into groups is sufficient.

- 2) Approach 2: Addition of parameters from other available sources: The basic parameters mentioned above are amended with more detailed information under this approach. This additional information can then be implemented in the microsimulation model and used in simulations – e.g., place of employment (region, district), which currently does not affect the projection, but could be introduced. Additional information includes also education, which already affects the projection and is assigned to everyone by a statistical model. The advantage is the refinement of the estimates due to less general grouping. The disadvantage is the need to modify the model for parameters that do not yet enter the projection (e.g., residence) and the difficulty of the process of adding information which is not yet fully available to MoLSA (e.g., refining data on education). Incompleteness of information may be solved by estimating/completing the missing parameter and by appropriate formulation when presenting the amount of pension (e.g., “According to our information, you are a man with secondary education. If we are wrong, please let us know”). Thanks to this solution, it is possible to add the missing parameters to the database, but it is necessary to expect a certain level of activity from the recipients of information.
- 3) Approach 3: Completion of parameters based on the responses of individual citizens: This approach further extends the information and implements it in the model. This information (e.g., number of children, expected income growth, expected maternity leave / parental leave, etc.) needs to be obtained via questionnaires filled out by citizens. This approach allows for a very specific division into groups and hence a much more precise estimation, but the feasibility of obtaining information is rather unrealistic. An appropriate use of these parameters is a form of interactive tool where this information could be filled in e.g., online. Such an interactive tool could serve as a supplement to paper-based information.

It is also worth carrying out a more in-depth analysis on which parameters have a significant impact on the amount of pension and, therefore, what division into groups is most appropriate. In our opinion, such parameters are as follows:

- Current income of the individual
- Current position in the labor market (employed/unemployed/inactive)
- Historical period of insurance
- Historical income of the individual (or, more precisely, assessment bases)
- Education
- Age and sex
- Region of residence (not used in the current model)
- Disability

The groups should be chosen to well represent the groups of the population that can be observed in society. We believe that it is sufficient to form groups at regular intervals in terms of age. On the other hand, in the case of income, the width of the interval may vary for each group (e.g., so that each group uses the same income quantile range).

The results of such individuals who are in the extreme values of the defined group may be problematic and may thus distort the results (e.g., a 30 year old in a group of 30 - 35 year olds). This situation could be resolved e.g., using the concept of overlapping groups. The groups are set so that it is possible to select a group for each individual in which his parameters are not extreme (e.g., groups by years: 25 - 30, 27 - 32, 30 - 35, and so the 30 year old individual would be presented results out of the group 27 - 32 years).

At the same time, due to technical limitations of the Prophet system, it is not possible to select too many groups. The theoretical maximum is 9,999, but each additional group increases the demand on computer performance. Therefore, in the models used by insurance companies, values below 500 are mostly used to calculate their cash flows. A higher number of groups can be selected if there is a significant reduction in the volume of results reported for each group (the so-called reporting variables). We recommend that MoLSA analysts perform tests that will review specific capabilities of their model in this respect.

Recommended procedure for selecting the groups

When choosing the groups, we consider important to find a balance between the number of groups, which affects plasticity of the results, number of modelpoints in one group (on which the reliability of the results for the group depends) and the computation time. This represents the main limitation in the practical application of the variant.

Therefore, we recommend first selecting the overall upper limit for the number of modelpoints run (e.g., 20,000,000, for which the calculation currently lasts less than a day). We will refine the groups and increase the number of groups until the total number of modelpoints exceeds this upper limit and until the refinement (e.g., addition of another distinguishing parameter) will appear meaningful (is practically applicable in terms of available information and has an impact on the amount of pensions in the group).

The first step in the process of selecting the groups can be division by basic categorical variables, namely:

- Sex (2 options)
- Education (4 options)

This basic division consists of 8 groups. These can be further divided according to the selected parameters e.g., as follows:

1. Select the parameters used (e.g., income, age, insurance period).
2. Add a number of intervals to each parameter in order of magnitude (e.g., 10 for each parameter, which produces $8 \cdot 10 \cdot 10 \cdot 10 = 8,000$ groups, i.e., 8,000,000 modelpoints, if there are 1,000 modelpoints in the group).
3. We run each group multiple times always for 1,000 modelpoints and look at how the results we want to report differ across the individual calculations. If the variability in any group is higher than the required accuracy of the communicated information (e.g., the average from the 1,000 modelpoints run was vastly different each time), we will increase the number of modelpoints in the group. This will ensure the reliability of the reported results. (This initial analysis can be very lengthy because it requires repeated runs of the model. It can be accelerated, for example, by performing only a few selected groups in the first wave and generalizing their results – for example, if it is necessary to increase the number of modelpoints in all selected groups, we will increase it directly for other groups as well and run the overall test directly on the adjusted values. At the same time, it is a largely one-time exercise – it can be expected that the necessary number of modelpoints per group will remain stable also in the following years, until the model is significantly modified).
4. For individual groups, it is possible to analyze the representation of individuals belonging to this group in society; if a significantly larger number of individuals belongs to a given group, we recommend further subdividing the group (e.g., using two intervals instead of one for the income), and conversely, for groups with a very low number of individuals in society, the intervals can be slightly relaxed (e.g., merging age groups)

If sufficient number of modelpoints cannot be found in any of the groups to ensure stable results, we recommend running the simulation multiple times (see below).

Let us consider an approach, where no intervals relevant to grouping are set for the income levels, but the pension amount is calculated in the given group for a sample amount of the current income (e.g., 20,000). Assessment bases and insurance periods at the time of retirement are monitored, and the assessment bases are subsequently re-scaled according to the actual amount of income of the particular individual. A discussion of how to use this approach is presented in the chapter on Variant 4, mainly in Chapter **Chyba! Nenalezen zdroj odkazů.** The advantage of this approach when using Variant 1 is that the number of groups required (and thus computational time and work associated with the formation of the groups) is reduced; on the other hand, when used widely, this approach requires a significant modification of the outputs from the model, which complicates the use of this variant.

4.1.1.3 Required Inputs

The range of inputs depends on the definition of individual groups. Approach 1 needs no additional inputs compared to the current situation. To form groups according to Approach 2, it is necessary to add input information about the selected parameter, e.g., place of employment or education. To add the place of employment, it is possible to use an employee personal record or place of permanent residence. However, both approaches distort the information. This is due to the fact that the personal record specifies the registered office of the employer (not the place of employment) and the individual may have permanent residence at a place different from the place where they work. To add education, it is possible to use the ISPV database which is newly connected with other sources of MoLSA. Its limitation is that it does not include all persons in the Czech population. Approach 3, which requires the highest number of inputs, also requires the most preparation. It is necessary to collect information from each individual such as, e.g., number of years on parental leave, expected income growth with regard to field of work, time when the individual did not pay pension insurance due to attending to another person, etc.

Other inputs necessary for the simulations and not related to a specific individual do not differ from the current settings.

4.1.1.4 Set-up and Use of the NEMO Model

Prophet set-up

We run the model on such a number of simulations that the total number of projected life paths within the group is at least 1,000. Since the number of simulations is common for the whole model run and set by run settings, we recommend dividing the groups according to the selected number of simulations and creating several variants of run settings which will differ by the settings of the number of simulations, but otherwise will be identical.

It is sufficient to set the number of periods for which we want to perform the calculations to the lowest value at which all persons in the group will reach retirement age. This can be performed in the run settings by unchecking the “Use Default Projection Term” option and entering the relevant “Maximum Projection Term” value.

We will use the “variable group” to set which variables the model should report in a standard way (i.e., for each month in total for all persons with the same SPCODE). If, in addition to determining the amount of pensions for individual groups of people, there will be no further examination of the results (e.g., to validate the model), this list may remain empty because we will report the amount of pensions differently (see the section on processing the results). We will leave the other settings of Prophet as in normal model runs.

Input set-up

We will exclude all persons to whom we do not want to send information (i.e., people under the age of 18, old-age pensioners, people who are yet to enter the model in the future, persons who can be informed more effectively in another way, etc.) from the model. As a result, the computational demands will be significantly reduced.

We will divide the persons into groups and assign the same SPCODE of the given group to all persons within the given group respectively (i.e., SPCODE equal to 1 is assigned to all individuals in group 1).

We will set all values in used mortality tables to 0 (we want to calculate the pension under the condition that the person will live to see it). In the same way, we set the probability of emigration to zero.

For all individuals we will set that they will retire in the month in which they reach the retirement age (thus eliminating the possibility of early retirement or its postponement).

Output set-up

It is necessary that the reporting of the amount of pensions for each person into a CSV file is introduced into the model (in normal circumstances, Prophet does not make it possible to report the results for all

individuals). The calculation of all other characteristics – e.g., average, median or quartiles – will then be performed outside of Prophet.

4.1.1.5 Processing the Model Results

The result of the simulation is the amount of pensions within a predefined group. Zero values may appear among the results. These are due to the fact that the individual did not meet the condition of the insurance period. If there are more zero values (e.g., more than 5%), it may be appropriate to look at the group with a different approach (in such a case, it is necessary to find out why so many people do not meet the condition of the insurance period, whether the group is correctly defined or the model is correctly set up, etc.). If, on the other hand, the number of zero values is negligible, we recommend excluding them from the results, because we are interested in the nonzero amounts of pensions to which people are entitled.

This data can be used to create e.g., the following statistics (for more detailed discussion see Chapter **Chyba! Nenalezen zdroj odkazů.**):

- Minimum, maximum;
- Quartiles or, as the case may be, other quantiles;
- Average;
- Median;
- Standard deviation / variance.

Sufficient data for a given group (and a specific individual) makes it possible to create charts (for more detailed discussion see Chapter **Chyba! Nenalezen zdroj odkazů.**), e.g.:

- Histogram of values in the group;
- Distribution (probability density) of the amount of pension in the group.

4.1.1.6 Suitable Form of Presentation

Variant 1 allows for paper-based presentation of information. A suitable form of presentation for the paper-based form of information is described below.

The variant provides a large amount of information that can be presented to the final recipient. For the sake of clarity, however, it is advisable not to overwhelm individuals with information and to limit the amount of information communicated.

For example, we recommend choosing one to three statistics that will form the main message and present them. One possibility is the median (one statistic presented), some range determined by quantiles (two statistics presented), or presentation in the form of scenarios (using three statistics, e.g., 10% quantile for a pessimistic scenario, median for a neutral scenario, and 90% quantile for an optimistic scenario).

It is also easy to produce a pension histogram from the sample, which can serve as a supporting element e.g., when presenting the median or quantiles of the amount of pension in a group (however, we do not recommend it in the case of presentation in the form of three scenarios). We consider the probability density to be too complicated and we do not recommend including it in the personalized letter.

Furthermore, it is important, within the presentation of the groups, to explain adequately the specific distribution of the groups as well as the method of assigning the individual to the group. The use of statistics also requires a detailed verbal explanation (an ordinary recipient of the information cannot be expected to know what variance, median, etc. are) – or the statistics should be presented in such a way that they are easier to grasp (avoiding technical terminology, percentages and the like).

Of course, the outputs of the variant can also be presented on a website, where it is possible to add a basic message of a similar type as above for those interested in further information (e.g., all significant quantiles, or depiction in the form of a consumer basket).

4.1.1.7 Good Practice

Within the research, we did discover a use of a microsimulation model for presenting information about the pension amount through predefined groups in Slovakia and their Orange Envelope. Their approach is not fully identical to the approach proposed in this chapter and the technical settings as a know-how is not accessible to the public nowadays. However, we have found out that during the calculation the individual is placed into the group with similar parameters.

4.1.1.8 Advantages and Disadvantages

This section presents general advantages and disadvantages of Variant 1. The advantages and disadvantages of the different approaches to the use of the variants are discussed within the text together with the description thereof.

Table 7 : Advantages and disadvantages of Variant 1

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none">• Possibility to use a tool which is available to MoLSA• Thanks to the microsimulation model, it is possible to work with various scenarios of the development of an individual's life path• This is a variant of the proposal that does not require any major model change• Wider range of information that can be chosen for presentation (average, median, quantiles)• Possibility to control time requirements (one simulation will suffice for most groups)• Storage requirements do not exceed the capacities of MoLSA	<ul style="list-style-type: none">• The need to define groups and assign individuals to them• Larger amount of information, longer text – risk of misunderstanding, confusion, discouragement from reading• It is a simulation under the current state of legislation• More difficult control of model results due to specific settings of mortality and other inputs

4.1.1.9 Example of Application of the Variant

The use of the proposal for a specific group is illustrated below, from the inputs used up to the presentation of the results. The group in the example is defined on the basis of the following parameters (an example of parameters listed in all three variants):

- Sex (information available to MoLSA)
- Age (information available to MoLSA)
- Period of payment of insurance (information available to MoLSA)
- Assessment base (information available to MoLSA)
- Place of work (information obtained according to permanent residence)
- Substitute insurance period (information obtained from individual citizens on the basis of inquiries concerning parental leave, period of attendance to another person and on the basis of information on disability pension from a database of MoLSA)

The place of employment (work) can be used to refine the probability of losing a job (e.g., according to information on the unemployed at individual employment bureaus). The substitute insurance period specifies the past – thus narrowing the selection of modelpoints for a given group.

The defined group will be men aged 50 to 56 years, (using overlapping groups – the results of this group will be presented to men aged 52, 53 and 54 years), with a pension insurance payment period of 25 years or more, with an assessment base falling within the interval of 30 to 40 thousand, working in the Region of Central Bohemia, and with zero substitute insurance period.

We will verify that the selected group contains a sufficient number (at least 1,000) of individuals. If this were not the case, we would have to define the group more broadly or run more simulations. In the example, however, we assume that this condition is met. The model will be launched only once for the corresponding modelpoints. The number of periods for which we want to perform the calculation is 15 years because all persons in the group reach the retirement age in 15 years. In the Prophet settings, we select an empty variable group (therefore, the model will not report results other than the amount of pension and group membership). The other settings of Prophet, the inputs and output are the same as presented in Chapter **Chyba! Nenalezen zdroj odkazů**.

The output in this illustrative case is a CSV file containing the amount of pension for each individual. These outputs can be further processed in any software (e.g., R). We assume that two zero values appear among the results; we will remove those before further analysis (this can be e.g., persons who were unemployed for a longer period of time in the projection, and because of this they have not yet reached the required insurance period). The median of the amount of pensions for the reviewed group can be easily obtained from the values produced.

Each man belonging to the defined group is sent a letter presenting the amount of the pension in crowns (CZK) together with a short written explanation. Such a letter may take the following form:

Dear Mr. Masopust,

*Based on the information we have about you, we have calculated the expected amount of the state old-age pension to which you will be entitled. The amount is **CZK 15,200** which you will receive every month. It is an estimate of the future that cannot be completely reliable.*

In the calculation, we assumed that you belong to the group of men aged 50 to 55 working in the Region of Central Bohemia. We also assumed that you have worked for more than 25 years in your lifetime and your average assessment base (the term is explained in the letter, e.g., in the form of a footnote) is in the range of 30 - 40 thousand.

If any information above is false or you have any questions, feel free to contact us at xyz@xy.cz.

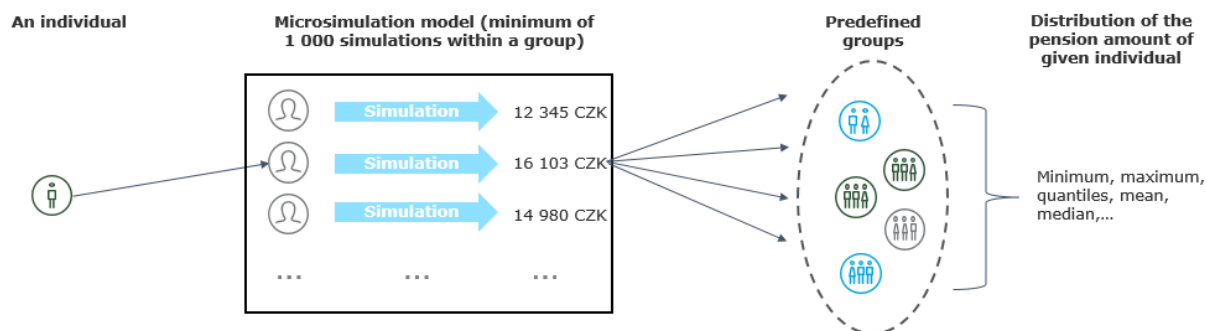
4.1.2 Variant 2: Non-anonymized Simulation for a Specific Individual

In Variant 2, a non-anonymized simulation is performed for a specific individual, where, based on the individual's history, a specific modelpoint is assigned with parameters corresponding to that history, for which simulations will be performed to determine the expected pension value. These simulations reflect the different life paths of an individual. The advantage of this option is a truly individualized approach and calculation, as well as the fact that information on the amount of pension can be presented in paper form. On the other hand, this variant requires more preparation (obtaining historical data about an individual) and poses higher computational demands.

4.1.2.1 Principle

Based on all available parameters, each individual is assigned exactly one modelpoint in the model, the settings of which correspond to the individual's history. Subsequently, a sufficient number of simulations are run (at least 1,000). In this way, a number of possible pension levels are obtained for each individual. From this data, it is possible to derive statistics which are then presented to individual residents

Figure 15: Graphic presentation of the principle of Variant 2



4.1.2.2 Required Inputs

This proposal requires complete information on each individual to the extent that it is possible to assign exactly one modelpoint the setting of which corresponds to the individual's history, i.e., sex, age, assessment base, economic status, insurance period, substitute insurance period, highest level of education achieved, length of unemployment, marital status, number of children, income from self-employment, income history. Although MoLSA has these inputs concerning a large number of individuals (in sufficient quality), there is a significant percentage of individuals for whom most of these states are assigned using statistical models based on distribution in society, and therefore it cannot be guaranteed that the data in the settings of the modelpoint fully corresponds to the real life situation of the individual. Regular cooperation of all individuals in society is necessary to complete all necessary information, which is practically not feasible. For a certain group of recipients of the information on future pensions, it would therefore be necessary to use some form of estimation, and this method would therefore not provide more accurate data than other, less demanding variants.

Another necessary input is the interconnection of anonymized modelpoints with data about real persons. At the moment, MoLSA receives citizens' data in an anonymized form from the Czech Social Security Administration – the deanonymization would therefore have to take place in cooperation with that institution. We see two possible approaches here:

- The Czech Social Security Administration supplies all information in deanonymized form to MoLSA – in such case, MoLSA may simply supplement the incomplete information with information provided by a particular individual.
- The Czech Social Security Administration supplies anonymized data, the key for deanonymization will be provided only to MoLSA employees who essentially need this data (i.e., people who would be sending the results to citizens). In such case, however, it may be more difficult to assign additional information provided by a particular individual to the anonymized data (requiring cooperation with the persons holding the encryption key).

If a table with complete information is available for each individual (anonymized or non-anonymized), it can be relatively easily transformed into modelpoint format.

Other inputs necessary for the simulations and not related to a specific individual do not differ from the current settings.

4.1.2.3 Set-up and Use of the NEMO Model

Prophet set-up

We run the model at least 1,000 times in order to obtain sufficient number of projected life paths for each individual. However, such a number of runs represents a considerable amount of time (even if all unnecessary modelpoints are omitted), which prevents the real use of this variant.

Possibilities of reducing computing time (if necessary, they can be applied to other proposals as well):

- *Reduce the number of simulations per person.* However, this solution alone is not enough because, if all recipients of the information on future pension are included in the calculation, it will be possible, in our opinion, to perform the calculation on no more than a few dozen simulations in real time, and that is not a sufficient number to produce valid conclusions. However, we recommend that MoLSA analysts perform a model convergence analysis to determine what the minimum sufficient number of simulations that is.
- *Application of the variant only to a small target group.*
- *Hardware solution*, e.g., using a cloud platform. However, this is not very common in combination with Prophet and the solution could be relatively costly.
- *Creation of a variant of the model in which partners or children are not assigned to the main persons.* The management of two parallel models places greater demands on their maintenance (to avoid a breach of their consistency), but the calculation will be accelerated by omitting the projections of secondary individuals who do not affect the actual amount of the old-age pension.
- *Aggregation of the same and similar individuals.*
 - For individuals with identical inputs, one common modelpoint is sufficient (such a situation is rather less common, it can be expected for younger people without a work history).
 - For individuals with similar states, it is possible to choose a template modelpoint and calculate the values of other persons by re-scaling (e.g., persons with the same inputs except the assessment base – template modelpoint with assessment base of CZK 20,000 – simulations are made for it; for a person with the same inputs but an assessment base of CZK 25,000; the simulated values are then multiplied by a coefficient 1.25).
 - Some individuals may have different histories, but they may still match in terms of all the variables that determine their future life paths. Then it is enough to simulate the life path for only one of them and assign its relevant results, i.e., insurance periods and assessment bases obtained during the projection, to the other person as well. Prophet would be run only for selected persons and the calculation of pensions would take place as part of the processing of results, for example in R. In our opinion, such a similarity can occur often enough for it to make sense to introduce a similar process, because the projection of a person in the future depends mainly on sex, education, age, current income and current position in the labor market. However, we recommend that you perform a careful analysis of which values observed in an individual's history affect his future and which do not.

It is sufficient to set the number of periods for which we want to perform the calculations to such value for which even the youngest individuals in the model will reach retirement age. This can be performed in the run settings by unchecking the “Use Default Projection Term” option and entering the relevant “Maximum Projection Term” value.

We will use the “variable group” to set which variables the model should report in a standard way (i.e., for each month in total for all persons with the same SPCODE). If, in addition to determining the amount of pensions for each individual, there will be no further examination of the results (e.g., to validate the model), this list may remain empty because we will report the amount of pensions differently (see the section on processing the results).

We will leave the other settings of Prophet as in normal model runs.

Input set-up

We will exclude all persons to whom we do not want to send information (i.e., people under the age of 18, old-age pensioners, people who are yet to enter the model in the future, persons who can be informed more effectively in another way) from the model.

We will set all values in used mortality tables to 0 (we want to calculate the pension under the condition that the person will live to see it). In the same way, we set the probability of emigration to zero.

For all individuals we will set that they will retire in the month in which they reach the retirement age (thus eliminating the possibility of early retirement or its postponement).

Processing the results

It is necessary that the reporting of the amount of pensions for each person into a CSV file is introduced into the model (in normal circumstances, Prophet does not make it possible to report the results for all individuals). However, it should be borne in mind that this is a large amount of data because the results for each individual contain 1,000 possible values of the amount of the pension. This, too, constitutes a technical problem that would have to be solved if the proposal is applied (e.g., using this approach for a specific group only). The calculation of all other characteristics – e.g., average, median or quartiles – will then be performed outside of Prophet.

4.1.2.4 Processing the Model Results

The result of the simulation for the particular individual is the amount of pension for 1,000 different scenarios of development of the individual's life path. Zero values may appear among the results due to the fact that the individual did not meet the condition of the insurance period in the given scenario. If there are more zero values (e.g., more than 5%), it may be appropriate to look at the individual with a different approach (find out why so many people do not meet the condition for receiving the pension in such a great number of scenarios and, if necessary, warn about this situation, etc.). If, on the other hand, the number of zero values is negligible, we recommend excluding them from the results, because we are interested in the nonzero amounts of pensions.

This data can be used to create e.g., the following statistics (for more detailed discussion see Chapter **Chyba! Nenalezen zdroj odkazů.**):

- Minimum, maximum;
- Quartiles or, as the case may be, other quantiles;
- Average;
- Median;
- Standard deviation / variance.

Sufficient data for a given group (and a specific individual) makes it possible to create charts (for more detailed discussion see Chapter **Chyba! Nenalezen zdroj odkazů.**), e.g.:

- Histogram of possible pensions of the individual;

Distribution (probability density) of the amount of pension of the individual.

4.1.2.5 Good Practice

Within the research, we did not discover any reference to informative presentation of the results from the simulation of the life paths of particular individuals.

4.1.2.6 Suitable Form of Presentation

Variant 2 allows for paper-based presentation of information. A suitable form of presentation for the paper-based form of information is described below.

The variant provides a large amount of information that can be presented to the final recipient. For the sake of clarity, however, it is advisable not to overwhelm individuals with information and to limit the amount of information communicated.

For example, we recommend choosing one to three statistics that will form the main message and present them. One possibility is the median (one statistic presented), some range determined by quantiles (two statistics presented), or presentation in the form of scenarios (using three statistics, e.g., 10% quantile for a pessimistic scenario, median for a neutral scenario, and 90% quantile for an optimistic

scenario). However, we do not consider the median to be as appropriate in this context as in the case of Variant 1, namely because the median of the amount of pensions of individuals with similar parameters appears to be a more comprehensible message than the median of the estimated amounts of the individual's pension. In general, in communication with the public, the median is used more in the context of groups (e.g., median income in the Czech Republic, etc.)

It is also easy to produce a pension histogram from the sample, which can serve as a supporting element e.g., when presenting the median or quantiles of the amount of pension in a group (however, we do not recommend it in the case of presentation in the form of three scenarios). We consider the probability density to be too complicated and we do not recommend including it in the personalized letter.

We also recommend communicating to the individual that the information, on which the calculation was based, is available about him to MoLSA.

Of course, the outputs of the variant can also be presented on a website, where it is possible to add a basic message of a similar type as above for those interested in further information (e.g., all significant quantiles, or depiction in the form of a consumer basket).

For more detailed information on the possible forms of presentation see Chapter **Chyba! Nenalezen z droj odkazů.**

4.1.2.7 Advantages and Disadvantages

A large number of technical barriers may prevent the application of this proposal for the entire population, but it is possible to apply this approach to smaller groups of people for whom the information is complete. A substantially smaller amount of modelpoints will reduce both time and memory demand.

Table 8 : Advantages and disadvantages of Variant 2

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> • Possibility to use a tool which is available to MoLSA • Thanks to the microsimulation model, it is possible to work with various scenarios of the development of an individual's life path • Wider range of information that can be chosen for presentation (average, median, quantiles) • A high degree of personification makes it possible to achieve more accurate results • Makes it possible to use an accurate history of the individual 	<ul style="list-style-type: none"> • Assigning a modelpoint to a particular individual is technically complicated • At the moment, data on individuals is not available to a sufficient extent; it is difficult to obtain it • It is a simulation under the current state of legislation • More difficult control of model results due to specific settings of mortality and other inputs • Very time-consuming method – a high number of simulations even in the case of a small number of modelpoints will cause very high computation time • Saving all results for each modelpoint is memory-demanding • Demanding output processing – millions of customized letters

4.1.2.8 Example of Application of the Proposal

The use of the proposal for a specific individual is illustrated below, from the inputs used up to the presentation of the results. The example is intended to be used only for those individuals who actively provide all the necessary information to MoLSA and request a more accurate simulation of the amount of pension (thereby reducing computation and memory demand) – for these individuals we have all the

necessary information about their work history. The following information from MoLSA database is available for each individual:

- Sex,
- Age,
- Assessment base,
- Insurance period.

Based on a questionnaire completed by each adult individual, this information is additionally supplemented by:

- Economic status,
- Substitute insurance period,
- Highest level of education achieved,
- Duration of unemployment,
- Marital status,
- Number of children,
- Income of self-employed individuals,
- Income history.

Such modelpoints will be prepared, where each represents one of the persons and their work history.

Therefore, the model will be run 1,000 times for all of these modelpoints. The number of periods for which we want to perform the calculation is 30 years, because the youngest person who provided information to MoLSA has currently 30 years to retirement. In the Prophet settings we choose an empty variable group (therefore, the model will not show results other than the amount of pension). The other settings of Prophet, the inputs and output are the same as presented in Chapter **Chyba! Nenalezen z droj odkazů..**

The output in this illustrative case is a CSV file containing a thousand possible amounts of pension for each individual. These outputs can be further processed in any software (e.g., R). We will now consider only the individuals for whom zero values are achieved in less than 50 cases (out of 1,000 simulations) – other cases will be resolved individually. For them we will obtain, from the extracted values, 5% and 95% quantile and create an interval of values for the expected amount of pension.

Every individual who has provided MoLSA with the necessary data and granted his consent to their processing is sent a letter presenting the amount of pension in crowns (CZK) together with a short written explanation. Such a letter may take the following form:

Dear Mr. Novotný,

*based on the information we have about you, the information you sent us (see the attached copy of the questionnaire), and based on the possible development of your work life, we calculated the probable range of the amount of your future state old-age pension to which you will be entitled. With a 90% probability, you can expect that the **monthly pension will be between CZK 13,260 and CZK 17,835**. However, it must be borne in mind that this is an estimate of the future which cannot be completely reliable.*

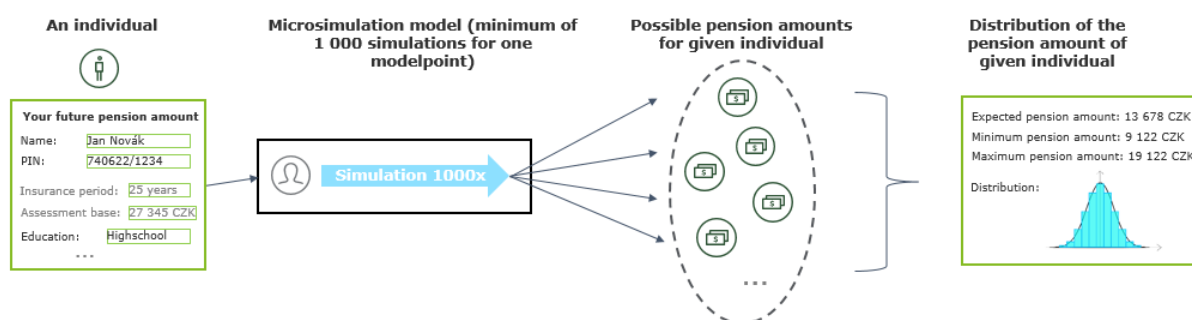
4.1.3 Variant 3: Online Tool Performing Simulation on Demand

In Variant 3, the calculation is based on the history of a particular individual, which creates the undeniable advantage of individualization. On the other hand, it will be necessary to find a way to obtain information about individuals. The best way in this case seems to be to use a web interface in the form of an online tool (or in combination with a paper form of presentation of information where this variant serves as an online tool complementing the simple information communicated in paper form and makes it possible to specify it more fully based on a more detailed specification of the individual).

4.1.3.1 Principle

The values of the future amount of pension for a given individual are obtained within the framework of this proposal from the simulation of the individual's pensions on the basis of his already experienced history. The individual fills in all the necessary information on the website. Based on this information, one modelpoint is prepared, for which the microsimulation model is run as many times as necessary to obtain a sufficient sample of data (at least 1,000 simulations). The amount of pension is observed as a result of individual simulations, and it is possible to work, regarding the amount of pension, with the distribution, minimum, maximum, median, average, intervals, etc.

Figure 16: Graphic presentation of the principle of Variant 3



4.1.3.2 Required Inputs

The individual fills in all the necessary data (sex, age, assessment base, economic status, insurance period, substitute insurance period, highest level of education achieved, duration of unemployment, marital status, number of children, income of self-employed individuals, income history). For easier reference, it is possible to build on MoLSA database and, after entering an identification code (e.g., personal identification number), add information which MoLSA has for the individual (e.g., sex, age, time worked and assessment base). The remaining information needs to be completed manually by the individual.

Other inputs necessary for the simulations and not related to a specific individual do not differ from the current settings.

The whole process of Variant 3 would have to take place using a script, which in the first phase would transform the filled in information into the format of modelpoints used in Prophet and save them in a directory which can be accessed by Prophet. The name of this file must match the name of the product in Prophet. The model would then be run using the Prophet API.

We see a great risk of this approach in the license conditions of the Prophet system. It is uncertain whether such run is possible at all, and if so, whether it is possible to perform the calculation for several users at once. We recommend that MoLSA analysts look into this issue thoroughly.

Another limitation is the computation capacity available to MoLSA and the associated time during which the users must wait for the results. Even if there were no restrictions regarding the licensing terms, it can be expected that the tool can effectively parallelize only a few calculations, and other users would have to wait in the queue in this case until the projection for the previous users has been completed. For a large number of visitors, the time could increase to such extent that it would no longer be possible to talk about an online tool.

Both of these issues can be solved by switching to a "less online tool" variant which sends the modeling results to an e-mail address e.g., the next day. In such case, it would be possible to register the applicants all day, the script would be run for all applicants from the previous day and the results would be automatically sent to each applicant on their e-mail address.

Last but not least, it is also necessary to mention the fundamental input of the variant – connection between the modelpoints in the model and the data obtained on the website. Transformation of

information into the format of the modelpoints used in Prophet is relatively technically demanding and generally complex.

4.1.3.3 Set-up and Use of the NEMO Model

Prophet set-up

We run the model on such number of simulations to ensure that the total projected number of the remaining life paths of the individual is at least 1,000. We will leave the other settings as in the normal run of the model.

The number of periods for which we want to obtain results is to be set individually according to the age of the individual. It is necessary to set the period in such a way that the individual reaches his retirement age. This can be performed in the run settings by unchecking the “Use Default Projection Term” option and entering the relevant “Maximum Projection Term” value.

Input set-up

We will set all values in used mortality tables to zero (because we want to calculate the pension under the condition that the individual, for whom the simulation is run, will live to see it). In the same way, we set the probability of emigration to zero (because we want to know what pension the individual will have in the Czech Republic).

For all individuals we will set that they will retire in the month in which they reach the retirement age (thus eliminating the possibility of early retirement or its postponement).

Processing the results

It is necessary that the reporting of the amount of pensions for each person into a CSV file is introduced into the model (in normal circumstances, Prophet does not make it possible to report the results for all individuals). The calculation of all other characteristics will then be performed outside of Prophet. The above-mentioned script, after the completion of the model, ensures the processing of the result in other software and reporting it in the web browser (or a file distributed by e-mail).

4.1.3.4 Processing the Model Output

The result of the simulation is the amount of pension for the particular individual. It is necessary to have the processing of results set so that it is universal for all possible types of outputs. Zero values may appear among the results due to the fact that the individual did not meet the condition of the insurance period. The results must be processed fully automatically, so it is not appropriate to review cases with too many zero values separately (e.g., from a certain number of 0, the applicant will see a warning or error message).

Zero values may serve to estimate the probability that the individual will not be entitled to a state pension (as the ratio of zero values to the total number of simulations). The remaining values can be treated similarly to Variant 2:

It is possible to create e.g., the following statistics:

- Minimum, maximum;
- Quartiles or, as the case may be, other quantiles;
- Average;
- Median;
- Standard deviation / variance.

Sufficient data for a particular individual makes it possible to create charts, e.g.:

- Histogram of possible pensions of the individual;
- Distribution (probability density) of the amount of pension of the individual

4.1.3.5 Good Practice

The use of a microsimulation model as an online tool is not common practice, however, an addition to the simple information communicated in paper form and its broadcasting by means of a web application can be found in the original Orange Envelope in Sweden

4.1.3.6 Suitable Form of Presentation

Variant 3 **does not allow for paper-based presentation of information**. A suitable form of presentation of information via website is described below.

Variant 3 counts on a form of an online tool, which is able to provide more information about the possible pension value compared to typical pension calculators. Thanks to a sufficient amount of simulated data, values can be obtained, as well as an estimate of the entire distribution. This makes it possible to get various practical statistics and charts. The website form enables presentation of all these results, as its content can be significantly more extensive than presentation in paper form.

The interactivity of the website thus allows you to switch between different types of value displays (e.g., relative vs. absolute, present vs. future value) or add more display options (e.g., depict as a consumer basket).

The essentially unlimited scope of information on the website also allows for a broad description and explanation of the results as well as the process how these results were obtained. However, we consider it appropriate to present the main conclusions graphically, concisely and clearly. All basic information should be provided in one place, more detailed description and explanation, if any, can be added elsewhere – e.g., in other tabs or information icons.

For more detailed information on the possible forms of presentation see Chapter **Chyba! Nenalezen z droj odkazů.**

4.1.3.7 Advantages and Disadvantages

A common problem with online applications is protection against overload or hacker attacks. For this reason, it is necessary to have an application that meets these higher demands. We also assume the need for two models/machines and licenses, as one will be fully utilized by the online tool, and it is necessary to have a second one available to MoLSA.

Table 9 : Advantages and disadvantages of Variant 3

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none">• Possibility to use a tool which is already available to MoLSA• Thanks to the microsimulation model, it is possible to work with various scenarios of the development of an individual's life path• It is a proposal variant that does not require any major change to the model• Wider range of information that can be chosen for presentation• A high degree of personification makes it possible to achieve more accurate results• Makes it possible to use an accurate history of the individual• Information that is not available to MoLSA will be provided by the applicant – the problem of obtaining inputs is eliminated	<ul style="list-style-type: none">• It is a simulation under the current state of legislation• More difficult control of model results due to specific settings of mortality and other inputs• Time and money requirements for preparation of a quality website• Not suitable for horizontal application – does not allow for paper presentation of information• Technically difficult – the need to connect the microsimulation tool and the web interface – Prophet is not an ideal software for this purpose

-
- When used online, several people can coincide at one time – it increases time demand
 - When Prophet is used by several persons at once, a licensing problem can occur
-

4.1.3.8 Example of Application of the Proposal

Let us now illustrate the application of Variant 3 for a particular individual. On the relevant website, the applicant (e.g., Mrs. Veselá aged 40 years, lives in Vysočina and has a working-class profession) enters her name and personal identification number. On the basis of that, her period of insurance worked and the assessment base will be filled out from the database of MoLSA (or, as the case may be, the Czech Social Security Administration if MoLSA has only anonymized data). Mrs. Veselá will then enter the following information:

- Substitute period of insurance (maternity leave or attendance to another person)
- Education
- Marital status, number of children
- Field of work or place of work (if these parameters were to further affect the expected amount of pension e.g., through income growth or probability of losing a job)

This information is stored correctly by means of a script and a microsimulation model for one modelpoint is run with states corresponding to the life situation of Mrs. Veselá. We run the model so that the total number of remaining life paths of the individual is large enough (at least 1,000). The number of periods for which we want to obtain results in our case is 25 years.

We will set all values in used mortality tables to zero (we want the individual to live to see the pension). In the same way, we set the probability of emigration to zero. Other settings of Prophet will remain unchanged, and we will start the simulation.

The output is subsequently a CSV file containing the amounts of pensions of an individual in his different life paths. The outputs can be further processed in any software (e.g., R) which can be used to obtain the required values and suitable charts.

The results displayed to Mrs. Veselá can be, as follows:

- Summary of the basic information, including income history;
- A table containing information on the probability that her pension will not exceed a certain amount;
- After clicking the individual rows of the table, information is added about what approximately she will be able to buy for this amount (e.g., with 50% probability Mrs. Veselá will have pension of less than CZK 11,000, for which she will be able to pay rent and energy for a small studio apartment, basic shopping – e.g., for CZK 500 a week – and medicinal products – e.g., for CZK 1,000 a month);
- Average compensation ratio and suitable explanation (e.g., upon your retirement, you can expect your income to drop to 40% of your pre-retirement income);
- Histogram of simulated pension amounts with adequate description.

4.1.4 Variant 4: Online Tool Assigning Prepared Results from the Model to an Individual

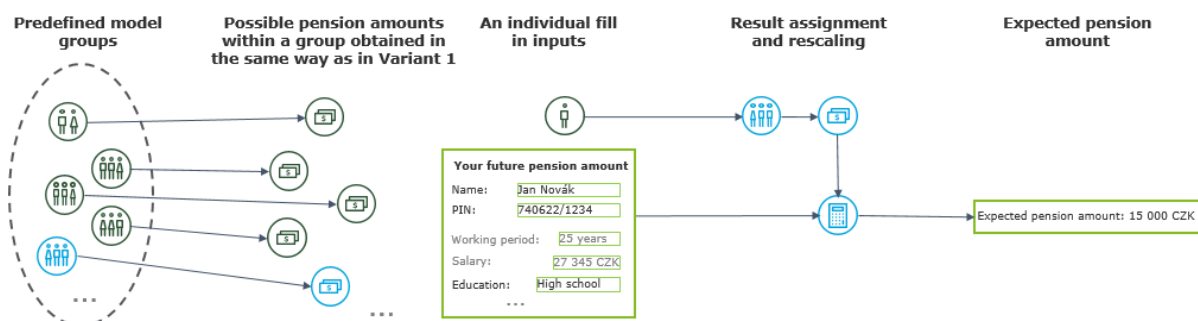
Variant 4 offers the possibility of combining a microsimulation model and a presentation in the form of a classic online pension calculator which is very popular in other countries. An individual enters the answers to basic questions on the website, the calculator assigns him to a certain group based on those

answers and displays the value of the expected amount of pension. This, however, is calculated in advance using a microsimulation model.

4.1.4.1 Principle

In Variant 4, the amount of pension for individuals is obtained by combining classical calculators and a microsimulation model. A number of groups will be defined in advance for which simulations will be performed regarding the amount of pension. When creating the groups, it is necessary to take into account two basic conditions – the number of groups must be large enough to be able to assign each resident to a defined group, and at the same time, the individual groups must contain a sufficient number of individuals for the results to be meaningful. The microsimulation model is run as many times as necessary to obtain a sufficient data sample. This stage is the same as in Variant 1. The simulations are run in advance and the individual is then assigned to one of the predefined groups based on identification data and is shown the result of the simulation from his assigned group directly (average or median, possibly supplemented by additional information). The options of the defined groups are presented in Chapter **Chyba! Nenalezen zdroj odkazů.** under Variant 1.

Figure 17: Graphic presentation of the principle of Variant 1



Alternatively, groups can be created in real time – in the background of the calculator there will be a database containing individual modelpoints (their initial parameters) and the corresponding pension values obtained by the simulation (or, as the case may be, by a larger number of simulations to obtain a larger sample of values). When filling in the information of an individual, the modelpoints are searched in the database based on the filled-in data – the groups are “tailor-made”:

- For categorical variables, the situation is simple (e.g., when entering secondary education, there will be only modelpoints with secondary education in the group).
- For continuous variables, it is necessary to set a range that determines which modelpoints will be included in the group. We recommend choosing these ranges so that there is always a predetermined number of modelpoints in the group, which provides sufficiently reliable information (e.g., 1,000). The range will therefore be different for each person.

It can be expected that the time required to create such a group, perform the calculation and display the result is not too long and therefore does not prevent the practical use of the variant. Its undeniable advantage is that the individual does not have to fill in all the required information – if he decides to omit some data during completion, this information will not be used when searching for modelpoints (for the price of a less accurate result). Simply put, if an individual enters only sex and age information, he may be shown e.g., the average amount of pensions of all men of the same age.

Another attractive feature of this variant is the possibility to avoid defining the groups in which individuals will be included, which is a relatively demanding process (see the discussion under Variant 1). We will actually achieve this simplification under the condition that only one of the variables we take into account is continuous (for example, we create a group based on sex, education, age designed as a category, and average income in the last year). Then we include persons in the group who have the same categorical values as the modeled person and the closest possible income. However, the situation becomes more complicated when we add another continuous variable, such as the time worked. Then we need to prioritize them for determining proximity (e.g., are we going to include in the group a person who has the same income as the individual, but an insured period which is one month longer, or a

person who has the same insured period, but an income which is different by CZK 200?). Determination of these priorities leads to a similar task as creation of groups in Variant 1, but with an additional complication that the groups cannot be fixed, but we must create an algorithm that creates a stable group regardless of the parameters of the default individual.

For this reason, we recommend setting the groups in the same way as in Variant 1 and using real-time formation of groups only if the user does not fill in all the information. Then we include all modelpoints from all groups that correspond to the inputs entered in the calculation of the result for the modelled individual.

Another disadvantage is the more demanding implementation of this variant and the need to prepare the database.

4.1.4.2 Required Inputs

The required inputs are the same as inputs required when using Variant 1. The scope of inputs depends on the detail of parameters on which the predefined groups will be based. A more detailed description of the use of groups (and definition thereof) is provided in Chapter **Chyba! Nenalezen zdroj odkazů.**

Within this variant, we recommend not to create groups with a range, but rather with a sample amount of income, for the parameter of the income / assessment base. After an individual enters his income on the website, the results from the model can only be re-scaled depending on the information provided (e.g., Based on the inputs, Mr. Novák is assigned to a group of men aged from 43 to 48 years, with pension insurance payment period of 25 years with an income of CZK 20,000. His income is CZK 25,000, i.e., 25% more than in the model group. The group results must therefore be multiplied by a factor of 1.25. More precisely, we need to know the period of insurance of the persons in the group and their average assessment bases. We multiply these bases by 1.25, we apply reduction limits to the result, by taking into account the insured period, we get a new pension for the person in the group and, from that we calculate the result which will be displayed to Mr. Novák.).

The alternative approach does not call for data different from the inputs used for the simulation at present.

4.1.4.3 Set-up and Use of the NEMO Model

Prophet set-up

We run the model on such number of simulations to ensure that the total projected number of the life paths within the group is at least 1,000. Because the number of simulations is common for the entire run of the model set using run settings, we recommend dividing the groups according to the selected number of simulations and creating several variants of the run settings which will differ in the setting of the number of simulations, but otherwise will be identical.

In the case of an alternative approach, the simulation can be run for all modelpoints one or more times for different seeds (to obtain a larger sample of data).

It is sufficient to set the number of periods for which we want to perform calculations to the lowest value at which all persons in the group reach retirement. This can be performed in the run settings by unchecking the "Use Default Projection Term" option and entering the relevant "Maximum Projection Term" value.

We will use the "variable group" to set which variables the model should report in a standard way (i.e., for each month in total for all persons with the same SPCODE). If, in addition to determining the amount of pensions for individual groups of people, there will be no further examination of the results (e.g., to validate the model), this list may remain empty because we will report the amount of pensions differently (see the section on processing the results). With the alternative approach to the variant, it is not necessary to include information and membership in the group, but we want to include the values of variables, according to which the groups will then be formed in the online tool (alternatively, these values can be paired from the inputs after the model has finished running). We will leave the other settings of Prophet as in normal model runs.

Input set-up

We will exclude all persons to whom we do not want to send information (i.e., people under the age of 18, old-age pensioners, people who are yet to enter the model in the future) from the model. As a result, the computation demands will be significantly reduced.

We divide the persons into groups and for each group, we select representatives that we will run. We choose them to cover the variability we allow within the group – for example, the whole range of the current insurance period falling into the given group. Each group will get its own SPCODE. This does not apply for the alternative approach.

We will set all values in used mortality tables to 0 (we want to calculate the pension under the condition that the person will live to see it). In the same way, we set the probability of emigration to zero.

For all individuals we will set that they will retire in the month in which they reach the retirement age (thus eliminating the possibility of early retirement or its postponement).

Output set-up

It is necessary that the reporting of the amount of pensions for each person into a CSV file is introduced into the model (in normal circumstances, Prophet does not make it possible to report the results for all individuals). The calculation of all other characteristics and re-scaling, if any, will be performed outside of Prophet.

4.1.4.4 Processing the Model Output

For each predefined group, we have 1,000 simulations available, which can be processed similarly as in Variant 1. Thus, a pension calculator is created, which calculates the result from the entered inputs as follows: based on the answers, the individual is assigned to a certain group. The amount of income is compared to the income from the group. In case of inconsistency, the scaling coefficient is calculated and the average monthly assessment base of the sample individual is multiplied by that coefficient. This assessment base having been calculated in advance for each group and each simulation using the model in Prophet and saved as an auxiliary output. We thus obtain the average monthly assessment base of the individual in question. The reduction limits will be applied (in each simulation), the time worked is taken into account to determine the individual's pension, which is then displayed.

In the case of using an alternative approach, all outputs from the model are uploaded to the database, where they will then be processed in real time (see the discussion above).

4.1.4.5 Good Practice

The classic pension calculator is a common practice, however, based on the inputs, the result is usually determined by a classic calculation from a formula conditioned by one scenario. The approach where this result is obtained from the simulation model was not found within the research.

4.1.4.6 Suitable Form of Presentation

Variant 4 **does not allow for paper-based presentation of information**. A suitable form of presentation of information via website is described below.

A suitable form of presentation of the output from this variant is through an Internet interface. The individual enters the predefined inputs on the relevant website, which are needed in order to be assigned to one of the prepared groups. Subsequently, he is shown the expected amount of pension. For the presentation of this amount, we recommend proceeding similarly to Variant 1.

We therefore recommend choosing one to three statistics that will form the main message and present them. One possibility is the median (one statistic presented), some range determined by quantiles (two statistics presented), or presentation in the form of scenarios (using three statistics, e.g., 10% quantile for a pessimistic scenario, median for a neutral scenario, and 90% quantile for an optimistic scenario).

In addition, it is possible to use tools/extensions of the Internet interface and, in addition to this basic communication, communicate also a wider scope of information to the final recipient, such as charts and a larger amount of statistics or option to switch between different types of value display (e.g., relative vs. absolute, current vs. future value) or to add more display options (e.g., depiction in a form of a consumer basket).

However, it is advisable to explain the results and statistics in such a way that the recipient understands them and is able to grasp the information communicated.

For more detailed information on the possible forms of presentation see Chapter **Chyba! Nenalezen z droj odkazů..**

4.1.4.7 Advantages and Disadvantages

The chapter summarizes the advantages and disadvantages of the proposal which are the same for the basic and alternative approach. The advantages and disadvantages, which are manifested by the alternative approach in addition to the basic approach, are presented together with the introduction to this alternative approach.

Table 10 : Advantages and disadvantages of Variant 4

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> • Possibility to use a tool which is available to MoLSA • Thanks to the microsimulation model, it is possible to work with various scenarios of the development of an individual's life path • It is a proposal variant that does not require any major change to the model • Wider range of information that can be chosen for presentation (average, median, quantiles) • Possibility to control the time requirements (one simulation will suffice for most groups) • Storage requirements do not exceed MoLSA capabilities • There is no need to find out information about a specific individual, he will enter it himself • Using a web interface that offers more options and is more interactive than paper form 	<ul style="list-style-type: none"> • The need to define groups and include individuals in them (does not apply to the alternative approach) • It is a simulation under the current state of legislation • More difficult control of model results due to specific settings of mortality and other inputs • Does not allow for paper presentation of information • Requires active involvement of the individual – signing onto the website and entering complete information about himself (completeness of data is not required for the alternative approach) • Necessity to create the website

4.1.4.8 Example of Application of the Proposal

Using the example described below, we will now show how the proposal can be used concretely. The population is segmented in advance into a sufficient number of groups, for which simulations are then run and results are obtained (in the example, we will present the following group: men aged from 43 to 48 years, with pension insurance payment period of 25 to 27 years, income of CZK 20,000).

The specific individual (e.g., man, aged 45 years, with insurance period 25 years and income CZK 25,000), after logging in to the web interface, fills in the required information, according to which we can assign him to one of the predefined groups. The parameters on the basis of which we can assign him to a group are as, follows:

- Sex

- Age
- Insurance period
- Education

After assignment to the group, the income of the applicant and the sample income within the group are compared (income of CZK 25,000 is 25% higher than in the model group – the group result, e.g., median CZK 12,000 is multiplied – re-scaled – by factor 1.25). After entering the required information, the simulation of the group to which the person has been assigned will be displayed. The simulation is adjusted to fit the individual's income (i.e., $12,000 \times 1.25 = \text{CZK } 15,000$). In addition to the expected pension number displayed, additional text may appear on the website.

4.1.5 Variant 5: Taking into Account the Amount of Funds of the Pension System

One of the biggest advantages of using a microsimulation model is the possibility of modeling both pension expenditure (and thus the amount of pensions) and the expected revenues of the pension system. It is therefore possible to use this knowledge when modeling the amount of pensions and to reflect the limitations in the form of available funds in the expected amount of pension. Within this variant, this is achieved by using the so-called scaling factor which tries to modify the amount of the pension so that it remains within financial capacity of the pension system.

This variant does not work alone, but in combination with another variant – the results of Variant 5 are applied to the results obtained in another way. Its practical application is very limited, as it is very likely that the pension system will change in the future in a different way than presented in this method. On the other hand, this variant may serve well to communicate the unsustainability of the pension system and the specific effects of this problem on individuals.

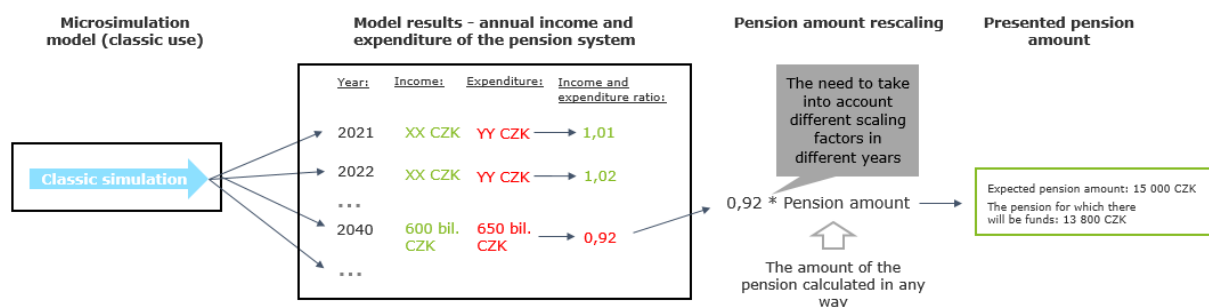
4.1.5.1 Principle

This variant only modifies the method of calculating the expected amount of pension so as to take into account the amount of available funds in the system, and it therefore does not make sense to use it separately.

The development of the entire population is simulated, including existing pensions and new business. The result of the simulation is the total income and expenditure of the pension system for each year. These results can also be used to determine the "scaling factor" that adjusts the expected amount of pensions paid so that the expected income amount to the expected expenditure.

This scaling factor can then be used to adjust the expected amount of pensions paid produced by another calculation.

Figure 18: Graphic presentation of the principle of Variant 5



However, determining the scaling factor is a major drawback of this method. A simple comparison of the income and expenditure of the pension system in one calendar year (as indicated in the figure) will produce a factor by which we balance the system if we apply it to all pensions, the new ones and the existing ones. It will therefore be misleading to provide the recipient with information only on the factor

valid in the year of retirement: for example, an individual who retires just before the system begins to fail will not learn about the problem at all (the scaling factor valid for his year of retirement will be 1).

This problem can be solved in two basic ways, but again both have significant limitations. The first option is to present to recipients a scaled pension from the year of retirement, but also from the following years. However, this will negatively affect the comprehensibility of the information. The second option is to assume that existing pensions will not be adjusted and that the system will be compensated by governments only by changes in the new pensions. However, such a development is highly unlikely.

Before using this method in practice, it would be necessary to determine the approach to scaling to suit the purpose of the communication.

4.1.5.2 Required Inputs

The required information does not differ from the inputs used for the simulation at present.

4.1.5.3 Set-up and Use of the NEMO Model

Prophet set-up

The model runs with the usual settings. It is sufficient to set the number of periods for which we want to perform calculations to the lowest value at which all persons in the group reach retirement. This can be performed in the run settings by unchecking the "Use Default Projection Term" option and entering the relevant "Maximum Projection Term" value.

We will use the "variable group" to set which variables the model should report in a standard way.

As this is a run with the usual settings, it is possible to use the results that MoLSA produces as part of their ordinary operations. Therefore, there is no need to start a special run just to perform this method. The monitored variables are the total income and expenditure of the pension system for individual years.

Input set-up

The input set-up is the same as the usual settings for standard model run.

Processing the results

The processing of the results (creation of the scaling factor) will take place outside of Prophet. The scaling factor is obtained for each year as the ratio of income and the ratio of expenditure (for a positive surplus, no increase in pensions is expected – for values higher than 1, only a value equal to 1 would be used).

4.1.5.4 Processing the Model Outputs

The scaling factor can also be applied to any of the variants determining the expected amount of pension, in two ways. Individual results can be re-scaled outside of Prophet before using them again, or the scaling factor can be used within Prophet and adjust the amount of the pension already in the calculation (if it is a variant in which the pension is calculated in Prophet).

4.1.5.5 Good Practice

Slovakian Orange Envelope presents the situation that reflected the pension amount as one of the scenarios. The results are calculated according to the microsimulation model that simulates even that future development (that there will not be any system change, only the adjustment of the amount of pension so that the expenditure equals income).

4.1.5.6 Suitable Form of Presentation

It is related to the variant used to calculate the results of the amount of pension, for which the scaling factor is then applied.

Because this is an unusual approach that produces values that do not correspond to reality (the system is expected to be modified), the presented results need to be explained well enough. This proposal can be used e.g., to supplement the communication concerning the need to change the settings of the pension system (we do not recommend using it as the primary information provided when communicating the future amount of an individual's pension).

4.1.5.7 Advantages and Disadvantages

Table 11: Advantages and disadvantages of Variant 5

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> • Possibility to use a tool which is available to MoLSA • It is a proposal variant that does not require any major change to the model • Possibility to control the time requirements (it only involves one simulation) • The variant reflects the problems with the set-up of the pension system 	<ul style="list-style-type: none"> • More difficult to explain correctly • It is very likely that the pension system will change; even if it does not, a reduction in pensions according to a scaling factor is an unlikely approach • This is not a good prediction of the amount of an individual's pension (it may be more appropriate to illustrate the need to change the system)

4.1.5.8 Example of Application of the Proposal

As an example, we will introduce an adjustment of the presented amount of pension, for a man who is now 45 years old, retiring in 2040, with the current income of CZK 25,000 and the amount of pension calculated for him is CZK 15,000 (e.g., according to Variant 2).

The model with the classic setting simulates the income of the pension system for the year 2040 as CZK 600 billion, expenditures as CZK 650 billion. This gives a scaling factor for the pension amounts in 2040 as 0.92 (= 600/650).

The pension of CZK 15,000 must be reduced to CZK 13,800 (= CZK 15,000*0.92).

Within the example, the communicated information is presented as follows:

Dear Mr. Kyselka,

Under current legislation, your pension would be CZK 15,000. However, the current set-up of the pension system is unsustainable in the future and it can be expected that the funds in the pension system will not be sufficient for pensions under current laws. If this loss is offset by a reduction of pensions, it will also reduce your pension to CZK 13,800

4.1.6 Variant 6: Calculation on the Basis of a Fixed Scenario

Due to the wider use of the classical calculation of the expected amount of pension (without the use of a microsimulation model) in other countries, we recommend also considering a calculation variant that calculates the amount of pension, assuming one fixed scenario for future development. The results obtained in this way can be sent in personalized letters to citizens or they can be presented in a form of a classic online calculator. The calculators are usually based on a simple calculation using data available about the population. This simple calculation allows for easy interpretation, but does not make it possible to capture the uncertainty in the development of an individual's life path.

This approach is particularly suitable for individuals who already have a clearly defined work history for the most part and will retire in a relatively short period. This approach gives them a more accurate result and for MoLSA it means less demanding preparation (e.g., appropriate assignment to groups in Variant 1 or assignment to a particular modelpoint in Variant 2).

There are several approaches to choosing a fixed scenario and they are further discussed below.

4.1.6.1 Principle

The basic principle of operation of this variant consists in working with already known facts affecting the amount of pension (for the assessment base and the period of insurance) and with the unknown development of these facts. The amount of pension is subsequently calculated based on the period of insurance and the assessment base (actual and future values). Unlike the microsimulation model, a standard calculator assumes only one possible scenario for the development of the assessment base and the period of insurance in the future. The options for choosing this scenario are mainly as follows:

Approach 1 – Retirement immediately (no further development of the insurance period or assessment base)

This approach takes only historical facts on the basis of which the amount of pension is calculated, and no other parameters are included in the calculation because we are interested in the current amount due to the set condition of retirement with immediate effect. If we want to use this approach, it is necessary to take into account the fact that the individual must meet the criterion of the mandatory minimum period of contribution to the pension system in order to achieve meaningful results. On the other hand, it is a very easy interpretation and useful information for these individuals.

Approach 2 – Retirement at the age defined by the law under constant conditions

In this approach, in addition to historical facts from a given individual, the calculation also includes the subsequent calculation of the expected development thereof until the time of retirement. The period of insurance from which the calculation will be performed is set to correspond to retirement at the age defined by law (no work interruption is assumed). The assessment base is subsequently calculated for these years as if the income of the individual would not change in the future compared to the last-mentioned income (or, if applicable, were adjusted only for inflation). The advantage is easy preparation for the calculation, the disadvantage is the fact that the majority of the population cannot expect a fixed income until retirement or uninterrupted work, which significantly distorts the result.

Approach 3 – Retirement at the age defined by the law under changing conditions

In this approach, too, in addition to historical facts from a given individual, the calculation also includes the subsequent calculation of the expected development thereof until the time of retirement. The period of insurance from which the calculation will be performed is set to correspond to retirement at the age defined by law. It is assumed that the assessment base, which fundamentally affects the calculation of the pension, will change over time, as will the economic activity of the individual (which affects the total insurance period). We see the following two options for the addition of the development of these parameters:

- Parameter development added by the individual
- Parameter development added by MoLSA

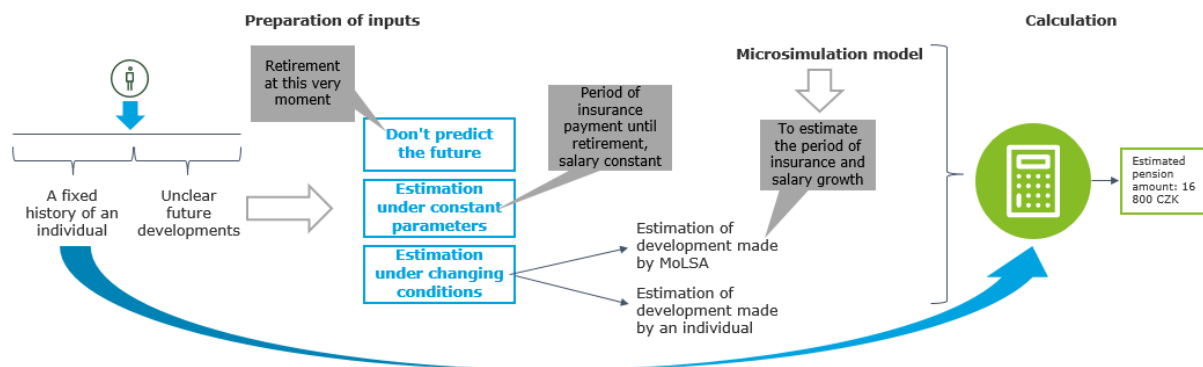
Parameter development added by the individual – a variant often used in practice, requiring a web form of the proposal (therefore it cannot be used for paper-based presentation of information). An individual can add their estimate of income development on the website – e.g., as an annual percentage increase – and the period of insurance – e.g., whether he is planning parental leave, etc. (historical data can also be added by the individual, or it is possible to use, based on an identifier, a database of MoLSA / Czech Social Security Administration). The obvious disadvantage of this approach is the risk of unrealistic expectations of individuals (the expectations can be too optimistic and distort the result significantly). On the other hand, e.g., the addition of the planned parental leave can be more accurate than in the simulation.

Parameter development added by MoLSA – this approach enables active presentation of information in paper form and, at the same time, by means of a web-based pension calculator. The development of parameters (insurance period and growth of the assessment base) must be estimated from the available data. The estimates can be obtained as follows:

- Using available statistics (e.g., average income growth in the given sector / in the given area, average insurance period in the population).
- Estimate/calculation using a microsimulation model: perform a simulation for specific groups (e.g., women 45 – 50 years, secondary-school education) and obtain the average insurance period and the average income growth.

In the case of the web variant of this approach, it is possible to combine the above-mentioned two options for adding parameters (e.g., allow an individual to modify a parameter).

Figure 19: Graphic presentation of the principle of Variant 6



4.1.6.2 Required Inputs

For Variant 6, historical facts concerning the life development of an individual are important but they are currently not fully available to MoLSA – therefore, for more accurate results MoLSA would have to add the currently missing data. To use the variant, it is necessary to own the data non-anonymized (or encrypted and with the encryption key accessible only to authorized persons). Specifically, it concerns the following inputs:

- Date of birth
- Number of children – especially for elderly, where this information affects the retirement age. If the information on the number of children is not available, the retirement age can be substituted by a retirement age of the individual without children and the recipient of the information will be notified of this fact; the calculation can be performed for the average number of children or the results can be averaged across all relevant options or the individual will be provided with information in multiple variants).
- Period of contribution to the pension system
- The amount of individual assessment bases
- Historical substitute periods of insurance – information that is currently not completely available to MoLSA. The solution is to add or neglect this information and notify the final recipient accordingly (e.g., if, at the time of non-payment of social insurance, you spent some time on parental leave or attending to another dependent person, this may result in a higher pension than indicated). In the case of an online variant of the calculator, it is possible to have this information filled in directly by the individual.

Data on future development is also required. For Approach 1, there is no such information, for Approach 2, the future development is set according to the last historical value. The inputs required for Approach 3 are as follows:

- Development of the individual's assessment base over time
 - The most typical is to determine the annual income growth from data available on the current population – it is possible to use the national average or perform an analysis at some lower level (e.g., via age, education, place of work or field of work).

- In the case of an online variant of the calculator, it is possible to have this information filled in directly by the individual.
- The development can be simulated using a microsimulation model. The procedure for obtaining this value using a microsimulation model is described in the following chapter. When using the microsimulation model, the inputs needed to run it do not differ from a normal run. The growth of the assessment base can be reviewed for specific groups (e.g., by sex, education, age).
- Remaining period of insurance
 - Completion of the insurance period so that it reaches average values (e.g., in society or a similar group of people).
 - In the case of an online variant of the calculator, it is possible to have this information filled in by the individual.
 - The remaining insurance period can be simulated using a microsimulation model. The procedure for obtaining this value using a microsimulation model is described in the following chapter. When using the microsimulation model, the inputs needed to run it do not differ from a normal run. The remaining insurance period can be reviewed for specific groups (e.g., by sex, education, age).

4.1.6.3 Set-up and Use of the NEMO Model for Obtaining Development of the Assessment Base and the Remaining Period of Insurance

For the calculation, we can define the basic groups and, for these groups, example modelpoints – e.g., groups by sex, age, education or number of children. As in Variant 1, we want to keep the total number of groups low enough given the available computing capacity. Unlike Variant 1, we will not divide the population by income / assessment base or the current insurance period because the development of the insurance period or the percentage changes in the assessment base in the future do not depend on them. On the contrary, we can proceed to a finer division by age. For each group, we will create several example modelpoints that will cover the variability we left in the group (for example in the field of work, if this information is ever added to the model). For the example modelpoints, we set any meaningful assessment base and any meaningful insurance period.

Prophet set-up

We run the model on such number of simulations to ensure that the total projected number of the life paths for each example modelpoint is at least 1,000.

It is sufficient to set the number of periods for which we want to perform calculations to the lowest value at which all persons in the group reach retirement. This can be performed in the run settings by unchecking the “Use Default Projection Term” option and entering the relevant “Maximum Projection Term” value.

We will use the “variable group” to set which variables the model should report in a standard way (i.e., for each month in total for all persons with the same SPCODE). In this calculation, we are interested in the values of the assessment base at the time of retirement and the total periods of insurance at the time of retirement, not the values of the amount of pensions.

We will leave the other settings of Prophet as in normal model runs.

Input set-up

We will set all values in used mortality tables to 0 (we want to calculate the pension under the condition that the person will live to see it). In the same way, we set the probability of emigration to zero.

The model is run only for pre-selected example modelpoints. We will set for all individuals that they will retire in the month in which they reach the retirement age (thus eliminating the possibility of early retirement or its postponement).

We will leave the other settings of Prophet as in normal model runs.

Output set-up

It is necessary that the reporting of the amount of pensions for each person into a CSV file is introduced into the model (in normal circumstances, Prophet does not make it possible to report the results for all individuals). The calculation of the average value of the growth of assessment base and the period of insurance will be performed outside of Prophet.

4.1.6.4 Processing the NEMO Model Outputs for Obtaining Development of the Assessment Base and the Remaining Period of Insurance

The obtained values of the assessment base and the period of insurance at the time of retirement are compared with the initial settings of the example model point. For the development of the assessment base, the average increase is monitored across all simulations in percent; for the insurance period, the average increase in the insurance period is monitored across all simulations in absolute values. These increases are then used to calculate an individual's pension.

4.1.6.5 Good Practice

Calculation based on only one scenario obtained by a classic calculator is one of the most typical approaches. For its simplicity, the method of unchanged parameters (i.e., Approach 2) is often chosen in the case of active presentation of information about the amount of pension, and the method with the development of income (i.e., Approach 3) – most often with the possibility of entering the expected growth by an individual – in the case of an online calculator (e.g. Slovakia, Australia).

In the Czech Republic, a calculator is now available regarding the expected amount of pension in MS Excel format. A link to this document can be found on the website of MoLSA and the Czech Social Security Administration. Their form is different, but they have the same goal – to tell the individual the expected amount of pension. It operates with individual assessment bases for the years of contributing to the pension system. The limitation of this calculator is that an individual can use it only if he has a maximum of 5 years left until retirement. If the individual has a longer time left until retirement, he cannot use the calculator. The portal of the Czech Social Security Administration, which is accessible to citizens with a data mailbox, has the same limitation. Here, too, the individual will learn information about the expected amount of pension only if the condition of having less than 5 years left until retirement is met.

4.1.6.6 Suitable Form of Presentation

Variant 6 allows for paper-based presentation of information. A suitable form of presentation for the paper-based form of information is described below.

In this case, using a calculator method, we obtain one specific number which is presented to the individual. For better comprehensibility of the presented number, it is appropriate to put it in a certain context. Therefore, we recommend improving the number e.g., by including it in the average amount of the future pension of the entire population, comparing the amount of the pension to the current income of the individual (through a replacement ratio), using the consumer basket, etc. It is also appropriate to add a verbal description and explanation to the presented number.

The results of this variant can be sent in paper form to every citizen for whom the information is relevant. This option, however, places higher demands on MoLSA in terms of obtaining inputs concerning the individuals.

It is also possible to have the calculators on a specialized website, where the individual can enter the data about himself. The disadvantage of this option is that it requires active involvement of the residents. It is necessary to take into account a certain time burden, and the question is how competent people are to enter the correct data in the required fields, apart from the "subjective" estimate of the future development in each approach calculating the amount of pension that will occur in a longer period of time.

It may also be appropriate to combine Approach 2 for active presentation of information in paper form, by adding a link to an online calculator in which the individual adds the missing information (and the non-missing information could be added based on a certain identifier from MoLSA database).

For more detailed information on the possible forms of presentation see Chapter **Chyba! Nenalezen z droj odkazů..**

4.1.6.7 Advantages and Disadvantages

Table 12: Advantages and disadvantages of Variant 6

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> • It is a specific amount of an individual's pension based on actual and real data • For people just before retirement age, this is a relatively accurate number • Simple calculation • Simple interpretation 	<ul style="list-style-type: none"> • The need for estimates of the future (provided that the individual does not retire immediately) • Uncertainty of future development not captured • The result is very uncertain for the young generation (little real data, a lot of estimates) • Need to modify/amend the current information database (mainly for self-employed individuals and, if applicable, substitute insurance periods)

4.1.6.8 Example of Application of the Proposal

As an example, let us present the calculation of the amount of pension at retirement at the age defined by law and with changing parameters. In this variant, the following information will be required for the calculation:

- Date of birth (information available to MoLSA);
- Period of payment of insurance (information available to MoLSA);
- Assessment base (information available to MoLSA);
- Substitute period of insurance (information not fully available to MoLSA) – this will not be used (zero period or such period that is available to MoLSA will be assumed, and the individual will be informed accordingly);
- Number of years remaining until retirement age (information available to MoLSA);
- Estimated time that the individual will still work (information not available to MoLSA) – it will be obtained using a microsimulation model;
- Estimate of the average income increase until retirement – it will be obtained using a microsimulation model.

In the example, the calculation will be performed for a female, with a college degree, aged 48, who has been paying social insurance for 22 years, and has 6 years of substitute period of insurance. Her current assessment base is CZK 30,000 and her current income is CZK 38,000. According to the microsimulation model (that is, runs for a group of modelpoints according to these parameters), the average income growth for women with a college degree aged 48 before retirement is 4% per year. The average total period of insurance for women with a college degree is 38 years. In the calculation we will therefore count with additional 16 (= 38 - 22) years of insurance period and annual income growth of 4%.

Based on this information, the future amount of the pension for these parameters will then be calculated.

With the result of the calculation, a letter will be subsequently distributed, presenting the expected amount of pension under the condition that the individual retires at the age defined by law and with changing parameters, including an explanatory text. Such a letter may take the following form:

Dear Mrs. Zelená,

Based on the information MoLSA has about you and based on an estimate of the development of parameters affecting the amount of pension, we have calculated that your expected monthly amount of the state pension is CZK 16,800. It is an estimate of the future that may not be completely reliable.

In the calculation, we relied on your past assessment bases and your current income. Based on the economic situation, we have estimated the annual increase in your income at an average of 4% per year. In the calculation, we assumed that you retire at the moment of reaching the retirement age, i.e., on the day of your 65th birthday and until your retirement you will be paying social insurance for another 16 years.

4.2 Additional Proposals

The above-mentioned proposals for communicating the future value of state pensions can be augmented by other information that can help citizens to better understand their expected pension situation or better orientate themselves in the pension system. Additional suggestions are, as follows:

- Information regarding retirement age and insurance period
- Private pension savings amount (pillar III)
- Pension value for specific scenarios
- Information about paid pension insurance

The chapters dealing with each proposal give the principle of the proposal, the necessary inputs and outputs, good practice in other countries, the advantages and disadvantages of the proposal and an illustrative example of application. The form of presentation of the additional proposal is closely dependent on the choice of the main proposal, to which the proposals below are complementary.

At the end of the chapter, the approach to the inclusion of economic scenarios in the calculation of the expected pension amount, which is not currently used in the microsimulation model, is discussed.

This chapter also discusses whether it is appropriate to include, in addition to the uncertainty of the individual's career path, as well the uncertainty of the economic development into the calculation, and if so, in what way.

4.2.1 Information Regarding the Retirement Age (and Required Insurance Period)

The information regarding the retirement age, and the expected pension amount, are essential to understand the individual's retirement situation and may not be obvious to each individual. It is, therefore, appropriate to communicate the retirement age of an individual when communicating the amount of pension.

Given that the pension entitlement arises when both the retirement age is reached and the sufficient insurance period is fulfilled, information on the retirement age may also be enriched with information on the insurance period.

4.2.1.1 Principle

The retirement age may differ for each individual, especially for older age groups, according to sex and number of children. This information is very often reported as crucial and in many countries, it is provided among the basic information regarding the individual's pension situation.

We do not expect to use the microsimulation model in this supplementary proposal, as retirement age can be easily calculated from the date of birth, number of children and sex, and for younger age groups it is fixed at 65 years.

Information on the insurance period and the minimum insurance period needed, which is the same for everyone, may also be considered useful and appropriate to inform citizens.

Proposal's compatibility:

This additional proposal is suitable for combination with any of the options listed in the previous chapter.

4.2.1.2 Required Inputs

Retirement age - information on the retirement age of the younger age groups does not require any special input; in case of birth date information availability, the retirement age information can be enriched with the information of the exact date of reaching the retirement age. For the older age groups, where retirement age depends also on sex (available information) and number of children (not always available information), it can be more complicated to determine. This situation can be solved by providing more retirement age options with explained dependency on number of children (i.e. "except age and sex, your retirement age is dependent on the number of your children, which is information we do not possess. For those who have no children, this age is 64.5 years, if there is one child, this age is 64 years," etc.).

The information regarding the insurance period is available to MoLSA for each individual, but substitute insurance periods are not fully available. This can also be solved by appropriate wording (e.g. according to our records, your insurance period is XX years (i.e. the period of work); if you have been on maternity, parental or sickness leave or attended another person, your insurance period is increased increased by this period.)

4.2.1.3 Output

The main information communicated is the retirement age of the person. It can be supplemented with information such as the age the early retirement may be claimed.

In the case of information on the insurance period, the main information to be communicated is the period of the insurance payment. It may be supplemented with the information of minimum period of the insurance payment required for entitlement to a retirement pension and also with a summary of the individual's situation (i.e. "to qualify for the retirement pension, you have to pay social insurance for at least 8 more years"), eventually a warning that the individual will not have a sufficient period of insurance payment at the time of reaching retirement age.

4.2.1.4 Good Practice

This information is very often said to be essential when informing citizens about their pension situation (as the Governor of the Slovak National Bank claims, for example).

Informing citizens regarding their retirement age (or more generally the age at which pension entitlement is acquired) is a common practice (e.g. in Slovakia, Canada or in Netherlands). Retirement age calculators are also usual. The Ministry of Labor and Social Affairs also makes it possible to find out the retirement age through a calculator. This calculator has a format of Excel spreadsheet. After entering the birth date information, a choice of sex and possibly also of the number of children appears for those whose retirement age depends on them.

4.2.1.5 Advantages and Disadvantages

Advantages

- Usefulness of information (mainly in terms of better understanding of pension issues by beneficiaries)
- Simple preparation

Disadvantages

- Knowledge of the number of children and substitute insurance periods is problematic (MoLSA database is not complete)

Because of the simplicity and usefulness of this additional proposal (and common practice in the world), we strongly recommend its use in personalized communication regarding the expected amount of pension.

4.2.1.6 Example of Application

A personalized letter containing information about the future pension amount can be supplemented by information regarding retirement age as follows:

Dear Mr. Černý,

[... Information on future pension amount according to the chosen variant...].

To qualify for a state old-age pension, you must meet two conditions:

- *Retirement age*
- *Minimum insurance payment period*

The higher the insurance payment period, the higher your pension.

Your retirement age is 65 years. You will reach it on June 5, 2035. You are entitled to early retirement at the age of 62.

The minimum insurance period is 35 years. According to our records, your current insurance period is 27 years. In order to be entitled to a state old-age pension, you must pay social insurance for additional 8 years. Your insurance period may be higher, though, if in time of non-payment of social insurance you were on parental or sickness leave or attending to another person – we do not have this information about you.

4.2.2 Private Pension Savings (3rd Pillar)

In this additional proposal, we see the potential of informing individuals not only about the amount of their first pillar retirement pension, but also in connection with private retirement savings in the third pillar. The greatest benefit we see is that one gets comprehensive information based on which he is able to make informed decisions.

It should be noted that informing citizens about savings from the third pillar is a comprehensive topic requiring sufficient exploration and preparation, which is not in scope of this study. The study only mentions this proposal as a complementary one, and a separate analysis would have to be carried out before its use.

4.2.2.1 Principle

People can use private retirement savings as one of the options for their future retirement income. If they do, informing them solely on the amount of the state old-age pension (first pillar) is insufficient. In fact, their retirement income will be slightly higher due to third pillar private savings. For the time being, we do not expect the use of the microsimulation model in this additional proposal, as its current configuration does not allow for it. However, its future use may be considered for this purpose (if its functionality is extended). In order to provide complete information of future retirement income including the savings from the third pillar, cooperation with pension companies is necessary.

Proposal's compatibility:

This additional proposal is suitable for combination with any of the variants listed in the previous chapter.

4.2.2.2 Required Inputs

When using this supplementary proposal, it is important to have access to information on individual citizens' private pension savings. In other words, it is necessary to ensure transfer of relevant information between individual pension companies and MoLSA. In addition to the current status of the individual's account, its monthly contributions, risk profile, etc., pension companies must also share an estimated yield on private savings, including considered time factor, etc. Examples from other countries show that

pension companies usually share their data in order to inform citizens of their pension income, which is often stipulated in the legislation.

4.2.2.3 Output

The output of the proposal is information on the amount of funds available at the time of retirement of each individual involved in the third pillar. These funds can be presented as a single number, or expressed as a monthly supplement to state retirement income in the case of annuity (such information may support the choice of annuity payments).

Both paper and the online form of informing are appropriate for this additional proposal. When using the web interface, it is possible for an individual to change various parameters and see which scenarios may occur and under which conditions (e.g. when increasing/decreasing paid amount or changing the strategy).

4.2.2.4 Good Practice

In the other countries that we focused on in the research, this supplementary proposal appeared quite often as an extension of the information communicated through the so-called Orange Envelope. This information can be communicated both in paper form and via the web. In Sweden, private pension savings are being reported through a web portal where everyone logs in with their unique credentials. In Poland, on the other hand, they decided to use a paper form and report on state and private pension savings through a letter. In the future, however, the web form is planned to be implemented. Similarly, project Orange Envelope is underway in Slovakia, communicating complex information (from all pillars). Informing participants about funds in supplementary pension savings is obligatory for pension companies here, as well as in Netherlands where this is done both in paper form and online.

4.2.2.5 Advantages and Disadvantages

Advantages

- Complete information to be provided (greater informative value for the individual)
- Promoted use of the third pillar
- Promoted use of annuities

Disadvantages

- Cooperation between MoLSA and pension companies necessary
- Increase complexity of provided information (larger amount of data to be collected and processed when reporting to each citizen).

The preparation of this supplementary proposal is quite demanding, however, given the clear trend in other researched countries to move towards providing information on the private pension pillar, this option is worth at least a deeper analysis.

4.2.2.6 Example of Application

As example use of the proposal, we chose a variant that combines paper-based information together with web interface.

Dear Mrs. Vomáčková,

Hereby, we would like to inform you about the pension amount which you will be entitled to under current legal conditions after you will have reached the age of 65.

Based on the current situation, your total pension amount will be CZK 19,680. This amount consists of the state old-age pension, which in your case is 14,900 CZK. The remaining amount, thus CZK 4,780, will be drawn from your private pension savings. This amount was calculated based on a realistic scenario defined below. If you would like to see your potential pension amount under changed input parameters or in another economic scenario, please visit our website www.mojepenze.cz and log in using the following credentials:*

Username: vomackova_lada

Password: 9778

** For annuity payments until 80 years of age.*

4.2.3 Pension Value for Specific Scenarios

Within reporting on future pension amount, some of the researched countries include, beyond basic scenario estimate, also a supplementary information on potential pension amount resulting from alternative scenarios. These scenarios are classic life situations that individuals may encounter and illustrate the impact these life situations might have on an individual's pension amounts. This approach is beneficial in helping individuals to better understand the pension system and how their life path development impacts the pension amount, specifically.

4.2.3.1 Principle

Information on the expected pension amount may be supplemented by information on pension amount related to a specific life event (which helps illustrate the impact of a specific event on the expected pension amount). As such life events that can significantly affect the pension amount and are relatively common, we consider:

- Loss of employment
- Change of employment (and related sudden income reduction, e.g. to 50%, or increase),
- Early retirement;
- Postponed retirement.

Thus, for the chosen variant, in addition to the 'basic scenario' pension amount estimate, the pension amount taking into account some of these situations is calculated. In the case of the classic calculator, it is a simple calculation based on parameters. In the case of calculations using the microsimulation model, it is necessary to adjust the settings.

An appropriate way to use this additional proposal, which allows the individual alternative scenarios to be sufficiently separated from the main information on the 'basic scenario' estimate and to be presented appropriately so as not to cause confusion, is within a web interface. The web interface also allows for a certain degree of interactivity, so an individual can, for example, choose to decrease their income or retirement age.

Proposals compatibility:

Combination with Variants 1, 2, 3, 4 and 6 is considered appropriate; however, the suitability of the use with a certain variant depends on the specific scenario. The situation of loss of employment (or change of employment) is taken into account in the microsimulation model, so it is not entirely meaningful to complement this scenario with the results obtained by the microsimulation model. By contrast, postponed retirement or early retirement is not included in the variants specified above, so these scenarios may be an appropriate complement for each of them.

4.2.3.2 Required Inputs and a Calculation

The necessary inputs do not differ significantly from those needed for the variant with which this additional proposal would be used.

In a calculation using a microsimulation model (postponed retirement or early retirement scenarios only), the setup and use of the model do not differ from the setup and use of the model that is defined for the variant. An exception is the setting of the retirement time – we set all persons to retire in the month when they reach the specified age (e.g. 63 for early retirement, 67 for postponed retirement).

When calculating on the basis of a fixed scenario, this fixed scenario is chosen to match the specific scenario that we want to present.

4.2.3.3 Output

The output is the pension value for a specific scenario. The output is processed similarly as for the variant used and presented together with the expected pension amount under standard conditions. As a result, the impact of specific life event on his pension amount is clearly presented to the individual.

Appropriate use of supplementary proposal is within the web environment, which allows for a certain degree of interactivity, for example, an individual can choose a specific decrease in their income or set the retirement age.

For presentation, it is suitable to use graphs or timelines, which will make provided information more transparent.

4.2.3.4 Good Practice

This way of informing citizens is not uncommon across the world; we can see it in the Netherlands and Denmark, for example. In both countries, however, it is about informing via interactive web interface. As a result, the recipient is not overloaded with information, which can be a risk when including various specific scenarios in personalized letters.

4.2.3.5 Advantages and Disadvantages

Advantages

- Requires no additional inputs
- Clear interpretation
- Helps to understand the pension amount and affecting factors

Disadvantages

- Significantly increases the time and processing demands of the preparation

We do not consider it necessary to use this supplementary proposal, but see it rather as a tool to increase financial literacy in the topic of pensions, which can explain specific situations using a personalized approach. In the case of an additional proposal, we recommend to consider using a web, which is a more appropriate distribution channel for this additional proposal than informing citizens in personalized letters.

4.2.3.6 Example of Application

In an illustrative example, the proposal is used together with variant 6 – Fixed Scenario Calculation for all of these specific scenarios for a specific individual – for Mr. Nový, who is currently 62 years old and thus has well defined work history:

- Increase in income by 25%
- Decrease in income by 25%
- Loss of employment (until retirement)
- Early retirement (retirement at 63)
- Postponed retirement (retirement at 67)

The initial pension amount assumes that Mr. Nový will work without a break until he is 65 (his retirement age) and for the same income as he is currently working (taking into account wage inflation). For this scenario, his pension amount is CZK 15,000.

Specific scenarios are calculated, as follows: increase/decrease in income expects an increase/decrease in Mr. Nový's income in the following year and its stabilization at this level until retirement at 65. For these scenarios, the expected amount of Mr. Nový's pension is CZK 16,500, resp. CZK 13,750. Loss of employment indicates that Mr. Nový will lose his job the following year and will not find another until he is 65 years old when he retires. In this case, the expected amount of his pension is CZK 12,250. The microsimulation model is not utilized for the calculation for these scenarios.

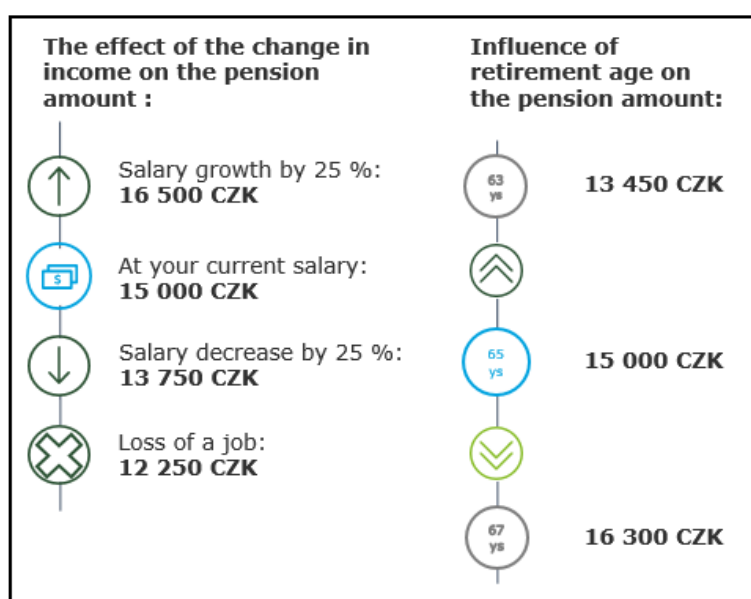
Early retirement and postponed retirement scenarios expect Mr. Nový to work without a break until the age of 63 (for early retirement) and until the age of 67 (for postponed retirement). These pension amounts then come to CZK 13,450, resp. CZK 16,300. An estimation of the growth of the assessment base is obtained on the basis of the results of the microsimulation model as the average income increase of men who are currently at the age of 62.

These values are presented to Mr. Nový on the website after logging into his personal account, as follows:

Dear Mr. Nový,

Your expected pension amount depends on the parameters that will develop in the future. Below we have prepared a basic overview of potential scenarios with corresponding amount of your pension:

Figure 20: Explanation of each of the situations



4.2.4 Information about Paid Pension Insurance

Some countries present their citizens with development of their respective pension insurance payments when informing them on the future amount of pension (often the status of their hypothetical accounts, which is a principle not used in the Czech pension system).

This method can be a good way to extend provided information that does not require demanding preparation. In our circumstances, however, communicating such information is not ideal, as the paid pension insurance amount is not a factor influencing the expected pension amount. We also see the risk of a negative psychological impact, because there is no direct connection between how much an individual gives to the system and how much he will subsequently receive as a state pension.

4.2.4.1 Principle

As part of the communication of pensions, it is possible to use information on paid pension insurance. The individual has an idea of how much he has already paid into the state pension system during his active contribution. This supplementary proposal is best applicable for countries that operate on the principle of "merit", that is, at the time of retirement, an individual subsequently receives a part (sometimes a significant part) of their income from this "hypothetical account". However, it may also be used for other systems, such as the Czech one, where the individual's money, which are continuously paid, do not accumulate on his "hypothetical account". In this case, it should be borne in mind that it is necessary to communicate that the money he has contributed to the system is not credited to any (hypothetical) account, but that the pension amount will result from other parameters.

Proposal's compatibility:

This additional proposal is suitable for combination with any of the variants listed in the previous chapter.

4.2.4.2 Required Inputs

As an input for this additional proposal, it is necessary to have an overview of contributions the individual has made into the system during his life as well as the period over which these contributions were paid. There may be a problem, because MoLSA does not have access to information regarding the substitute insurance period as it only needs to be documented just before retirement.

4.2.4.3 Output

In the case of a system where the above-mentioned hypothetical accounts are being created for citizens, the output for an individual is made of information on how much he has contributed into the system and what is the part he will be paid his pension from. If hypothetical accounts are not used (which is the case of the Czech Republic as well), the outcome of this supplementary proposal is to inform about the amount of pension insurance contributed and the related current assessment base for a specific person.

Contributions paid may also be presented for each year. However, this information can be quite extensive. It is therefore recommended not to send it in paper form, but rather to use it as a supplement, for example, on a website where it is possible to log in for personalized information.

4.2.4.4 Good Practice

According to our research, information about paid pension insurance is used in countries that have their systems based on the principle that people in their retirement age are paid part of their pension based on how much they have contributed to their "hypothetical account" in their lives. Among the researched countries those are specifically Sweden and Poland. Information about paid contribution is also provided in Canada, primarily to younger age groups, because they do not have sufficient data to estimate their pension amount well.

In the Czech Republic, cumulated insurance contributions are currently not reported. An individual only gets an overview of their assessment bases – either through an annual employee personal record or through the Czech Social Security Administration portal, which can only be accessed by people with a data mailbox.

4.2.4.5 Advantages and Disadvantages**Advantages**

- Simple preparation
- Raises awareness of how the system works(the level of contributions)

Disadvantages

- This information does not indicate (or simply follow) the expected pension amount

In general, we do not consider this information necessary. We see its utility rather in the form of a specialized website where the user can log in to get a complete overview of his expected pension situation.

4.2.4.6 Example of Application

When informing about the amount contributed to the pension system, each individual would receive personalized information.

Dear Mr. Vágner,

We send you the current assessment base below, which would currently be the basis for calculation of your pension amount. To date, this assessment base is CZK 32,000. At the same time, we provide you

with an overview of the pension insurance premiums contributed so far, which in your case amount to CZK 2,190,000 for 20 years of active contribution to the pension system.

4.2.5 Inclusion of Economic Scenarios

The variants presented above work with the possible development of the individual's life path, but do not include the possible development of the economy. In variants 1 to 4 (calculations using the microsimulation model), it is possible to include the uncertainty of the economic development using various economic scenarios, which may influence e.g. growth of income or probability of loss of employment. Possible use of economic scenarios is, as follows:

- Approach 1: Calculation assuming one average economic scenario,
- Approach 2: Calculations for a small number of representative economic scenarios (e.g. pessimistic, neutral, optimistic),
- Approach 3: Calculation using a large number of economic scenarios.

The first approach most resembles the current setting, where typically only one economic scenario, which represents a medium estimate of future economic development is taken into account. Applying this approach to informing the public about their future pension entitlements is simple and does not require any modification of the procedure for a specific variant. However, this estimate will not capture possible extreme cases of future economic development. The end recipient should be informed about this fact and it is necessary to emphasize that in the case of unfavorable economic development, his actual pension amount may not reach the predicted value.

The second approach refers to a procedure in which the calculation is performed several times according to the procedure of a given variant, each time with a different economic development scenario. For example, there are three possible economic scenarios – pessimistic, neutral and optimistic. The values can then be presented for each scenario separately. The outputs of this approach are easy to interpret and a similar approach is common practice, for example, in the presentation of investment development. The disadvantage of this approach is that it still reduces the entire complexity to only a small number of scenarios that are selected arbitrarily.

The third approach uses a large number of economic scenarios. Applying every economic scenario (e.g. 1,000 options) to each modelpoint is impracticable due to the computational requirements of this approach. Therefore, we propose to simulate only one development of an individual life path and one economic scenario for each modelpoint. The whole variability of possible future development of the economy becomes apparent when we analyze the results of a larger number of modelpoints. However, this approach worsens the convergence of the calculation, so it is necessary to increase the minimum number of simulations per group or modelpoint (depending on the variant used).

The question is how to choose the right number of simulations for this setting. In our opinion, it is appropriate to monitor the variability of the results that we want to report. For example, we suggest starting with 10,000 simulations for a given group or modelpoint and comparing the obtained results with, for example, 15,000 simulations. If the variability of any of the parameters is higher than the required accuracy of the information provided (e.g. the average of the 10,000 modelpoints significantly differs from the 15,000 simulations), we will increase the number of simulations and repeat analogically. Otherwise, we can consider the lower number of simulations tested as sufficient and use this number when using the variant.

In order to save computational time, we recommend to perform this analysis at first for one group and run it for a large number of modelpoints (for example, 500,000). Then we can calculate the reported statistics (for example, average old-age pension) for the first 10,000 modelpoints, the first 15,000, the first 20,000, and so on, and track its development. A suitable number of modelpoints would be such where the statistics stabilize. For other groups, we will start at this number of modelpoints and only verify that the result is stable for them as well. Therefore, for most groups, we will avoid repeated model runs on a large number of modelpoints.

However, the results of this approach do not show the impact of a life path or economic scenario separately – as for the range of the results, it is unclear what the effect of an individual's life path is and what the effect of economic scenario is, which requires appropriate explanation to the information

recipient. To break down these effects, it is possible to analyze the impact of different scenarios on an individual – to perform 1,000 simulations for each scenario and analyze the results. However, such analysis is not possible for all individuals due to computational and time constraints.

General advantage of this option is that it captures a large amount of uncertainty in future developments. There is no need to point out that the results do not reflect the uncertainty in economic development to the recipient, on the other hand, there is a need to better explain the results so that the individual understands the displayed values correctly.

If MoLSA would consider including economic scenarios, we recommend, from the perspective of communication clarity and ease of use, to apply Approach 2 with three basic economic scenarios.

To include economic scenarios is common for example in Slovakia, where the microsimulation model also includes political and economic future developments. Sweden also allows for some economic development when preparing the information.

4.3 Presentation of the Pension Value

The main topic of Chapters 4.1 and 4.2 is how to obtain the information we want to communicate later. Nevertheless, it is equally important who is the recipient of the information and what kind of distribution channel is used to get this information to the population.

These areas are discussed in the following chapter. Target groups' choice, as well as usage of all six Variants and additional variants for the given target groups, are discussed in the part about *Target groups*. The part about the *Form of pension value presentation* summarizes options about the presentation of pension value in detail, and also the suitability of these options and their utilization in the context of proposed variants and distribution channels is discussed. The third part called *Distribution channels* deals with opportunities of distribution channels and their suitable use. The last part called *Campaign progress* specifies recommendation related to an information campaign as a whole.

4.3.1 Target Groups

As mentioned in Chapter 3.2.2, suitable selection of target groups and suitable communication for specific groups is a necessary element of every communication campaign and it can be a significant determinant of a communication campaign's success.

As mentioned earlier, it is desirable to select people we want to address and divide them into smaller and more homogeneous groups. Then, communicated information and selected distribution channel should be adapted.

There are many ways how to divide the population into smaller and more homogeneous groups. People can be divided into groups according to sex, age, place of residence, education, place of employment, type of work performed, financial literacy, etc.

Distribution into target groups is a very important phase as demonstrated by examples from other countries in Chapter 3.2.4. In these countries, the most common approach to distribution of target groups is the use of labor market status (it is common to target working population for example in New Zealand, Mexico or Hungary). Because this group is too large, it turned out during these campaigns that it is crucial to divide groups into even smaller and more homogeneous groups. In this case, the age of individuals seems to be the best indicator. There was not this kind of distribution in Hungary – the campaign was targeted to the working population in general and it turned out that this campaign was not successful as such group was not homogeneous enough. Some countries choose financial literacy as a segmentation aspect that seems meaningful. Financial literacy helps to determine what information content we communicate to the population and what are the respective means of such communication. This approach was chosen in e.g., the New Zealand campaign.

Given what data is available to MoLSA and what type of information MoLSA wants to communicate to the people, we consider the age segmentation as the most suitable approach. MoLSA does not have sufficient available information for the other approaches discussed above. For example, there is not a complete database for education – MoLSA does not know every citizen's highest completed education. Another example is the segmentation according to financial literacy. In this case, it would be necessary

to carry out population surveys. Only then, the segmentation into such homogeneous groups would be possible. Everything mentioned earlier represents increased effort for MoLSA. Moreover, the age segmentation makes sense even in the context of the Variants proposed by us. Target groups can be defined as follows:

- < 26 years
- 26 – 35 years
- 36 – 49 years
- > 60 years
- Old-age pensioners

We will describe each of the groups defined above in more detail now.

Target group < 26 years

According to the fact that in this case we consider young people with long waiting period until the retirement age, it is necessary to think twice what is the information we want to present. We do not consider the information about a specific amount of pension relevant for this target group for many reasons. Working history is minimal to none. Pension amount estimation cannot be supported with enough real data. Moreover, there is a lot of young people who are still studying and they do not have any idea about their future incomes themselves. This might make it difficult to set the communicated pension amount into the context of the individual's life. Furthermore, the estimations can vary due to the fact that we are considering almost the whole life path of the individual. It could also be objected that if there is, for example, 45 years until the retirement age, it is highly likely that the pension system will have changed until this time. It is more meaningful to try to increase financial literacy in the area of pensions in general instead of communicating personalized information.

For this group, it is appropriate to provide several selected scenarios which obviously cannot be reliable but can serve as a good indication of how the pension system works and arouse the recipient's interest in pension issues at the same time. We consider getting the young interested to be a suitable communication target for younger target groups.

Target group 26 - 35 years

We can expect these people are involved in the labor market and are actively participating in pension insurance in this target group. At the same time, it is important to realize some of the individuals in this age range are at the beginning of their career and they have a lot of time until their retirement. Thus, we encounter similar issues as in the previous age group; here, however, we possess at least some minimal information about them. The estimate of pension amount can be based on initial income, completed education, etc. at the minimum. Information can be more personalized than for the target group under 26 years.

Besides presenting the pension amount itself, potential pension amount can be presented for different sub-groups as well (in the context of different life paths). The sub-groups are chosen according to the most probable paths given the circumstances (for example 5 years on parental leave).

Target group 36 - 49 years

We can expect individuals aged between 36 and 49 years will choose specific field of work and their income will stabilize. According to the field of work we can estimate income amount and growth. Inclusion of the individual to a specific group according to parameters such as income or expected income growth can make sense in this case. It can be assumed that the estimate of the future can already have sufficient informative value. Work history is also available for every individual and can be used to derive further assumptions. Moreover, people belonging to this target group have a bigger interest than people from the previous two target groups because they are closer to their retirement age. The expected retirement amount can be an interesting information for these individuals.

Target group 50 - 59 years

This age group has enough information about work history, however, significant time in the labor market precedes their retirement age. This time can influence future retirement value. The past of these individuals significantly refines the information about expected retirement value. Some specific scenarios will most likely not occur anymore, e.g., change in the field of work.

More interest in the pension system can be assumed for this target group, therefore, we see the communication about potential retirement value as highly suitable. We also consider using a microsimulation model to simulate the remaining part of an individual's life path given the considerable period of time before retirement.

Target group > 60 years

In this case we are talking about a target group which is relatively close to the retirement age and whose almost whole working history is fixed at the same time. Information about potential retirement value is quite reliable. Due to this fact we consider it as suitable base for the retirement value calculation on specific data about the individual. However, the use of a microsimulation model could be counterproductive because remaining time till retirement is quite short and the complexities of using the model outweigh its advantages. We do not consider it necessary to run a lot of simulation for the estimation of the future. On the contrary – calculation under a fixed scenario of future development should be fully sufficient.

Unlike the previous groups, active thinking about retirement can be expected along with higher demand for information. We consider it as suitable to inform people about specific requirements that an individual has to meet to qualify for a state pension and an individual's particular situation in the context of those requirements. Personalized retirement value is also suitable information. For these individuals, information about the amount of pension concerning a specific retirement time not only concerning an individual's age but also in the context of specific months can be relevant. According to this information, the individual can choose the preferred retirement time.

Target group old-age pensioners

People from this target group already know their retirement value. However, communicated information can reflect information that may affect the evolution of the retirement amount (for example expected valorization) or how certain specific scenarios (for example partner's death and entitlement to a widow's/widower's pension) can affect retirement value.

Table 13 below contains our recommendation for each variant and additional proposal.

Table 13 : Suitability of each Variant according to target age groups

Target Group	Less than 26 years	26 - 35 years	36 - 49 years	50 - 59 years	60+ years	Old-age pensioners
Variant 1	<p>YES</p> <p>According to the fact that members of this age group do not have any (or just a very short) work history, it is suitable to use simulation. Grouping can be based only on basic parameters (sex, education.)</p>	<p>YES</p> <p>Members of this age group have their working life mostly ahead; thus, it is suitable to use simulation. Income information of individuals can be used for grouping.</p>	<p>YES</p> <p>Members of this age group have their working life mostly ahead; thus, it is suitable to use simulation. Created groups can be defined in more detail.</p>	<p>YES</p> <p>It is suitable to use simulation, because persons in this age group have a relatively long time to reach retirement age and results from a calculator would be less accurate.</p>	<p>Rather YES</p> <p>In our opinion, V1 is too demanding on inputs (financially, technically, for preparation etc.) and for this age group no better results are available than those in V6 which is much easier to use. Eventual reduction of target group by these individuals can lead to reduced complexity of the variant.</p>	<p>NO</p> <p>There is no need to simulate the future.</p>
Variant 2	<p>YES</p> <p>According to the fact that members of this age group do not have any (or just a very short) work history, it is better to use simulation. It can be expected that due to the lack of information one could use one</p>	<p>YES</p> <p>Members of this age group have their working life mostly ahead; thus, it is suitable to use simulation. There is more information available for modelpoint assignments.</p>	<p>YES</p> <p>Members of this age group have their working life mostly ahead; thus, it is suitable to use simulation. There is more information available for modelpoint assignments.</p>	<p>YES</p> <p>It is suitable to use simulation as well, because persons in this age group have a relatively long time to reach retirement age and results from a calculator would be less accurate.</p>	<p>Rather YES</p> <p>In our opinion, V1 is too demanding on inputs (financially, technically, for preparation etc.) and for this age group no better results are available than those in V6 which is much easier to use.</p>	<p>NO</p> <p>There is no need to simulate the future.</p>

modelpoint for more individuals (for example male undergraduate, 22 years)

Eventual reduction of target group by these individuals can lead to reduced complexity of the variant.

Variant 3	Rather YES For this age group there may not be enough historical information that the individual can fill in and on the basis of which a simulation would be run. However, calculation can be done based on basic parameters.	YES Members of this group already have some history on which the simulation can be run.	YES Members of this group already have some history on which the simulation can be run. However, more information about the individual is needed. This can be discouraging from using this tool.	YES Members of this group already have some history on which the simulation can be run. However, more information about the individual is needed. This can be discouraging from using this tool.	YES Members of this group already have some history on which the simulation can be run. However, more information about the individual is needed. This can be discouraging from using this tool.	NO Retired already know their pensions.
Variant 4	Rather YES For this age group there may not to be enough historical information that the individual can fill in about himself and on the basis of which a simulation would be run. However, calculation can be performed based on basic parameters.	YES Members of this group already have a history based on which they can be assigned to prepared simulations.	YES Members of this group already have some history on which the simulation can be run. However, more information about the individual is needed. This can be discouraging from using this tool.	YES Members of this group already have some history on which the simulation can be run. However, more information about the individual is needed. This can be discouraging from using this tool.	YES Members of this group already have some history on which the simulation can be run. However, more information about the individual is needed. This can be discouraging from using this tool.	NO Retired already know their pensions.

Variant 5

YES

We consider V5 as a means to inform people about the unsustainability of the pension system (rather than the pension value), which can be applied to all age groups.

Variant 6	NO For this age group, no historical data is expected. Therefore, using a calculator based on historical data is not appropriate.	Rather NO For this age group, only limited historical data is expected. Therefore, using a calculator based on historical data is not entirely appropriate.	Rather NO Although the historical data is already extensive, the period of the future is still long. Approximation by fixed scenario does not have such informative value.	YES We already have the prerequisites to use the calculator method for this age group.	YES We already have the prerequisites to use the calculator method for this age group.	NO Retired already know their pensions.
Information regarding retirement age (and necessary insurance period)	YES The information is relatively easy to identify, easy to interpret and useful.	YES The information is relatively easy to identify, easy to interpret and useful.	YES The information is relatively easy to identify, easy to interpret and useful.	YES The information is relatively easy to identify, easy to interpret and useful.	YES The information is relatively easy to identify, easy to interpret and useful.	NO For this age group, the information about retirement age or insurance period is no longer relevant.
Private savings amount for retirement	YES It is suitable for all age groups. For this age group, it is important to arouse interest in the possibility of saving for retirement.	YES It is suitable for all age groups.	YES It is suitable for all age groups.	YES It is suitable for all age groups.	YES It is suitable for all age groups. For this age group, it is important to show the effect of personal savings on retirement.	YES It is possible to inform for example about the remaining amount of funds.
Retirement value for specific life	NO This age group has almost a whole working life ahead of	Rather NO The range of possible pensions depending on the career path is	Rather YES The range of possible pension values depending on the	YES It makes sense to work with certain	YES It makes sense to work with certain	YES For this age group, a relevant change for the pension value can

course development	it. It does not make sense to work with any specific scenarios.	still too wide and the specific scenario will not have such a meaningful value.	career part his already lower and the use of specific scenarios is suitable.	specific scenarios for this age group.	specific scenarios for this age group.	happen only if spouse dies.
Payment of pension insurance	<p>YES</p> <p>However, it only makes sense for individuals who have already joined the pension system.</p>	<p>YES</p> <p>It can be used for everyone who has contributed to the pension system for at least a while.</p>	<p>YES</p> <p>It can be used for everyone who has contributed to the pension system for at least a while.</p>	<p>YES</p> <p>It can be used for everyone who has contributed to the pension system for at least a while.</p>	<p>YES</p> <p>It can be used for everyone who has contributed to the pension system for at least a while.</p>	<p>NO</p> <p>Old-age pensioners already know their pension value based in this information.</p>

4.3.2 Form of Presentation of Pension Value

This chapter gives an overall summary of ways to present the expected pension value and their evaluation. A specific recommendation of a suitable presentation form (including more detailed setup) is included in Chapter 5.

This section also deals with various aspects related to presentation form, including processing results, choice of a suitable value for presentation, a graphical representation, as well as other specific forms of presentation (for example using the consumer basket) and general recommendation for communication with the public and presenting values or graphs.

At the end of this section, the suitability of presented approaches for use in the context of target groups and distribution channels is discussed.

4.3.2.1 Processing of Calculated Results

Calculation results can be presented in two forms according to aforementioned Variants:

1. A single value (Variant 6);
2. A large sample of possible pension amounts (Variants 1, 2, 3 and 4).

The output in the form of 1 does not require significant further adjustments. We only recommend to round this number to integers (or tens or hundreds). The output in the form of 2 has to be adjusted further, though. As already mentioned in the description of the Variants themselves, various statistics can be generated from the sample of pension amounts. For example:

- Minimum, maximum – we do not consider these statistics suitable because they depend on the realization of random variables; distortion may occur and these values are not very stable;
- Quartiles or other quantiles – we consider these statistic suitable – these statistics carry useful information, however, they have to be communicated comprehensibly without the use of technical terminology (for example: 20% of persons in your assigned group who are now in a situation similar to yours will have a pension of less than CZK xxx). However, we recommend to prefer upper limits (for example a pension lower than CZK xxx) as it forms a bounded interval (from CZK 0 to CZK xxx). Lower limits are less specific (greater than CZK xxx) and may create false expectations;
- Average – it is a very stable statistic (more stable than the minimum and maximum) and in practice it is the most widespread and understandable concept. However, in some circumstances, the average may be higher than the median, which can lead to overly optimistic expectations;
- Median – it can be used similarly to quantiles (for example, half of the people in your group will have a pension of less than CZK xxx). Again, we consider it more appropriate to interpret the median as „less than“ – because this formulation forms a bounded interval (from CZK 0 to CZK xxx), while the formulation „higher than“ is not as specific and may mislead the recipient. This is the most stable value.
- Standard deviation / variance – we do not recommend this option because of the difficulty of its interpretation.

We also recommend to round the resulting statistic (or statistics) to integers (or tens/hundreds).

If we want to present a large sample of possible levels of pensions we can also use graphs, for example:

- Histogram of group values – may support the presentation of quartiles;
- Distribution (probability density) of the income in the group – it provides full information to those who understand the topic, but we do not consider it appropriate in normal communication (however, it could be used as a supplementary information).

4.3.2.2 Used Value

The value can differ according to the approach to discounting (present or future value) or according to expression – it can be an absolute value or some ratio / relative value.

Present vs. future value

For amounts that are in the distant future, the future value can be misleading and also incomprehensible to the final recipient. For this reason we recommend using primarily the present value, accompanied by a suitable verbal explanation (for example amounts are shown in today's prices, which means that the purchasing power of your pension will correspond to these values). Presenting current values is common practice and this approach is also recommended by the Governor of the Slovak National Bank.

Future value may not be an inappropriate approach in all cases, though. The use of future value is recommended for target groups which will gain entitlement to a pension soon as the difference between the present and future value is negligible. On the contrary, in this case we consider using a future value that gives information on the amount of pension that will correspond to real income more meaningful. However, it is also possible to use the future value for other target groups – in this case we recommend to complement it with a conversion to the present value or to use some comparison – for example in the form of a consumer basket (see below). The future value is used in Slovakia. An example can be seen in Appendix 3 where the value is supplemented with a warning and converted to current money.

Absolute vs. relative value

The absolute pension value should be the primary amount communicated to the final recipients and its use is also common practice in the world. However, the use of relative value can be an appropriate form to supplement this information. It can also serve as an alternative to the conversion to the present value. The relative value can be in the form of:

- The pension amount compared to the average pension amount at the time of the individual's retirement (in this case it is necessary to simulate the pension value of the whole population), can serve to better understand the situation in which the individual will be.
- Reimbursement ratio (to calculate this, one needs to output the last income from the simulation for each individual) – it is a useful relative value that prepares the individual for the loss of income at the moment of retirement.
- The ratio of income to the current income of the individual – we consider this information the most useful in the context of grasping the amount presented (since the current income is well-known to the individual, the ratio to it constitutes an understandable information for each individual that shows comprehensibly what financial options will the individual have after retirement). This ratio is presented for example in Slovakia, comparison with current income is mentioned for example in the Netherlands.
- The ratio of pension amount to current average income / income at the time of retirement – this information is interesting rather in the context of average pension / average income.

4.3.2.3 Graphic Design

Graphic design is an important part of any communication campaign and it is strongly connected with the used communication channel. When informing, we recommend paying close attention to the graphical representation. The graphical representation must be interesting enough to the message recipient to get his attention but at the same time, it mustn't distract from the message itself. Supplementing the communication with a graphic representation is a common practice, we can see examples in most countries (Orange Envelope website in Slovakia, graphs showing the course of retirement in Canada or Australia, etc.).

Some basic options to present the pension amount graphically are mentioned below.

Display values in graphs

We recommend using graphs only as a complementary means of presentation. When using charts, we recommend thinking carefully about the appropriate chart type for the information. Furthermore, do not forget to provide sufficient explanation of what is shown on the graph, including the correct description of the axes and indicate the units of the displayed values. In the context of the presented variants, we see all these possibilities of using graphs:

- Simulated values presentation – for example in the form of a histogram or probability distribution
- If relative amounts are presented, these values can be supplemented for example by simple bar charts, which can help to imagine the presented amounts

Complementing presented values with images

Images are a common tool used to make a text attractive to final recipients. In the context of information on retirement pensions, we see two main approaches to using images

- Communicated information should be complemented by emotional images (for example happy/sad pensioner for positive/negative scenario – see in Appendix 9)
- An image related to the general pension communication used to evoke an association with the topic of pension (for example orange color in Sweden, oak picture in Estonia, etc.)

4.3.2.4 Other Specific Presentation Form

Below we describe specific presentation forms where we see some potential for future pension value communication, which, however, do not belong to categories above.

Expressing the amount of the pension in the form of a consumer basket

The pension amount itself can be hard to grasp for recipients and it does not have to reflect the impact of retirement value to recipient's life properly. One way how to explain the value to recipients is to use the consumer basket. The consumer basket describes what an individual can roughly afford from his expected income, thus linking the number to practical life.

One advantage of this approach is that the number is converted into real commodities. Thanks to that, the recipient can imagine the living standard he will be able to afford from his state retirement pension. The disadvantage of this approach is its relatively demanding implementation. It is difficult to determine which components of the consumer basket to choose (housing, medicines, food, culture...). It can also be problematic to choose a „universal“ consumer basket in the context of different prices across different parts of the Czech Republic (especially housing and prices of services).

Higher preparation demand is the reason why we do not recommend this approach as the main solution, however it can be a supplement to other presented values.

The use of the consumer basket can serve as a good explanation of the amount if the communicated amount is in future value. In such a case, the information communicated is practically unusable for the recipient (for example the information „Your pension will be CZK 50,000 in 2060“ does not give the recipient an idea of what financial situation he will be in). In this approach the consumer basket can transform this information into a useful one (for example „Your pension will be CZK 50,000 in 2060, for which you could afford approximately renting a smaller apartment, basic medicines and groceries, but not above-standard goods or services“). However, the challenge in this approach is the estimation of the future prices – we have to estimate not only income amount but also the cost of housing, goods and services – which is a rather complicated process.

Value presentation for different scenarios of future

A relatively common presentation form that simply demonstrates uncertainty in the development of the presented value is showing it for some smaller number of future scenarios – typically in three (sometimes four) scenarios – positive, neutral and negative scenarios (sometimes complemented by a catastrophic scenario). We consider this approach suitable to present various quantiles as it is simple, clear and easy to imagine. Adding this information does not take up much space and is easy to use for paper-based

information. It can also be easily supplemented with images or other graphical representations for each scenario.

This approach is typically used to present possible development of investments so it is natural to use it for private savings. In our opinion, however, this approach has potential in presenting the state pension amount as well.

The approach of showing three scenarios is common in other countries – it is used for example in Slovakia or in the Netherlands.

Use of interactivity

To include interactive elements in the presentation of the pension amount, it is necessary to use a web environment – it cannot be used for a paper form of communication. Nevertheless, the web offers wide range of possibilities for information presentation – both the possibility of a much wider scope of communicated information or easier access to explanation (for example window with information that pops up after clicking), as well as interactivity – the possibility to modify the calculation.

Given the primary objective of MoLSA is to actively inform all persons in paper form, this form is not preferred. However, this is a fairly frequent approach in other countries and is considered a good addition when using the web interface.

The advantage of interactivity is the ability of the individual to become more involved in the process of calculating the pension amount. It increases the attractiveness of information (it is a kind of „toy“), which can lead to an individual's interest in the subject. At the same time, it allows for a very high degree of personalization and can serve as a support for the final recipient in the context of financial planning (for example till what age to work, how much to put to the side every month, etc.). The disadvantage is significantly more demanding preparation than it is necessary for the presentation of static information.

The elements that the individual might be allowed to adjust might include for example income growth, insurance period (it is possible to add information that is not available for MoLSA, or make an estimate of the future – such as planned parental leave, etc.), retirement time, amount of private savings contribution, private savings investment strategy, loss of employment (when and for how long the loss will occur) or decrease in income (when and by how much the income will be reduced).

Interactive tools are relatively popular, their use can be seen for example in Slovakia, Great Britain, Canada or Australia.

4.3.2.5 General Recommendations

This section summarizes basic recommendations for the presentation form.

Text and figures

- Text is an essential part of any presentation form, it should be simple and explain everything clearly.
- We recommend using shorter sentences and phrases and trying to avoid technical terms.
- To keep the communication simple and clear, we recommend not overloading the recipient with a lot of text, information and numbers. We also recommend choosing only essential information for the main communication. If there is any additional or extending information, it is preferable to communicate it separately (for example on request or via the website).
- We recommend presenting all values as integers (possibly rounded to tens or hundreds), stating the units unambiguously and always providing a brief explanation.
- We recommend keeping the selected approach to text and values consistent across the document.
- We do not recommend including the technical explanations in the paper form. In our opinion, it will be better to publish this information somewhere else (for example on the MoLSA website). The personalized letter should only contain results and it should refer to this website for more details.

Graphics and formatting

- Graphic elements attract attention and help to explain information. We recommend using them.
- Iconography is advisable because it allows a quick visual communication.
- We also recommend using colors sparingly – there should not be a lot of colors.
- It is crucial to place important information in the upper left corner – this is the place of the document where people start to read.
- It is advisable to unify text format across the document.
- Only crucial parts should be highlighted (for example using bold text).

4.3.2.6 Approaches to the Presentation Form

For better understanding what form is appropriate, we have divided the approaches into three categories – basic, detailed and technical form.

Basic presentation form

As basic we consider those approaches that allow the use of a personalized letter as fundamental distribution channel, as they also do not require higher education and financial literacy. Therefore, we recommend using this basic presentation form for every distribution channel and target group – we consider it necessary for every way of informing.

Recommendation for basic presentation form: We recommend communicating only calculated value or only a small amount of statistics. We recommend displaying values in present value (except values that are estimated for the very near future). We consider it necessary to accompany every presented value with a verbal explanation.

Detailed presentation form

Those approaches that are not necessary from our point of view, that can however serve as a support to the clarity of the message, belong in this group. These approaches can be also used for a paper form of information and do not place too high demands on the education level of the final recipient.

Recommendation for detailed presentation form: We recommend using relative values for better interpretation of the communicated value (alternatively, using a consumer basket). When communicating more quantiles, we recommend using three scenarios. It also includes the recommendation of using basic graphs and figures.

Technical presentation form

Approaches that demand a more active interest from the individual and a higher financial literacy or use of web sites (or possibly both) belong in this category. As such, we do not recommend to use these approaches in the first wave of communication. In our opinion it is suitable to use them as additional options (for example personalized account on the web site).

Recommendation for technical presentation form: More complicated distribution graphs and more sophisticated statistics. We do not recommend using these together with the basic message but rather providing these for example in a specific part of the website. Similarly, it is recommended to interpret the use of interactivity as an additional tool and not to use it as a key form of information.

4.3.3 Distribution Channels

Of all the distribution channels used for communication within campaigns in the Chapter 3.2.4, three of them are the most suitable for communication of personalized information. These are letters, phone and the internet.

Distribution channels reaching most of the people like television, radio, leaflets, seminars, etc. are suitable to use as an additional communication form – for example as a part of a campaign that should prepare people to introduce personalized information about pension or to increase overall financial

literacy in the pension area as such. Most countries prefer to use more distribution channels. Modern platforms and internet communication are on the rise in general.

When selecting a particular distribution channel, it is necessary to think about the fact that the channel should be chosen based on the target group. Different distribution channels should be chosen for young people, older people, etc. If we want to address more target groups, a combination of more distribution channels should be used.

Channels suitable for individual information about future pension values are described in more detail below.

4.3.3.1 Paper

Paper form is suitable for communication when we expect passivity on the part of the recipients. The advantage of this form is that we can easily arrange to get the information to all recipients from our target group. Besides this general fact, the paper form is more suitable for recipients from older age ranges. As mentioned earlier (in the chapter on literature review), Sweden conducted a survey on the subject. This survey found that people over 55 years of age better like the information about pension value via paper form. Whereas it works the other way around for young people. A drawback of the paper form is that we cannot be sure that recipients will read the respective letter and that the provided information was received.

4.3.3.2 Telephone

When it comes to informing by telephone, it is not ideal to inform a large mass of people in this way. It is better to use this option as an addition to some other channel. For example, if people are not clear about the information they received through another distribution channel, they can use the phone and specialized lines to have the information explained. Shortage of this approach is that there has to be an activity from the information recipient – the information has to be received by the recipient, and he has to be interested in the topic enough that he wants to learn more about it to actively do something about it. On the other hand, this may be a good way for the elderly people if they need some explanation (there is a higher probability that these people will not want to work with the Internet).

4.3.3.3 Mass Media

If we have information that we want to communicate to a large group of people, it seems that mass media (television, radio, press, etc.) is the most effective way to do it. We can choose specific mass media according to who we want to address. For example, depending on whether we want to target elderly people or younger people, we can distinguish by time of day or by type of media (for example television/radio etc.). If we choose to communicate through mass media we have to bear in mind that it is not suitable for communicating individualized information. It will never be possible to communicate personalized information to a particular person through mass media.

4.3.3.4 Internet

Broadcasting information over the Internet is more suitable for younger and middle age groups (however, this cannot be seen as a dogma). The advantage of the Internet as a distribution channel is that we can change the information we communicate and get it to the recipients quickly. On the other hand, there has to be some degree of proactivity on the target group's side. People have to make an effort to visit the site (or to log into a special web interface etc.). Without any discussion, the variability and adaptability is the biggest advantage of the Internet. Another interesting advantage can be the possibility to use several different channels – for example social networks (such as Facebook, Instagram, Twitter...) video platforms (YouTube) or news portals. Possibilities are quite wide and therefore, the impact and the efficiency can be interesting.

The Czech Social Security Administration has its website where individuals (behind a login gate) can see some information related to their pension. Specifically, it is an overview of insurance periods, what kind of period it was, how long this period was (in days), what periods are excluded, and what are the amounts of assessment bases, and the information about individual employers. Each individual can

decide whether to view this information as disaggregated or aggregated. If the individual has less than five years until his retirement age, he can use a provided calculator and review potential retirement value. Slight limitation to this approach is that only a person with data mailbox can log in to this portal. Therefore, the current approach cannot be used for mass information about pensions – both in terms of access (requiring a data mailbox complicates access) and in terms of content. The information that is provided to people should be extended as described in Chapter 3.2.4. Therefore, a question remains, whether it is better to try to modify the existing website or whether it is better to create a brand new web portal that will meet all requirements defined by MoLSA.

We consider the paper form for distribution of communicated information as suitable from our point of view. However, we recommend considering a comprehensive mix of distribution channels. For example, Estonia wanted to engage and improve PR during their communication campaign. They used television, radio, print media, web, etc. In Italy, there was a similar approach. There were conducted campaigns that were entrusted to a specialized PR agency.

Various countries perceive issues related to financial literacy as important and supplementary pension insurance may be used as means to improve financial literacy, e.g. through special websites (Denmark or New Zealand). However, a growing utilization of interactive web interfaces, specialized websites and social media is an overall trend across most countries. For example, Sweden, Slovakia, New Zealand, Denmark, the Netherlands or the UK can be mentioned.

4.3.4 Course of the Campaign

In this chapter, we summarize what we consider the best way to prepare a communication campaign about pension value towards the population. Following upon conducted research and campaign successes from various other countries, there are some crucial steps that should not be omitted. We should be clear about the message we want to pass on to the recipients – in our case it is future pension value for the individual. Further, it is important to set up the main campaign target (and possibly sub targets according to how specific the main target is). For our situation, the main target can be, for example, to raise awareness of the pension issue and the individual target that leads to the fulfilment of the main target – for example, to determine the percentage increase in awareness among individual groups of people according to their age or increase the percentage of people actively trying to influence the amount of their future pension value. Regarding the fact that the goal is to measure improvement over the current situation, it is important to survey before the campaign begins (this is the tool that helps us to find out what the current situation is). That way we will have a comparison for the ongoing evaluation of the communication campaign. In our opinion the ongoing evaluation and feedback from the recipients on the information is also an important part of the campaign (it is also confirmed by the OECD, see Chapter 3.2.2.3).

Another important point before the campaign starts is to determine target groups. Regarding to the fact that MoLSA wants to communicate pension value across the entire population, the campaign should be targeted to more target groups, because the entire population is too big a group and it is not homogeneous enough. We also consider it very important that every group has its specifics and it is required to approach every group differently according to its specifics as well as to think about proper targeting communication (including chosen ways of communication). Moreover, it is equally important to have a specific campaign timeframe and budget. We understand that the campaign will have a long-term character. Despite this fact, it is important to set an exact timeframe (for example for individual targets, etc.)

Another key aspect of the campaign is its clarity. To achieve this, it is really important to have a good understanding of target groups. That brings us back to the point mentioned above – it is important to map the current situation before the campaign starts and get to know our recipients. In our opinion the main factor influencing the individual's ability to understand the communicated information about the future pension value is his financial literacy. We recommend conducting a financial literacy survey before setting up and running the campaign. A relatively common phenomenon is that increasing financial literacy is a partial target of communication campaigns of pensions (it worked like this for example in these countries from our research – Singapore or New Zealand in Chapter 3.2.4). Another step how to support the clarity is to conduct a „piloting“. Once the specific form and content of the letter through

which MoLSA wants to communicate the future pension amount is created, it should be found out whether the target group understands it or whether it needs any adjustments.

From the communicated needs by MoLSA we understand that the requirement for information on the pension amount is primarily through paper form. However, we recommend thinking about the creation of a specialized website that would focus only on the pension issue. People would have all information in one place there. Moreover, this path – the establishment of a specialized website – is chosen by the vast majority of countries from our research (Slovakia, Sweden, Poland and the Netherlands). The website can also hold several functions. In phase one it can provide things mentioned above – namely comprehensive information in one place. In the next phases there can also be a possibility to log in to the web interface and view personalized information about potential future pension amount, the option to view the possible pension amount under different scenarios, etc. We know that the Czech Social Security Administration already has a portal where an individual can view information about his pension. However, we also see shortcomings of this portal. The important shortcomings of the Czech Social Security Administration portal are in its accessibility – the portal is accessible only for people with a data mailbox. Another shortcoming is in the fact that the website is not specialized only on providing information about pension issues.

Last but not least, we consider it important that marketing communication to target groups about these initiatives should not be underestimated. Therefore, let people know that there is some effort to inform the population about retirement value or that there is a specialized website and what is the purpose of all of that. Several communication campaigns failed since there was not enough awareness among people. The overall trend in the world is that there is a real effort for complex communication. For example, creation of a specialized website, association with a certain color (for example, in Sweden the association of orange color which means things related to pensions, in Great Britain pensions are connected with blue colors and a characteristic bus), comprehensive communication via the Internet and social networks (Facebook, Instagram, etc.) or reservation of a certain month of a year that is dedicated to the communication of pensions (for example, in early May letters are sent out and contain the information about possible future pension amount and throughout May there are ongoing activities to raise people's interest in pensions).

4.4 Summary and Evaluation of Proposals

Below in Table 14 we see the evaluation of individual proposals in terms of specified parameters, namely the possibility to inform through paper form, whether the Variant requires some modification of the microsimulation model, what is the complexity of inputs to the model, how high is the accuracy of reported results and computational complexity.







Based on these parameters, we see Variant 1 and Variant 6 as the most suitable option. Both of these Variants meet the requirement of MoLSA and their results can be presented via paper form and at the same time no modification of the existing microsimulation model needs to be made.

On the contrary, we evaluate Variant 2 and Variant 3 as not entirely suitable. Both Variants are very computationally demanding and require modification of the existing model. In addition, Variant 2 needs inputs that MoLSA does not currently have at its disposal. In Variant 3, on the other hand, it is not optimal to inform about the results via paper form, which in our understanding is an important parameter for MoLSA.

We can look at the overall evaluation of variants according to the given parameters below.

A more detailed analysis of the proposals we introduce in the study is provided in Chapter 5 below.

Table 14: Evaluation of proposal

	Paper form	Model adjustment	Input requirements	Accuracy of results	Computational complexity	Overall evaluation
Variant 1	Yes	No	According to the chosen variant	Medium	Medium	
Variant 2	Yes	Yes	High	High	High	
Variant 3	No	Yes	Low	High	High	
Variant 4	No	No	Low	Medium	Medium	
Variant 5	Yes	No	Low	Low	Low	
Variant 6	Yes	No	Low	Depends on the chosen variant	Low	

5 Recommendation of the Most Suitable Approach

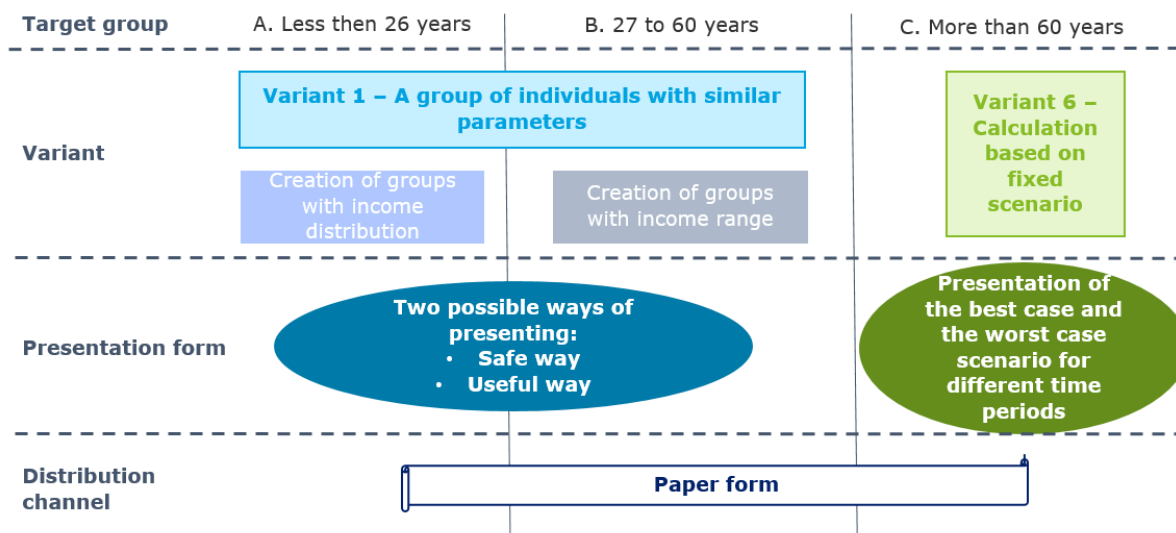
In this chapter, Deloitte's recommendations for individual communication with citizens on their future pension value is presented. The discussion regarding the realization of the campaign itself took place in the previous chapter. This chapter focuses on the content and form of presentation of the message in such a way that it allows information to be sent through letters.

Presentation of the proposal:

Below is a detailed description of the recommended choice of target groups, the choice of suitable variants, an appropriate form of presentation and distribution channel. We recommend distinguishing the informing approach for 3 different target groups (A, B, and C), using two of the presented variants (and two of the additional proposals). In total, we present 3 possible forms of presentation: a safe way and a useful way for target groups A and B and the presentation of the worst and the best possible scenarios for different periods for group C. We see the paper form as a suitable distribution channel for all target groups. For better clarity, the recommendation is visualized in *Figure 21: Deloitte's recommendation of suitable approach*. Furthermore, the individual parts of the recommendation are discussed, namely:

- Choice of target groups
- Use of variant
 - Use of Variant 1 for target group A and B
 - Use of Variant 6 for target group C
- Form of presentation
 - Form of presentation for target groups A and B – Safe way
 - Form of presentation for target groups A and B – Useful way
 - Form of presentation for target group C – Presentation of the worst and best possible scenarios for different periods
- Distribution channel

Figure 21: Deloitte's recommendation of suitable approach



5.1 Target Groups

For the sake of usability of the proposal, we recommend dividing the population into 3 target groups according to age (see discussion in Chapter 4.3.1). The first target group (group A) are people under 26 years of age. We assume that this group will capture students and people with a very short work history. It is, therefore, logical to treat people in this group in a similar way. Secondly, we will introduce the target group C, people older than 60 years. Thus, these are persons who are close enough to retirement age and their work history is for the most part clearly defined (alternatively, group C can be defined as persons who will retire in less than X years, e.g. 5). The remaining target group B logically includes all persons between these two groups, i.e. persons with at least some work history but still considerable time to retire. For target group B, it is possible to mention minor differences in the way of presenting, which is discussed in the next part of the chapter.

In general, it is advisable to divide the population into groups as homogeneous as possible, which leads to the use of more than three target groups, but in terms of practical feasibility and complexity of preparation, we recommend using a smaller number of target groups. The choice of target groups can be (and often is in practice) adjusted during the communication on the basis of ongoing evaluation. However, we consider the above-mentioned division into at least 3 groups to be necessary. The presented choice of 3 target groups is made for groups based on the expected availability of historical information (low amount of information for people under 26) and based on the expected demand for information (people close to retirement age require more specific information).

A similar division is used, for example, in Canada (see Chapter 3.1.7.3), where different communication is released for the target group 18 to 29 years old (a sufficiently good estimate of the pension amount is not expected, therefore, it is only communicated what part of the individual income goes to pension and what earnings are taken into account in this matter) and for a group of people aged 30 and over (the communication also includes the potential future pension value).

5.2 The Use of Variants

Our preferred variants are Variant 1: Group of individuals with similar parameters for target groups A and B and Variant 6: Calculation based on a fixed scenario for target group C. We consider these variants to be the most suitable to use, as already discussed in Chapter 4.4.

We will now look at the use of variants for individual target groups.

Use of Variant 1 for target group A (less than 26 years):

We recommend creating groups with income categorization, as follows:

- Create groups mainly based on categorical parameters, specifically according to sex and education (total of 8 groups).
- Age does not need to be used for division, at this stage it does not play a significant role in determining the amount of pension. All used modelpoints can be set, for example, 18 years old. This may not be the case if the system is modified and the rules become different, for example, for people under 22 and over 22, or if a different retirement age is introduced for each birth year – in which case it will be necessary to divide the groups in more detail.
- Assign approx. 10,000 modelpoints to each group. The required number of results is higher because the amount of income is assigned based on income distribution in the society and therefore a larger number of simulations is needed for the convergence of results.
- Within the group, divide the initial income according to the respective income distribution in society (e.g. high school educated women) among the selected 10,000 modelpoints. In this way, we avoid assigning an individual to a group based on income, which in this group may be either unavailable (the individual has not yet participated in working life) or misleading (these may be part-time employments, etc., which do not fully correspond to the expected life path of the individual).

The remaining settings are identical to the settings listed in Chapter 4.1.1.

Use of Variant 1 for target group B (27 to 60 years):

We recommend creating groups with an income range, as follows:

- Create groups based on categorical variables, i.e. according to sex and education, but also the year of birth and the amount of income (Chapter 4.1.1.2 deals with the creation of groups in more detail).
- To ensure calculability and thus usability of the variant, we recommend choosing an upper limit for the total number of groups, e.g. approximately 800 groups in total.
- Run a simulation for approx. 1,000 modelpoints in each group.
- Computational capacity allows increasing those numbers if this leads to more accurate results.

The remaining settings are identical to the settings listed in Chapter 4.1.1.

Use of Variant 6 for target group C (61 and over):

We recommend performing the calculation for the best and worst scenario of the future of the individual. At the same time, we recommend performing this calculation for each subsequent month in which the individual can retire, starting with the month in which the individual can first retire early and ending with a month, e.g. 5 years after this month (so that enough values presenting the amount of the pension for the case of overrunning).

We recommend obtaining the worst-case scenario or lower estimate under the following assumptions:

- No addition to the replacement insurance period – only the substitute insurance period available to MoLSA will be used for the calculation.
- If the information on the number of children is not available, we recommend assuming a minimum number of children for the individual (this approach is only relevant if they are individuals whose retirement age depends on the number of children).
- If the individual does not meet the condition of 35 years of paying the insurance premium, we recommend adding only the necessary missing part for the calculation. At the time of retirement, only the necessary insurance payment period for entitlement to pension is assumed for the calculation with this approach.
- The growth of the assessment base is not expected, the calculation will be performed based on the already existing assessment base.

We recommend obtaining the best case scenario or upper estimate under the following assumptions:

- All periods of non-payment of social insurance for which MoLSA does not have available information are assumed as substitute periods of insurance. This maximizes total insurance period in the past.
- In cases where it is relevant (retirement age depends on the number of children), we recommend assuming the maximum possible number of children, which reduces the retirement age to the lowest possible value.
- We recommend assuming a continuous increase in the insurance payment period up to the time of retirement (the individual pays premiums all the time). This maximizes total insurance period in the future.
- We recommend assuming an increase in the assessment base (e.g. based on wage inflation).

We recommend leaving the resulting values in the form of future value (this is not a distant future and transformation to the current value may, on the contrary, cause confusion, because the real numbers of acquired pensions amounts will then be different).

Alternatively, the average scenario can be calculated, based on the use of average assumptions (e.g. average number of children, average insurance period, etc.). This expected scenario can then be presented together with the upper and lower limits for estimating the pension amount. Average

assumptions can also be obtained using a microsimulation model, as described in Approach 3 for Variant 6 in Chapter 4.1.6.

We understand that the primary goal of MoLSA is to communicate forecasts obtained using a microsimulation model, but we recommend considering this approach as well (using two or three fixed scenarios), especially for target group C, where it is not necessary to estimate the future development for a significant period. On the contrary, it is appropriate to obtain the fair values of the pension amount at a time that is not far from the present.

5.3 The Form of Presentation

Form of presentation for target groups A and B:

For these target groups, we recommend considering one of the following two forms of presentation (or their combination):

- Safe way of presenting (safe in the sense that a wide range of the pension amount is presented, so the communicated information does not sound like a "guarantee" provided by MoLSA)
- Useful way of presenting (useful in the context of the end user/intended recipient, to whom it also presents a practical proposal on how to improve his prospects for the future pension amounts)

A safe way of presenting

From the simulated values, we recommend creating quantiles for each group and presenting the three selected quantiles as the pension amount for three different scenarios – pessimistic, neutral, and optimistic. Scenarios appropriately illustrate the uncertainty of future development and at the same time present the pension amount under an average development and in more extreme scenarios as well. For each scenario, we recommend using the 5% quantile, the median, and the 95% quantile, values should be given in whole numbers, in absolute value and in the present value (the choice of quantiles depends on the preference of the Ministry of Labor and Social Affairs).

We recommend providing a simple explanation of the meaning of the scenarios, the values displayed, and a notice that this is an estimate, not a guarantee.

We also recommend adding information regarding the retirement age (or the insurance payment period), as already mentioned in the additional proposal in Chapter 4.2.1. We consider providing information on the retirement age to be necessary, it can be supplemented by information on the age for early retirement (with a notice that it is subject to a reduction).

Providing information on retirement age is common practice in many countries, as is the use of scenarios, see e.g. informing in Slovakia (Appendix 1) or Netherlands (Figure 8). The study Brüggem, Rohde, and Broeke (2013) mentioned in Chapter 3.2.3 also sees potential in the use of scenarios.

An example of the use of the proposal is shown below in *Figure 22: Illustrative example of the safe way of presenting* (this is only an illustrative example not suitable for real use).

Figure 22: Illustrative example of the safe way of presenting

Dear Mr. Novák,		
Your retirement age is 65 years. At this age, you will be entitled to a state pension, which may be as follows:		
Pessimistic scenario	Neutral scenario	Optimistic scenario
12 345 CZK	14 643 CZK	16 812 CZK
<p>The pessimistic scenario captures a combination of poor economic development and unfavorable development of your working life, the neutral scenario expects the average development of the economy and your working life, and the optimistic scenario represents a combination of above-average good economic development and above-average successful development of your working life. The amounts are given in today's prices, which means that the purchasing power of your pension will correspond to these values.</p> <p>These amounts are only an estimate of the possible situation and do not guarantee a state pension of this amount.</p>		

A useful way of presenting

From the simulated values, we recommend choosing one value that will be presented to the final recipient. We recommend presenting the median pension value within the group but avoiding more complicated terminology. We also recommend presenting the value in absolute value and at present value.

We subsequently recommend displaying the presented value in relative value by comparing it to the individual's current income, as this comparison is easy to grasp for most.

Thus, the individual knows that at the time of retirement, his retirement income will be, for example, about 40% of his current income. We recommend following this information with a practical example of how this percentage can be increased and a higher standard of living can be achieved. Ideally, it can be linked to the additional proposal from Chapter 4.2.2, which proposes to inform about the amount of funds resulting from private savings (to state how much these funds will increase the pension or whether the individual should adjust the amount of regular contributions).

However, the current settings do not link state pension with private savings. We, therefore, propose to communicate a theoretical example of savings and its specific impact on individuals. Specifically, we see two possible approaches:

- Approach 1: Inform the final recipient how much they have to contribute per month so that their total income corresponds to the selected percentage of current income (e.g. 60%). The disadvantage of this approach is that it does not take into account the already saved funds and for older age groups that would have retired in a shorter period, absurd recommendations may be delivered (e.g. for recipients aged 59, it would be necessary to contribute CZK 15,000 per month). The advantage, on the other hand, is a clear message with precise instructions on how to increase the expected pension amount (e.g. if you want to have a retirement income corresponding to approximately 60% of your current income, you must start contributing CZK 1,200 per month).

- Approach 2: Inform the final recipient how much he should have on his saving account at the time of retirement so that he can increase his income to, for example, 60% of his current income. The individual will then assess whether his funds from private savings are sufficient or not (e.g. if you want to have pension amount corresponding to approximately 60% of your current income, you must have saved CZK 1,200,000 at the time of retirement). The advantage of this approach is applicability for all individuals, but the obvious disadvantage stems from the requirements for the individual, who must work further with the information and take into account his personal situation.

When using these approaches, the use of Approach 1 may be appropriate for the target group A and for younger individuals in the target group B, for whom a high amount saved in private savings is not expected yet and, on the contrary, less interest in future pensions is expected. Simpler information, with which people do not need to work further on, can then be more comprehensible and easier to use for individuals. Conversely, we consider Approach 2 to be more appropriate for older individuals in target group B, where, firstly, the amounts saved may be significant (and thus the information provided under Approach 1 would be misleading) and secondly, Approach 1 could give high figures for monthly savings (since individuals have less time to retire). Even here, however, it is possible to supplement approach 2 with a simple example of how such amounts can be achieved (e.g. with savings of CZK 5,000 per month in private pension savings, the amount of CZK 1,000,000 can be reached in ten years.)

In general, we recommend testing on real cases before using the particular variant, so that the final setting is appropriate and applicable within the population. For investment calculations, we recommend choosing a simple sample set of input assumptions (e.g. private pension savings with a regular fixed monthly contribution and a 2% appreciation.)

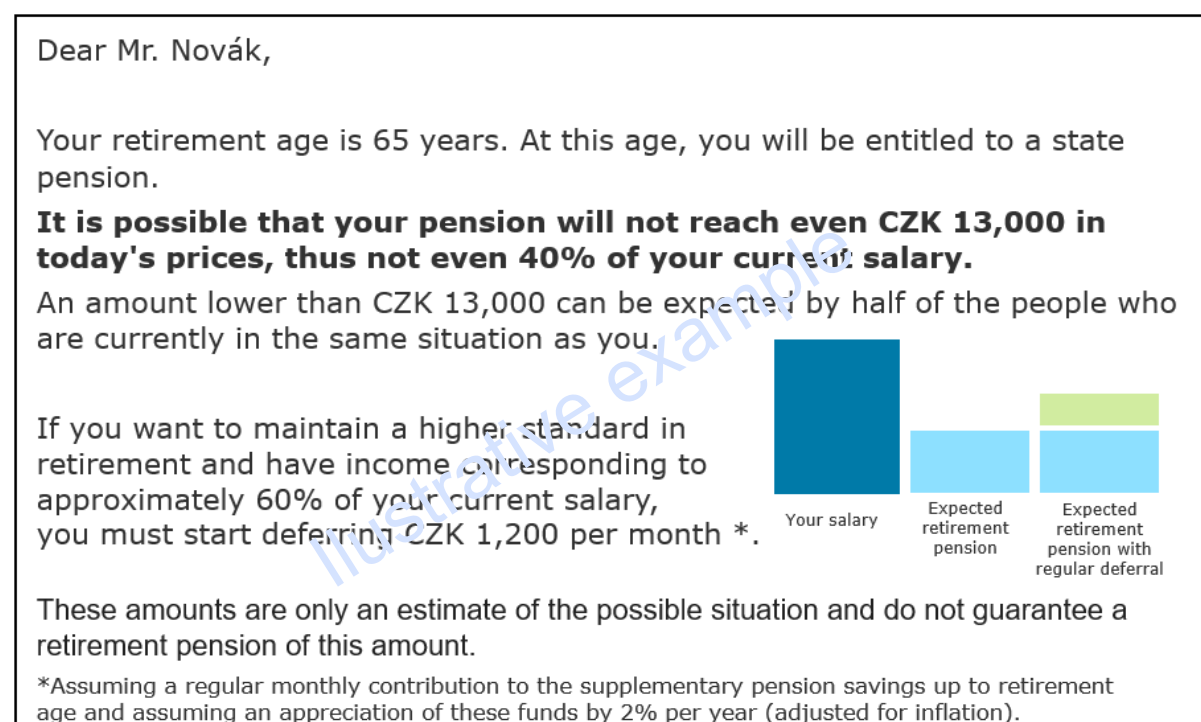
We recommend that you include a simple explanation of the meaning of the values presented and a notice that the presented number is an estimate and not a guarantee.

We also recommend supplementing the information with information regarding the retirement age (or the period of insurance), see the supplementary proposal in Chapter 4.2.1. We consider providing information on retirement age to be necessary. It can also be supplemented by the age for early retirement (with a notice that it is subject to a reduction).

Providing information on retirement age is common practice in many countries. Research shows that fear-raising campaigns providing specific instructions on how to deal with the situation are the most effective (see Chapter 3.2.1.1). Prast (2015) then states that providing information only on the pension amount is insufficient, as it is passive and does not motivate the individual to take any action. Therefore, we recommend including a section with a practical procedure for increasing the amount of the pension. The presentation of the pension amount in absolute value and its subsequent comparison with the income can be seen, for example, in Slovakia on the website of the Orange Envelope, for more detail see . A comparison with current income is also provided in the Netherlands, see *Figure 9: View the amount of pension for different retirement times*.

An example of the use of the design is shown below in *Figure 23: Illustrative example of the useful way of presenting* (this is only an illustrative example unsuitable for real use).

Figure 23: Illustrative example of the useful way of presenting



Missing information about education of an individual

In the context of the form of presentation of the pension amount for target groups, we want to mention the issue of incomplete information on the education of individuals. We recommend classifying individuals based on education, among other things. This is information that is not fully available to MoLSA (besides, younger individuals may not have yet completed their studies and this information is completely unknown). We see the following options for such procedure:

- Approach 1: Perform the calculation for all options and send them all to the final recipient.
- Approach 2: Do not use education when dividing groups, but present the results for a group containing modelpoints with all the education options.
- Approach 3: Choose a model example based on some best estimate (e.g. an individual started working at the age of 26, so he can be expected to be a university student) and publish possible other variants on the website.

For target group A, we consider Approach 1 to be appropriate, communicating all possible variants, or Approach 2. For target group B, we have the information on the income of individuals at our disposal, which has greater impact on the pension amount than education. For this reason, we do not consider the incompleteness of this information to be a very significant problem and we recommend solving it with Approach 2 or Approach 3, although these approaches require the creation of a support website for pension communication.

Form of presentation for target group C:

As mentioned above, for target group C, which has a shorter period until retirement age, demand for different kinds of information can be expected. A large amount of information needs to be communicated (e.g. lower and upper pension limits for each possible retirement month). In this case, we consider it more appropriate to inform using a graph, which is more suitable for presenting such a large number of values. However, there is a risk of misunderstanding on the part of the final recipients with this display method. To eliminate this problem, we recommend considering the use of an online environment (which

allows adjusting, e.g. with different ages or numbers of children), or limiting the amount of information communicated or a combination of these approaches.

We recommend not including the exact description of the calculation in the letter, but rather publishing it on MoLSA website.

For this target group, we also recommend communicating the conditions for entitlement to a state retirement pension and the situation of the individual in the context of these conditions. We consider providing information on retirement age to be necessary. For older age groups, this information depends on the number of children, which is an information unknown to MoLSA. We, therefore, recommend providing a complete overview for each given year of birth and sex. We recommend supplementing the information on retirement age with information on the age required for early retirement. We also recommend communicating the registered insurance period (based on which calculations are also performed).

Providing information on retirement age is common practice in many countries. Presenting the information on pension amounts for different retirement age is also used within the researched countries. Typically, however, websites are used for this purpose, which communicate information more clearly thanks to their interactivity, see, for example, informing in the Netherlands (*Figure 9: View the amount of pension for different retirement times*) or Denmark (*Figure 11: Information overview of pension on „PensionsInfo“ website*).

An example of the use of the proposal is shown below in **Chyba! Nenalezen zdroj odkazů.** (this is only a n illustrative example not suitable for real use).

In case that MoLSA would choose to present the pension amount using a specialized website to which the individual can apply, we recommend, for example, to send the expected pension amount for some fixed assumptions via paper form (e.g. average number of children, average insurance period, etc.) together with the login credentials for the website account. On the website, the individual can enter necessary input information and the resulting estimate of the lower and upper limit for these parameters will be displayed in a similar graphical way. Interactivity also allows you to provide the individual numbers, either by including the option to display tables instead of graphs or using an interactive graph, which displays the corresponding value after hovering the mouse over a specific place on the graph.

The MoLSA can also enable the recipient to fill in the planned retirement age (assuming he already knows it) and, given this already clear information, to show the development of the pension also in the context of the regular valorization of pensions.

Figure 25: Illustrative example for presentation of pension value development for specific retirement age below shows an illustrative example of the use of a proposal of a pension development display for a specific retirement date on a website (this is only an illustrative example not suitable for real use).

Figure 24: Illustrative example of form of presentation for the target group C

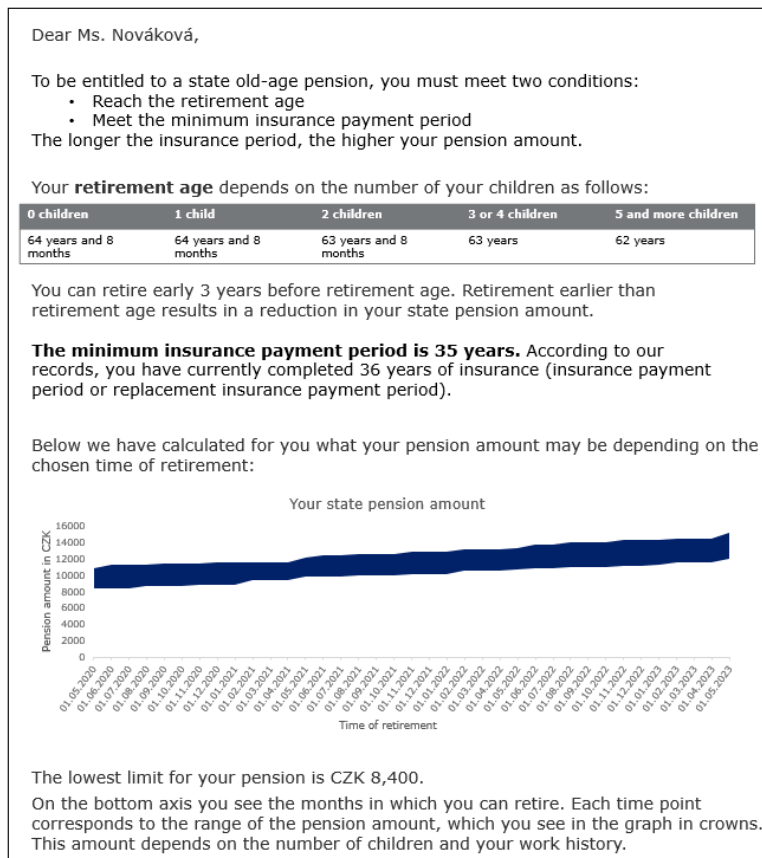
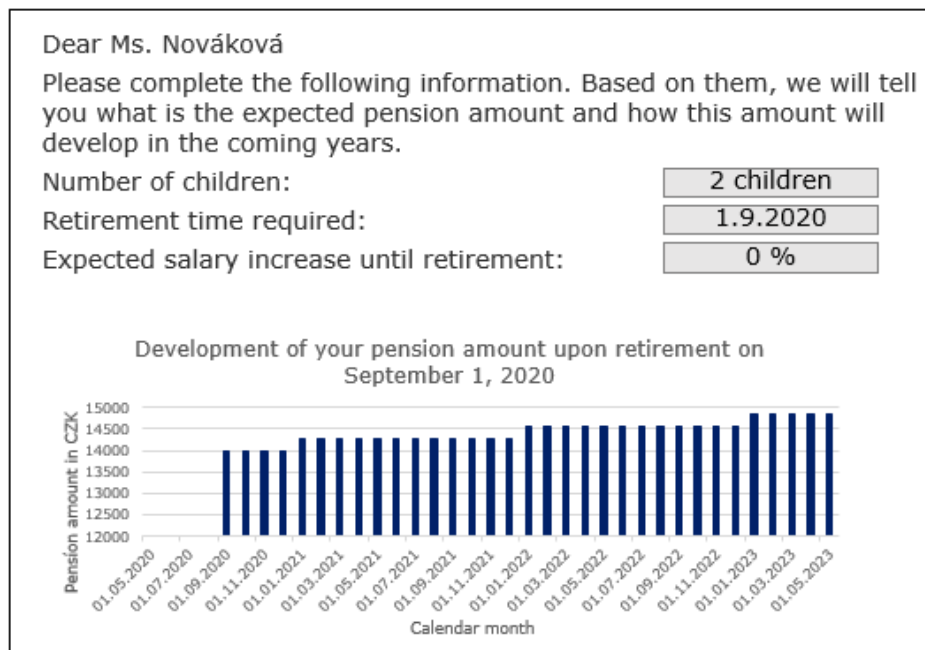


Figure 25: Illustrative example for presentation of pension value development for specific retirement age



5.4 The Distribution Channel

For all target groups, we recommend choosing a personalized way of communication in the form of letters, as it does not require active interest on the part of the recipients and allows for horizontal distribution of information. We encourage you to consider a transition or combination with an electronic form of letters (via email or data mailbox), which reduces the cost of this approach.

In the case of target group C, for which we recommend communicating a wider range of information, we recommend that you consider adding a web interface where an individual can log in and view specific information more clearly.

6 Overview of Used Literature and Sources

3.1

- [1] International Social Security Association, 2016. The Orange Envelope, a case of swedish pension agency. Available on: https://www.issa.int/documents/10192/17317507/2_Sweden_P-AFM-SUEDE_2016_212011.pdf/9b055d7b-71f6-4d45-a97e-69f3a485fdb6
- [2] VÝPIS Z OSOBNÉHO ÚČTU A VÝKAZ PREDPOKLADANÝCH DÔCHODKOVÝCH DÁVOK ÚČASTNÍKA, slov-lex.sk. [online]. Available on: https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2019/411/20200101#prilohy.priloha-priloha_c_1_k_opatreniu_c_411_2019_z_z
- [3] Účastníci 3.piliera dostanú zrozumiteľnejšie výpisy. Ministerstvo práce, sociálnych vecí a rodiny Slovenskej republiky [online]. [cit. 2020-03-25]. Available on: <https://www.employment.gov.sk/sk/informacie-media/aktuality/ucastnici-3-piliera-dostanu-zrozumitelnejsie-vypisy.html>
- [4] Sporitelia v treťom pilieri dostávajú od januára podrobnejšie výpisy z účtov. *Webnoviny* [online]. 31. 01. 2019 [cit. 2020-03-25]. Available on: <https://www.webnoviny.sk/vofinanciach/sporitelia-v-tretom-pilierii-dostavaju-od-januara-podrobnejsie-vypisy-z-uctov/>
- [5] SMOROŇ, Ladislav. Ako na 2. pilier v roku 2019? (Ne)prišiel mi výpis, čo mám robiť Prečítajte si celý článok na: <https://www.podnikajte.sk/osobne-financie/2-pilier-2019> © Podnikajte.sk. *Podnikajte.sk* [online]. 20.2.2019 [cit. 2020-03-25]. Available on: <https://www.podnikajte.sk/osobne-financie/2-pilier-2019>
- [6] KOKOLOVÁ, Helena. Chcete sledovať vývoj vašej penzie? Podporte projekt oranžovej obálky. *HN Expert* [online]. 14.01.2020 [cit. 2020-03-25]. Available on: <https://hnonline.sk/expert/2072157-chcete-sledovat-vyvoj-vasej-penzie-podporte-projekt-oranzovej-obalky>
- [7] Simulačný model "Oranžová obálka". Tatra banka [online]. [cit. 2020-03-25]. Available on: <https://www.tatrabanka.sk/files/sk/dochodok/predstavenie-modelu.pdf>
- [8] Výška súkromnej penzie už nebude tajomstvom, Domáce Správy, Pravda.sk. [online]. Copyright © P E R E X, a. s. Available on: <https://spravy.pravda.sk/domace/clanok/478291-vyska-sukromnej-penzie-uz-nebude-tajomstvom/>
- [9] Ako môže penziám pomôcť jedna oranžová obálka, Allianz DSS. 2. pilier - starobné dôchodkové sporenie [online]. Available on: <https://www.asdss.sk/13802>
- [10] Oranžová obálka. [online]. Available on: <https://www.oranzovaobalka.sk/web/sk/>
- [11] Dôchodkový systém - MOLSAR SR. [online]. Available on: <https://www.employment.gov.sk/sk/socialne-poistenie-dochodkovy-system/dochodkovy-system/>
- [12] Slováci sú finančne podvýživení. Ukázal prieskum Nadácie Partners. NADÁCIA PARTNERS. [online]. Copyright © Partnersgroup Available on: <https://www.nadaciapartners.sk/detail/slovaci-su-financne-podvyziveni-ukazal-prieskum-nadacie-partners-7>

- [13] Ľudia v druhom pilieri majú byť lepšie informovaní, EKONOMIKA, ekonomika.sme.sk. [online]. Available on: <https://ekonomika.sme.sk/c/22105901/ludia-v-druhom-pilierii-maju-byt-lepsie-informovani-o-usporach-rozhodla-vlada.html>
- [14] Sporitelia v 3. pilieri dostanú podrobné výpisy - MOLSAR SR. [online]. Available on: <https://www.employment.gov.sk/sk/informacie-media/aktuality/sporitelia-3-pilierii-dostanu-podrobne-vypisy.html>
- [15] Sporitelia v 2. pilieri získajú komplexné informácie - MOLSAR SR. [online]. Available on: <https://www.employment.gov.sk/sk/informacie-media/aktuality/sporitelia-2-pilierii-ziskaju-komplexne-informacie.html>
- [16] Slováci môžu mať švajčiarsky dôchodok. Ak prekonajú strach z investovania a podielových fondov, NADÁCIA PARTNERS. [online]. Copyright © Partnersgroup. Available on: <https://www.nadaciapartners.sk/detail/slovaci-mozu-mat-svajciarsky-dochodok-ak-prekonaju-strach-z-investovania-a-podielovych-fondov-9>
- [17] Dynamický mikrosimulačný model dôchodkového systému - MOLSAR SR. [online]. Available on: <https://www.employment.gov.sk/sk/socialne-poistenie-dochodkovy-system/dynamicky-mikrosimulacny-model-dochodkoveho-systemu/>
- [18] Pension system in Sweden - Pension Funds Online. Asset allocation and contact data for pensions - Pension Funds Online [online]. Available on: <https://www.pensionfundsonline.co.uk/content/country-profiles/sweden>
- [19] Národní rozpočtová rada, Komparativní analýza penzijních systémů [online]. Copyright ©. Available on: https://unrr.cz/wp-content/uploads/2019/06/Informa%C4%8Dn%C3%AD-studie_Komparativn%C3%AD-anal%C3%BDza-penzijn%C3%ADch-syst%C3%A9m%C5%AF.pdf
- [20] OECD (2015), Pensions at a Glance 2015: OECD and G20 indicators, OECD Publishing, Paris. Available on: https://doi.org/10.1787/pension_glance-2015-en.
- [21] Government.se, The Swedish old-age pension system. [online]. Copyright ©. Available on: https://www.government.se/49aff8/contentassets/f48ac850ff0f4ed4be065ac3b0bcab15/the-swedish-old-age-pension-system_webb.pdf
- [22] Listy od ZUS już w drodze. Zakład rozpoczął informowanie o prognozie emerytur - Money.pl. Money.pl - Money.pl [online]. Copyright © [cit. 03.03.2020]. Available on: <https://www.money.pl/gospodarka/listy-od-zus-juz-w-drodze-zaklad-rozpoczal-informowanie-o-prognozie-emerytur-6393209478391425a.html>
- [23] Sökrresultat | Pensionsmyndigheten. Pensionsmyndighetens startsida [online]. Available on: <https://www.pensionsmyndigheten.se/sokresultat?query=orange+envelope>
- [24] World Bank Group, 2019, Sweden's Fifteen Years of Communication Efforts Copyright ©i,B, [online]. Available on: <http://documents.worldbank.org/curated/en/245621556880062665/pdf/Sweden-s-Fifteen-Years-of-Communication-Efforts.pdf>

- [25] Pensionsmyndigheten, Orange envelope shows how much you will get [online]. Available on: <https://www.pensionsmyndigheten.se/other-languages/english-engelska/english-engelska/orange-envelope-shows-how-much-you-will-get>
- [26] Pensionsmyndigheten, Publications about pensions. [online]. Available on: <https://www.pensionsmyndigheten.se/other-languages/english-engelska/english-engelska/publications0>
- [27] minPension, minPension is here to serve you. [online]. Available on: <https://www.minpension.se/minpension-se-info-pa-engelska>
- [28] SESIM - Dynamic Microsimulation [online]. Available on: <http://www.sesim.org/>
- [29] SESIM (Lennart Flood, Fredrik Jansson, Thomas Pettersson, Tomas Pettersson, Olle Sundberg & Anna Westerberg), A Swedish dynamic micro simulation model. Page 16. [online] Available on: <http://www.sesim.org/Documents/Handbook%20of%20SESIM.pdf>
- [30] The Economic Policy Committee and Directorate-General for Economic and Financial affairs, Pension Schemes and Projections Models in EU-25 Member States, 2007. Page 349. [online] Available on: https://ec.europa.eu/economy_finance/publications/pages/publication10173_en.pdf
- [31] Listy od ZUS już w drodze. Zakład rozpoczął informowanie o prognozie emerytur - Money.pl. Money.pl - Money.pl [online]. Copyright © [cit. 04.02.2020]. Available on: <https://www.money.pl/gospodarka/listy-od-zus-juz-w-drodze-zaklad-rozpoczal-informowanie-o-prognozie-emerytur-6393209478391425a.html>
- [32] emerytura.gov.pl . emerytura.gov.pl [online]. Available on: <http://www.emerytura.gov.pl/>
- [33] Poglądowa informacja o wysokości przyszłej emerytury z I filaru - Wyjaśnienie danych zawartych w informacji o stanie konta - ZUS. Strona główna - ZUS [online]. Available on: <https://www.zus.pl/swiadczenia/emerytury/kalkulatory-emerytalne/emerytura-na-nowych-zasadach/wyjasnienie-danych-zawartych-w-informacji-o-stanie-konta/pogladowa-informacja-o-wysokosci-przyszlej-emerytury-z-i-filaru>
- [34] Money.pl, Listy od ZUS już w drodze. Zakład rozpoczął informowanie o prognozie emerytur. [online]. Copyright ©. Available on: <https://www.money.pl/gospodarka/listy-od-zus-juz-w-drodze-zaklad-rozpoczal-informowanie-o-prognozie-emerytur-6393209478391425a.html>
- [35] Star Wars Day: May the Fourth be with you. The Pensions Advisory Service [online]. Copyright © Copyright 2020 The Pensions Advisory Service 120 Holborn, London EC1N 2TD [cit. 03.03.2020]. Available on: <https://www.pensionsadvisoryservice.org.uk/news/pensions-the-light-and-the-dark-side>
- [36] Home | IMA [online]. Copyright © [cit. 03.03.2020]. Available on: https://www.microsimulation.org/IJM/V6_2/2_IJM_6_2_2013_Li_Odonoghue.pdf
- [37] Overview - Pensions Policy Institute. Pensions Policy. UK Pension Statistics and Facts - Pensions Policy Institute [online]. Copyright © 2020 [cit. 03.03.2020]. Available on: <https://www.pensionspolicyinstitute.org.uk/about-us/models/>
- [38] Listy od ZUS już w drodze. Zakład rozpoczął informowanie o prognozie emerytur - Money.pl. Money.pl - Money.pl [online]. Copyright © [cit. 04.02.2020]. Available on:

- <https://www.money.pl/gospodarka/listy-od-zus-juz-w-drodze-zaklad-rozpoczal-informowanie-o-prognozie-emerytur-6393209478391425a.html>
- [39] Národní rozpočtová rada [online]. Copyright © [cit. 04.02.2020]. Available on: https://unrr.cz/wp-content/uploads/2019/06/Informa%C4%8Dn%C3%AD-studie_Komparativn%C3%AD-anal%C3%BDza-penzijn%C3%ADch-syst%C3%A9m%C5%AF.pdf
- [40] Aegon, Center for Longevity and Retirement, The New Social Contract: a blueprint for retirement in the 21st century, Poland report. 2018. Copyright ©. Available on: <https://www.aegon.com/globalassets/corporate-2018/research/2018-retirement-survey/poland-2018-country-report-english.pdf>
- [41] Ministerstwo Rodziny, Pracy i Polityki Społecznej (@MRPiPS_GOV_PL), Facebook [online]. Available on: <https://www.facebook.com/mrpipsRP/>
- [42] Ministerstwo Rodziny, Pracy i Polityki Społecznej, YouTube [online]. Available on: <https://www.youtube.com/user/MPiPSRP/videos>
- [43] Ministerstwo Rodziny (@MRPiPS_GOV_PL), Instagram [online]. Available on: https://www.instagram.com/mrpips_gov_pl/
- [44] Ministerstwo Rodziny (@MRPiPS_GOV_PL) Twitter. It's what's happening. [online]. Copyright © 2020 Twitter [cit. 04.02.2020]. Available on: https://twitter.com/MRPiPS_GOV_PL
- [45] emerytura.gov.pl . [online]. Available on: <http://www.emerytura.gov.pl/>
- [46] European Commission, Employment, Social Affairs & Inclusion [online]. Available on: <https://ec.europa.eu/social/main.jsp?catId=1124&langId=en&intPageId=4726>
- [47] PwC: wzrost, bezpieczeństwo, efektywność, Employee's Capital Pension Scheme – draft of new regulations. [online]. Copyright ©. Available on: <https://www.pwc.pl/en/articles/tax-news/2017/2017-12-13-employees-capital-pension-scheme-draft-of-new-regulations.html>
- [48] ZUS, Kalkulator emerytalny - prognozowana emerytura - Emerytura na nowych zasadach. Strona główna [online]. Available on: <https://www.zus.pl/swiadczenia/emerytury/kalkulatory-emerytalne/emerytura-na-nowych-zasadach/kalkulator-emerytalny-prognozowana-emerytura>
- [49] ZUS, Opis spraw - emerytury i renty. Strona główna [online]. Available on: <https://www.zus.pl/swiadczenia/emerytury/opis-spraw-emerytury-i-renty>
- [50] Wyniki wyszukiwania - ZUS. Strona główna - ZUS [online]. Available on: https://www.zus.pl/wyniki-wyszukiwania?p_p_id=searchportlet_WAR_searchportlet&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-3&p_p_col_count=1&_searchportlet_WAR_searchportlet_query=emerytura&_searchportlet_WAR_searchportlet_action=details&_searchportlet_WAR_searchportlet_cur=3&_searchportlet_WAR_searchportlet_articleId=2805496

- [51] W rządowej bazie sprawdzisz wszystkie oszczędności emerytalne. ZUS, KRUS, OFE - wszystko o Twojej emeryturze [online]. Available on: <https://serwisemerytalny.rp.pl/centralna-informacja-emerytalna-2/>
- [52] UK Government, State Pension [online]. © Crown copyright. Available on: <https://www.gov.uk/browse/working/state-pension>
- [53] UK Government, Get to Know Your Pension - Start planning for the retirement you want [online]. Available on: <https://www.yourpension.gov.uk/>
- [54] UK Government, Pension Wise | 50 or over? | Get to know your options. [online]. © Crown copyright. Available on: <https://www.pensionwise.gov.uk/en>
- [55] The Pensions Advisory Service.[online]. Copyright ©. Available on: <https://www.pensionsadvisoryservice.org.uk/>
- [56] Money Advice Service, Free and impartial money advice, set up by government. [online]. Copyright ©. Available on: <https://www.moneyadviceservice.org.uk/en>
- [57] UK Government, Pension Credit calculator - Department for Work and Pensions. [online]. © Crown copyright. Available on: <https://pensioncreditcalculator.dwp.gov.uk/pension-credit-calculator.php?new>
- [58] MEMBER | SOA [online]. Available on: https://www.soa.org/globalassets/assets/Files/Research/Projects/Chapter_6.pdf
- [59] A COMPLETE GUIDE TO CANADA’S RETIREMENT INCOME SYSTEM, Savvy New Canadians - Personal Finance For Canadians [online]. Available on: <https://www.savvynewcanadians.com/a-complete-guide-to-canadas-retirement-income-system/#workplace-pensions-rrsp>
- [60] Public Service Pension Plan Survey - Executive Summary - Canada.ca. [online]. Available on: <https://www.canada.ca/en/treasury-board-secretariat/services/pension-plan/pension-publications/reports/public-service-pension-plan-survey-executive-summary.html>
- [61] Statement of contributions to the Canada Pension Plan - Canada.ca. [online]. Available on: <https://www.canada.ca/en/services/benefits/publicpensions/cpp/statement-contributions.html>
- [62] Canadian Retirement Income Calculator - Canada.ca. [online]. Available on: <https://www.canada.ca/en/services/benefits/publicpensions/cpp/retirement-income-calculator.html>
- [63] General Information - Canada.ca, Canadian Retirement Income Calculator. [online]. Available on: <https://srv111.services.gc.ca/GeneralInformation/Index>
- [64] MEMBER | SOA [online]. Available on: https://www.soa.org/globalassets/assets/Files/Research/Projects/Chapter_6.pdf
- [65] INTERNATIONAL MICROSIMULATION ASSOCIATION, A survey of dynamic microsimulation models: uses, model structure and methodology, 2013. Copyright ©. Available on: https://www.microsimulation.org/IJM/V6_2/2_IJM_6_2_2013_Li_Odonoghue.pdf
- [66] Pensions Policy Institute, Pensions Policy - Overview. UK Pension Statistics and Facts [online]. Copyright © 2020. Available on: <https://www.pensionspolicyinstitute.org.uk/about-us/models/>

- [67] Money Advice Service, Pension information: guide to the basic facts. [online]. © Copyright 2020. Available on: https://www.moneyadviceservice.org.uk/en/articles/pension-information-guide-to-the-basic-facts?_ga=2.151256761.1651344785.1572519822-1383053595.1572519822
- [68] OECD.org, Pensions at a Glance 2019 OECD and G20 Indicators, 2019. Available on: <https://www.oecd.org/els/public-pensions/PAG2017-country-profile-United-Kingdom.pdf>
- [69] OECD.org, Pensions at a Glance 2017 How does the UNITED KINGDOM compare?, 2017. Available on: <http://www.oecd.org/unitedkingdom/PAG2017-GBR.pdf>
- [70] UK Government, personal pensions [online]. © Crown copyright. Available on: <https://www.gov.uk/personal-pensions-your-rights>
- [71] The Guardian, OECD: UK has lowest state pension of any developed country. [online]. © 2020 Guardian News. Available on: <https://www.theguardian.com/money/2017/dec/05/oecd-uk-has-lowest-state-pension-of-any-developed-country>
- [72] UK Government [online]. Available on: <http://www.gov.uk>
- [73] Aegon, Center for Longevity and Retirement, The New Social Contract: a blueprint for retirement in the 21st century, United Kingdom report. 2018. Copyright ©. Available on: <https://www.aegon.com/contentassets/44b70e9c50524f82a15da544a2f50cf7/uk-2018-country-report.pdf>
- [74] The Independent, Don't ignore your financial future, experts beg, UK and Worldwide News [online]. Available on: <https://www.independent.co.uk/money/spend-save/ignore-financial-future-pensions-awareness-savings-retirement-investments-old-age-a9103291.html>
- [75] UK Government, Check your State Pension age [online]. © Crown copyright [cit. 05.02.2020]. Available on: <https://www.gov.uk/state-pension-age>
- [76] Financial services Sergei Totrov, Canada's Retirement Income System [online]. Copyright © 2000. Available on: <https://www.totrov.com/en/pension-rrsp-2/pension-system/>
- [77] DYNACAN, A CANADIAN MICROSIMULATION MODEL FOR PUBLIC PENSION ANALYSIS, 1998. [online]. Available on: https://www.soa.org/globalassets/assets/Files/Research/Projects/Chapter_6.pdf
- [78] Government of Canada, Canada Pension Plan (CPP) Enhancement, 2016. [online]. Available on: https://www.fin.gc.ca/n16/data/16-113_3-eng.asp#ftn3
- [79] Canada.ca, Statement of contributions to the Canada Pension Plan. [online]. Available on: <https://www.canada.ca/en/services/benefits/publicpensions/cpp/statement-contributions.html>
- [80] Canada.ca, Canadian Retirement Income Calculator. [online]. Available on: <https://www.canada.ca/en/services/benefits/publicpensions/cpp/retirement-income-calculator.html>
- [81] Government of Canada, Canadian Retirement Income Calculator - Canada Pension Plan. [online]. Available on: <https://srv111.services.gc.ca/GeneralInformation/Index>
- [82] Global Retirement Reality Report 2018 [online]. 2018 [cit. 2020-03-03]. Available on: <https://www.ssga.com/investment-topics/retirement/global-retirement-reality-report-2018-balancing-flexibility-and-security.pdf>

- [83] Welcome | WGEA [online]. Copyright © [cit. 03.03.2020]. Available on: https://www.wgea.gov.au/sites/default/files/documents/unisa_work-care-health--retirement-report_digital.pdf
- [84] Australian government, Age pension. [online]. Available on: https://www.humanservices.gov.au/individuals/services/centrelink/age-pension?utm_campaign=eea-pf&utm_content=claiming&utm_medium=web-application&utm_source=eea
- [85] Australian government, Estimate my super. [online]. Available on: <https://www.ato.gov.au/calculators-and-tools/estimate-my-super/>
- [86] Australian government [online]. Available on: <https://www.moneysmart.gov.au/tools-and-resources/calculators-and-apps>
- [87] Australian government [online]. Available on: <https://www.moneysmart.gov.au/superannuation-and-retirement>
- [88] De Nederlandsche Bank, DNB and the Pension system [online]. Copyright © De Nederlandsche Bank Available on: <https://www.dnb.nl/en/about-dnb/dnb-pension-system/index.jsp>
- [89] Dutch Association of Industry-wide Pension Funds and Dutch Association of Company Pension Funds, The Dutch Pension System an overview of the key aspects. Copyright ©. Available on: <http://www.pensiondevelopment.org/documenten/The%20Dutch%20Pension%20System.pdf>
- [90] Sociale Verzekeringsbank, Your AOW pension age. [online]. Available on: <https://www.svb.nl/en/aow-pension/aow-pension-age/your-aow-pension-age>
- [91] Mercer, MELBOURNE MERCER GLOBAL PENSION INDEX. [online]. Copyright ©. Available on: <https://info.mercer.com/rs/521-DEV-513/images/MMGPI%202019%20Full%20Report.pdf>
- [92] Úřad Národní rozpočtové rady, Komparativní analýza penzijních systémů. [online]. Copyright. Available on: https://unrr.cz/wp-content/uploads/2019/06/Informa%C4%8Dn%C3%AD-studie_Komparativn%C3%AD-anal%C3%BDza-penzijn%C3%ADch-syst%C3%A9m%C5%AF.pdf
- [93] Netspar, Pension Communication in the Netherlands and Other Countries. [online]. Copyright ©. Available on: https://www.netspar.nl/assets/uploads/P20181507_DP036_VanSoest.pdf
- [94] Sociale Verzekeringsbank, AOW pension. [online]. Available on: https://www.svb.nl/int/en/aow/hogte_aow/bedragen/index.jsp
- [95] Flexsecurity, Uniform Pension Overview. [online]. Available on: <https://www.flexsecuritypensioen.nl/en/faq/uniform-pension-overview/>
- [96] Pensionenfonds Zorg & Welzijn, [online]. Copyright ©. Available on: <https://www.pfzw.nl/content/dam/pfzw/web/particulieren/uniform-pensioenoverzicht/2019-voorbeeld-upo.pdf>
- [97] Mijnpensioenoverzicht.nl, Wat vind ik op Mijnpensioenoverzicht.nl. YouTube [online]. Available on: <https://www.youtube.com/watch?v=-WOWWDMV-Fc>
- [98] Grant Thornton, Pensioen 1-2-3 vervangt het UPO [online]. Available on: <https://www.grantthornton.nl/insights/actualiteiten/pensioen-1-2-3-vervangt-het-uniform-pensioen-overzicht/>

- [99] Mijnpensioenoverzicht.nl, Welkom op Mijnpensioenoverzicht.nl. [online]. Copyright © 2020. Available on: <https://www.mijnpensioenoverzicht.nl/>
- [100] Pensioenkijs.nl., Dé onafhankelijke site over al uw pensioenkwesties - [online]. Copyright © Pensioenkijs 2020. Available on: <https://pensioenkijs.nl/>
- [101] Pension to be attained in three scenarios – DEPF. DEPF – DuPont European Pension Fund [online]. Copyright © 2017 DuPont. Alle rechten voorbehouden. OFP DuPont European Pension Fund, Antoon Spinoysstraat 6, 2800 Mechelen [cit. 03.03.2020]. Available on: <https://www.depf.eu/en/pension-to-be-attained-in-three-scenarios/>
- [102] Micro Simulations on the Effects of Ageing-Related Policy Measures: The Social Affairs Department of the Netherlands Ageing and Pensions Model by Jan-Maarten van Sonsbeek :: SSRN. [online]. Available on: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1411781

3.2

- [103] OECD, Improving pension information and communication [online]. Copyright ©. Available on: https://www.oecd.org/daf/fin/financial-education/TrustFund2013_OECD_%20Improving_Pension_Information_and_Communication.pdf
- [104] OECD, Lessons from National Pensions Communication Campaigns [online]. Copyright ©. Available on: <http://www.oecd.org/finance/private-pensions/50255339.pdf>
- [105] PensionsInfo. Velkommen [online]. Available on: <https://www.pensionsinfo.dk/Borgerservice/velkommen.html>
- [106] Sorted - Your independent money guide, Calculators and money tools to manage your finances [online]. Copyright © 2020, Commission for Financial Capability. Available on: <https://sorted.org.nz/tools/retirement-planner>
- [107] ZAMAZALOVÁ, Marcela. Marketing. 2., přeprac. a dopl. vyd. V Praze: C.H. Beck, 2010. Beckovy ekonomické učebnice. ISBN 978-80-7400-115-4.
- [108] KARLÍČEK, Miroslav a Petr KRÁL. Marketingová komunikace: jak komunikovat na našem trhu. 2., přeprac. a dopl. vyd. Praha: Grada, 2011. Beckovy ekonomické učebnice. ISBN 978-802-4735-412.
- [109] KARLÍČEK, Miroslav a Petr KRÁL. Základy marketingu: jak komunikovat na našem trhu. 2., přepracované a rozšířené vydání. Praha: Grada, 2018. Beckovy ekonomické učebnice. ISBN 978-802-4758-695.
- [110] KARLÍČEK, Miroslav a Petr KRÁL. Marketingová komunikace: jak komunikovat na našem trhu. 2., aktualizované a doplněné vydání. Praha: Grada Publishing, 2016. Beckovy ekonomické učebnice. ISBN 978-80-247-5769-8.
- [111] FTOREK, Jozef a Petr KRÁL. Public relations jako ovlivňování mínění: jak úspěšně ovlivňovat a nenechat se zmanipulovat. 3., rozš. vyd. Praha: Grada, 2012. Komunikace (Grada). ISBN 978-80-247-3926-7.
- [112] OECD.org - OECD [online]. Copyright © [cit. 03.03.2020]. Available on: https://www.oecd.org/daf/fin/financial-education/TrustFund2013_OECD_%20Improving_Pension_Information_and_Communication.pdf
- [113] PRAST, Henriette, Federica TEPPA a Anouk SMITS. Is Information Overrated? Evidence from the Pension Domain: Working Paper No. 360. De Nederlandsche Bank, The Netherlands, 2012.

- [114] ALESSIE, Rob, Maarten VAN ROOIJ a Annamaria LUSARDI. Financial Literacy, Retirement Preparation and Pension Expectations in the Netherlands: DNB Working Paper No. 289. De Nederlandsche Bank, The Netherlands, 2011.
- [115] BARRETT, Alan, Irene MOSCA a Brendan J. WHELAN. (Lack of) Pension Knowledge [online]. Germany, 2013. Available on: <http://ftp.iza.org/dp7596.pdf>
- [116] CLARK, R., D'AMBROSIO, M., McDERMED, A., & SAWANT, K. (2006). Retirement plans and saving decisions: The role of information and education. *Journal of Pension Economics and Finance*, 5(1), 45-67. doi:10.1017/S1474747205002271
- [117] BRÜGGEN, Elisabeth, Ingrid ROHDE a Mijke van den BROEKE. Different people, different choices: The influence of visual stimuli in communication on pension choice [online]. 2013 [cit. 2020-03-03]. Available on: https://www.netspar.nl/assets/uploads/NDP_15_WEB.pdf. Tilburg University.
- [118] Atkinson, A. et al. (2012), "Lessons from National Pensions Communication Campaigns", OECD Working Papers on Finance, Insurance and Private Pensions, No. 18, OECD Publishing. <http://dx.doi.org/10.1787/5k98xwz5z09v-en>
- [119] The Pensions Authority [online]. [cit. 2020-03-03]. Available on: https://www.pensionsauthority.ie/en/I_want_to_start_a_Pension_PRSA/PRSAs/
- [120] KiwiSaver [online]. [cit. 2020-03-03]. Available on: <https://www.kiwisaver.govt.nz/>
<https://sorted.org.nz/>

4.3

- [121] The balance sheet of life: Knowing the three phases of personal finance - Lifestyle - The Jakarta Post. The Jakarta Post - Always Bold. Always Independent [online]. Copyright © 2016 [cit. 03.03.2020]. Available on: <https://www.thejakartapost.com/life/2019/09/06/the-balance-sheet-of-life-knowing-the-three-phases-of-personal-finance.html>
- [122] SOEPRAPTO, PANDU W. The balance sheet of life: Knowing the three phases of personal finance. The Jakarta Post [online]. Jakarta, September 6, 2019 [cit. 2020-03-25]. Available on: <https://www.thejakartapost.com/life/2019/09/06/the-balance-sheet-of-life-knowing-the-three-phases-of-personal-finance.html>
- [123] EVERGREEN, Stephanie. Presenting Data Effectively [online]. 2013 [cit. 2020-04-29]. Available on: <https://stephanieevergreen.com/wp-content/uploads/2013/02/PDEHandout.pdf>
- [124] KISS, MICHELE. 10 Tips for Presenting Data. Observe Point [online]. 2018 [cit. 2020-04-29]. Available on: <https://resources.observepoint.com/blog/10-tips-for-presenting-data>
- [125] Presenting Data People Can't Ignore: How to Communicate Effectively Using Data. Prezi [online]. [cit. 2020-04-29]. Available on: http://cdn2.hubspot.net/hubfs/53/Presenting_Data_People_Wont_Ignore_Ebook.pdf

Figures sources

3.1

- [1] Oranžová obálka. [online]. Dostupné z: <https://www.oranzovaobalka.sk/web/sk/>
- [2] Simulačný model "Oranžová obálka". Tatra banka [online]. [cit. 2020-03-25]. Dostupné z: <https://www.tatrabanka.sk/files/sk/dochodok/predstavenie-modelu.pdf>

- [3] Vad är en prognos. *MinPension* [online]. [cit. 2020-03-11]. Dostupné z: <https://www.minpension.se/allt-om-pensioner/pension-for-nyborjare/vad-ar-en-prognos>
- [4] Canadian Retirement Income Calculator - General Information. *Government of Canada* [online]. [cit. 2020-03-11]. Dostupné z: <https://srv111.services.gc.ca/generalInfo/Index>
- [5] Canadian Retirement Income Calculator - General Information. *Government of Canada* [online]. [cit. 2020-03-11]. Dostupné z: <https://srv111.services.gc.ca/generalInfo/Index>
- [6] Payment and Service Finder. *Centrelink* [online]. [cit. 2020-03-11]. Dostupné z: https://www.centrelink.gov.au/custsite_pfe/pymtfinderest/paymentFinderPage.jsf?wec-appid=pymtfinderest&wec-locale=en_US#stay
- [7] Superannuation calculator: Find out your super balance at retirement. *Moneysmart* [online]. [cit. 2020-03-11]. Dostupné z: <https://www.moneysmart.gov.au/tools-and-resources/calculators-and-apps>
- [8] Pension to be attained in three scenarios. In: *DuPont European Pension Fund (DEPF)* [online]. [cit. 2020-03-11]. Dostupné z: <https://www.depfe.eu/en/pension-to-be-attained-in-three-scenarios/>
- [9] Wat vind ik op Mijnpensioenoverzicht.nl. *YouTube* [online]. 2016 [cit. 2020-03-11]. Dostupné z: <https://www.youtube.com/watch?v=-WOWWDMV-Fc>

3.2

- [10] KARLÍČEK, Miroslav a Petr KRÁL. Marketingová komunikace: jak komunikovat na našem trhu. 2., aktualizované a doplněné vydání. Praha: Grada Publishing, 2016. Beckovy ekonomické učebnice. ISBN 978-80-247-5769-8, translated
- [11] *Pensions Info* [online]. [cit. 2020-03-11]. Dostupné z: <https://www.pensionsinfo.dk/Borgerservice/bruger/overblik/overblik.html>
- [12] *Pensions Info* [online]. [cit. 2020-03-11]. Dostupné z: <https://www.pensionsinfo.dk/Borgerservice/bruger/overblik/overblik.html>
- [13] Retirement planner: See whether you're on track financially for the retirement lifestyle you want. *Sorted* [online]. [cit. 2020-03-11]. Dostupné z: <https://sorted.org.nz/tools/retirement-planner>
- [14] Source: study authors
- [15] Source: study authors
- [16] Source: study authors
- [17] Source: study authors
- [18] Source: study authors
- [19] Source: study authors
- [20] Source: study authors
- [21] Source: study authors
- [22] Source: study authors

- [23] Source: study authors
- [24] Source: study authors
- [25] Source: study authors

Sources of appendices

- [1] Príloha č. 1 k opatreniu č. 411/2019 Z. z. *Slov-Lex* [online]. [cit. 2020-03-12]. Available on: https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2019/411/20200101#prilohy.priloha-priloha_c_1_k_opatreniu_c_411_2019_z_z
- [2] 411/2019 Z. z.: Príloha č. 2 k opatreniu č. 411/2019 Z. z. *Slov-Lex* [online]. [cit. 2020-03-12]. Available on: https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2019/411/20200101#prilohy.priloha-priloha_c_1_k_opatreniu_c_411_2019_z_z
- [3] I. pilier: What Pension can I expect? *Oranžová obálka* [online]. [cit. 2020-03-18]. Available on: <https://focus.oranzovaobalka.sk/#!/16/pension/social-security/forecast>
- [4] Pensionsmyndigheten, Orange envelope shows how much you will get [online]. Available on: <https://www.pensionsmyndigheten.se/other-languages/english-engelska/english-engelska/orange-envelope-shows-how-much-you-will-get>
- [5] Ministerstwo Rodziny, Pracy i Polityki Społecznej. In: Facebook [online]. [cit. 2020-03-12]. Available on: <https://www.facebook.com/photo?fbid=1493771297453926&set=a.382674771896923>
- [6] RATAJCZAK, MATEUSZ. Listy od ZUS już w drodze. Zakład rozpoczął informowanie o prognozie emerytur. *Money.pl* [online]. 2019 [cit. 2020-03-12]. Available on: <https://www.money.pl/gospodarka/listy-od-zus-juz-w-drodze-zaklad-rozpoczal-informowanie-o-prognozie-emerytur-6393209478391425a.html>
- [7] Will the retirement you get bet he retirement you want?: Get to know your pension. In: Facebook [online]. Her Majesty's Government [cit. 2020-03-12]. Available on: <https://www.facebook.com/photo?fbid=1229902407198463&set=a.140852176103497>
- [8] Will the retirement you get bet he retirement you want?: Get to know your pension. In: Facebook [online]. Her Majesty's Government [cit. 2020-03-12]. Available on: <https://www.facebook.com/photo?fbid=1247188978803139&set=a.140852176103497>
- [9] Uniform Pensioenoverzicht 2020. Pensioenfonds Zorg en Welzijn (PFZW) [online]. 2019 [cit. 2020-03-12]. Available on: <https://www.pfzw.nl/content/dam/pfzw/web/particulieren/uniform-pensioenoverzicht/2020-voorbeeld-upo.pdf>
- [10] BRÜGGEN, Elisabeth, Ingrid ROHDE a Mijke VAN DEN BROEKE. Different people, different choices: The influence of visual stimuli in communication on pension choice. *Netspar, Network for Studies on Pensions, Aging and Retirement* [online]. 2013 [cit. 2020-03-12]. Available on: https://www.netspar.nl/assets/uploads/NDP_15_WEB.pdf

List of Tables

TABLE 1 : BASIC SUMMARY OF THE PARAMETERS OF SELECTED COUNTRIES.....	6
TABLE 2 : PENSION SYSTEMS OF THE REVIEWED COUNTRIES	9
TABLE 3 : COMMUNICATION OF THE AMOUNT OF PENSION IN EACH COUNTRY.....	12
TABLE 4 : INFORMING PEOPLE USING PERSONALIZED LETTERS/ACCOUNTS (“ORANGE ENVELOPE”).....	13
TABLE 5 : CALCULATORS OF THE AMOUNT OF PENSION IN EACH COUNTRY.....	14
TABLE 6 : MICROSIMULATION MODELS IN EACH COUNTRY	17
TABLE 7 : ADVANTAGES AND DISADVANTAGES OF VARIANT 1.....	63
TABLE 8 : ADVANTAGES AND DISADVANTAGES OF VARIANT 2.....	68
TABLE 9 : ADVANTAGES AND DISADVANTAGES OF VARIANT 3.....	72
TABLE 10 : ADVANTAGES AND DISADVANTAGES OF VARIANT 4.....	77
TABLE 11: ADVANTAGES AND DISADVANTAGES OF VARIANT 5	80
TABLE 12: ADVANTAGES AND DISADVANTAGES OF VARIANT 6	85
TABLE 13 : SUITABILITY OF EACH VARIANT ACCORDING TO TARGET AGE GROUPS	98
TABLE 14: EVALUATION OF PROPOSAL	110

List of Appendices

APPENDIX 1: A STATEMENT FROM THE PERSONAL ACCOUNT AND A STATEMENT OF THE PARTICIPANT'S EXPECTED PENSION BENEFITS	135
APPENDIX 2: STATEMENT FROM THE PERSONAL ACCOUNT AND STATEMENT OF PENSION BENEFITS OF THE RECIPIENT OF THE BENEFIT	137
APPENDIX 3: INFORMATION SHOWN IN THE SLOVAK ALTERNATIVE OF THE ORANGE ENVELOPE	138
APPENDIX 4: SWEDEN ORANGE ENVELOPE	142
APPENDIX 5: EXAMPLE OF INFORMING ON MRPIS FACEBOOK.....	144
APPENDIX 6: POLISH ANNUAL LETTER SENDEB BZ ZUS (AN ALTERNATIVE OF ORANGE ENVELOPE).....	145
APPENDIX 7: BRITISH CAMPAIGN CALLED: WILL THE RETIREMENT YOU GET BET HE RETIREMENT YOU WANT?	148
APPENDIX 8: DUTCH LETTER UPO (AN ORANGE ENVELOPE ALTERANTIVE).....	149
APPENDIX 9: BRÜGGEN, E., ROHDE I, BROEKE M. VAN DEN: DIFFERENT PEOPLE, DIFFERENT CHOICES. THE INFLUENCE OF VISUAL STIMULI IN COMMUNICATION ON PENSION CHOICE	153

List of Figures

FIGURE 1: BASIC INFORMATION ON PENSION ON THE WEBSITE NAMED ORANZOVAOBALKA.SK	20
FIGURE 2: MICROSIMULATION MODEL OF THE ORANGE ENVELOPE OF THE SLOVAK REPUBLIC	22
FIGURE 3: AN EXAMPLE OF THE DESCRIPTION OF THE PRODUCTION OF A FORECAST FOR THE VISITORS OF THE MINPENSION WEBSITE	24
FIGURE 4: OVERVIEW OF INFORMATION ON THE AMOUNT OF PENSION ON THE WEBSITE OF THE CANADIAN GOVERNMENT.....	32
FIGURE 5: GRAPHICAL REPRESENTATION OF THE AMOUNT AND STRUCTURE OF THE PENSION ON THE WEBSITE OF THE CANADIAN GOVERNMENT.....	32
FIGURE 6: PRESENTATION OF THE RESULT OF THE AUSTRALIAN PENSION CALCULATOR	35
FIGURE 7: GRAPHICAL REPRESENTATION OF THE PENSION AMOUNT DEVELOPMENT ON MONEYSMART.GOV.AU	36
FIGURE 8: PRESENTATION OF PENSION AMOUNT PENSION FOR VARIOUS ECONOMIC SCENARIOS IN THE NETHERLANDS.....	38
FIGURE 9: VIEW THE AMOUNT OF PENSION FOR DIFFERENT RETIREMENT TIMES	39
FIGURE 10: COMMUNICATION CAMPAIGN PHASES	42
FIGURE 11: INFORMATION OVERVIEW OF PENSION ON „PENSIONSINFO“ WEBSITE	50
FIGURE 12: EXAMPLE OF PENSION STRUCTURE ON THE “PENSIONSINFO” WEBSITE.....	51
FIGURE 13: COMPARISON OF THE AMOUNT OF PENSION AND THE AMOUNT NEEDED FOR LIVING ON A SPECIALIZED WEBSITE	55
FIGURE 14: GRAPHIC PRESENTATION OF THE PRINCIPLE OF VARIANT 1.....	58
FIGURE 15: GRAPHIC PRESENTATION OF THE PRINCIPLE OF VARIANT 2.....	65
FIGURE 16: GRAPHIC PRESENTATION OF THE PRINCIPLE OF VARIANT 3.....	70
FIGURE 17: GRAPHIC PRESENTATION OF THE PRINCIPLE OF VARIANT 1.....	74
FIGURE 18: GRAPHIC PRESENTATION OF THE PRINCIPLE OF VARIANT 5.....	78
FIGURE 19: GRAPHIC PRESENTATION OF THE PRINCIPLE OF VARIANT 6.....	82
FIGURE 20: EXPLANATION OF EACH OF THE SITUATIONS.....	92
FIGURE 21: DELOITTE’S RECOMMENDATION OF SUITABLE APPROACH.....	111
FIGURE 22: ILLUSTRATIVE EXAMPLE OF THE SAFE WAY OF PRESENTING	115
FIGURE 23: ILLUSTRATIVE EXAMPLE OF THE USEFUL WAY OF PRESENTING	117
FIGURE 24: ILLUSTRATIVE EXAMPLE OF FORM OF PRESENTATION FOR THE TARGET GROUP C.....	118
FIGURE 25: ILLUSTRATIVE EXAMPLE FOR PRESENTATION OF PENSION VALUE DEVELOPMENT FOR SPECIFIC RETIREMENT AGE	119

List of Abbreviations

V4	Visegrad group	Visegrádská skupina
PAYG	Pay As You Good	Systém průběžného financování
DB	Defined Benefit	stanovená výše penze
DC	Defined Contribution	Stanovená výše příspěvků
ŽP	Life insurance	Životní pojištění
ČSSZ	The Czech Social Security Administration	Česká Správa Sociálního Zabezpečení
SADNAP	Social Affairs Department of the Netherlands Ageing and Pensions model	Oddělení ministerstva sociálních věcí Nizozemska modelu stárnutí a důchodu
EPC	European Political Cooperation	Evropská politická spolupráce
ZUS	Zakład Ubezpieczeń Społecznych	Úřad pro sociální pojištění
MRPIPS	Ministerstwo Rodziny Pracy i Polityki Społecznej	Ministerstvo práce a sociální politiky
PPI	The Pension Policy Institute	Institut penzijní politiky
OAS	Old Age Security	Zajištění ve stáří
CPP	Canadian Pension Plan	Kanadský penzijní plán
CRA	The Canada Revenue Agency	Kanadská finanční agentura
SOC	Statement of Contributions	Přehled příspěvků
CPI	Consumer price index	Index spotřebitelských cen
MARIA -	The Model of Australian Retirement Incomes and Assets	Model australského důchodového systému
AOW -	Algemene Ouderdomswet	Obeční zákon o starobních důchodech
UPO –	Uniform Pension Overview	Jednotný přehled důchodů
SVB -	Social Insurance Bank	Banka sociálního pojištění
SMART -	Specific, Measurable, Agreed, Realistic and Timed	Konkrétní, měřitelné, odsouhlasené, realistické a časově definované
WOM	Word of Mouth marketing	„osobní doporučení“ nebo „o čem se mluví“
OECD -	Organisation for Economic Co-operation and Development	Organizace pro hospodářskou spolupráci a rozvoj

Appendices

Appendix 1: A statement from the personal account and a statement of the participant's expected pension benefits

VZOR

VÝPIS Z OSOBNÉHO ÚČTU A VÝKAZ PREDPOKLADANÝCH DŮCHODKOVÝCH DÁVOK ÚČASTNÍKA*)

Údaje o účastníkovi a doplnkovej dôchodkovej spoločnosti^{b)}

Blok A^{c)}

K ...^{d)} máte nasporené ...^{e)}.
Mesačne si priemerne sporíte ...^{f)},
Váš zamestnávateľ Vám priemerne mesačne prispieva ...^{g)}.
Váš predpokladaný dočasný dôchodok vyplácaný ...^{h)} bude v sume ...ⁱ⁾,
čo v dnešných cenách predstavuje ...^{j)}.

Blok B^{c)}

Váš predpokladaný ^{k)} vek pre doplnkový starobný dôchodok	l)
Podľa Vášho dávkového plánu si musíte sporiť najmenej	m)
Doteraz ste si sporiť	n)

o) Váš vek pre doplnkový výsluhový dôchodok	p)
q) Pre nárok na doplnkový výsluhový dôchodok je potrebné mať zaplatené príspevky zamestnávateľom z dôvodu výkonu tzv. rizikovej práce najmenej za	q)
r) Zaplatené príspevky zamestnávateľa z dôvodu výkonu tzv. rizikovej práce za	r)

Blok C^{c)}

Prognózy Vašej nasporenej sumy a dôchodkových dávok v nominálnom vyjadrení*

Do dovŕšenia ^{s)}	
budete sporiť	t)
prispievate si	u)
zamestnávateľ Vám prispieje	v)

Grafické znázornenie prognóz nasporenej sumy^{w)}

Prognózy nasporenej sumy, dôchodkového veku a dôchodkovej dávky sa môžu líšiť od konečnej hodnoty poberaného mesačného dôchodku.

	Pesimistický scenár	Základný scenár	Optimistický scenár
Prognóza nasporenej sumy k veku ... ^{x)}	y)	y)	y)
Predpokladaný mesačný dôchodok vyplácaný počas ... ^{z)}	y)	y)	y)

Je dôležité si uvedomiť, že ceny tovarov a služieb postupne rastú. Rast cien vo výške 2 % ročne môže po ...^{y)} sporenia znížiť kúpnu silu Vášho dôchodku o ...^{z)}. Množstvo tovarov a služieb, ktoré si budete môcť kúpiť, teda v skutočnosti nebude zodpovedať sume ...^{w)}, ale sume ...^{x)}.

*Na výpočet prognóz boli použité parametre: Váš priemerný mesačný príspevok a priemerný mesačný príspevok Vášho zamestnávateľa (...^{y)}), celková hodnota Vašich úspor, predpoklad, že v sporení budete pokračovať do veku ...^{z)}, inflácia a odhad zhadnotenia počas obdobia sporenia znížený o odplaty, náklady a poplatky. Grafické znázornenie prognóz nasporenej sumy zahŕňa Váš vek pre doplnkový výsluhový dôchodok^{w)} vek podľa Vášho dávkového plánu, ako aj vek, kedy pravdepodobne dovŕšite dôchodkový vek potrebný na starobný dôchodok zo Sociálnej poisťovne^{x)}. Parametre na výpočet prognóz, okrem výšky odplát, nákladov a poplatkov, sú ustanovené Ministerstvom práce, sociálnych vecí a rodiny Slovenskej republiky. Výpočty sú uvedené v sumách pred zdanením.

Blok D^{e)}

Celková hodnota Vašich úspor k ... ^{ae)}	^{ae)}
Transakcie a zmeny na Vašom osobnom účte od ^{ae)} ... do ^{d)}	
	Názov doplnkového dôchodkového fondu ^{ae)} ^{ah)}
^{ai)} Stav Vašich úspor v doplnkovom dôchodkovom fonde k ... ^{ae)}	^{ai)}
^{aj)} Vaše príspevky	^{aj)}
^{ak)} Príspevky Vášho zamestnávateľa	^{ak)}
^{al)} ... ^{am)}	^{al)}
^{an)} Prestupy medzi doplnkovými dôchodkovými fondmi ^{ae)}	^{an)}
^{ao)} Vyplatené dôchodkové dávky ^{ae)}	^{ao)}
^{ap)} Čisté zhodnotenie	^{ap)}
^{aq)} Stav Vašich úspor v doplnkovom dôchodkovom fonde k ... ^{d)}	^{aq)}
Celková hodnota Vašich úspor k ... ^{d)}	^{c)}
^{ar)}	

Blok E^{e)}

Váš podiel na odplatách, nákladoch a poplatkoch zúčtovaných z majetku doplnkového dôchodkového fondu	Názov doplnkového dôchodkového fondu ^{ae)} od ^{ae)} ... do ... ^{d)}
^{as)} Odplata za správu	^{as)}
^{at)} Odplata za zhodnotenie	^{at)}
^{au)} Odplata za prestup	^{au)}
^{av)} Náklady a poplatky	^{av)}
^{aw)} Spolu za doplnkový dôchodkový fond	^{aw)}
Spolu za všetky doplnkové dôchodkové fondy	^{ax)}
V percentách z priemernej hodnoty Vašich úspor od ^{ae)} ... do ^{d)}	^{ay)}

Doterajšia výkonnosť doplnkového dôchodkového fondu nie je zárukou rovnakej výkonnosti doplnkového dôchodkového fondu v budúcnosti. Výkonnosť doplnkového dôchodkového fondu sa počíta každý pracovný deň. Odplata za zhodnotenie Vám bola zúčtovaná len za tie dni, v ktorých výkonnosť doplnkového dôchodkového fondu prekonal svoju historicky najvyššiu hodnotu. V budúcnosti Vám bude odplata za zhodnotenie znovu zúčtovaná len v tom prípade, ak výkonnosť doplnkového dôchodkového fondu prekonal svoju historicky najvyššiu hodnotu.

Blok F^{e)}

^{bby)}

Blok G^{e)}

^{bc)} Informácia o významných zmenách
--

Dalšie informácie o:

1. možnostiach účasti na doplnkovom dôchodkovom sporení,
2. účtovných závierkach, ročných a polročných správach o hospodárení a správe o investičnej politike,
3. vplyve skončenia zamestnania na výšku Vašich predpokladaných dôchodkových dávok,
4. pravidlách investovania doplnkového dôchodkového fondu,
5. dôchodkových dávkach (označenie Vášho dávkového plánu: ...^{bd)}) a
6. prognózach dôchodkových dávok

môžete získať na ...^{be)}.

* Na výpočet alternatívnej prognózy boli použité parametre navrhnuté Vašou doplnkovou dôchodkovou spoločnosťou, celková hodnota Vašich úspor, predpoklad, že v sporení budete pokračovať do veku ...^{e)}, inflácia a odhad zhodnotenia počas obdobia sporenia znížený o odplaty, náklady a poplatky. Parametre na výpočet prognóz, okrem výšky odplát, nákladov a poplatkov, sú ustanovené Ministerstvom práce, sociálnych vecí a rodiny Slovenskej republiky. Výpočty sú uvedené v sumách pred zdanením a môžu sa líšiť od skutočnosti.

Appendix 2: Statement from the personal account and statement of pension benefits of the recipient of the benefit

VZOR

VÝPIS Z OSOBNÉHO ÚČTU A VÝKAZ DÔCHODKOVÝCH DÁVKO POBERATEĽA DÁVKY^{a)}

Údaje o poberateľovi dávky a doplnkovej dôchodkovej spoločnosti ^{b)}	
Dátum, ku ktorému sa vzťahujú informácie vo výpise poberateľa dávky ^{c)}	
Celková hodnota Vašich úspor k ... ^{d)}	^{e)}
Transakcie na Vašom osobnom účte od ^{d)} ... do... ^{e)}	
Vyplatené dôchodkové dávky ^{f)}	^{g)}
Daň z príjmu	^{h)}
Čisté zhodnotenie	ⁱ⁾
Celková hodnota Vašich úspor k ... ^{e)}	^{j)}
Doterajšia výkonnosť doplnkového dôchodkového fondu nie je zárukou rovnakej výkonnosti doplnkového dôchodkového fondu v budúcnosti.	
Zostávajúce dôchodkové dávky ^{k)}	
Váš podiel na odplatách, nákladoch a poplatkoch zúčtovaných z majetku doplnkového dôchodkového fondu	od ^{d)} ... do... ^{e)}
Odplata za správu	^{l)}
Náklady a poplatky	^{m)}
Spolu	ⁿ⁾
^{o)} Informácia o významných zmenách	
Ďalšie informácie o: 1. účtovných závierkach, ročných a polročných správach o hospodárení a správe o investičnej politike, 2. pravidlách investovania doplnkového dôchodkového fondu, môžete získať na ... ^{p)} .	

Appendix 3: Information shown in the Slovak alternative of the Orange Envelope

Dnes mám odpracovaných **22,3 rokov**. Mesačne prispievam na starobné dôchodkové poistenie sumou **188,17 €**. Po dovŕšení **64 rokov** môžem podľa dnes platných pravidiel očakávať starobný dôchodok vo výške **415,72 €**.

Aký dôchodok môžem očakávať?

Pri rôznych scenároch vývoja politiky, demografie a ekonomiky

Dnes platné podmienky Udržateľný deficit Soc. poisťovne Bez deficitu Soc. poisťovne

Pri dnes platných podmienkach

Uvedené v dnešných cenách

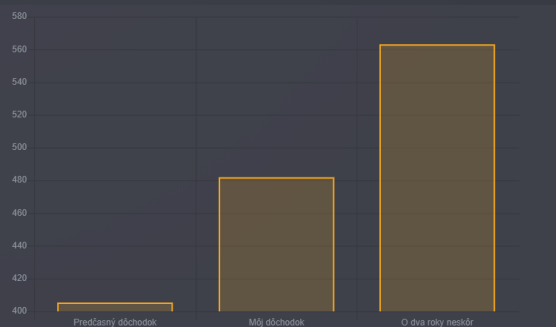
Keď dosiahnem dôchodkový vek **481,96 €**

Aký bude pomer môjho dôchodku ku mzde? **41,78 %**

Minimálny dôchodok **319,14 €**

Ak by som šiel/šla do dôchodku o dva roky neskôr **563,16 € ▲ +17%**

Ak by som šiel/šla do predčasného dôchodku **405,45 € ▼ -16%**



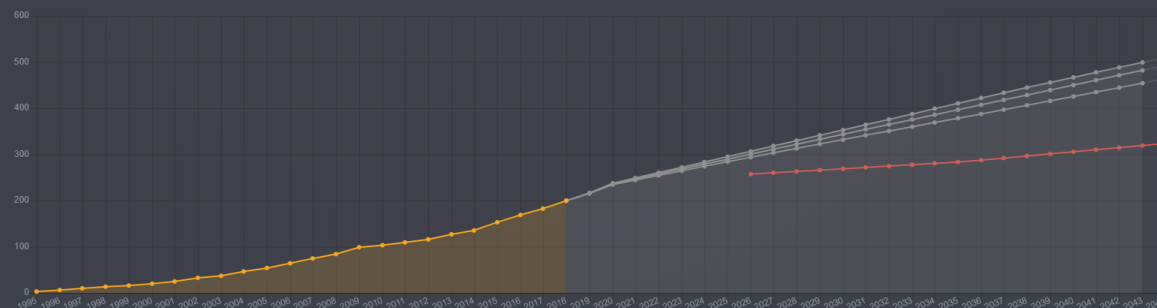
Ako sa počíta starobný dôchodok?

$$SD = POMB \times N \times ADH$$

Aký by bol môj dôchodok, ak by som do dôchodku mohol/a ísť dnes?

$$199,68 \text{ €} = 0,90750 \times 22,32500 \times 11,9379 \times 0,8256$$

POMB N ADH Koeficient krátenia



Scenáre vývoja nárokov zohľadňujú Vaše dosiahnuté vzdelanie a berú do úvahy rozdielny vývoj ekonomiky, inflácie, Vášho príjmu a očakávanej nezamestnanosti.

* Všetky údaje sú prepočítané na dnešné ceny, aby ste očakávané hodnoty vedeli porovnať s dnešnou úrovňou príjmu a kúpnej sily peňazí. Pomôžu Vám tak predstaviť si hodnotu dôchodku v čase, keď budete odchádzať z tíhu práce.

Appendix 4: Report of private pension savings in Slovakia

Výpis z osobného účtu a výkaz predpokladaných dôchodkových dávok

Spoločnosť AXA d.d.s, a.s., Kolárska 6, 811 06 Bratislava, AXA linka: +421 02 2929 2929, e-mail: info@axa.sk

Údaje o účastníkovi

Meno a priezvisko: JOZEF DÔCHODKOVÝ dátum narodenia 01.01.1987
E-mailová adresa: J.DOCHODKOVY@GMAIL.COM
Trvalý pobyt: DÔCHODKOVÁ 1, KOŠICE, PSČ 04012, Slovensko
Dátum vzniku účasti na dôchodkovom sporení: 07.03.2018
Číslo zmluvy: 000000000

K 31.12.2018 máte nasporené 534,89 €

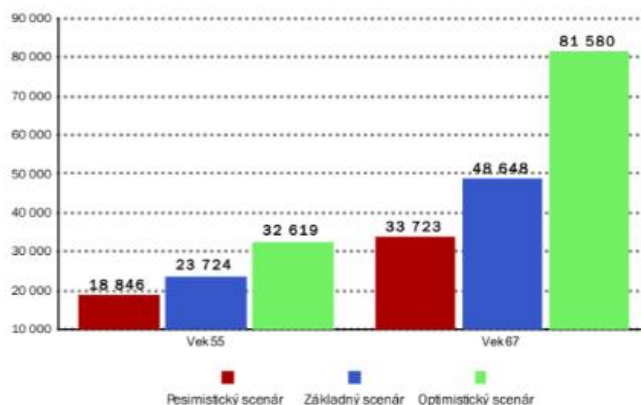
- Mesačne si priemerne sporíte **15,00 €**
- Váš zamestnávateľ Vám priemerne mesačne prispieva **31,01 €**
- Váš predpokladaný starobný dôchodok vyplácaný desať rokov bude v sume 405 €
čo v dnešných cenách predstavuje 170 €
- Váš predpokladaný vek pre doplnkový starobný dôchodok: 67 rokov 5 mesiacov
- Váš vek pre doplnkový výsluhový dôchodok: 55 rokov
- Pre nárok na doplnkový výsluhový dôchodok je potrebné mať zaplatené príspevky zamestnávateľom z dôvodu výkonu tzv. rizikovej práce najmenej za: 120 mesiacov
- Zaplatené príspevky zamestnávateľa z dôvodu výkonu tzv. rizikovej práce za: 10 mesiacov

Prognózy Vašej nasporenej sumy a dôchodkových dávok v nominálnom vyjadrení *

Do dovŕšenia 67 rokov 5 mesiacov

budete sporiť:	36 rokov 2 mesiace
príspejete si:	6 510,00 €
zamestnávateľ Vám príspeje:	13 458,34 €

Prognózy nasporenej sumy, dôchodkového veku a dôchodkovej dávky sa môžu líšiť od konečnej hodnoty poberaného mesačného dôchodku.



	Pesimistický scenár	Základný scenár	Optimistický scenár
Prognóza nasporenej sumy k veku 67 rokov 5 mesiacov	33 723 €	48 648 €	81 580 €
Predpokladaný mesačný dôchodok vyplácaný počas 10 rokov	281 €	405 €	679 €

Je dôležité si uvedomiť, že ceny tovarov a služieb postupne rastú. Rast cien vo výške 2 % ročne môže po dobe 36 rokov 2 mesiace sporenia znížiť kúpnu silu Vášho dôchodku o 58 %. Množstvo tovarov a služieb, ktoré si budete môcť kúpiť, teda v skutočnosti nebude zodpovedať sume 405 €, ale sume 170 €.

*Na výpočet prognózy Vašej nasporenej sumy a výšky predpokladaného mesačného dôchodku boli použité tieto parametre: Váš priemerný mesačný príspevok 15,00 € a priemerný mesačný príspevok Vášho zamestnávateľa 31,01 €, celková hodnota Vašich úspor, predpoklad, že v sporení budete pokračovať do veku 67 rokov 5 mesiacov, inflácia 2 % a odhad zhodnotenia počas obdobia sporenia znížený o odplaty, náklady a poplatky. Grafické znázornenie prognóz nasporenej sumy zahŕňa Váš vek pre doplnkový výsluhový dôchodok, vek, kedy pravdepodobne dovŕšite dôchodkový vek potrebný pre starobný dôchodok zo Sociálnej poisťovne. Parametre na výpočet prognóz, okrem výšky odplát, nákladov a poplatkov, sú ustanovené Ministerstvom práce, sociálnych vecí a rodiny Slovenskej republiky. Výpočty sú uvedené v sumách pred zdanením.

Transakcie a zmeny na Vašom osobnom účte 000000000 od 07.03.2018 do 31.12.2018

Celková hodnota Vašich úspor k 07.03.2018		0,00 €	
	Príspevkový doplnkový dôchodkový fond	Globálny akciový dôchodkový fond	Výplatný dôchodkový fond
	(počas obdobia 250 dní)	(počas obdobia 250 dní)	(počas obdobia 0 dní)
Stav Vašich úspor v d.d.fondu k 07.03.2018	0,00 €	0,00 €	0,00 €
Vaše príspevky	90,00 €	90,00 €	0,00 €
Príspevky Vášho zamestnávateľa	186,09 €	186,06 €	0,00 €
Prestup z inej doplnkovej dôch. spoločnosti	0,00 €	0,00 €	0,00 €
Prestupy medzi doplnkovými dôchodkovými fondmi	0,00 €	0,00 €	0,00 €
Vyplatené dôchodkové dávky	0,00 €	0,00 €	0,00 €
Čisté zhodnotenie	-5,15 €	-12,11 €	0,00 €
Stav Vašich úspor v d.d.fondu k 31.12.2018	270,94 €	263,95 €	0,00 €
Celková hodnota Vašich úspor k 31.12.2018		534,89 €	

Doterajší výnos doplnkového dôchodkového fondu nie je zárukou rovnakého výnosu doplnkového dôchodkového fondu v budúcnosti.

Odplaty, náklady a poplatky od 07.03.2018 do 31.12.2018

	Príspevkový doplnkový dôchodkový fond	Globálny akciový dôchodkový fond	Výplatný dôchodkový fond
Odplata za správu	0,98 €	0,97 €	0,00 €
Odplata za zhodnotenie	0,00 €	0,08 €	0,00 €
Odplata za prestup	0,00 €	0,00 €	0,00 €
Náklady a poplatky	0,07 €	0,07 €	0,00 €
Spolu za doplnkový dôchodkový fond	1,05 €	1,12 €	0,00 €

- Spolu za všetky doplnkové dôchodkové fondy: 2,17 €
- V percentách z priemernej hodnoty Vašich úspor od 07.03.2018 do 31.12.2018: 0,20 %

Informácia o významných zmenách

Od 1.1.2019 došlo k zmene veku potrebného na splnenie podmienky pre dávku doplnkový starobný dôchodok.

Do 31.12.2018 bolo jednou z možností pre splnenie nároku na doplnkový starobný dôchodok dovŕšenie veku 62 rokov.

Od 1.1.2019 sa tento vek určuje v súlade so zákonom o sociálnom poistení. V roku 2019 je možné najskôr požiadať o doplnkový starobný dôchodok vo veku 62 rokov a 6 mesiacov v prípade, ak ste nesplnili dôchodkový vek skôr. Každým rokom sa bude tento vek o príslušný počet mesiacov zvyšovať.

Pre účastníkov, ktorých súčasťou zmluvy je dávkový plán, sa táto úprava zákona netýka a riadia sa vekom určeným v príslušnom dávkovom pláne.

Ďalšie informácie o:

1. možnostiach účasti na doplnkovom dôchodkovom sporení,
2. účtovných závierkach, ročných a polročných správach o hospodárení a správe o investičnej politike,
3. vplyve skončenia zamestnania na výšku Vašich predpokladaných dôchodkových dávok,
4. pravidlách investovania doplnkového dôchodkového fondu,
5. dôchodkových dávkach (označenie Vášho dávkového plánu: Bez dávkového plánu) a
6. prognózach dôchodkových dávok

môžete získať na www.axa.sk.

Annual Statement 2019

**PENSIONS
MYNDIGHETEN**

You have earned this much towards your National Public Pension

Your Pension Accounts

Changes during 2018 in SEK	Income Pension	Premium Pension	
Value 2017-12-31	1 078 131	250 091	
Pension entitlement for 2017	56 272	8 792	
From deceased contributors	730	182	
Administration and fund fee	- 355	- 1 456*	
Change in value	29 608	297**	
Value 2018-12-31	1 164 386	257 906	Total earned to the National Public Pension
			1 422 292 kr

* Including SEK 1748 discount on the fund fee for 2017.

** Including SEK 88 as interest on your pension entitlement for 2017.

85 810 4 0,57 25 33

Your Premium Pension

Premium Pension account 2018-12-31	Value, SEK	Change in value, per cent	Fund fee, per cent	Chosen allocation, per cent	Current allocation, per cent
Equity Fund Sverige	74 972	2	0,47	30	29
Equity Fund Global	85 810	4	0,57	25	33
Interest Fund Sverige	18 759	0	0,14	25	7
Generation Fund	50 351	1	0,21	10	20
Pharmaceutical Fund	28 014	10	0,49	10	11
Total	257 906	3	0,43	100	100
<i>The average pension saver</i>		4	0,23		

Fund fee. Keep in mind that high fees will have a negative effect on the performance of your savings.

Switching funds. In order to increase security for you, all fund switches are to be made by logging in with your electronic identification or Mobile BankID.

20xx-xx-xx
19xxxxxx-xxxx
Demo Person

Decision regarding your pension entitlements

Pension entitlement for Income Pension		Pension entitlement for Premium Pension		Your total pension entitlement 2017
SEK 56 272	+	SEK 8 792	=	SEK 65 064

Demo Person (eng)
Vägen 19
123 45 Staden

Basis for calculation of your pension entitlements

Pensionable income SEK 357 100

The decision regarding your pension entitlement during 2017 is based on your last established declared income. The regulations that form the basis for the decision can be found in Chapters 59-61 of the Social Insurance Code.

How to request a reconsideration of the decision

If you wish to have the decision reconsidered, write to Pensionsmyndigheten, P.O. Box 304, SE-301 08 Halmstad, Sweden. Indicate which decision you would like reconsidered, how you want it changed and why. Include your name, Swedish personal ID-number, address and telephone number. The Swedish Pensions Agency must receive the letter by 31 December 2019 or, if you have not been informed of the decision before 1 November 2019, within two months from the date you received the decision. You can also apply for a reconsideration via e-mail to registrator@pensionsmyndigheten.se.

Appendix 5: Example of informing on MRPIS Facebook

#EmeryturaPlus

11,75 mld zł

zakładany koszt wypłaty tzw. trzynastej emerytury dla seniorów w 2020 r.



Ministerstwo Rodziny,
Pracy i Polityki Społecznej

EmeryturaPlus⁺

Appendix 6: Polish Annual letter sended bz ZUS (an alternative of Orange Envelope)



Zakład Ubezpieczeń Społecznych
Inspektorat w Cieszyńie
ul. Bielska 29
43-400 Cieszyń

Informacja o stanie konta ubezpieczonego
w Zakładzie Ubezpieczeń Społecznych

Znak: [REDACTED]

PESEL: [REDACTED]

Sz.P.
[REDACTED]

Twoje konto w ZUS stan na 31 grudnia 2018 roku

I. Twoje konto

1. Kapitał początkowy powiększony o kwoty corocznej waloryzacji	199 043,66 zł
2. Składki na ubezpieczenie emerytalne powiększone o kwoty corocznej waloryzacji - bez części składek na subkonto / otwarty fundusz emerytalny (waloryzujemy składki za okres od stycznia 1999 r. do grudnia 2017 r.)	92 325,23 zł
3. Składki na ubezpieczenie emerytalne za 2018 rok (jeszcze niezwaloryzowane)	3 232,45 zł
	294 601,34 zł

Kapitał początkowy:
kwota, jaką zgromadziłeś,
jeśli pracowałeś przed 1999 r.
(czyli przed utworzeniem
indywidualnych kont w ZUS).

Waloryzacja:
zwiększamy wartość Twoich składek
i kapitału początkowego w zależności
od poziomu inflacji i wynagrodzeń
w Polsce.

Wykaz składek na ubezpieczenie emerytalne za 2018 rok (jeszcze niezwaloryzowane)

Miesiąc i rok	Wysokość składki	Oplacający Twoje składki
styczeń 2018	259,82 zł	[REDACTED]
luty 2018	273,72 zł	[REDACTED]
marzec 2018	274,61 zł	[REDACTED]
kwiecień 2018	272,97 zł	[REDACTED]
maj 2018	272,04 zł	[REDACTED]
czerwiec 2018	274,61 zł	[REDACTED]
lipiec 2018	268,30 zł	[REDACTED]
sierpień 2018	263,64 zł	[REDACTED]
wrzesień 2018	272,97 zł	[REDACTED]
październik 2018	274,61 zł	[REDACTED]
listopad 2018	274,45 zł	[REDACTED]
grudzień 2018	250,71 zł	[REDACTED]
Razem:	3 232,45 zł	

II. Twoje subkonto

Kwota ogółem składek wpłaconych, odsetek, opłaty prolongacyjnej i środków z otwartego funduszu emerytalnego (OFE) powiększona o kwoty waloryzacji 31 501,06 zł

Waloryzacja subkonta: zwiększamy wartość Twojego subkonta w zależności od poziomu polskiej gospodarki (poziomu PKB).



Informacja o stanie konta ubezpieczonego
w Zakładzie Ubezpieczeń Społecznych

III. Suma na Twoim koncie i subkoncie

1. Konto	294 601,34 zł
2. Subkonto	31 501,06 zł
Razem:	326 102,40 zł

IV. Składki należne i wpłacone (bez waloryzacji)

Subkonto:	
1. Składki należne - czyli te, które wynikają z dokumentów przysłanych do ZUS	9 193,67 zł
2. Składki wpłacone na subkonto	9 193,67 zł
Otwarty fundusz emerytalny:	
1. Składki należne - czyli te, które wynikają z dokumentów przysłanych do ZUS	18 400,19 zł
2. Składki odprowadzone do otwartego funduszu emerytalnego	18 400,19 zł

V. Hipotetyczna (prognozowana) wysokość Twojej emerytury

Twój wiek emerytalny to 65 lat

Emerytura obliczona na podstawie konta

Podajemy ją w dwóch wariantach:

Wiek, w którym przejdiesz na emeryturę	Wariant I Pracujesz do emerytury i składki wpływają średnio w tej samej wysokości co do tej pory	Wariant II W 2019 roku przestajesz pracować i do emerytury nie wpływają już nowe składki
65 lat	1 718,99 zł	1 348,91 zł

Ważne! Jeśli przekroczysz wiek emerytalny i nie masz jeszcze ustalonej emerytury, to jej prognozowaną wartość podajemy dla Twojego rzeczywistego wieku oraz dla kolejnych pięciu lat.

Emerytura obliczona na podstawie konta i subkonta

Podajemy ją w kolejnych wariantach:

Twój wiek emerytalny	Wariant III Pracujesz do emerytury i na konto i subkonto wpływają składki średnio w tej samej wysokości co do tej pory	Wariant IV W 2019 roku przestajesz pracować i do emerytury nie wpływają już nowe składki na konto i subkonto
65 lat	1 964,96 zł	1 493,14 zł

Ważne! Pamiętaj, że na 10 lat przed Twoim wiekiem emerytalnym środki z OFE będą co miesiąc wpłacane na Twoje subkonto w ZUS. Przy prognozie emerytury nie uwzględniliśmy tego, co masz jeszcze w OFE.

Co dają Ci ubezpieczenia społeczne już teraz

Ubezpieczenia społeczne poza emerytalnym obejmują także:

- ubezpieczenie chorobowe,
- ubezpieczenie wypadkowe,
- ubezpieczenia rentowe.

Ważne! Dzięki nim możesz uzyskać jednorazowe, okresowe lub stałe świadczenia w razie choroby, urodzenia dziecka i rodzicielstwa, wypadku przy pracy, niepełnosprawności, niezdolności do pracy.

Na Platformie Usług Elektronicznych na www.zus.pl możesz sprawdzić, jakim ubezpieczeniom podlegasz.

Świadczenia, które Ci przysługują, jeśli masz ubezpieczenie chorobowe

Zasilek chorobowy w razie niezdolności do pracy z powodu choroby



Informacja o stanie konta ubezpieczonego w Zakładzie Ubezpieczeń Społecznych

Zasilek macierzyński	w związku z urodzeniem dziecka albo przyjęciem na wychowanie dziecka w wieku do 7 roku życia (w przypadku dziecka, wobec którego podjęto decyzję o odroczeniu obowiązku szkolnego - w wieku do 10 roku życia)
Zasilek opiekuńczy	gdy musisz opiekować się chorym dzieckiem, dzieckiem niepełnosprawnym, chorym innym członkiem rodziny albo zdrowym dzieckiem do lat 8 w określonych ustawowo przypadkach
Zasilek wyrównawczy	jeżeli jesteś pracownikiem i Twoje wynagrodzenie obniżyło się, ponieważ poddano Cię rehabilitacji zawodowej, aby adaptować lub przyuczyć do określonej pracy
Świadczenie rehabilitacyjne	jeśli po wyczerpaniu okresu pobierania zasiłku chorobowego jesteś nadal niezdolny do pracy z powodu choroby, a dalsze leczenie lub rehabilitacja lecznicza rokuje odzyskanie zdolności do pracy

Świadczenia, które Ci przysługują, jeśli masz ubezpieczenie wypadkowe

Zasilek chorobowy i świadczenie rehabilitacyjne, renty wypadkowe i dodatki do tych rent	jeżeli niezdolność do pracy spowodował wypadek przy pracy albo choroba zawodowa
Zasilek wyrównawczy	jeśli jesteś pracownikiem i Twoje wynagrodzenie obniżono w związku z wypadkiem przy pracy albo chorobą zawodową

Świadczenia, które Ci przysługują, jeśli masz ubezpieczenia rentowe

Świadczenia z tytułu niezdolności do pracy	m.in. renty z tytułu niezdolności do pracy, renty szkoleniowe, renty rodzinne, dodatki do rent rodzinnych dla sierot zupełnych, dodatki pielęgnacyjne oraz zasiłki pogrzebowe
Zasilek pogrzebowy	przysługuje po śmierci ubezpieczonego, emeryta, rencisty; ma do niego prawo osoba lub instytucja, która zapłaciła za pogrzeb

Dodatkowe informacje

- Informacje te przygotowaliśmy dla Ciebie zgodnie z art. 50 ustawy z dnia 13 października 1998 r. o systemie ubezpieczeń społecznych.
- Podane przez nas wysokości emerytury są tylko orientacyjne i nie mogą być podstawą roszczeń.
- Kobiety urodzone po 1948 roku, które są członkami otwartego funduszu emerytalnego, mogą mieć prawo do uzyskania - obok emerytury z Funduszu Ubezpieczeń Społecznych - okresowej emerytury kapitałowej ze środków zgromadzonych na subkoncie.
- Objaśnienia w sprawie danych wykazanych w informacji, sposobu ich weryfikacji oraz trybu postępowania w przypadku stwierdzenia nieprawidłowości uzyskasz:
 - telefonicznie pod numerem **22 560 16 00**,
 - na stronie internetowej ZUS: **www.zus.pl**,
 - w każdej placówce ZUS.
- Wszystkie powyższe informacje możesz też sprawdzić na swoim profilu ubezpieczonego na Platformie Usług Elektronicznych na stronie internetowej ZUS: **www.zus.pl**.

Appendix 7: British campaign called: Will the retirement you get bet he retirement you want?

HM Government

Will the retirement
you get



be the retirement
you want?

GET TO KNOW **YOUR PENSION**

HM Government

Will the retirement
you get



be the retirement
you want?

yourpension.gov.uk GET TO KNOW **YOUR PENSION**

Appendix 8: Dutch letter UPO (an Orange Envelope alternative)

Pensioenfonds

Zorg & Welzijn

Uniform Pensioenoverzicht 2019 ?

Stand per: 31 december 2018



Uw persoonlijke gegevens

Mevrouw C.M. Voorbeeld

Geboren op: 17 september 1964
Werkgever: Example Kliniek
Klantnummer: 640917999



Uw partner

D. Specimen

Geboren op: 8 februari 1962



Uw pensioengegevens

Pensioenuitvoerder: Pensioenfonds Zorg en Welzijn (PFZW)

Soort pensioenregeling: Uitkeringsovereenkomst, bruto pensioenregeling, Collectief

Datum start pensioenopbouw: 1 september 1989

Pensioenleeftijd bij PFZW: 67 jaar en 3 maanden

Hoe hoog was de premie in 2018?

- Voor ouderdomspensioen: 23,50%
- Voor arbeidsongeschiktheidspensioen: 0,70%

U en uw werkgever betaalden deze premie samen. Uw werkgever hield uw deel van de premie in op uw bruto salaris. Het premiepercentage dat u betaalde vindt u op uw loonstrook.

Uw inkomen dat meetelt voor uw pensioenregeling (voltijd pensioengevend salaris): € 43.660

U bouwt geen pensioen op over: € 12.028

Inkomen waarover u wel pensioen opbouwt: € 31.632

Percentage jaarlijkse pensioenopbouw: 1,75%

Percentage dat u werkt(e) in verhouding tot een volledig dienstverband: 80%

? Welk pensioen kunt u verwachten?



Wat heeft u aan pensioen opgebouwd?

Tot 31 december 2018 heeft u bij ons pensioen opgebouwd:

- vanaf 60 jaar tot 65 € 7.789 bruto per jaar
- vanaf 67 jaar en 3 maanden zolang u leeft € 12.647 bruto per jaar

Wat krijgt u als u met pensioen gaat?

Als u tot uw pensionering blijft werken in deze bedrijfstak, dan kunt u bij PFZW aan pensioen verwachten:

- vanaf 60 jaar tot 65 jaar € 7.789 bruto per jaar
- vanaf 67 jaar en 3 maanden zolang u leeft € 21.338 bruto per jaar

De AOW van de overheid staat niet op dit overzicht.

Die vindt u op www.mijnpensioenoverzicht.nl.

Uw pensioenregeling is op 1 januari 2018 gewijzigd. De pensioenrekenleeftijd steeg naar 68 jaar. Het verhogen van de pensioenrekenleeftijd heeft invloed op uw te bereiken pensioen, niet op uw AOW-leeftijd of pensioenleeftijd. Kijk in de toelichting voor meer informatie.

Let op!

Bij bovenstaande te bereiken bedrag(en) is rekening gehouden met het voorwaardelijk pensioen van € 1.306. Daarvan is nog niets aan u toegekend. Het voorwaardelijk pensioen ontvangt u alleen als u tot 1 januari 2021 deelnemer blijft in de pensioenregeling. Kijk in de toelichting voor meer informatie.

Actuele bedragen vindt u op pfzw.nl/mijnpfzw.

**Wat krijgen uw partner en kinderen als u overlijdt?**

Stel dat u overlijdt voor uw pensioendatum.

Uw partner krijgt dan:

- vanaf de maand na uw overlijden tot hij of zij 67 jaar en 3 maanden is

	€	10.293	
Anw-compensatie	€	4.899	
Totaal	€	15.192	bruto per jaar
- vanaf 67 jaar en 3 maanden zolang hij of zij leeft

	€	10.293	bruto per jaar
--	---	--------	----------------

Elk kind krijgt dan:

- vanaf de maand na uw overlijden totdat hij of zij 21 jaar is

	€	2.613	bruto per jaar
--	---	-------	----------------

Let op!

Volgens onze gegevens bent u gescheiden. Wij hebben bij bovenstaande bedragen rekening gehouden met uw scheiding. Een deel van uw partnerpensioen is naar uw ex-partner gegaan. Het bovenstaande bedrag is de uitkering voor uw huidige of toekomstige partner als u komt te overlijden.

Let op!

Uw nabestaanden krijgen mogelijk een lagere uitkering als u overlijdt nadat u met pensioen bent gegaan of niet meer deelneemt aan deze regeling. Kijk op pfzw.nl/mijnpfzw en www.mijnpensioenoverzicht.nl voor wat uw nabestaanden krijgen als u overlijdt nadat u met pensioen bent gegaan of wanneer u niet meer deelneemt aan deze regeling.

Voorwaardelijk pensioen voor uw partner

Het partnerpensioen houdt rekening met € 707 aan pensioen dat uw partner onder voorwaarden krijgt. Het voorwaardelijk pensioen ontvangt uw partner alleen als u tot 1 januari 2021 deelnemer blijft in de pensioenregeling. Kijk in de toelichting voor meer informatie.

**Wat krijgt u als u arbeidsongeschikt wordt?**

Als u arbeidsongeschikt wordt dan gaat uw pensioenopbouw door. U krijgt van PFZW ook een aanvulling op de WIA-uitkering van de overheid.

Als u volledig arbeidsongeschikt wordt en arbeidsongeschikt blijft, krijgt u vanaf moment arbeidsongeschiktheid totdat u 67 jaar en 3 maanden bent

	€	1.250	bruto per jaar
--	---	-------	----------------

Kijk op www.pfzw.nl/wat-doe-ik-bij/arbeidsongeschikt voor meer informatie over arbeidsongeschiktheid en een mogelijke aanvulling op uw WIA-uitkering.

? Hoe zeker is uw pensioen?



De hoogte van uw pensioen staat niet vast

De hoogte van uw pensioen staat niet vast en kan in uitzonderlijke situaties worden verlaagd. Wij hebben te maken met onder meer de volgende zaken:

- Mensen worden gemiddeld steeds ouder. We moeten het pensioen daardoor langer uitbetalen.
- Een lage rente maakt pensioen duurder. PFZW heeft daardoor meer geld nodig om hetzelfde pensioen te kunnen betalen.
- De resultaten van beleggingen kunnen tegenvallen.



Verhoging pensioen

Uw pensioen is per 1 januari 2018 niet verhoogd.

Elk jaar wordt het leven duurder. Daarom is het belangrijk dat uw pensioen zijn waarde houdt. Om dat mogelijk te maken wil PFZW de pensioenen jaarlijks verhogen. Dit heet indexering. Vanaf 2017 is het onze ambitie om de pensioenen mee te laten stijgen met de prijsontwikkeling volgens de consumentenprijsindex gemeten over de periode van september ten opzichte van september van het jaar daarvoor (voor 2017: 1,5%). Tot 2017 was het onze ambitie om de loonontwikkeling in de sector te volgen. Wij besluiten elk jaar of er kan worden geïndexeerd. Er moet namelijk wel genoeg financiële ruimte zijn. Deze ruimte was er het afgelopen jaar niet. Uw pensioen is per 1 januari 2018 dus helaas niet verhoogd.

De afgelopen vijf jaar heeft PFZW uw pensioen als volgt verhoogd.

Datum	Verhoging/indexering	Ambitie van PFZW	Prijsontwikkeling
01-01-2017	0%	1,29%	0,3%
01-01-2016	0%	0,68%	0,6%
01-01-2015	0%	0,48%	1%
01-01-2014	0,94%	1,88%	2,5%
01-01-2013	0%	1,67%	2,5%

Wij verwachten uw pensioen de komende jaren regelmatig niet of niet volledig te kunnen verhogen.



Verlaging pensioen

Uw pensioen kan in bepaalde situaties worden verlaagd. De afgelopen jaren is uw pensioen niet verlaagd.

Meer weten?

**Wilt u een persoonlijk totaaloverzicht?**

Op www.mijnpensioenoverzicht.nl staat een persoonlijk totaaloverzicht van het pensioen dat u via uw werk heeft opgebouwd én van de AOW. U ziet ook een inschatting van uw netto inkomen na pensionering. En u kunt uw pensioen met uw huidige inkomen vergelijken en samen met uw eventuele partner uw gezamenlijk pensioen bekijken.

**Wilt u meer inzicht in de keuzes die u heeft?**

Op Pensioen 1-2-3 (www.pfzw.nl/pensioen-bij-pfzw/pensioen-1-2-3) ziet u welke keuzes u heeft. En vindt u informatie over uw pensioenregeling. Daarnaast kunt u op pfzw.nl/mijnpfzw zien wat de invloed van die keuzes is op uw eigen situatie. Bekijk daar ook hoeveel u netto krijgt.

**Wilt u meer weten over de financiële gezondheid van PFZW?**

De beleidsdekkingsgraad van PFZW is per 31 december 2018 101,3%.

Kijk op www.pfzw.nl voor meer informatie over onze financiële situatie en de actuele beleidsdekkingsgraad, die gevolgen kunnen hebben voor uw pensioen.

Omdat de financiële situatie niet goed genoeg is, maakte PFZW een herstelplan. De laatste jaren gaat het financieel minder goed en ook zijn er strengere regels waaraan pensioenfondsen moeten voldoen. Daarom heeft PFZW de laatste jaren helaas moeten besluiten de pensioenen niet te verhogen (indexeren). Ook dit jaar kan dat niet. Als het financieel minder goed blijft gaan, kan er een moment komen dat PFZW ook andere maatregelen moet nemen. Dan moet u bijvoorbeeld denken aan het verhogen van de premie of het verlagen van de pensioenen als de dekkingsgraad lang te laag blijft. Dat kan zich bijvoorbeeld voordoen als de rente blijft dalen en we daar niet voldoende rendement op onze beleggingen tegenover zetten.

**Heeft u vragen?**

Neem dan contact met ons op. Op www.pfzw.nl en pfzw.nl/mijnpfzw kunt u ook terecht voor meer informatie. PFZW is bereikbaar via www.pfzw.nl/info en op (030) 277 55 77.

**Pensioenaangroei (factor A) in 2018: € 409**

U heeft uw factor A nodig als u wilt berekenen hoeveel fiscale ruimte u heeft om uw pensioen aan te vullen met lijfrentes.

Dit pensioenoverzicht is op zorgvuldige wijze tot stand gekomen. Wij zijn uitgegaan van de ons bekende gegevens en uw pensioenreglement. Het pensioenreglement is uiteindelijk bepalend. U kunt het pensioenreglement downloaden van www.pfzw.nl.

De Nederlandsche Bank (DNB) en Autoriteit Financiële Markten (AFM) houden toezicht op pensioenuitvoerders in Nederland. Dus ook op PFZW.

Appendix 9: Brüggen, E., Rohde I, Broeke M. van den: Different people, different choices. The influence of visual stimuli in communication on pension choice

Hoped-for general self

Will your future look like this....



...in approximately the last 30 years of your life?

Feared general self (male)

Will your future look like this....



...in approximately the last 30 years of your life?

Feared general self (female)

Will your future look like this....



...in approximately the last 30 years of your life?

Hoped-for material self

Will your future look like this....



...in approximately the last 30 years of your life?

Feared material self

Will your future look like this....



...in approximately the last 30 years of your life?

Hoped-for connective self

Will your future look like this....



...in approximately the last 30 years of your life?

Feared connective self (male)

Will your future look like this....



...in approximately the last 30 years of your life?

Feared connective self (female)

Will your future look like this....



...in approximately the last 30 years of your life?



Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited ("DTTL"), its global network of member firms, and their related entities (collectively, the "Deloitte organization"). DTTL (also referred to as "Deloitte Global") and each of its member firms and related entities are legally separate and independent entities, which cannot obligate or bind each other in respect of third parties. DTTL and each DTTL member firm and related entity is liable only for its own acts and omissions, and not those of each other. DTTL does not provide services to clients. Please see www.deloitte.com/about to learn more.

Deloitte is a leading global provider of audit and assurance, consulting, financial advisory, risk advisory, tax and related services. Our global network of member firms and related entities in more than 150 countries and territories (collectively, the „Deloitte organization“) serves four out of five Fortune Global 500® companies. Learn how Deloitte’s approximately 312,000 people make an impact that matters at www.deloitte.com.

This communication and any attachment to it is for internal distribution among personnel of Deloitte Touche Tohmatsu Limited ("DTTL"), its global network of member firms and their related entities (collectively, the "Deloitte organization"). It may contain confidential information and is intended solely for the use of the individual or entity to whom it is addressed. If you are not the intended recipient, please notify us immediately by replying to this email and then please delete this communication and all copies of it on your system. Please do not use this communication in any way.

None of DTTL, its member firms, related entities, employees or agents shall be responsible for any loss or damage whatsoever arising directly or indirectly in connection with any person relying on this communication. DTTL and each of its member firms, and their related entities, are legally separate and independent entities.

© 2020. For information, contact Deloitte Czech Republic