

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Management



Diploma Thesis

**Economic analysis of options for financing self-employed
individuals in their post-productive age in the Czech
Republic**

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DIPLOMA THESIS ASSIGNMENT

Martin Holý

Economics and Management

Thesis title

Economic analysis of options for financing self-employed individuals in their post-productive age in the Czech Republic

Objectives of thesis

This Thesis aims to test a range of options for the financial security of self-employed individuals in the Czech Republic, in their post-productive age, by comparison of the state pension system with private savings in the form of long-term investment.

Methodology

From a methodological point of view, the diploma thesis can be considered as a describing qualitative research, primarily divided into three parts. In the first part is elaborated theoretically-scientific context of the topic, based on a secondary analysis of sources. The second analytical part is then developed on the basis of economic analysis, specifically horizontal ratio analysis, where are used primarily indicators evaluating long-term investments. The third research part is based on simulations and an opinion poll in a form of qualitative research, specifically semi-structured guided interviews.

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Declaration

I declare that I have worked on my diploma thesis titled "Economic analysis of options for financing self-employed individuals in their post-productive age in the Czech Republic" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any third person.

In Prague on 30th March

Martin Holý

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Economic analysis of options for financing self-employed individuals in their post-productive age in the Czech Republic

Abstract

This Thesis aims to test a range of options for the financial security of self-employed individuals in the Czech Republic, in their post-productive age. It includes an assessment of the strategy of the Ministry of Labour and Social Affairs introduced in February 2016 and the Thesis author's own proposals for dealing with the issue. The topic is considered from both the viewpoint of self-employed persons and from the viewpoint of the government's legislative power, which aims at increasing the share of the above mentioned group within the framework of the retirement account of the Czech Republic.

The theories and approaches as outlined by the World Bank and the OECD, and the comparison of the Czech pension system with the pension systems of selected European countries, on the basis of application of The Melbourne Mercer Global Pension Index, within the framework of the theoretically-scientific context, made it possible to gain an insight into this issue in a broader perspective, because different approaches emphasise different sets of variables. The definition of the pension system in the Czech Republic based on the demographic forecasts and economic burden imposed on the productive population explains the necessity of future measures which would lead to the financial stabilization of the entire system. The Thesis analytical section critically evaluates alternative kinds of long-term investments and pension pillars of the Czech Republic and points out the overall profitability, riskiness and liquidity of individual types of possible financial security in old age. Presented results show potential benefits for a particular entrepreneur and refer to alternative parametric changes within the pension system. The following research section tests the applicability of identified proposals in practice.

The research carried out by the author and described in this Thesis, has shown a higher profitability of alternative forms of investment in the context of improving financial security of self-employed individuals in their old age, compared to the state pension system. The outcomes refer primarily to the low variability of the state pension system and critically judge the official, governmental, partial strategies.

Keywords: Long-term investment, pension system in the Czech Republic, qualitative research, securing for retirement age, self-employed individual

Ekonomická analýza možností financování postproduktivního věku osob samostatně výdělečně činných v České republice

Abstrakt

Tato práce si klade za cíl otestovat možnosti finančního zabezpečování osob samostatně výdělečně činných v České republice na post-produktivní věk. Včetně zhodnocení strategie Ministerstva práce a sociálních věcí aplikované v únoru roku 2016, s připojením vlastních návrhů a přístupů, jak k dané problematice přistupovat a to jak z pohledu osoby samostatně výdělečně činné, tak z pohledu vládní zákonodárné moci, cílící ke zvýšení podílu zmíněné skupiny v rámci důchodového účtu České republiky.

Zahrnutí teorií a přístupů klasifikovaných Světovou bankou a OECD, včetně porovnání Českého důchodového systému s penzijními systémy vybraných evropských zemí na základě aplikace The Melbourne Mercer Global Pension indexu, v rámci teoreticko-odborného kontextu práce, umožňuje pohled na zmíněnou problematiku v širší perspektivě, neboť různé přístupy akcentují různé soubory proměnných. Vymezení penzijního systému České republiky v souvislosti s demografickou predikcí a ekonomickým zatížením produktivního obyvatelstva, následně vysvětluje nezbytnost budoucích opatření vedoucích k finančnímu zastabilizování celého systému.

Kritické zhodnocení alternativních druhů dlouhodobého investování a důchodových pilířů České republiky analytickou částí práce, poukazuje na celkovou profitabilitu, rizikovost a likviditu jednotlivých typů možného zabezpečování se na stáří. Uvedené výsledky zobrazují potencionální výhodnost pro konkrétního živnostníka a poukazují na případné parametrické změny důchodového systému. Následující výzkumná část práce dále testuje aplikovatelnost zjištěných návrhů v praxi.

Provedený výzkum popsáný touto publikací, prokázal vyšší výhodnost alternativních forem investování v rámci zabezpečování osob samostatně výdělečně činných na stáří, oproti státnímu důchodovému systému. Vyplyvající subsekventní výsledky poukazují především na nízkou variabilitu státního penzijního systému a kriticky hodnotí oficiální, vládní, parciální strategie.

Klíčová slova: Dlouhodobá investice, penzijní systém České republiky, kvalitativní výzkum, zabezpečení se na důchodový věk, osoba samostatně výdělečně činná

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1 Introduction

A social security system, which includes the provision of social guarantees for citizens of a state, after they reach the post productive age, is one of the main areas of interest of every economically developed country. The aim of this policy is to maintain a reasonable standard of living, or making a provision for the economically inactive part of a population. However, this positive fact brings, in present day, an increase in public expenditures on social security, in most developed countries and the issue of social security is discussed ever more intensively across all social levels.

The reason for these debates, in the vast majority of OECD¹ countries and the European Union, is in this regard the adversely evolving demographic situation, which is due to the declining birth rates on the one hand and aging population on the other hand. In the long-term perspective, the current pension systems are therefore becoming unsustainable and unstable. Suitable anchoring of such a pension system, and thus the security of a decent life for people in retirement in conjunction with minimizing the financial burden on people in productive age, is part of the rhetoric of almost every upcoming legislative power, across all those countries.

In the Czech Republic, where the balance of the pension account has been in the negative numbers for a long time, even after the reform of the pension system in 2013, this topic is still open. Specific strategies are logically distinct within the political spectrum. This thesis discusses in detail one of these strategies, specifically with the process of the Ministry of Labour and Social Affairs as from February 2016. The strategy consisted of sending a mass letter to all self-employed individuals (performing self-employment as the main activity), where the Minister of Labour and Social Affairs, Mrs. Michaela Marksová familiarized entrepreneurs with possible financial scenario that may occur, after reaching the retirement age, in case of contributing the minimum advance payments into social insurance. This letter contained a table pointing to an increase in pension annuities, in the case of doubling and quadrupling of mentioned minimum deposit. This strategy, which aimed at increasing the share of self-employed individuals in the total income of the pension account, did not meet with great success. The Czech Social Security Administration states that there was an increase in these contributions in only a very small, almost negligible number of entrepreneurs.

¹ OECD _ Organization for Economic Co-Operation and Development

Therefore, this thesis focuses on the possible causes of the failure of this strategy, and considers potential solutions of this problem concerning the self-employed individuals in the Czech Republic. This thesis deals with the issue from the perspective of the state, that means the relevant legislature and legislative power. Based on the substance of the mentioned range of issues, and therefore the options that self-employed individuals have within their assurance for their post-productive age, the research described in the following sections, has focused on the comparison of overall profitability and attractiveness of the state pension system and the alternative, individual long-term investments. From this analysis and research are then derived recommendations for adapting the government's social rhetoric, or specific measures within the range of issues, in the context of the selected population.

The structure of this Thesis is primarily divided into three basic parts. Part one, dealing with the theory and scientific background of the topic, acquaints readers with the classification of the pension systems as such, according to different approaches and recommendations of the World Bank and the OECD, demographic development and its forecasts, including its economic impact on the economically active population. The end of this section outlines the pension systems of the Czech Republic, Denmark and the Netherlands in detail and then compares them. This section provides potentially applicable scenarios which are subjected to research in this Thesis.

The second, analytical part, evaluates investment opportunities that are available to self-employed individuals for their pension age financial security. Knowledge of these options contributes to the development of a possible government social policy within the pension system of the Czech Republic. The third part deals with research which primarily involves testing the potential applicability of the proposals in practice.

2 Objectives and Methodology

2.1 Objectives

The aim of the Thesis is to test a range of options for the financial security of self-employed individuals in the Czech Republic, in their post-productive age, by comparison of the state pension system with private savings in a form of long-term investments. The main research hypothesis is based on the idea described in the letter of the Ministry of Labour and Social Affairs, sent to self-employed individuals in the Czech Republic, in February 2016.

Main hypothesis:

For self-employed individuals, contributing more than the minimum required amount into the state social insurance provides a higher return, than alternative private ways of saving.

As it was mentioned in the introduction of this publication, the strategy of the Ministry of Labour and Social Affairs by sending the letter, was not, according to the annual report of Czech Social Security Administration, very effective. Since only a very small number of self-employed individuals increased their monthly contributions embedded in social insurance. From this fact came out the main research question of the Thesis, which investigates the existence of others possible and more effective strategies.

Research question:

How to motivate self-employed individuals in the Czech Republic to invest more into the state-run pension system, in order to protect their quality of life after retiring?

As a partial aim of the Thesis is creation of the draft of recommendations, on how to approach this issue, from the perspective of state, leading to an increase of the state revenues from payments inserted into pension system, concerning the self-employed individuals in the Czech Republic.

2.2 Methodology

From a methodological point of view, the diploma thesis can be considered as a describing qualitative research, primarily divided into three parts.

The first part, acquaints readers with the theory and scientific background of the topic. Where are based on a secondary analysis of sources discussed pension schemes in the framework of

concepts and theories, designed by the World Bank and the OECD, according to different approaches and classifications. Retirement system of the Czech Republic is analysed with a primary focus on the self-employed individuals. Following explanation and prediction of the demographic situation in the Czech Republic is based on historical data synthesis in collocation with the financial burden on the economically active population, based on the basis of a hypothetical-deductive method. The end of this section is made by application of the Melbourne Mercer Global Pension Index, not only applied on the pension system of the Czech Republic, but also applied on the pension systems of Denmark and the Netherlands, in the context of a following comparison.

The second analytical part is developed on the basis of case studies and economic analysis, specifically horizontal ratio analysis, where are used indicators evaluating long-term investments. Specific evaluation criteria, which classified the pension system in the Czech Republic and alternative forms of securing on the post-productive age, are based on the theory of investment triangle, from where are also both parts mutually compared. Selection of analysed categories and types of alternative investments is based on the book named: 10 best investments for the next 10 years.

All subsequent types of possible securing on a pension age are subjects of a risk analysis. There are, for determining of significances of factors, both subjective and objective, set out the long-term volatility, trend factor, time and ensuring or guarantee. Another decisive criterion is evaluated on the basis of analysis of the liquidity of invested funds. The last evaluation criterion is stipulated within the analysis of profitability, specifically evaluation of interest rate, calculated by successive approximation method, and return on equity. In the applicable parts are, for comparison of the state pension system and alternative forms of investment, used a case studies.

The third research part deals with an empirical research specifically simulations and an opinion poll. The option poll has a form of qualitative research, specifically semi-structured guided interviews, based on Hendl's typology. The research was conducted with representatives of the Czech Chamber of Commerce and the Ministry of Labour and Social Affairs. The reason for choosing of these two institutions was based on the critical evaluation of current and potential future situation, both from the perspective of representatives of self-employed individuals and in terms of representatives of the state legislative system.

3 Theoretical background of the thesis

The following literature review deals with the classification of pension systems, not only in the Czech Republic environment, but it is based on the basic concepts and theories designed by the World Bank and the OECD, as well as for other countries and by different approaches. In the following text is then described the pension system of the Czech Republic in detail, including basic calculation procedures and parameters that are primarily focusing on the self-employed individuals. Proceeding on this retirement system is also explained by the demographic situation in the Czech Republic, where are listed both historical and possible future scenarios in collocation with the economic burden of economically active part of population. In the final part of the literature review are explained and evaluated pension systems of selected European countries based on the application of The Melbourne Mercer Global Pension Index. This methodology is then used to evaluation of the Czech pension system and concrete results are given into mutual comparison. The entire theoretically-scientific context of the topic is creating a favourable background for the analytical and the research portion.

3.1 The classification of pension systems

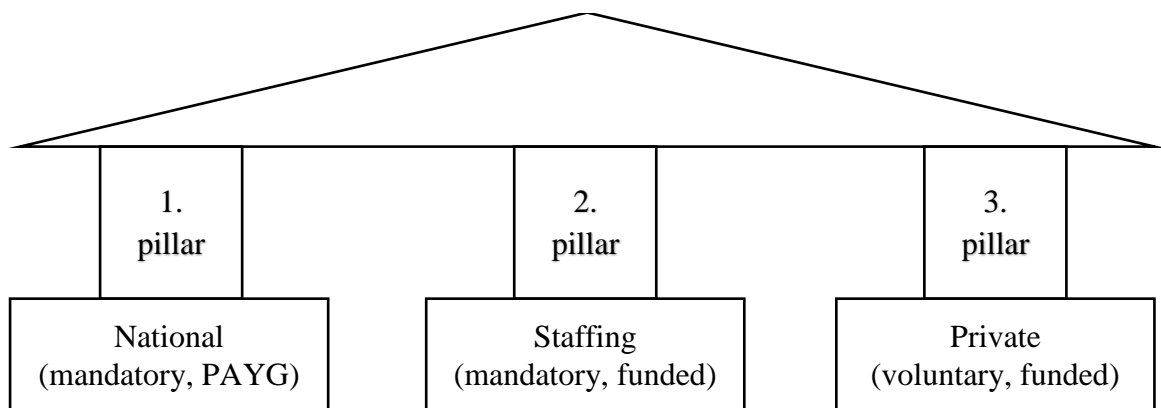
In the following chapter are described the different approaches to the classification of pension systems. The basic pension system, together with the health insurance forms part of the social security of a state. Generally, it is possible to split pension systems between two main currents. Namely on the mandatory pension scheme, which is obligatory for a defined group of participants, where compensation guarantees a state, based on established social event. Within this scheme is provided compensation to people, who for instance have not had sufficiently high income and other such cases of social nature. The second so-called voluntary pension scheme is constituted primarily on personal and employee base, in some countries complemented by a state contribution. The vast majority of European countries applies a combination of both schemes (Gregorová, 1998).

It should be noted that some of the described basic concepts, respective their definitions are not uniform and may vary in materials of different institutions.

3.1.1 The classical approach

The classical approach to the pension system is based on the distribution of pension burden among the three pillars (see. Fig. 1). These three pillars then represent different ways of financing of a post-productive age, increasing variability of possibilities for ensuring of a specific participant (Pollnerová, 2002).

Figure 1: Classical approach: the three pillars of the pension system



Source: Own illustration by pattern (Cipra, 2012)

3.1.1.1 First pillar

The first pillar in the general public perception is called national, it represents the traditional support system of insurance protection of citizens, commonly conceived as a social insurance. Pension systems forming the first pillar are routinely mandatory² and so-called. PAYG³. Major purpose of the first pillar is to reducing of poverty of people in post-productive age (OECD Private Pensions Conference, 2000).

3.1.1.2 Second pillar

Pension systems of the second pillar known as the capital pillar, are generally connected with the exercise of the profession. They are occupational collective insurance schemes organized by enterprises for their employees. Since this pillar is closely linked to the state pensions, paid under the first pillar it is often understood as a supplementary. The contribution is ordinarily

² *Mandatory* _ compulsory for a defined group of participants

³ *PAYG* _ pay-as-you-go method: participants' contributions are immediately redistributing for beneficiaries of benefits, according to their immediate legitimate claims, without creation of any fund.

earnings related, fund-financed from large volumes appearing as an important source of long-term investment capital (Cipra, 2012).

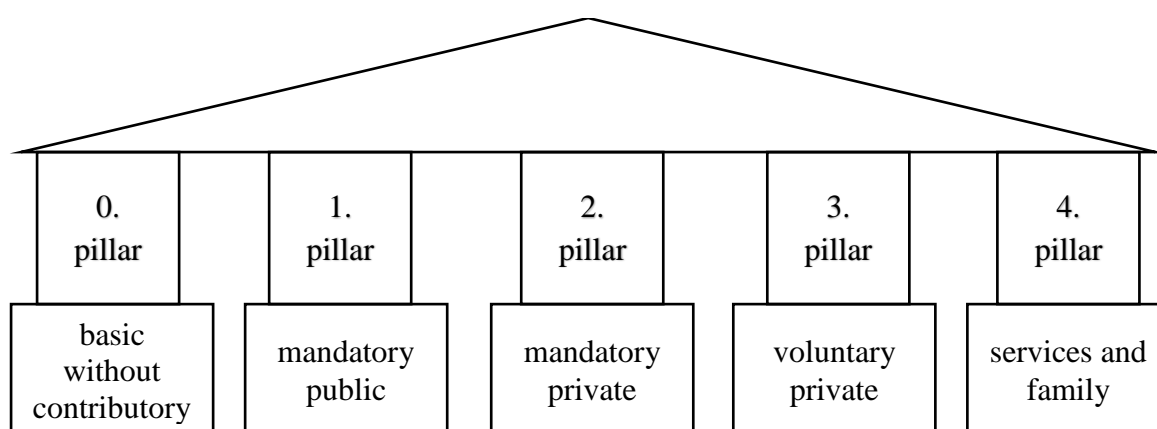
3.1.1.3 Third pillar

The third pillar serving as a sort of supplement to the previous two pillars is made up of private savings for retirement of individual citizens. Participation in the third pillar is voluntary, provided under a contract with a provider of an annuity product (for example insurance company providing life insurance product), or with a collective investment subject (mostly pension fund). Donations inserted by citizens into the third pillar, covered from personal assets (net income after taxes), are usually favoured and supported by the state, whether in the form of tax credits or state financial contributions. Therefore, participant may by its own initiative, with assistance of a third pillar, reach to interesting financial improvements in his or her retirement age (Pension schemes, Study for EMPL Committee, 2014).

3.1.2 Characteristics according to the World Bank

The World Bank extended heretofore three piling system arrangement, on five pillars disposition (see Fig. 2). This is not an extension of the original system by the other two pillars, but a reworking of characteristics of individual pillars. This arrangement, according to the World Bank should be more adequate in today's pension context (Investment Pensions Europe: World Bank proposes five-pillar pension model, 2005).

Figure 2: World bank: five pillars of the pension system



Source: Own illustration by pattern (Cipra, 2012)

3.1.2.1 Zero pillar

Prime pillar acts as a basic protection against poverty in the form of non-contributory social assistance, social pension respectively. It is funded by central or local government mostly from tax payments. It is usually funded by central or local government mostly from tax payments. It is intended primarily for underprivileged individuals who did not earn a sufficient amount during their working period, or otherwise socially vulnerable citizens. Some countries such as Ireland or New Zealand are using prime pillar for paying current basic pensions paid to all citizens, who have reached retirement age. In Australia, Chile and Denmark were, from a zero-pension pillar, paid only people with limited assets or limited income (Bovenberg, 2012).

3.1.2.2 First pillar

Pension insurance or also compulsory employee insurance, that is how could be the first pillar of the World Bank characterized. This pillar aims to replace a portion of earnings received during economically active part of the life of the participants. It is built on earnings related principle and it is often mandatory and continuously funded. Its goal is to cover individual lack of preparation for retirement within population. Some countries such as for instance Norway, Poland and Sweden had in 2011 first pillar in the form of notional accounts NDC⁴.

Its disadvantages are high contributions, helping to keep it running, and that increasing ancillary labour costs in international competitiveness. This pillar is also very sensitive to demographic and political risks (e.g. during the alternation of political parties). If the state tries to fulfil both the principle of merit and solidarity, its gets into trouble again. However, if countries focus only on the principle of merit and solidarity is left to additional social programs, that is being among such established pension plans, it can be observed higher functionality (see. Italy, Hungary, Austria, Greece and Slovakia) (Holzmann, 2003).

3.1.2.3 Second pillar

The second pillar, in contrast to the former second pillar of the Czech Republic, is for citizens of the country compulsory. These mandatory contributions, the participants invest to their individual savings accounts where they may freely choose the investment strategy and investment manager. Therefore, it can be characterized as mandatory private pension savings.

⁴ NDC _ Notional defined contribution plan: it seems to be funded, but it is about creating an individual account for each participant, including making the appropriate contributions and interest. However, they exist only in the accounts books of the institutions (e.g. In the national accounts). The pension is then paid accordingly by annuity allocation of a notional capital based on a formula taking into account the medium remaining life expectancy at the time of retirement. (Cipra, 2012)

For developed countries, it is typical that these individual savings accounts are kept by private institutions. For this reason, these contributions defined financial plans, plays a positive role in the development of financial markets.

A very interesting feature is the possibility of lump sum withdrawal. Which consists of the pillar an attractive investment opportunity, not only for the reason of securing for elder age. The advantage of this option, is possibility to cover financial distress in the case of unexpected life events.

On the other hand, the second pillar issued of its participants, financial and agendas risk (relative to private management of asset), risk of high administrative fees, etcetera. State-mandated duty to save, imposes to state itself some kind of involvement (such as for instance a minimum nominal income), thus a sort of fiscal risk. Recent history aroused other risk, which is a state-mandated transfer of these funds back to the state budget (see. Hungary, Poland and Slovakia), for the reason of reducing of the state deficit on the pension account.

Solidarity-oriented countries using both the prime and first pillar then use the second pillar rather for savings for middle and higher income groups (Cipra, 2012).

3.1.2.4 Third pillar

The third pillar is characterized by its voluntary nature. The main sections are formed by private savings or investment accounts. It can be defined as the voluntary pension insurance. However, this pillar bears some similar risks, as the second pillar. Countries such as Ireland, Canada, UK, USA are using third pillar as a key source of income for seniors (Bovenberg, 2012).

3.1.2.5 Fourth pillar

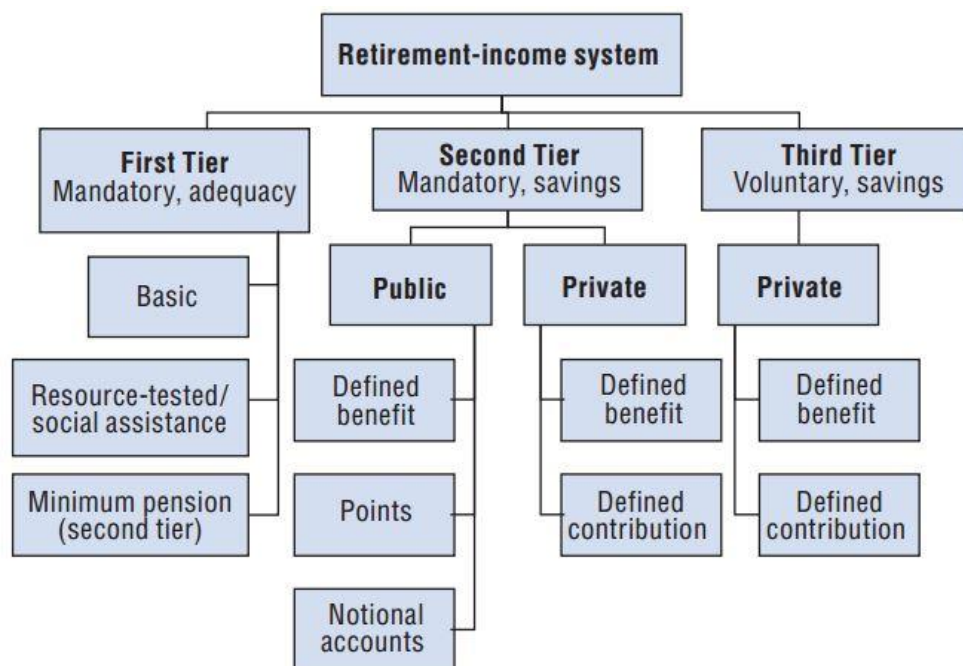
The fourth pillar is considered to be supportive within the assistance from family, charity or other non-profit organizations. It includes both informal (family, charity support) and formal (health, care services), support including of individual financial and non-financial assets.

This pillar is in developed countries on the rise. An increased burden on health services due to an aging of the population and even more, than the burden coming from of pension payments. As a solution to reduce the burden of health and pension insurance, World Bank recommends strengthening of the responsibility of families and communities in which people lives (Investment Pensions Europe: World Bank proposes five-pillar pension model, 2005).

3.1.3 OECD, approach of the three layers

OECD established taxonomy of pension systems, where are pillars replaced by layers. The reason is allegedly better usage of this classification for the overview tables showing the development of pension indicators. As is evident from the Figure 3, the first two layers are covering mandatory pension systems, opposed to the third layer, which relates to voluntary schemes.

Figure 3: OECD: three tiers of the pension system



Source: (OECD, 2015)

3.1.3.1 First Tier

The first layer aims to ensure a minimum standard of living for the participants. It includes pension programs that can be characterized as redistributive. These programs are provided by public sector mandatorily and they are generally divided by type:

Basic pension scheme, representing the board pension, is paying the pension amount identically across all participants, with no difference and indiscriminately on earnings earned up to now. The only difference in the amount of pension can be judged by the number of years of work,

where side revenues perceived as a sideliner, are not counted to the final amount of set pension (Cipra, 2012).

Resource-tested pension plan is suited especially in cases of intermittent career, lies on the difference in the amount of benefits under the wealth of individual users. Specifically, they are paid a higher dose for less well-off participants and vice versa lower doses for those who are better off. Towards of benefits takes three positions: In the first position, the benefits are set according to the income of the participant's retirement. Another position is determination of the amount of benefits according to all incomes of the participant. The last option is to taking into account of all income and property of the participant (OECD, 2015).

Minimum pensions avoid a decrease in pension incomes below a certain lower limit. However, conditions entitling to attend are institutionally distinct. Usually the minimum pension is applied to the total retirement income (Hoeller, 2014).

3.1.3.1 Second tier

Second tier can be, under the OECD taxonomy, understood as savings or insurance, which should provide to participants' comparable standard of living in their retirement with their economically active period of life. Pension programs provided obligatorily can be different:

Defined benefit among into the most frequently used in the second layer. The pension plan pre-determined required amount of pension benefits. From this point are consequently determined costs, that are necessary to maintain of defined doses in this way. The uniqueness of this plan is delimitation from individual accounts (OECD, 2015).

Defined contribution, whose mechanism is the opposite of a defined benefit pension scheme, since the contribution is given in advance by salary, or other values by using percentages. This allowance is then channelled into a fund respective into participant's individual account, where are his or her contributions accumulating and adding on value. However, those allowances are subject of investment risk and the participant is thus subject to uncertainty of what amount of pension he or she will receive. Nevertheless, it has an advantage of consistently defined contribution, which has to be dissipated (OECD, 2015).

Notional accounts pension plan, also known by the acronym NDC was described in chapter: 3.1.2.2.

Points pension scheme, whose principle is consistent acquisition of points among the participants, which are being derived according to their individual earnings. The total sum of

these points is then, at the time of retirement, multiplied by the corresponding point value. This result is then determining a specific pension payment (Cipra, 2012).

3.1.3.2 Third tier

Is defined on the same principle as the third pillar in the classical arrangement, or as World Banks five pillars classification. Therefore, it is a voluntary retirement savings system, when depends on the individual assessment of each participant, whether he or she wants with state-ent, also draw some additional resources.

Figure 4: Structure of retirement-income provision in specific countries

	Basic	Minimum	Social assistance	Public	Private	Basic	Minimum	Social assistance	Public	Private	
				Type	Type				Type	Type	
OECD members						OECD members (cont.)					
Australia	✓				DC	New Zealand	✓				
Austria				DB		Norway	✓		NDC	DC	
Belgium		✓	✓	DB		Poland		✓	NDC		
Canada	✓		✓	DB		Portugal		✓	DB		
Chile	✓		✓		DC	Slovak Republic			Points	DC	
Czech Republic	✓	✓		DB		Slovenia		✓	DB		
Denmark	✓		✓		DC	Spain		✓	DB		
Estonia	✓			Points	DC	Sweden	✓		NDC	DC	
Finland	✓		✓	DB		Switzerland		✓	DB	DB	
France		✓		DB + points		Turkey		✓	DB		
Germany				Points		United Kingdom	✓		DB		
Greece	✓			DB		United States			DB		
Hungary		✓		DB							
Iceland	✓		✓		DB	Other major economies					
Ireland	✓					Argentina	✓	✓	DB		
Israel	✓				DC	Brazil		✓	DB		
Italy		✓		NDC		China		✓	NDC/DC		
Japan	✓			DB		India		✓	DB + DC		
Korea			✓	DB		Indonesia			DC		
Luxembourg	✓	✓		DB		Russian Federation	✓		NDC	DC	
Mexico		✓			DC	Saudi Arabia		✓	DB		
Netherlands	✓				DB	South Africa	✓				

Note: DB = Defined benefit, DC = defined contribution, NDC = Notional accounts

Source: (OECD, 2015)

3.2 The pension system in the Czech Republic

The following chapter is focused on the pension system in the Czech Republic. It should be noted, that it cannot replace the full wording of the Act and it serve rather to facilitate quantitative understanding of legal formulations. Subsequent chapters are focusing primarily on the pension system from the perspective of self-employed individual, however, since the

Czech pension system applies the principle of uniform treatment, there is a deviation from the perspective of employees, only in the chapter focuses on calculation of the pension assessment. There is also examined the structure of the Czech pension system in detail, including the introduction of conditions for the payment of retirement benefits and the calculation of basic variables for determining of the amount of a particular batch.

3.2.1 The structure of the pension system in the Czech Republic

The structure of the Czech pension system is at the present time (2017), built on two pillars.

The first pillar is the state guaranteed pension insurance, defined by Act No. 155/1995 Coll., about the pension insurance. It is a mandatory, public and unfunded (PAYG) pension insurance, providing compensation of incomes, in the case of a social event (retirement pension, disability pension, widow's, widower's and orphan's pension)

The system of the first pillar consists of two DB (Defined Benefit) components. First, the basic amount, which is areal for all kinds of pensions. Furthermore, the second, percentage amount, levied in relation to the average level of income in the reporting period and the duration of insurance (The Pension Insurance Act, 1995).

The general principles, of the first pillar, are containing the factor of social solidarity (solidarity between groups with different incomes and solidarity among the economically active population and pensioners). The system is also uniform for all insured and it is subject to the same principles (with a little exception for self-employed individuals, described in the introduction to Chapter 3.2). Another characteristic element is then the dynamics⁵ of the pension system (The Pension Insurance Act, 1995).

The second capital pillar, characterized as retirement savings, which was based on voluntary admission, the current Czech government abolished in 2016. Already inserted contributions, by parts of the population, will be paid back to policyholders, eventually transferred to the first pillar.

⁵ The dynamics of pension system _ gradual increase of the retirement age, updating of values of coefficient of increase in the general assessment base, the possibility of increasing of the reduction levels for the personal assessment base.

*The third pillar*⁶, or additional pension savings is in operation since 2013 under Act No. 427/2011 Coll. Which replaced the original pension beside insurance with state contribution in 1994. It is a voluntary and supplementary system, which also includes the products of private insurance companies, especially life insurance. Nowadays, the saving consists of two types of funds:

- Transformed funds (in those funds is no longer possible to enter, because they are a former funds of original supplementary pension schemes)
- Participating funds (created on the basis of the latest pension reform of 2013, in which it is currently possible to enter)

Difference between both funds differ primarily in guaranteed non-negative return of investments in transformed funds. Both of these funds offer state contribution in the same amount, currently (2017) is the maximum state contribution of CZK 230 per month for the monthly contribution of CZK 1,000. In case of any contribution exceeding CZK 1,500 there is a possibility of a tax deduction from CZK 6,000 (for the monthly contribution of CZK 1,500) to CZK 24,000 per year (for the monthly contribution of CZK 3,000) (The law on supplementary pension savings, 2011).

Within the participating funds is a possibility of choice of investment strategies for individual participants. From a conservative fund, through a balanced, up to the dynamic fund, however, as follows from the theory of investment triangle, it is also a subject of higher investment risk.

The last major difference between both funds is the change of the type of pay-out of saved funds. Different liquidity then lies in the possibility of so-called retirement pension afforded within the transformed Funds, where is the possibility of entitlement to half of the saved funds after 15 years of saving. The second half of the account is then possible to draw after reaching retirement age. In the case of participating funds are all means possible to draw in retirement age, with the exception of the so-called pre-retirement payment, which is entitled to use 5 years before the age designated as a retirement pension age (The law on supplementary pension savings, 2011).

⁶ Specific profitability of this pillar is described in the analytical part.

3.2.2 Basic computing variables

The following chapter deals with basic computing variables and the construction of calculation of pensions, for the self-employed individuals in the Czech Republic. Among the basic values, from which is determined amount of granted direct pension (i.e. invalidity pension and old age pension), are included:

- *The reference period*⁷, generally perceived as the period of insurance, is the time period from where are finding gross incomes from employment. This is the period before granting the pension.

Activities of self-employed persons are divided into major⁸ and minor⁹ independent activity, while participation in the pension insurance may be awarded only from one of these activities.

- *The annual assessment bases*, are achieved gross revenue for each calendar year, within the reference period is recalculated, on the basis of multiplication with a coefficient of increase of the general assessment base, on the current value (Kukalová, 2015).
- *The coefficient of increase of the general assessment base*, is determined by the Ministry of Labour and Social Affairs on the basis of the average wages identified by the Czech Statistical Office.
- *The personal assessment base*, it is a monthly sum of annual assessment bases.
- *The calculation base*, its calculation is based on the reduction of the personal assessment base after application of the reduction limits¹⁰.

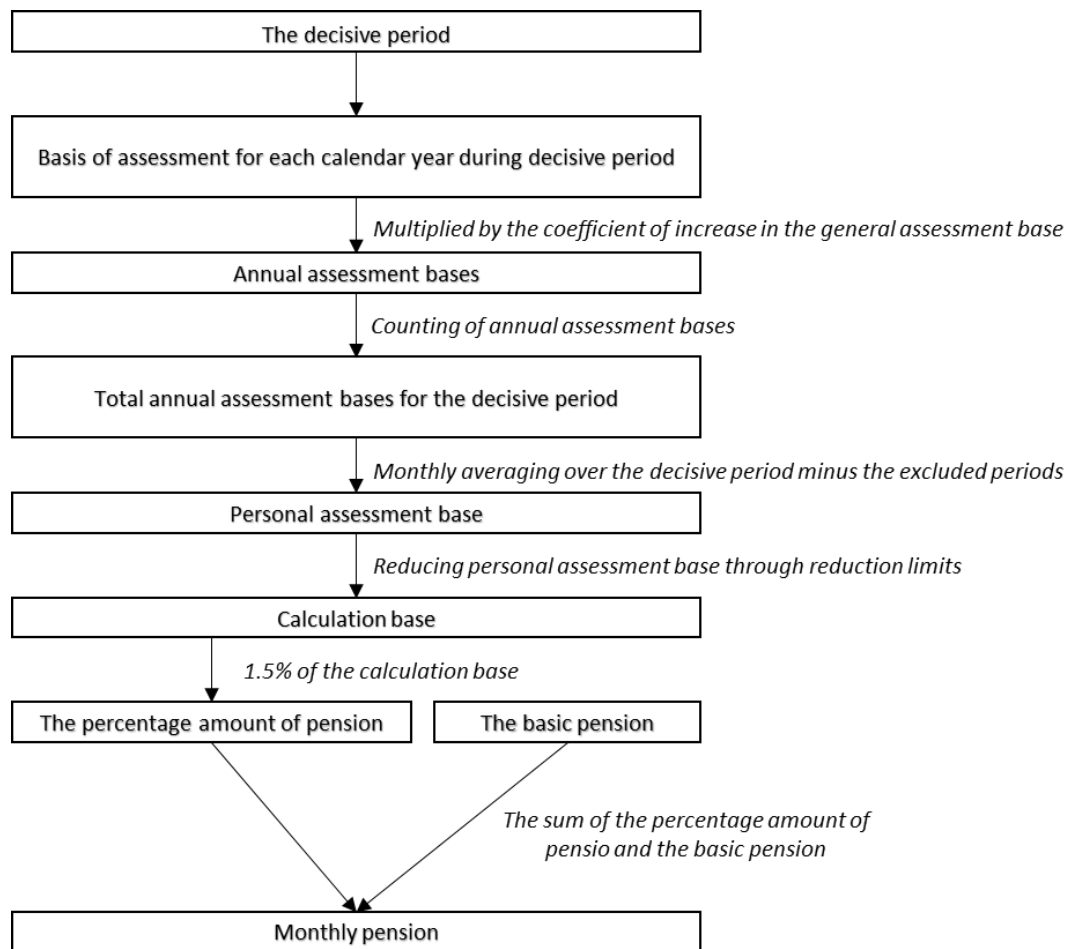
⁷ Income earned before year 1986 are not counted into the reference period.

⁸ Major _ Self-employment is a major in the period when it is not considered as minor. The main self-employment obliges citizens to participate in the mandatory pension insurance, regardless of the level of achieved incomes. Under the relevant insurance shall be considered the period of time during which the employed self-person paid pension premiums (The Pension Insurance Act, 1995).

⁹ Minor _ Self-employment is considered minor only in the period, when it took sickness insured employment, or insisted certain facts (such as disability, retirement pension, for entitlement to parental benefit, studies, etc.). For the reference period within the minor activities considers, the period of time, during which it was reached, after deducting costs, for the applicable amount for a given period, subject to the payment of premiums. In case of failing decisive amount is for self-employed individual the option of paying pension insurance on voluntary participation (Czech Social Security Administration, 2015).

¹⁰ Reduction limits _ are in the Czech Republic defined two. The first for the monthly amount of CZK 12,423 (for 2017) counted 100% of the assessment base. The second reduction limit CZK 112,928 (2017) is counted from 26%. Assessment base exceeding the amount of the second reduction limit is not counted (Regulation 343/2016 Collection).

Figure 5: Calculating a pension scheme for self-employed individuals



Source: Own illustration

As seen from Figure 5, the monthly pension is consisting of two components. Thus, the percentage of amount of pension and the basic pension. When the percentage amount of pension is 1.5% of the calculation base and the basic pension is the same for all citizens of pensionable age. Is about 9% of the average wage. For year 2017 it was estimated on CZK 2,550.

3.2.3 Conditions of entitlement to pension insurance benefits

In the next chapter, are not included claims for disability benefits, widow, widower or orphan's pensions, since these types of incomes are beyond the scope of this work. On the basis of the law on pension insurance are set various conditions for entitlement to pension insurance benefits. A situation which must always occur is called a social event (attainment of a retirement

age, disability recognition, etcetera). An important role is also played by the length of the insurance period and the specific age of the applicant (Kukalová, 2015).

- *Ordinary retirement pension*

For legitimate claim to the ordinary retirement pension, the applicant must fulfil both statutory conditions, namely reaching the statutory age and obtaining necessary insurance period (for year 2018 will be minimal amount of years 35 years).

- *Permanently reduced early retirement pension*

In the case of early retirement pension, the applicant must fulfil just the condition of the required insurance period. The age limit is then reduced according to the following rules: First rule, to retirement age is lacking to applicants' maximum of 3 years, if is his or her retirement age lower than 63 years. The second rule, to achieving the retirement age is missing by applicant no more than five years, if the retirement age is at least 63 years and he or she, already reached the age of at least 60 years (The Pension Insurance Act, 1995).

The actual amount of the pension is reduced, until the reaching retirement age, when its percentage amount depends on the number of days, missing to the retirement age.

3.3 Demographic development in the Czech Republic

Absolutely indispensable factor, that have to be taken into account within the pension system, is the demographic development. Within the demarcation of concepts is, in the following chapter, analysed demographic aging of the population, not aging of individual. Both of these groups have different features, the most prominent, is the fact that an individual, unlike the population, has not have the ability of youthing. Furthermore, as the name of the chapter implies, is analysed only the demographic development of the Czech Republic.

The overall sustainability of pension systems is then from a demographic perspective distorted mainly by two trends. It is the low number of births and increasing life expectancy. Based on the significant changes in the age structure of the population, the Czech Republic ranks among demographically developed countries. Thus, countries where in the process of demographic revolution was completed transition to low level of fertility and mortality. From this fact it can be deduced, that the Czech population leads to demographic aging. This long and very coherent

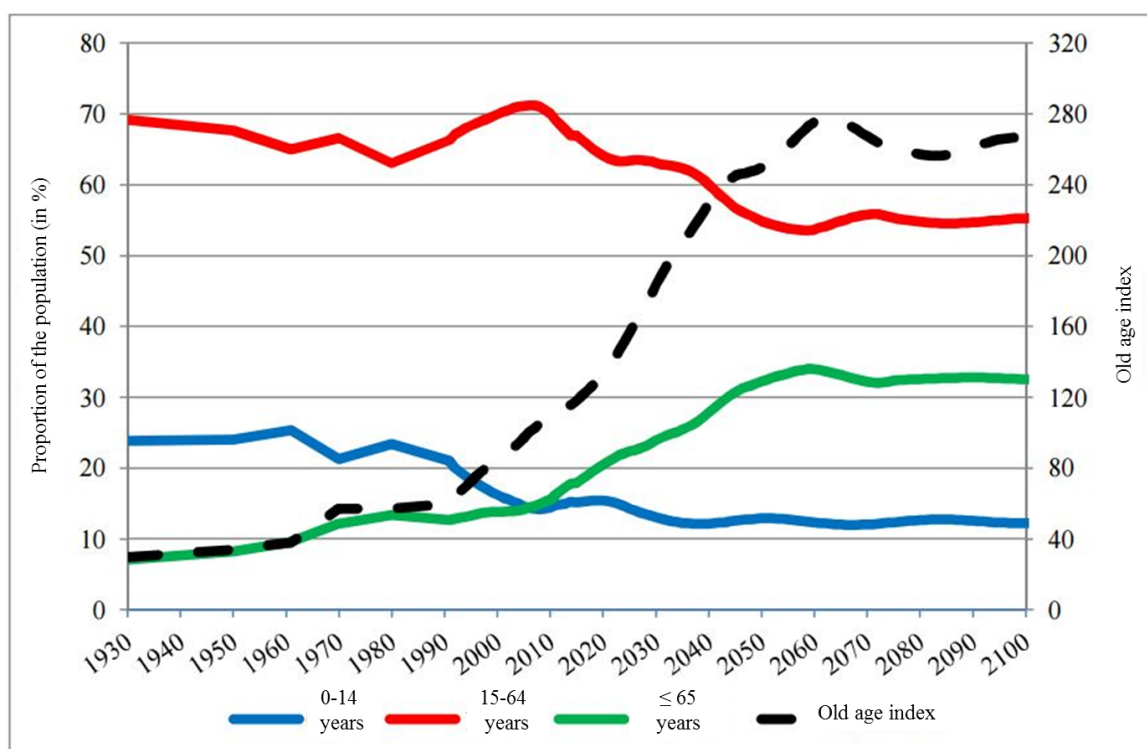
process causes a change in the relative representation of age groups in the population, particularly the increasing proportion of seniors towards the declining proportion of children.

From the economical point of view, this factor is adversely affecting economic relations between the productive and post-productive population groups. Long-term process of demographic aging then affects the overall socio-economic development of the country, including concerns about the overall stability of the pension system.

3.3.1 Development of the population age structure

The age structure of the Czech population, which is "*the result of the development of levels of fertility, mortality and migration, should be more important, about the past hundred years*" (Pavlík, 2002). Undergoes a significant deformation based primarily on the wave of volatility of the birth rate during the 20th century. These population fluctuations will affect the future population development, resulting in additional irregularities in the future.

Graph 1: Development of the age structure of the population of the Czech Republic by main age groups and the old age index between years 1930 – 2100



Source: (CZSO, Czech Statistical Office)

As can be seen from Graph 1, Czech population aged over almost the entire 20th century. Significant fluctuations in the age structure, mainly due to low birth rates, occurred as a result of the First World War and the economic depression in 30s. By contrast, compensatory natal periods are characteristic for the post-war periods. Although the aforementioned demographic revolution occurred, in the territory of the Czech Republic, already in the inter-war period, its following progress has been quite slow.

Especially in the fifties there was a slowdown of population aging. The reason was not only because of medical progress in reducing infants and children mortality, but also an increase in the birth rate in the context of the post-war period and the input of numerous generations of 20-ies into a reproductive age. In 1949, the proportion of children in the population was higher than 25%, whereas the number of seniors did not exceed 10%. Big break in an aging population, was then recorded in 60-ies, in which the age pyramid got narrows, as from below and from above. As a consequence, among other things was deemed the acceptance of abortion law in 1958. The socio-economic crisis at the end of this period, supported a trend of an aging population. To slow down of the aging of the population then occurred in the 70-ies of the 20th century, when was, due to government pro-natal steps, recorded a sharp increase in the birth rate. These steps were for following years improving the overall characteristics of the age composition in the population (e.g. the average age, or old age index) (Sak, 2012).

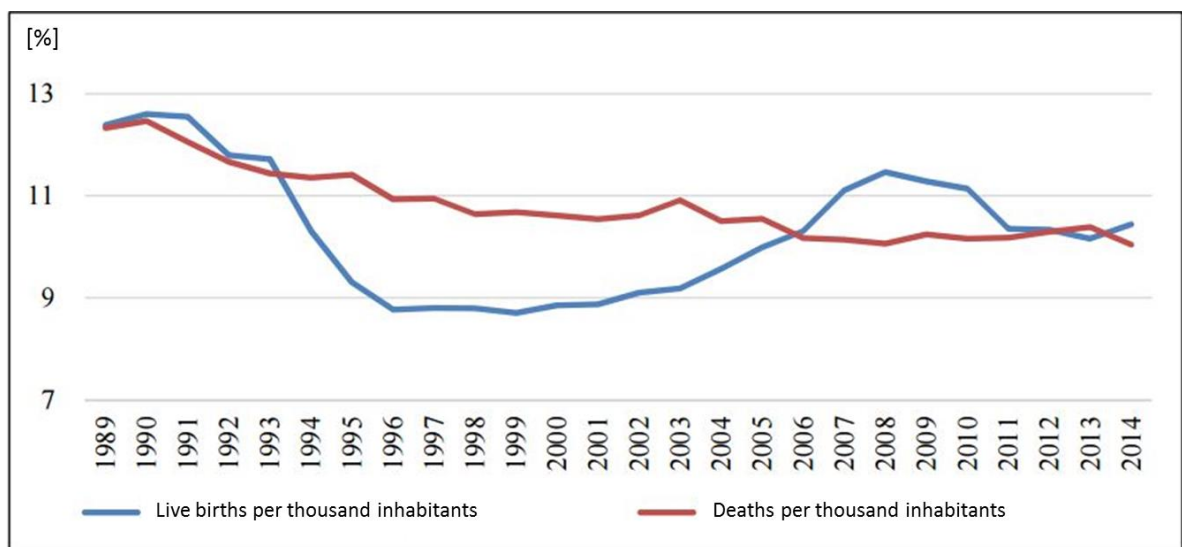
However, mentioned measures have caused and still causing a number of economic and sociological problems, because it was taken during a period, when into the reproductive age came a very strong generation from the mid-40th century. Generation from the years 1974 and 1975 is, among the last numerically strong age groups born in our country, one of the strongest ones. After this wave, has occurred only to long-term reduction in fertility (Pavlík, 2002).

Overall, it is possible to confirm the relatively favourable age structure of the post-war period until the early 90s. As the proportion of people in the economically active age exceeded, throughout this period, 60% and the proportion of children constituted more than one-fifth of the population, while the proportion of seniors was increasing only slightly. Index of aging in this period does not exceed value of 100, thus the number of children under 15 years prevailed on the number of people over 65 years.

So-called second demographic transition is observed since the mid-90s, when was reflected the postponing of parenthood for a later age and reducing of the number of children in the family. Overall, it was a reaction of young people to change of the political and economic situation in

the country, after the revolution in 1989. At the turn of the millennium, within the stagnation of the total population, the proportion of children, has decreased by 5 percentage points to 16%, compared to 1991. In monetary terms, it is the loss of about half a million children. However, in the same period entered into productive age numerous generation, which temporarily recorded some favourable changes in socio-economic situation. Age pyramid in this period was changing primarily, because of reducing of child element. Since 2003, the increase in people reaching senior age, was gradual, significant increases occurred only in 2007, thanks to population boomers from 40-ies of the last century. Despite the fact that between 2004 and 2014 the share of economically active population increased by more than 3% and the proportion of children under 15 years was evolving in the opposite direction. That has given, that in 2006 first time in the history of the Czech Republic, got into predominance number of senior over number of children. This trend continues and predictions shows that it will continue henceforward (Sak, 2012).

Graph 2: Birth rate and death rate in the Czech Republic during 1989 - 2014



Source: (CZSO, Czech Statistical Office)

Opposed to birth rate is possible in case of mortality, in the Czech Republic territory, during the same period, see a little smoother development (see Graph 2). Large demographic changes were recorded logically during both world wars but since the end of World War II until the early '60s, it can be seen a gradual reduction in mortality, particularly infant mortality. Overall,

there was increasing of life expectancy across both sexes. Also, due to the constant increase of people entering into the retirement age occurs, in the 80-ies, there was a gradual reduction in mortality. Reducing of the mortality is associated with many factors, such as the progress of health care, improve food supply, economic activity of population associated with change in the lifestyle. Steadily decreasing mortality is very well recognizable with increasing life expectancy. Specifically, over the past 20 years, the life expectancy of men increased by 7.5% (75.8 years) and women by 6 years (81.7 years) (Pavlík, 2002).

As it was indicated in the definition described at the beginning of the chapter, in addition to the development of fertility and mortality, it is crucial to include also factor of migration, in the overall survey. Impact of migration is reflected mainly in the category of the working age population. A substantial change in the demographic map of the Czech Republic was the separation of Czechoslovakia in 1993. The census in 2001, showed the sharp increase of foreigners with visas or long-term residence permission in the country. Beneficial effect on the growth of the economically active population, was caused also by entrance of the Czech Republic into the European Union in 2004, associated with the entry into the Schengen area in 2007. A certain beneficial role played also a continuous economic growth until 2008 (Triandafyllidou, 2010).

From the previous investigation, it is evident that demographic aging of the Czech Republic will, at least for the next several decades, continue. Based on the data from Czech Statistical Institute can be stated, although the share of children slightly grows, that in the following at least 100 years, will not reach the level of 16% of the population, which was at the beginning of twenty first century.

In the time period illustrated on the Graph 1, can be expected major changes in the context of people in working age, thus 15-64 years. Taking into account that the economically active are becoming, citizens of Czech Republic, around 20 years of age, because the current trend is to continue of studies after completing elementary education. The overall trend would be in this age group declining, since its peak in 2009 (71% of the population) over the current 68% to just 55% in 2100. On the basis of retirement for baby boomers is possible to expect the fastest decline in 2020 from 67% to 64%, thus from the number of 5.7 million persons to 6.75 million.

The most significant changes, can be expected within the category of persons aged 65 years and over. From the Graph 1 is noticeable progressive aging of the Czech population, both in absolute and relative terms. Absolute aging is primarily supported by increasing average age

expectancy. Expected relative aging is based on the trend of a declining number of children and the overall population decline in our territory. The highlight of this curve is then expected to year 2057 when the number of seniors will almost double from 1.8 million. to 3.2 million, which would constitute approximately one third of the Czech population.

3.3.2 The economic burden of population in the context of demographic aging

In the previous Chapter was described the trend of progressive aging of the population in detail. This chapter provides data describing the possible economic consequences on the basis of that demographic fact.

Table 1: Characteristics of age structure and indexes of load of the economically active part of the population of the Czech Republic between 1991-2100 (on 31.12. of selected years)

	1991	2001	2011	2020	2030	2040	2050	2060	2070	2080	2090	2100
Average age (in ages)	36.3	39.0	41.1	43.0	45.7	47.7	48.8	49.8	49.9	49.4	49.4	49.8
Old age index	59.7	85.2	110.4	132.9	183.2	229.3	249.8	275.5	267.4	257.3	261.1	266.8
Index of dependence	19.0	19.70	23.40	31.9	37.9	46.4	58.6	63.3	57.7	59.5	60.0	58.9
Index of economic burden	63.8	52.9	51.5	67.7	73.3	80.2	96.9	104.1	94.8	98.1	99.5	96.7

Source: Own elaboration based on data from CZSO (Czech Statistical Office)

Based on the data shown in Table 1, it is possible to deduce the increase of the average age of the economically active population, which is estimated the average age of working citizen for 2100 of about 50 years. Old age index, which in 2006 exceeded the 100, should be, according to predictions, permanently increasing and doubled when compare year 2020 and 2060. For that year, would have accounted numbers of 275 seniors per 100 children under the age of 14 years. Index of dependence, compares the number of economically inactive persons with in the economically active age ones. From the Table 1 is then seen a growing trend that will increase the economic burden on the population. The index of economic burden refers to the ratio of the economically inactive part of the population (the number of senior citizens and children under 14 years of age) with the economically active population. Specifically, how many economically inactive persons accrue to 100 persons aged 15-64.

Expenditure on pension insurance consists, in the Czech Republic, approximately one-third of public spending budget. For the year 2014 totalled expenditures on pension insurance were CZK 376.4 bill. In contrast, revenues from pension insurance amounted in 2014 CZK 333 bill. The total balance of the retirement account is then approximately CZK -43.3 bill. It confirmed the negative trend from year 2008 (Statistical yearbook of pension insurance for 2014, The Czech Social Security Administration).

From mentioned demographic trend, the economic burden of the population and the negative balance of the retirement account of the Czech Republic, is an obvious need of reforms of the pension system, or differently adjusted state social policy, for the possibility of the sustainability of these systems in the future.

3.4 Evaluation of selected European pension systems and their comparison with the Czech Republic

Pension systems in European countries show, despite some common characteristics, a great diversity. It logically comes from the economic, sociological but also from geopolitical differences within the European Community. It is important to note that there is no perfect pension system, which could be applied globally. However, it is possible to observe a certain number of common features, which could lead to better results. Factors influencing the setting of specific pension systems are often highly dependent on, for example, traditions, customs and historical development of the country. Based on these differences is a juxtaposition of the pension systems a very difficult discipline that may exhibit traits of subjective perception of specific pension model.

For these reasons, the next chapter focuses on the perception of different pension systems more from the perspective of a functioning organism rather than comparing gross macroeconomic and demographic data. By focusing on the pension system as an organism, it is possible to evaluate its current "condition". If it is in a good condition and its future sustainability is also strong, that pension system may be identified as a well-functioning. In contrast, the poor condition may indicate possible areas for improvement, leading to the subsequent reform measures, leading to the recovery of the pension system as a whole.

On the basis of this perception was selected for the following comparisons The Melbourne Mercer Global Pension Index, which is described in detail in chapter 3.4.1. Within the great

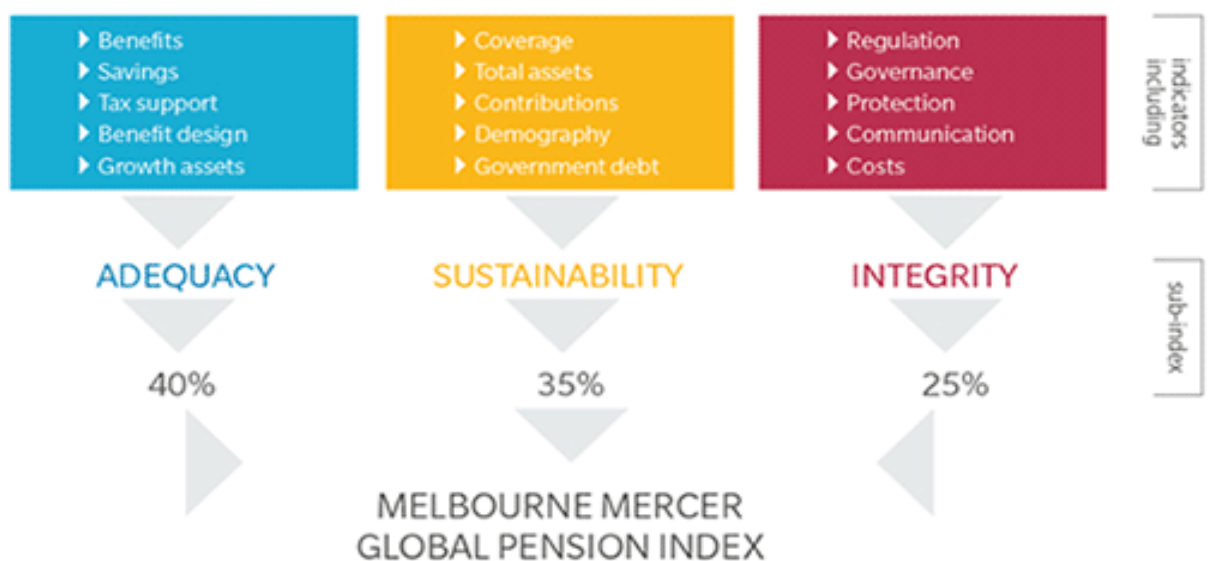
diversity of data, following chapters are based on publicly respected OECD data for the year 2015.

In the following chapters are compared pension systems of Denmark and the Netherlands. The selection of these two countries was based on the British daily newspaper The Telegraph, which has assessed these two countries (selected only from the European countries), as the countries having the best pension systems in the world. These systems are then described and compared with the Czech pension system described in previous chapters. Focusing only on European countries comes from the demographic situation in Europe, which is exhibiting some identical elements.

3.4.1 The Melbourne Mercer Global Pension Index

The index is characterizing the retirement income of twenty-seven countries within the OECD, according to more than forty indicators. Czech Republic is not included, at least till now. In case of political acceptance could, based on this system, leads its results to the reform steps leading to increased efficiency, sustainability and confidence in the pension system as a whole. The indicators are grouped, according to criterial weight, into three sub-indices. Specifically, the adequacy with the criterion weight 40% sustainability (35%) and index of integrity affecting the overall index of the 25% (The Melbourne Mercer Global Pension Index, 2016).

Figure 6: Calculation of The Melbourne Mercer Global Pension Index



Source: (The Melbourne Mercer Global Pension Index, 2009)

- *The Adequacy Sub-index*

As apparent from Figure 6, the sub-index of adequacy has the highest criterion weight. It measures the benefits and other advantages, that derive from the pension system. It consists of 11 questions. The primary object of this sub-index is to provide adequate income to people in post-productive age. For an adequate system is regarded as such, which is providing a basic pension amount equal to the median of wages in a particular country. Within this sub-index is also included ownership of households (savings, share ownership of real estate, etc.). All these factors may have an important role in the overall financial situation of seniors (ChartsBin, 2016).

- *The Sustainability Sub-index*

The Sustainability Sub-index is reflecting the probability of future functioning of a particular pension system. Structure of the sub-index is included in the seven questions. Evaluated is primarily a long-term system stability. As the main factors here figuring demographic situation in the country, including any increase in the national debt (The Melbourne Mercer Global Pension Index, 2016).

- *The Integrity Sub-index*

This index reflects mainly the overall message and the operation of the pension system, including citizens' confidence in the system. Factors influencing this index, as functions of public administration, legislative protection of participants, the control system, communication between the provider and the participants (also potential participants), private pension plans and so forth. The actual sub-index sections are dealing with governmental policies and nepotism of participants of pension scheme. From this indicator is then visible, emphasis on the need of private pension plans, thus limiting of the state as the sole provider of pension doses (The Melbourne Mercer Global Pension Index, 2016).

3.4.2 Denmark

The Danish pension system consists of batch and publicly defined schema. This system is also made up of the private pillar, which is managed by a private company under the ATP¹¹ fund.

¹¹ ATP fund _ Danish labour market supplementary pension fund. Warranty for participants, of not leap depreciation and ensuring of old-age benefits at a certain level, regardless of age expectancy. Two-thirds of annual contributions are paid by the employer, in a case of a full-time job (ATP, 2016).

In addition to these financing options for securing the post-productive age, Danish system allows the existence of the employee pension funds. Within the defined benefit scheme, are most in favour economically weaker individuals opposed to financially stronger seniors (OECD Economic Surveys: Denmark, 2016).

The condition for the payment of pensions for batch-oriented scheme is reaching retirement age of 65, having regard to its gradual increase to 67 years by 2022. The second condition is, to be at least 40 years a resident of the country. The remaining funds are purely voluntary (OECD Economic Surveys: Denmark, 2016).

The amount of benefits from the pension system will then vary according schemes as it shown in following text. *Benefits from the basic pension scheme*: Basic dose height is DKK 70,896 (approximately CZK 260,000) annually. This is rounding of 17% of the average wage. The amount of benefit also takes into account salary, rents, medical condition and marital status of participant. After exceeding the boundaries of annual wage of DKK 301,200, is the payment of benefits, in the retirement age, reduced by 30% (OECD Economic Surveys: Denmark, 2016).

Doses from ATP funds are dependent on the amount of the contribution. Then the lump payment until the death of a participant is guaranteed (after reaching retirement age). It is a kind of deferred life annuity with a fixed contribution. The amount of contribution varies according to number of worked hours (ATP, 2016).

Doses from employee collective agreement, are derived under specific agreements in relation employee and employer, with a big difference between public and private sectors. Self-employed individuals have no possibility of benefit. Contributions, that covers more than 90% of the Danish workforce, are in the range of 12% to 18% of payroll. Usually is taken into account an education of the participant with respect to subsequent entry of university-educated individuals (OECD Economic Surveys: Denmark, 2016).

3.4.3 The Netherlands

The Dutch pension system consists of three pillars. First state pillar, funded from tax payments, based on the minimum wage. The second pillar consists of employee funds, based on voluntary basis. It is therefore purely on a decision of the employer, whether the contract will offer to his or her employees. Despite the voluntary basis of the second pillar is in the Netherlands covered

up to 91% of employees. The third pillar is then made up of the personal savings scheme of specific citizen (OECD Economic Surveys: Netherlands, 2016).

The condition for the payment of pensions in the Netherlands, is the acquisition of the retirement age and proving of the permanent residence (50 years) in the country. The current retirement age is designed on 65 years with a gradual increase to 67 years in 2021 (OECD Economic Surveys: Netherlands, 2016).

The description of height and calculation of benefits is based on OECD Economic Survey, conducted in the Netherlands in 2016.

Doses from the state system, are adjusting every two years according to the minimum wage. Next is distinguished of marital status of seniors with different payment of benefits for citizens in a pair and single persons. Minimum rate is EUR 1,149.48 (approximately CZK 31,000) for single living person and EUR 1,619.29 (approximately CZK 43,800) for couples.

Doses from employment contracts, this type of benefits has many faces, because it uses offers from a large amount of brokerage funds. Approximately 400 pension funds.

Doses from an individual form of savings, as the name suggests is entirely dependent on the investment strategy of a citizen and on a specific contract with a private pension companies.

3.4.4 The Czech Republic and its comparison

In the following chapter are described the results of the individual sub-indices of the Melbourne Mercer Global Pension Index for the Czech Republic, including a comparison with the already mentioned countries. There is a need to emphasize that the calculation of the Melbourne Mercer Global Pension Index for the Czech Republic is discussed only by two authors so far. In this work was carried out the correction calculation in which was achieved almost identical results with just some slight differences, which are caused by often subjective ranking of questions. For this reason, it is requested from readers of this publication to take into account any inaccuracies and errors.

- *The Adequacy Sub-index for the Czech Republic*

Based on the evaluation of the sub-index is considered the minimum pension (approximately 12% of the average wage), to be very negative, due to lack of compliance with the share of the average wage of 30%. This amount is assessed as insufficient to cover basic needs of living. In

contrast, positively evaluated the percentage of people owning property (approximately 79%), as well as tax relief and state contributions in the case of supplementary pension savings. As a further problem is evaluated the absence of social security specified in the contract with the employer, when the percentage distribution of employers supporting the additional pension saving is minimum. Absence of former 2nd pillar can cause insufficient pension payments from pension insurance. Total sub-index of adequacy was calculated to 40.7, where the global average for 2016 is 59.0.

- *The Sustainability Sub-index for the Czech Republic*

Within this sub-index was evaluated as a deficit the lack of funds for the funding of pension insurance. Thanks to the almost immediate financing of these funds to benefits for current seniors, funds are not invested (no adding value), and taking into consideration on the decrease in the percentage ratio of the economically active population and the increasing life expectancy and aging of population, the system becomes more and more deficient. Thus, less sustainable for future years. This deficit increasing government spending, respective cost, may cause to a gradual increase of the national debt.

In contrast, the positive aspects are evaluated by the high participation of the population on supplementary pension insurance and the amount of government debt to GDP. The overall sustainability sub-index was calculated on the value of 46.8, where the global average for 2016 is 48.5.

- *The Integrity Sub-index for the Czech Republic*

Based on the calculation of the index of integrity is within the communication between the Czech National Bank and pension companies, as well as the availability of information provided by pension companies, based on the subjective assessments of the author (based on scientific articles). Those responses are not substantiated by scientific research. This area was rated by the author as good. Information relating to the success of investment funds etcetera are available for applicants. The last subjective evaluation, is the evaluation of the perception of pension system by the general public, in this point was a system evaluated as less credible. For in this section troubled is introduced a legislative change of the supplementary pension insurance in 2013. Thus, removal of non-negative warranty of contributions. This step is partially weakened the popularity of this form of securing on the post-productive age, and among the general public was perceived rather negatively.

In contrast, the tax advantages of this pillar, including eventual state contributions streamlines this model both in terms of contributions and in resulting payoffs. Total sub-index of integrity was calculated to 47.5, where the global average for 2016 is 70.1.

Table 2: The results of the comparison of selected countries, according to The Melbourne Mercer Global Pension Index for year 2016

	Denmark	Netherlands	The Czech Republic
The Adequacy Sub-index	75.8	78.2	40.7
The Sustainability Sub-index	85.3	77.0	46.8
The Integrity Sub-index	81.4	87.7	47.5
The overall index	80.5	80.1	44.5

Source: (Own computation according to the results of The Melbourne Mercer Global Pension Index in 2016)

As it is evident from Table 2, the overall scores for the Czech Republic is 44.5 points. Which is, compared to the both evaluated countries, huge difference. However, it should be noted that both selected countries belong by the Melbourne Mercer Global Pension Index to the best rated countries in the world. Namely Denmark in October 2016 in the global ranking obtained first place and the Netherlands second place. The overall world average of the Melbourne Mercer Global Pension Index is appointed to a value of 58.1.

According to following Table 3 is evident that the Czech Republic obtained for its overall index, grade D. Pointing on some weaknesses of the pension system with a certain number of suitable elements. From this study, emerging proposals and recommendations, are described in the research part and in conclusion of this work, where are supported by scientific analysis and by own research of the author.

Table 3: The results of The Melbourne Mercer Global Pension Index for October 2016

Grade	Index Value	Countries	Description
A	>80	Denmark Netherlands	A first class and robust retirement income system that delivers good benefits, is sustainable and has a high level of integrity.
B+	75–80	Australia	A system that has a sound structure, with many good features, but has some areas for improvement that differentiates it from an A-grade system.
B	65–75	Finland Sweden Switzerland Singapore Canada Chile	
C+	60–65	Ireland UK	A system that has some good features, but also has major risks and/or shortcomings that should be addressed. Without these improvements, its efficacy and/or long-term sustainability can be questioned.
C	50–60	Germany USA France Malaysia Brazil Poland Austria	
D	35–50	Italy South Africa Indonesia Korea (South) China Mexico India Japan Argentina	A system that has some desirable features, but also has major weaknesses and/or omissions that need to be addressed. Without these improvements, its efficacy and sustainability are in doubt.
E	<35	Nil	A poor system that may be in the early stages of development or non-existent.

Source: (Mercer, 2016, Melbourne Mercer Global Pension Index)

4 Analytical part

The following analytical part is dealing with the comparison of the state pension system and alternative forms of securing on post-productive age. Within this analysis is evaluated the pension system of the Czech Republic from the perspective of long-term investments for individuals, specifically self-employed individuals. The following analysis of alternative forms of assurance for elder age is based on the same investment assumptions, such as investment horizon and invested amount. Specific comparison is made on the basis of the horizontal ratio analysis where the determining factors are liquidity, profitability and riskiness, based on the theory of investment triangle.

The aim of the analytical part is the evaluation of the both above explained strategies and thus an answering of the basic hypothesis of this thesis. The results presented in this chapter are then applied in the research part of this publication.

4.1 State pension as an investment in the Czech Republic

The following chapter contains an analysis of financial securing on the post-productive age within the state pension system. The primary focus of the study is on self-employed individuals. Framework concept of this chapter is focusing on the state pension system, as on investment. There is the emphasis on quantifying of the financial capital inserted into the system and then drawn from the system, with resulting in calculated profit or loss. Distribution of this chapter is by currently operating two pillars of the Czech pension system (see chapter 3.2.1). In both cases, the emphasis is on calculation of factors of investment triangle, from this long-term investment flowing.

4.1.1 The first pillar

The self-employed individuals can, in contrast with employees positively affect the amount of their future pension payments by increasing the voluntary higher advance payments of social insurance. Thus, they can increase their future pension, even if they do not achieve sufficient revenues, namely personal assessment base for a certain period or for the duration of their gainful activity. Since this publication is based on information sent in a letter of the Minister of Labour and Social Affairs Michaela Marksová, is the primary focus, within the next chapter, on payments of the minimum and higher advance payments into the pension insurance. Important note for readers of this publication is the fact that the following analysis ignores the factors of inflation and indexation. The reason is possible less meaningful value of work based on the relatively weak forecast of the future development of both factors, resulting from the econometric analysis. This publication and the following chapter, counts with mutual subtraction of both indicators. Thus, a legislative adjusting, by another name the indexation of pensions, according to appropriate price level for a specific period. This self-compensating mechanism then occurs to auto-corrections enabling omission of both factors from the subsequent analysis.

Factors that affects the amount of pension and therefore factors entering into subsequent calculations are: personal assessment base, period of social insurance, the amount of voluntary contribution into the social insurance, the average time of drawing of pension (derived from the average life expectancy of the population in the Czech Republic according to the Czech Social Security Administration data).

Table 4: The amount of monthly pension in with higher than minimum payments into the pension insurance, for year 2016

<i>Multiple of the minimum insurance</i>	<i>The level of payments per month (2016)</i>	<i>Amount of pension</i>	<i>Multiple of the minimum pension</i>
1	CZK 1,972	CZK 5,768	1
2	CZK 3,944	CZK 9,136	1.58
4	CZK 7,888	CZK 11,751	2.04

Note: Calculated to the insurance period of 45 years with an appropriate multiple of the minimum pension insurance and with time of business from 1990 to 2014 in the Czech Republic.

Source: (Letter of Minister Mgr. Michaela Marksová for entrepreneurs and own computations)

From table 4 it is seen a regressive dependence of the entering factor (monthly fee), and from the system exiting factor (the amount of pension at retirement age). Clear evidence is only twofold increase in retired after a four-fold increase of monthly payments. Taking into account an average period of savings, or more precisely the average length of pension insurance (45 years for the self-employed individuals in the Czech Republic) and average time of drawing a retirement pension thus 24 years (the figure quoted by Czech Social Security Administration for the year 2015), is apparent conversion of positive balance (acquired pension during life minus sum of payments into the social insurance) of return on invested funds into the negative balance (see. Table 5)

Table 5: The total balance according to multiple of the minimum payments into the pension insurance

<i>Multiple of the minimum pension insurance</i>	<i>Amount invested into the pension insurance</i>	<i>The total amount drawn from the pension insurance</i>	<i>The total balance</i>
1	CZK 1,064,880	CZK 1,661,184	CZK 596,304
2	CZK 2,129,760	CZK 2,631,168	CZK 501,408
4	CZK 4,259,520	CZK 3,384,288	CZK -875,232

Note: Amount invested into the pension insurance is calculated for period 45 years. Drawing of social insurance is calculated for 24 years.

Source: (Own computations)

Table 5 highlights the inverse relationship between the payments into the social insurance and the overall average profit. Specifically, by increasing of the advance payments to social insurance, decreases overall profitability (after a certain level occur to lost). This calculation thus denies the general hypothesis, regarding to the profitability of a voluntary increase of this type of contributions. In the already mentioned letter is also correctly noted that the pension amount may be lower, than in the case of the minimum payment, since the 1996-2003 period was not duty to the citizens of exhibiting a loss to pay a minimum amount of insurance. This then reduces their total insurance period, therefore one of the factors determining the final amount of the pension. Pension would be in this case amounted to CZK 4,603 (see. Letter from the Ministry of Labor and Social Affairs).

By focusing on the perception of the first pillar, as a long-term investment, it is coming out a big advantage in terms of *riskiness*. Failing very rare socio-political phenomena is this type of securing for the post-productive age a safe investment with a guarantee of future drawing at least some amount. More simply there is no possibility within this system to the case when, after inserting a minimum amount of social insurance for at least 33 years (level for 2017), and reaching the statutory retirement age, for not drawing any financial means, such as with other highly dynamic methods of investigation.

Rentability of investment in that case is shown in the following table 6. Thus, return on equity (ROE) is at a minimum amount of monthly allowance equal to 56% and for double of the minimum advance is equal to 23.54%.

Table 6: Attributed annual interest rate of payments into the pension insurance

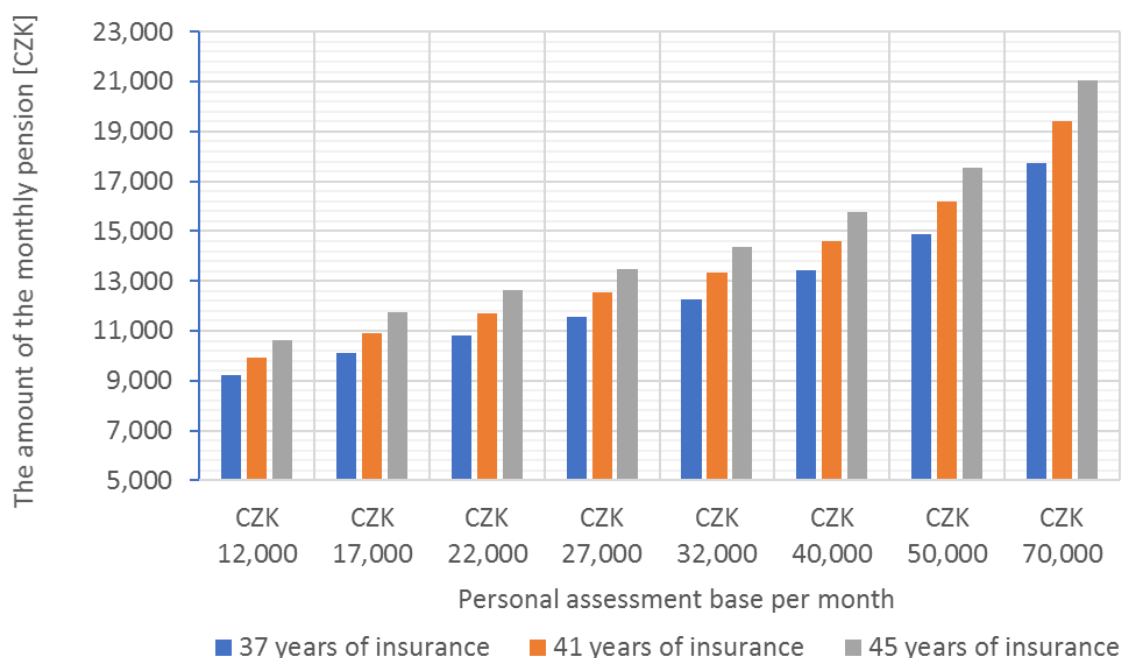
<i>Multiple of the minimum pension insurance</i>	<i>Annual Interest Rate</i>
1	1.83 % p.a.
2	0.90 % p.a.
4	-20.55 % p.a.

Note: *Obtained results are valid only for the case described in tables 4 and 5, thus, for the same period of insurance and the same period of drawing.*

Source: (Own computations)

After focusing only on a minimum payment of social insurance, together with an assessment of risks, it is according to profitability a very conservative way of savings. Even though such contributions are mandatory, from higher contributions implies their lower profitability. Obtained results will hereinafter be subjected to comparison in the analysis of alternative ways of securing the pension age. Assessment of *liquidity* in this case is rather pointless, but within a critical evaluation all these types of long-term investment, this way of savings may be considered to be highly illiquid.

Graph 3: The amount of the pension, depending on insurance period and personal assessment base



Note: Calculations according to the legislation of 2017.

Source: (Own computations)

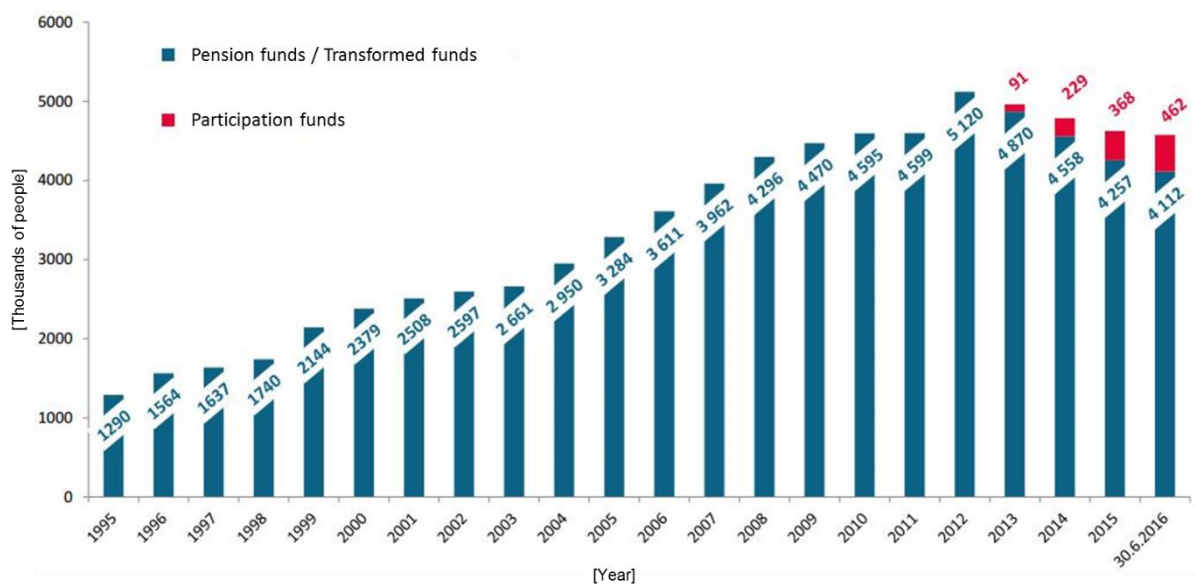
From dependence illustrated in graph 3 is obvious a very disproportionate increase in monthly pension based on the increase in monthly contributions to social insurance. In the extreme case of monthly personal assessment base of CZK 70,000 is determined monthly pension after 45 years of insurance only CZK 21,041.

4.1.2 The third pillar

As has been described in the literature review, the third pillar of the pension system is made up of so-called supplementary pension savings after pension reform (in 2012), known as pension schemes. The potential advantages of this product, is for the self-employed individuals lower than for employees, who in some cases could have an option of obtaining employer contribution into this type of savings. Following chapter deals with investment assessment, as (from 2013 impossible to conclude) transformed the funds and current participating funds.

Among the great advantages of this type of savings include the tax deductibility of expenses (contributions), potential opportunity of getting an employer contribution and from the certain amount the entitlement to state contributions into this type of savings. The disadvantage, but only in case of participating funds, is no guarantee of non-negative appreciation of contributions, which is reflected in the declining popularity of this type of investment for securing on pension age. This is also possible to read from the graph 4.

Graph 4: Development of the number of participants of the third pillar in years 1995-2016



Source: (Czech Association of Pension Companies)

Popularity of this type of savings underscores more than a half participation (57%) of the economically active population of the Czech Republic. Within this amount, pension companies administered in 2016 about 36 billion Czech crowns.

Graph 5: State contribution and tax savings according to monthly allowance of participant for year 2016

The contribution of the participant (CZK per month)	The state contribution (CZK per month)	Tax savings (annually CZK)
300	90	0
1,000	230	0
1,500	230	900
2,000	230	1,800
3,000 and more	230	3,600

Source: (Czech Association of Pension Companies)

Graph 5 illustrates possible advantages, that can participant receive, based on the amount of his monthly contribution. A participant may each year, from the part of the contributions which exceeds CZK 12,000, claimed as a deduction from the tax base. The tax deduction can then reach up to CZK 24,000 CZK / year, saving on income tax to 3,600 CZK / year. From CZK 300 monthly contribution of the participant is entitled to receive a state contribution in the amount of CZK 90. Employer contributions are tax deductible costs. Employer contributions of up to CZK 50,000 are exempt from paying health and social insurance. In case of death of the participant, accumulated funds will receive designated persons or potential heirs. The minimum monthly contribution of participant is CZK 100.

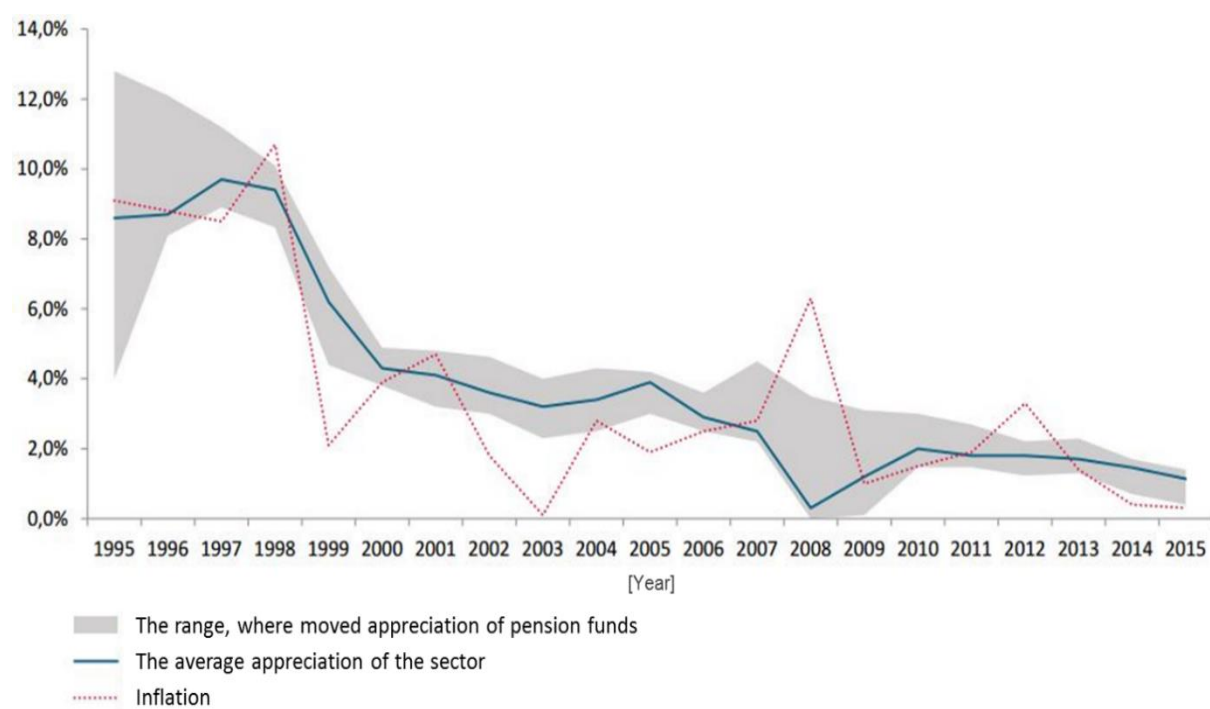
Graph 6: Development of the average monthly contribution of participants in years 1995-2016



Source: (Czech Association of Pension Companies)

Development of the average monthly contribution of participants is shown in graph 6, which points to a growing trend, until the aforementioned reform from year 2012, after which there is a kind of stabilization of these contributions, in participation funds even a slight decline. This trend from last 3 years, is based on several aspects, for example interest rates at a record low and declining confidence of participants in this type of savings.

Graph 7: The average appreciation of deposits for the period 1995-2015



Source: (Czech Association of Pension Companies)

Graph 7 illustrating the third pillar of *profitability*, shows a downward trend of appreciation of invested funds. Especially in 2008, this appreciation reached to prior minimum, after the market reaction to the global financial crisis. The average annual appreciation shown for the period is 3.86 %. If is, from this percentage, adjusted period with very different exchange rate and interest rate, thus till year 2000, the average appreciation of funds moving around **2.94 % p. a.** In the previous graph 7 are included results from both funds. It is also possible to read, for most of the period, higher value of appreciation, compared to long-term inflation. This means that finance inserted into this product are really positively appreciated, in long-term perspective.

Table 7: Outcome of savings in the third pension pillar in the Czech Republic

Multiple of the minimum insurance	Amount invested into additional pension savings	Total in savings	Total in savings after taxation	The total net balance
1	CZK 1,064,880	CZK 2,450,480	CZK 2,261,270	CZK 1,196,390
2	CZK 2,129,760	CZK 4,645,006	CZK 4,286,349	CZK 2,156,589
4	CZK 4,259,520	CZK 9,034,058	CZK 8,336,507	CZK 4,076,987

Note: Computations are for an average appreciation of 2.94 % in an investment horizon of 45 years.

Source: (Own computations)

The data that are shown in following Table 8 indicates not only the profitability of individual funds of pension companies, but also to the potential *riskiness* of the investment. At transformed funds, as was already mentioned, the risk of loss of invested funds is zero (except some extreme political and social situations). In contrast, the participating funds depends on the investment strategy and thus the level of risk that the participant is able to undergo. Especially in dynamically oriented funds is also sometimes possible to see a negative evaluation. However, when taking into account, the long-term character for this type of savings, it can be said that this product is also in dynamically oriented strategy relatively safe, because the potential risk associated with fluctuations in the markets diversifies throughout whole saving period.

Subsequent *liquidity* is then the similarly low as within the first pillar, when is allowed the drawing of funds after reaching the retirement age, except the possibility of so-called early retirement that the participants is able to use 5 years before reaching retirement age. After fulfilling the conditions is to participant given the opportunity to one-time withdrawal or drawing of payment in form of pension.

Table 8: Evaluation of the funds of individual pension companies in years 2013 to 2015

Name of pension company	Transformed funds			Participation funds			Investment fund according to the chosen strategy
	Year			Year			
	2015	2014	2013	2015	2014	2013	
Allianz penzijní společnost, a.s.	1.38 %	1.64 %	1.6 %	1.22 %	1.31 %	1.44 %	PKF
				3.18 %	2.12 %	1.67 %	Balanced PF
				4.98 %	2.78 %	1.76 %	Dynamic PF
AXA penzijní společnost, a.s.	1.1 %	1.46 %	2.29 %	0.59 %	2.67 %	0.49 %	PKF
				-0.23 %	3.61 %	0.54 %	Debenture PF
				2.02 %	n/a	n/a	Balanced PF
Conseq PS, a.s.	0.4 %	0.7 %	2.17 %	0.51 %	1.39 %	0.69 %	PKF
				0.60 %	5.00 %	3.40 %	Debenture PF
				-0.08 %	12.71 %	19.53 %	Global Equities PF
Česká spořitelna - penzijní společnost, a.s.	0.85 %	1.42 %	1.3 %	0.50 %	1.34 %	0.44 %	PKF
				-0.23 %	4.11 %	0.41 %	Balanced PF
				-1.04 %	7.02 %	0.17 %	Dynamic PF
ČSOB Penzijní společnost, a.s.	1.2 %	1.4 %	1.7 %	1.35 %	2.68 %	0.94 %	PKF
				3.55 %	3.77 %	0.70 %	Balanced PF
				7.66 %	3.28 %	0.66 %	Dynamic PF
				0.87 %	1.65 %	1.10 %	Guaranteed PF
NN Penzijní společnost, a.s.	0.88 %	1.13 %	1.41 %	1.15 %	0.61 %	0.27 %	PFK
				-11.53 %	n/a	n/a	Growth PF
				-0.05 %	n/a	n/a	Savings PF
KB Penzijní společnost, a.s.	1.16 %	1.35 %	1.44 %	0.36 %	1.33 %	0.36 %	PKF
				1.57 %	3.54 %	1.07 %	Balanced PF
				1.60 %	5.81 %	2.16 %	Dynamic PF
				0.36 %	n/a	n/a	Savings PF
PS České pojišťovny, a.s.	1.4 %	1.7 %	2.1 %	1.00 %	0.90 %	2.50 %	PKF
				1.20 %	2.40 %	2.90 %	Savings
				0.50 %	2.50 %	3.60 %	Balanced PF
				-0,30 %	1.80 %	3.50 %	Dynamic PF

Source: (Own computations, based on data from the Czech pension companies)

4.1.3 Summary

When evaluate the pension system in the Czech Republic, under the criteria of the investment triangle. Both pillars are resulting as a safe investment in the context of providing for old age. Low riskiness is then compensated by the lower appreciation of the financial funds. Especially in the first pillar is declining profitability of investment with higher contributions, more precisely advances into the pension insurance. The third pillar is then quite profitable, and

taking into account the possible tax advantages and potential employer contributions (except for the self-employed individuals), this type of savings is appropriate conservative product in the context of securing for pension age. Low liquidity is based on specific conditions, under the laws of the Czech Republic.

From the analysis resulting lower advance payments into social insurance and the declining popularity of supplementary pension schemes, when taking into consideration the demographic situation in the Czech Republic, are very risky and warning indicators for current and future legislative power. The current trend should be exactly the opposite. Potential solutions and measures for self-employed individuals is separately described at the end of this publication.

4.2 Analysis of alternative options to securing on pension

As is contained in the introduction into the analytical part, the following chapter is based on the same investment assumptions from those mentioned in the previous chapter. The reason for this is the greatest possible consistency of both chapters, leading to increase of mutual correlation and meaningful value of the thesis. In this part are also evaluation factors the individual vertices of the investment triangle. The selection of specific types of alternative forms of financial securing for retirement age is based on the publication by Jim Mellon and Al Chalabi: *Ten of the best investments for the next 10 years*.

4.2.1 Properties

There are different variations of approaches within the property investment and to cover all, would certainly beyond the scope of this publication. Therefore, the next chapter primarily intended to enumerate these factors that are important to a potential investor. It should be noted that there is no guaranteed method, which would be quite cost-effective and efficient for all investors. Each investor is an individual, but in the following case study it is shown the model reflecting the majority of the self-employed individuals in the Czech Republic.

Despite the fact that there are more investment options in real estate. For example, the purchase of real estate share certificates, investing in real estate trusts, buy of shares of companies operating in the real estate sector, etc. The focus of the following chapter is based on the definition of immovable property under the civil code (Law No. 98 / 2012 Coll.), title IV, §498

(Immovable and movables things), para. 1: "*The intangible things are land and underground construction with a separate purpose specification, as well as property rights to them, and the rights for immovable assets declared by law. If determined other legislation that a thing is not part of the land and cannot do such a thing to migrate from place to place without violating its essence, is this thing real property.*" Based on this definition, the following text focuses only on investment in one residential real estate. Commercial real estate carrying the higher risk associated with a higher potential yield are not analysed within this publication.

In one of the last filtration of the analysed criteria, is presentation of the motives of an investor. This may be an investment, in own housing, investment with speculation of growth in real estate prices, or purchasing a property because of renting. For the following text, will be thinking about taking a pure investment property, therefore it is calculated that the investor already has a place to stay. Investment property will be in the Czech Republic, where the potential investment opportunities in this area, will be listed at the end of this chapter.

Among the determining factors, in the context of real estate investments, are included:

- *The macroeconomic cycle*, specifically monitoring of key indicators such as GDP growth, interest rates, unemployment, prognosis of inflation on the horizon of the monetary policy and suchlike.
- *Factor of the return of costs*, with the related volatility¹², which is within the real estate market quite favourable. Market volatility has been in long term moving in ones of percentage, if they are not taken into account the great crisis that influences market volatility in tens of percent. As an important element figures a price for the construction of the property, with the comparison with its market value in the future. Unless, the mentioned difference can be expected as high, it can be expected a decline in market value due to increasing of constructions. Absolutely crucial role, plays the price and the place on which the property is built. It is based on the amenities, accessibility, abundance of greenery and other aspects, including the popularity of the location.
- *Factor of availability*, which includes primarily the current economic and financial situation of the investor, including his or her age or the ability of obtaining of extraneous funds.

¹² Volatility in the case of real estate represents changeability of market values and yields.

- *Local aspects*, such as concrete facts associated with real estate. It is for instance, the technical condition of the building, layout, used building's technology, orientation to the cardinal, number of floors, parking possibilities etc.

4.2.1.1 Case study

This case study presents a model investor representing the majority of the self-employed individuals in the Czech Republic. Specialist publications include gross profitability of real estate investments in the Czech Republic to around 3.74% p.a. The following case study aims at confirming these percentages by own analysis.

Model Client:

Age: 37 years (the largest representation in the self-employed individuals for the year 2016)

Sex: Male (the largest representation in the self-employed individuals for the year 2016)

Average net monthly income: CZK 27.006 (self-employed individuals - the average "salary" for 2016)

Net Money Expenditure: CZK 10,888 (the average expenditure by calculation CZSO¹³, 2015)

Retirement age: 67 years (Tables of retirement age)

Model client plans to purchase an investment property, which wants to finance by own funds and by a mortgage loan (the most common case of real estate financing in the Czech Republic). During the repayment of the mortgage loan, the property will be rented from financial yields will be repaid the mortgage loan. The aim is to have rent, or acquired property, after reaching retirement age, providing financial benefit next to state pension.

Mortgage loan:

LTV¹⁴: 85% (Determined amount is because of unavailability of providing 100% mortgages. For subsequent years, will be possible to obtain a mortgage loan only to a maximum LTV of

¹³ CZSO _ Czech Statistical Office

¹⁴ LTV _ Loan to value, is the ratio between a mortgage loan and a collateral value.

90%, which by assumption Czech National Bank, will mean an increase in loans of between 80% and 90% LTV. Its expected percentage ratio is more than half of all provided mortgage loans)

Pledge: Investor warrants by purchased property

The size and layout of the property: 50m², 2 + kt after reconstruction (Identified apartment size and layout are based on professional journals, describing this type of property as best for renting in the Czech Republic)

Location: City of Prague, Prague 4 (Selection is based on considerations about the effort to long-term rental of investment apartment. According to the characteristics of effective market, the capital city of Prague was evaluated as a city where is the easiest and the fastest of finding of tenant. Selection of district Prague 4, is intended on bases of amenities and investor funds)

The maturity of the mortgage loan: 30 years (67 years retirement age minus 37 years, current age of the investor)

Price of the property: CZK 2,400,000 (average price of real estate for given area and desired layout of the apartment)

Disbursement of funds: CZK 1,900,000 (initial investment of CZK 500,000 from investor's own resources)

Interest rate fixation: 30 years (longer fixation was determined because of the meaningful value of this case study, because of the possibility of inaccuracies in predicting of interest rates, providers' conditions etc. calculation for a shorter period would be beyond the scope of this publication. This non-standard requirement should be placed within possible fluctuations in property prices by financial institutions, etc.)

Others: During arranging of the mortgage loan is not, in this model, calculated with any discount for insurance, a discount of account management or other options for individual rebate.

The list of demands was entered into three mortgage calculators of Czech financial institutions, namely Hypoteční banka Inc., Česká spořitelna Inc. a Komerční banka Inc. The best mortgage loan was subsequently calculated as a mortgage loan provided by Hypoteční banka Inc. Offered interest rate was 3.29% and instalment amount CZK 99,720 p.a.

The calculation of cash flows:

Within the yields is understood gross annual rent. For the determination of yields is used a comparative method based on market rent (for a given time and location). For calculation of the nominal rental growth is calculated by taking the long-term inflation target of the Czech National Bank at the level of 2% per annum. For consideration of the impact of increases in rents, is for every five years increased revenue by cumulative height of 6%. For the property from the case study, was intended the average rent on CZK 124,000 p.a.

Costs within the model example is divided into two parts, namely the costs associated with the property and the cost of funding. Costs associated with the property include operating costs, costs related with the management of the object, loss of rent, income tax. These costs are included in the rent, except income tax (15% for 2016).

Table 9: Annual disproportion of financial flows

<i>Years</i>	<i>0</i>	<i>1-5</i>	<i>10-15</i>	<i>15-20</i>	<i>20-25</i>	<i>25-30</i>	<i>Total [CZK]</i>
<i>Yield [CZK]</i>	0	620,000	657,200	696,630	738,425	782,730	3,494,985
<i>Costs [CZK]</i>	500,000	591,600	597,180	603,094	609,363	616,099	3,517,336

Source: (Own computations)

As can be seen from table 9, revenues and expenditures after 30 years are almost identical. Thus, the expectations of the investor, to cover the financial resources to purchase the property, from the rental income, were fulfilled. The return on investment is very difficult to predict, because it is not clearly determined the price of acquired property after 30 years of saving. However, if there will be any mortgage crisis or other crisis in the real estate market, it could be assumed that the investor's effort for securing for his or her pension age with the usage of property investment was successful. After thirty years, the property is paid and the investor may continue to receive an annuity from rents or convert property into cash, which would be probably determined by the price of real estate at the particular moment. In case where would be taken into account hypothetical fact that upon reaching the retirement age, the investor acquired property with the same market value as the value was during the acquisition. It would be, within regular monthly investing of the same amount as the minimum advance payment into pension insurance, established the interest rate of this investment to 3.22% p.a.

Liquidity, taking into account a minimum time necessary to sale (according to the server penize.cz three months), the investment into properties can be determined as a medium-term.

Riskiness, mainly depends on the investor's strategy of financing of real estate by foreign funds. However, in the context of frequent long-term nature of this method of investing (within the Czech self-employed individuals), it is possible to consider this strategy as a conservative and with regard to developments in real estate prices for relatively safe.

Profitability is, as confirmed a case study based on a long-term basis. Scientific periodicals determine the return on investment in real estate **3.74% p.a.** (in the Czech Republic). In the context of low interest rates, this way of investing in the Czech Republic, becomes increasingly popular. However, with regard to record-high prices of real estate it is necessary to consider all the previously mentioned criteria and factors. Server Global Property Guide placed Czech Republic currently on the 59th place within the most potential real estate investments arranged by country. As a reason was given high property prices in proportion with low rents and monetary policy of the Czech National Bank against the euro. European gross rental yields for 2016, can be found in the annexes of this publication.

The same server then in that list recommends investments in Moldova (Chisinau), Jamaica (Kingston) and in Egypt (Cairo). Conversely Anglo-Saxon countries shows within property prices grow, even possible peak, which for an investor with regard to possible future decline in the market price of a property may not be favourable (Globalpropertyguide.com, 2017).

In the case of real estate investments within the foreign markets, it can clearly lead to significantly higher appreciation than in the Czech Republic environment, this way is fraught with many specific measures and primarily finding of enough information such as investment options for not residents of the country, the tax burden, the political situation with regard to the potential development etc. According to Jim Mallon director and majority shareholder of Consider Trust (the Bank) in terms of real estate investments abroad, is supposedly better utilize professional collective funds or real estate companies in the specific region.

4.2.2 Shares, mutual funds and bonds

The financial instruments mentioned in a following chapter, are the traditional instruments of building wealth in democratic countries, standing on the foundations of capitalism. They are fundamentally important part of investing. The financial analysis of various financial

instruments would have been, because of the large number of variables having influence on those subjects, beyond the scope of this thesis. Therefore, in the next chapter, there are defined only the most important factors. At the end of the chapter will be evaluated conducted analysis dealing with the securing for the pension age of the model investor, with the help of these financial instruments, under the same criteria described in chapter 4.1.1 (first pillar, i.e. income from advances into social insurance).

As mentioned earlier because of the large number of input variables (for instance business cycles, the results of individual sectors, market sentiment, etc.), are direct investments on the stock market, according to vast majority of authors, into the most difficult types of investment at all. Analysing all the variables is very time consuming and requires a proper knowledge. However, absolutely crucial, within this segment, are information. Information leading to an inexpensive purchase and more expensive subsequent sale. Despite the simplicity of the strategy, there is very little likelihood of long-term successful strategy for an unprofessional investor. Even though, he or she can within the trading on a stock exchange, appreciate his or her founds through investment companies, mutual funds or other forms of collective investment.

Mentioned assets are ones of the most *liquid* of all. On a stock market, is the conversion of the securities into cash without major problems.

Also, a potential *profitability* can be very high, it depends on the investment strategy or investment portfolio of particular investor. In the calculation of the profitability of a particular investment is very important to include the tax burden or additional administrative charges associated with the investment (for instance fee within a percentage from profit, the entry fee for fund management etc.).

However, potential profitability is, in this case, redeemed by riskiness. That is based on the theory of investment triangle. Possible risk diversification then lies on the specified timeframe and an investment portfolio. A simple definition states: "*Shares are nothing more than today's net value of future profits and dividends of a company.*" (Janda, 2012). Resulting from the definition of riskiness corresponds to the probability of estimating the future development of particular company, in a general plane of the asset.

4.2.2.1 Case study

This case study analyses the potential return on investment mediated by an investment company with the aim of security for retirement. The result, is then subjected to a comparison with the proceeds from the first state pillar, when the deposited amount is equal to amount periodically inserted as advances into the social insurance. Within the monthly regularity of advances into social insurance, is chosen for this study a product, based on the same principle, because of greater comparability. Specifically, the periodic (monthly cycle), collective investment. The study also foresees a lower financial literacy of the investor, that is primarily engaged in his or her gainful activity, and his or her rather conservative mentality, because those funds he or she is going to use in the post-productive age.

The methodology of the case study is based on calculations based on historical yields and statistical methods of different economic scenarios, reflected in the internal calculations of the investment company Conseq Investment Management, Inc. The actual revenues could be different from the presumed ones, value of funds can fluctuate over time and there is no guaranteed return on the invested amount.

The aim of this case study is the comparison of profitability of the investment with profitability of the first pillar.

Investment horizon: 45 years (the same as the length of calculated social insurance)

The monthly amount: CZK 1,972; CZK 3,944; CZK 7,888 (all three amounts correspond to multiples of the minimum amount of payments into social insurance, specifically 1,2,4 multiple)

Information about the investor: they are not essential for the calculation

Investment focus of the investor: Conservative

Investment company: Conseq Investment Management, Inc.

Selected Product: Horizon Invest (investment program of a life cycle¹⁵, especially suitable for long-term and regular investments, the selection of this product was not only based on its

¹⁵ The program of life cycle _ is based on different investing of high-risk assets over time. Specifically, initially the program is investing within more risk funds (especially into equity), when with approaching end of the investment period, the subsequent investment is focused on less risky assets, such as bonds, mortgage bonds and the like. Thus, the share of dynamic components, with the approaching of end a period, declines at the expense of conservative components.

similarity with regular contributions to pension schemes but also on multi-annual awards of this product as the best in the context of mutual funds within Golden crown competition)

Table 10: Comparison of mutual fund revenues and total amount drawn from the pension insurance

<i>Monthly contribution</i>	<i>The yield at the end of the period</i>	<i>Total amount at the pension insurance</i>
CZK 1,972	CZK 2,937,202	CZK 1,661,184
CZK 3,944	CZK 5,852,085	CZK 2,631,168
CZK 7,888	CZK 11,751,791	CZK 3,384,288

Source: (Own computations based on data from investment calculators of Conseq Investment Management, a.s.)

Table 10 refutes the basic hypothesis, therefore, points to significantly higher profits by investing within unit trusts, compared to the appreciation of funds in the first pillar. In the sum of the final evaluation are included all taxes and also relatively high administrative fees. Calculated the annual return on the financial resources was determined to **4.12% p.a.** However, it should be noted that this is only a calculation and real yields may be different. Another important fact is, that the mentioned appreciation is, opposed to the first pillar, not guaranteed and there is the possibility of a total loss of invested funds.

In this analysis was shown only one example of many possibilities of assurance for pension age through shares, mutual funds or bonds. In the case of investing in differentiated products or in different countries, an investor can achieve a significantly higher or lower profits. Displayed a simple example, was aiming to illustrate a relatively easy way of investing in this file of options and highlight its advantages against the securing for retirement within state pillars.

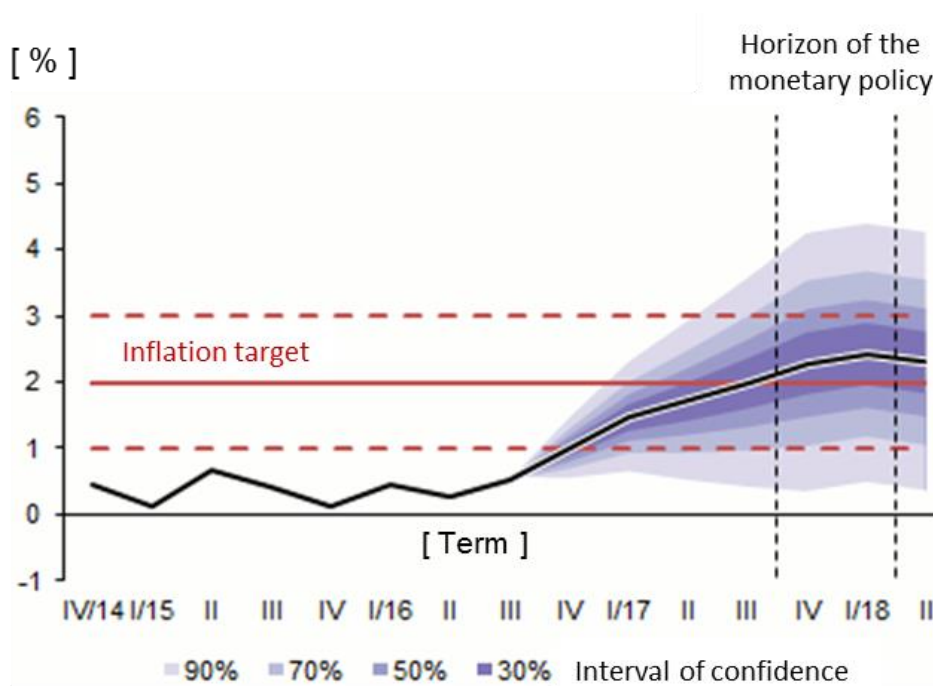
4.2.3 Term deposits, savings accounts and cash

In this chapter are compared, in name of the chapter mentioned types of savings with revenues obtained on the basis of the advances paid into social insurance.

Even though the retention of cash at home or on a current account does not seem like a good investment strategy, and actually it is not. As illustrated in graph 8, when taken into account the

long-term inflation target of Czech National Bank, in the long-term horizon as the discount rate. If is this value, fluctuating around 2%, deducted from zero, is subsequently obtained and estimated revenue or more precisely loss of funds that are left at home in cash, at -2% p.a.

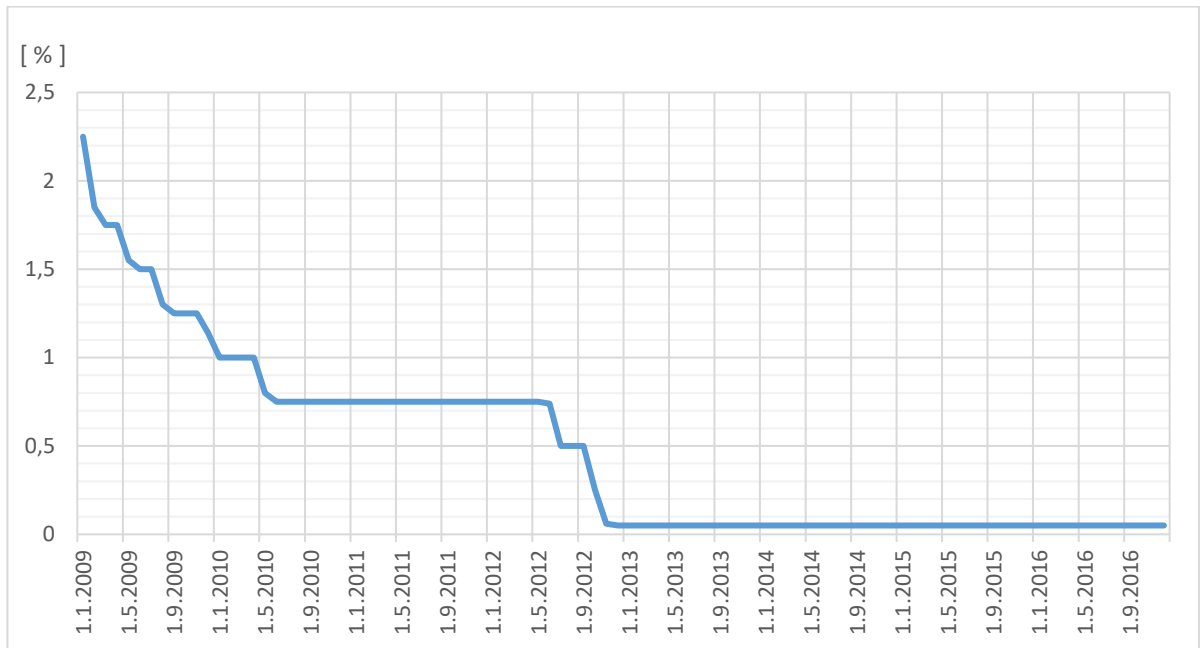
Graph 8: The forecast for inflation at horizon of the monetary policy



Source: (Czech National Bank, 2016)

However, even in this case, is this investment strategy more profitable than in the case of social insurance contributions equal to four times of the minimum amount of payment into social insurance. For even better strategy could be considered to deposit funds on a current account. There would be, based on data from the Czech National Bank, at least a minimal appreciation (the current average of the interest rate on current account is 0.06%, which is the lowest level in history of its measurement), and in future years to the probable slight increase in interest rates as was confirmed by the Governor of the Czech national Bank Jiří Rusnok. Significantly more interesting appreciation is possible, within the framework of the strategy, to achieve by retention of foreign currencies. However, their analysis, is beyond the scope of this publication.

Graph 9: Development of the repo rate after the global financial crisis



Source: (Own illustration according to data from Czech National Bank, 2016)

On the basis of developments of the repo rate¹⁶ announced by the Czech National Bank, it is possible to derive trends in interest rates of term deposits and savings accounts. Term deposits are presented in the following analysis, nevertheless their average profitability for this year is 0.5% per annum. Which is worse average yields than in the case of double of minimum of social insurance advances. Nevertheless, this type of investment, compared to the state fund has a multitude of benefits. They are described at the end of this chapter. In the following analysis, is reflected the fact of historically low repo rate, and thus the worst possible scenario for interest on invested funds within savings accounts. The expected increase in interest rates is not counted in the following scenarios, since the description of subsequent development would be rather speculative. Upcoming counted interest rates are the average interest rate on savings accounts and building savings of all banks, credit unions and building societies.

¹⁶ Repo rate _ The maximum limit rate, at which is Czech National Bank willing, within repo trades, accept loans from a bank. The basic duration of these operations is 14 days.

Table 11: Comparison of the profitability of savings accounts and the first pillar of the pension system in the Czech Republic

<i>Contribution per month</i>	<i>Multiple of the minimum insurance</i>	<i>Savings accounts</i>	<i>Total amount at the pension insurance</i>
CZK 1,972	1	CZK 1,155,174	CZK 1,661,184
CZK 3,944	2	CZK 2,310,348	CZK 2,631,168
CZK 7,888	4	CZK 4,620,695	CZK 3,384,288

Source: (Own computations)

Table 11 shows the higher profitability of investments in the context of increasing advances into pension insurance, for minimal and double of the minimum advances for this type of insurance. In contrast, in the case of a fourfold or greater amounts than the minimum payment into pension insurance, invested within a savings account, it is apparent significantly higher return.

Table 12: Creation of financial reserves within the building savings

<i>Deposit per month</i>	<i>Net deposits appreciation*</i>	<i>Savings period</i>	<i>Savings in total</i>	<i>Total for 42 years</i>
CZK 2,000	2.89%	6 years	CZK 157,111	CZK 1,099,777
CZK 3,900	1.80%	6 years	CZK 296,337	CZK 2,074,359
CZK 6,000	1.25%	6 years	CZK 448,343	CZK 3,138,401

Note: The amount of monthly deposits is not exactly equal to the monthly advances into social insurance, due to contractual provisions of building societies. In net deposit appreciation (for December 2016) are included: state support (CZK 2,000 per year), all fees and withholding tax. The total time of savings is only 42 years (no 45 years, as in the case of pension insurance), because of a limited supply of products of building societies.

Source: (Own computations)

Despite a higher net percentage appreciation of deposits, is savings within building savings limited by the possibility of long-term compound interest, such as in the case of a savings account. Its overall assessment is thus based on comparison with the pension insurance or

savings accounts individually. Within the short-term formation of a financial reserve, it is still a relatively cost-effective and also absolutely riskless financial product limited by liquidity that is linked with period, specified in a contract.

Profitability, return on term deposits and savings accounts (in analysis it was calculated with an interest rate of 0.35% per annum, which is the average level for all banks in December 2016) is nowadays very low, for the period recorded by the Czech National Bank, at the very minimum. It is thus reasonable to assume its future increase and when this type of savings exceeds the threshold of appreciation of 0.90% per annum It will then be more favorable than the increase of the minimum advance payments into pension insurance. Nevertheless, savings accounts are recommended to usage of short-term deposits covering any unexpected events.

Riskiness is in this kind of savings very low, due to guaranteeing of ascribed interest rate and primarily by deposit insurance (up to EUR 100,000). It is therefore a very safe type of savings.

Liquidity is very high (except term deposits, where is liquidity derived by a particular contract, the most common minimum is then 3 years). Financial funds are possible to turn into cash, from savings accounts and conventional accounts, almost immediately. Despite the current lower appreciation, than in the case of contributions to pension insurance, has this form of savings certain advantages, that are connected to the liquidity of funds, or reducing a dependency on government finances, that if it is taking into account the demographic development of the Czech Republic, may operate as nonnegligible factor.

4.2.4 Commodities and collectibles

The following chapter deals with commodities and collectibles from an investment perspective. Within commodities, is focused on investment opportunities in commodity exchanges. Marketable is then almost every commodity. The following section does not deal with specific examples, but rather points to the reasons for commodities and collectibles to think about them as on an attractive investment opportunities in the context of securing for pension age.

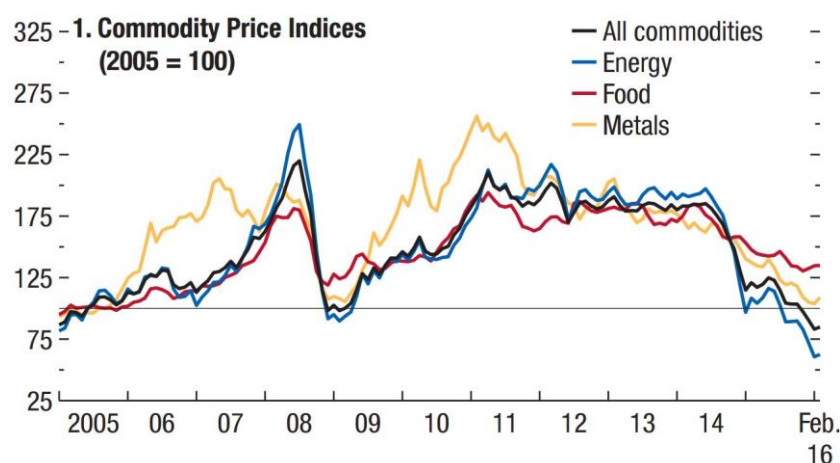
Since this publication does not focus on a particular self-employed individual, that could for example has a tradable interest in holding a certain amount of a physical commodity, therefore is following text focusing on investment in commodities for speculative purposes. The rules for this kind of trading are very similar to the rules described in chapter 4.2.2. Principle of long-

term success are information, for commodity transactions primarily knowledge of supply and demand balance, from which is the price logically created (The Economist, 2005).

- *The reasons for pertinent investments into commodities*

Commodities are on account of their interdependence with physical assets and limitation of their reserves, good insurance against inflation. Demand for commodities in the long-term perspective growing due to increasing demand from BRIC countries, mostly of China and India. It acts as a good risk diversification within an investment portfolio, precisely because of their minimal correlation with other types of investments. It is established and functioning system in which is more than 25% of world trade, as it is shown in graph 10, disadvantage is the relatively high price volatility.

Graph 10: Commodity Market Developments



Source: (International Monetary Fund, Commodity Special Feature from World Economic Outlook, 2016)

Within collectibles is very difficult to trace the evolution of the economic cycle, which can be determined primarily by issuing a list of sales prices of art objects. It is thus one of the riskiest types of investment, particularly for less creditworthy investors. The individual objects and collections are then hardly liquid, when depends on the specific piece.

The overall *profitability* and *liquidity* are largely individual and depends on many factors (uniqueness, object, condition, age, fashion, creator, etc.). Likewise, the *riskiness* of the investment depends on individuality and time.

4.2.5 Green investments

Figure 7 illustrates, what is in the next chapter displayed as green investments. The next chapter shows green investments within the investment opportunity for long-term securing on the post-productive age.

Figure 7: Structure of Green Investment

Component		Item and Sub-Item	
Supply Factors	Low-emission energy supply	<ul style="list-style-type: none"> • Low-emission electricity supply <ul style="list-style-type: none"> ➢ Nuclear ➢ Renewable sources of electricity: <ul style="list-style-type: none"> ▲ Hydropower ▲ Wind ▲ Solar ▲ Biomass⁶ • Other low-emission/renewable energy supply <ul style="list-style-type: none"> ➢ Biofuels ➢ Biomass ➢ Solar and geothermal for heating • R&D in clean energy 	
	Carbon sequestration	<ul style="list-style-type: none"> • Agriculture • Deforestation • Carbon capture and storage technologies 	
Demand Factors	Energy efficiency in energy-consuming sectors	<ul style="list-style-type: none"> • Households • Industry • Transport 	<ul style="list-style-type: none"> • Services • Agriculture
		Mixed Factors ⁷ Energy efficiency in the electricity sector (generation, transmission, distribution)	

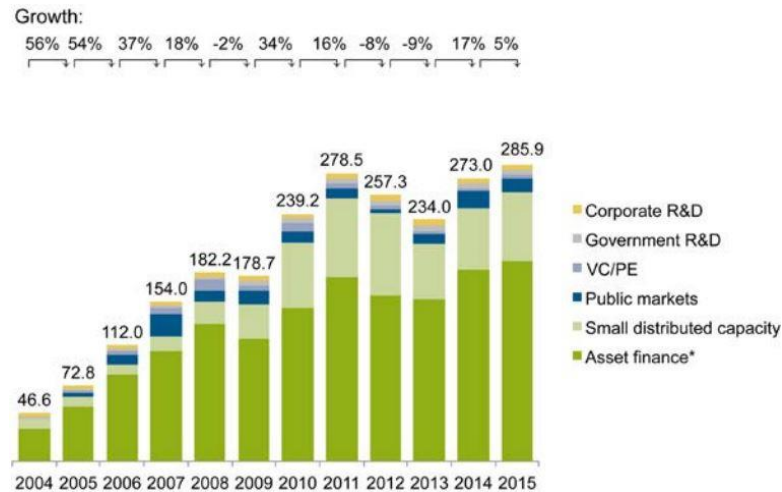
Note: *Biomass is carbon neutral in that plants absorb and store carbon while they are growing and return it when they burn or decay. Mixed factors: the electricity sector both demands and produces energy, making it difficult to categorize efforts to improve energy efficiency in this area into those that affect energy demand or supply.*

Source: (IMF Working Paper, 2011)

Of this group, mostly stands out categories of solar and wind renewable electricity resources, as far as the amount of investment between years 2014 and 2015. And by increasing trend

shown in graph 11 is visible investment opportunity for the next decade. Especially investment in solar energy appears, from a global perspective, as a very interesting sector.

Graph 11: Global new investment in renewable energy by asset class, 2004 – 2015, \$BN



Note: *Asset finance volume adjusts for re-invested equity. Total values include estimates for undisclosed deals

Source: (UNEP, Bloomberg New Energy Finance, 2016)

Based on the report of the Market Vectors Global Alternative Energy ETF fund trading as GEX, is investment capital appreciation in the long-term perspective (more than 8 years) fluctuating according to the selected portfolio between 6.67% and 8.62% per annum. It's just one of the funds, but confirming the global trend of the profitability of this sector. This publication is not dealing with concrete model case study of individual funds, trading within green investment, it would be beyond its scope. However, it points on possible investment strategies which could be for self-employed individuals in the Czech Republic very interesting within creation of financial reserves for pension.

Potential *profitability* of green investments is relatively high in the case of quality investment portfolio and sufficient amount of information for a possible investment. If self-employed individual invested in mentioned fund and that kept a lower limit of appreciation of funds, the final value would have been, in case of regular investment of the minimum deposit amount of

pension insurance, of CZK 3,675,240 higher (the calculation does not include tax payments and administrative fees for managing of the fund, the resulting amount will be lower).

Liquidity of green investments, in the case of mentioned investment funds, is relatively high, and therefore very similar to those of investing in equities or similar types of investments.

Riskiness, in abovementioned example is the same as for investments in shares. An investor may lose all invested funds, but he or she can potentially achieve higher profits. Within long-term trends and in the case of long-term investment (over 10 years) the riskiness is also because of the global trend of support of these factors by government structures, partially lower than investments into common stocks. Despite the mentioned riskiness comes from long-term trends its forecast has rather speculative character.

4.2.6 Own business

This very specific category has been included in this analysis, particularly for the kind of assembling of the entire set of alternative forms of securing for the post-productive age. Since profitability, liquidity and riskiness of investing into own business depends on the industry and size of the business, it is very difficult to measure, especially when is taken into account a globalization trend. In the case of imagining of the company as a living mechanism, full of people. It is possible to derive its great flexibility to changes in current trends and the like.

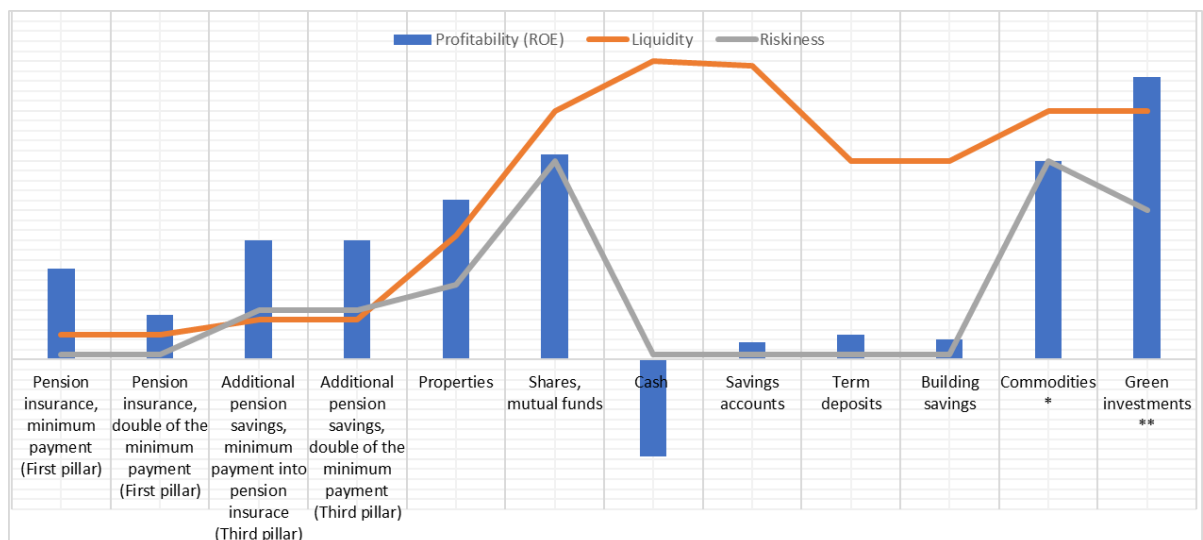
Because of the primary focus of this publication on the self-employed individuals, it is described strategy rather possible option, than actually analyzed part of the thesis.

4.3 Summary of analytical part

Based on the previous analysis, the main research hypothesis was disproved. Thus, by paying of higher advance payments into social insurance self-employed individual generally does not reach to subsequent annuities, compared with alternative forms of savings. Conversely, by increasing of the financial foundation paid into a pension insurance, self-employed individual reduces the overall profitability, achieved after years of saving. Within the critical evaluation of the analytical part, it is necessary to note that, opposed to some particularly profitable alternative investments, self-employed individual within the first pension pillar, almost no investment risk of losing the invested funds. Also, the resulting appreciation of funds invested

into the first pillar is for the minimum payment and double of the minimum payment, not so critical. Especially when the results are compared with other forms of savings such as a savings account or term deposit. However, it is important to note, that current interest rates are reaching a record and extremely low level, and therefore it can be according to cyclicity of economic fluctuations assumed a slight increase in the future time. In contrast, the state pension system is facing to probable negative demographic development in the near future, and it can be presumed a significant drop, within retirement annuities. Self-employed individual can, by reducing of dependency, within his or her strategy of securing for the post-productive age, minimized this scenario.

Graph 12: Illustration of interdependence of obtained results from the analytical part



Note: Graf does not provide specific units, because of its primary aim, thus reflecting of interdependencies of displayed factors. Concrete numerical indicators, are possible to find in previous chapters. Displayed results are illustrating concrete examples of the model representing the real situation. It is not possible to generalize the displayed data and apply them in other cases with different entering criteria at another time.

* Results of commodities are not based on a model case study, but they are based on information obtained from professional servers and periodicals.

** Results of green investment are not based on a model case study and displayed ROE value is based on long-term results of a particular fund.

Source: (Own computations)

Summarization shown in graph 12 partially confirms the theory of investment triangle, which indicates increasing riskiness in direct proportion to the amount of expected revenues. If they are considered only these two factors, additional pension savings is relatively profitable and also safe product in comparison with other forms of investments. However, this result is redeemed by very low liquidity. In contrast, with regard to long-term investment horizon (illustrated for 45 years) and therefore a possibility of diversifying of risk over time, may be also more dynamic forms of investments, seen as relatively safe. Overall analysis is inherently conservatively oriented with a strong emphasis on the awareness of the fact that past returns are not guarantee of future returns. Nevertheless, on the basis of concrete results (macroeconomic situation of each country, recognizing of expected demand, and so forth) identify potential investment opportunities.

Particular choice of investment strategy depends entirely on the investment focus of a particular citizen. Recommendations of the author of this thesis, are the percentage distribution of alternative forms of investment, because of the possibility of attractive appreciation on one hand and the diversification of risks on the other. Inserting of all fund into one product, could be in long-term perspective irrational behavior.

5 Research outcomes

Following chapter examines the applicability and acceptability of data, obtained from previous chapters, in practice and it is primarily divided into two parts. Specifically, there are, in the first part, presented simulations showing the advantages and disadvantages of alternative forms of securing for pension age, referring to the level of profitability within which it is financially advantageous to use a different strategy, then voluntary increase of the minimum advances of social insurance.

Within the second part are presented summarizing protocols of structured interviews, based on Hendl theory, with representatives of the Czech Chamber of Commerce and representatives of the state sector, thus with representatives of the Ministry of Labor and Social Affairs. From the following conceptual set of responses from both institutions, is, after mutual interaction of data, formed a set of acceptable proposals and measures, with its possible applicability in practice.

The aim of this section is confirmation or refutation of the main research hypothesis, answering of the main research question and formation of proposals of solutions and recommendations, that would be acceptable in practice.

5.1 Simulations

All four simulations shown in this chapter are based on the same assumptions. Specifically, distrust in profitability within increasing of advance payments into pension insurance, with the expectation of higher profits than within investing of the same amount in the context of alternative forms of securing on the post-productive age. Another prerequisite is to invest exactly the same amounts as those described in the letter to the Minister of Labor and Social Affairs Michaela Marksová, thus twice and four times higher payments than the minimum advance payment of social insurance for 2016 (shown in table 4). All imaginary self-employed individuals are entering into the simulation, that they are saving for their post-productive age alternatively, plus they are regularly paying the statutory minimal payment into social insurance. The last assumption, derived from the letter, within accurate comparison, is the insurance period equal to 45 years. All displayed simulations are calculated for the year 2016 and they are not including possible legislative changes, such as different pension levels in the upcoming years, which can be expected in the real situation. All cells that are marked in yellow defines the higher profitability of alternative ways of savings beside increasing of advances in pension contributions. The idea of these simulations is to clarify the conditions under which it pays to reduce dependency on the state by no increasing of payments into pension insurance in behalf of higher yields in future.

The aim of this chapter is the current comparison of the advantages of both systems within saving to retirement age, thus confirming of refutation of the main hypothesis in the analytical part. The resulting number of monthly pensions and the accumulated rent is compared with the amount of income shown in the letter (see Table 4).

- *Self-employed individual 1*

The first self-employed individual invests CZK 1,972 per month to various alternative forms of investment. Then also pays the statutory minimal payment into social insurance ie CZK 1,972. This investment is equal to the same situation as increasing payments to twice of the minimum pension advances.

Table 13: The amount of 24-year annuity while saving CZK 1,972 per month

Annual interest rate	0.5%	1%	2%	4%	6%	8%
Amount saved	CZK 904,925	CZK 991,192	CZK 1,198,084	CZK 1,801,877	CZK 2,809,529	CZK 4,523,536
Monthly rent	CZK 3,532	CZK 3,868	CZK 4,676	CZK 7,032	CZK 10,965	CZK 17,654
Monthly pension with rent	CZK 9,300	CZK 9,636	CZK 10,444	CZK 12,800	CZK 16,733	CZK 23,422

Note: Calculations are counted with savings over 35 years (from year 2016) and rent drawdown of 24 years. During the using of rent is used funds saved appreciation of 1% p.a.

Source: (Own computations)

The time of savings 35 years is based on professional journals describing the average starting age for retirement savings among young people after reaching 30 years of age. Drawing of the rent for 24 years, is determined according to data of Czech Social Security Administration, which this period referred to as the average time of drawing a retirement pension for the year 2016. To increase of the meaningful value of the simulation, are financial funds appreciated also during using of them, by 1% per annum, since it is assumed, the subsequent very safe manipulation with the funds, even after reaching of the retirement age of a citizen.

From the simulation results, shown at table 13, arises an alternative form of investment after addition of the pension and annuity, more profitably in comparison with an increase in advances of social insurance, even within very conservative and safe products with a corresponding appreciation of deposits of 0.5% p.a.

- *Self-employed individual 2*

Table 14: The amount of 24-year annuity while saving CZK 5,916 per month

Annual interest rate	0.5%	1%	2%	4%	6%	8%
Amount saved	CZK 2,714,774	CZK 2,973,576	CZK 3,594,253	CZK 5,405,632	CZK 8,428,586	CZK 13,570,609
Monthly rent	CZK 10,595	CZK 11,605	CZK 14,027	CZK 21,097	CZK 32,894	CZK 52,962
Monthly pension with rent	CZK 16,363	CZK 17,373	CZK 19,795	CZK 26,865	CZK 38,662	CZK 58,730

Note: Calculations are counted with savings over 35 years (from year 2016) and rent drawdown of 24 years. During the using of rent is used funds saved appreciation of 1% p.a.

Source: (Own computations)

Conditions entering into simulation are, for self-employed individual number 2, the same as for self-employed individual number 1, with one difference. The monthly amount of the deposited sum is equal to four times of the minimum amount of social insurance contributions. After comparing of tables 4 and 14 can be seen dramatically higher profitability with usage of alternative forms of investment.

- *Self-employed individual 3*

Self-employed individual number 3 has the same input conditions as the self-employed individual number 1, with difference within the later start of the savings to retirement age. In this case, if it is assumed that the statutory retirement age for self-employed individual number 3 is 65 years, then it means that the beginning of his or her savings for retirement, is in 45 years of age.

Table 15: The amount of 24-year annuity while saving CZK 1,972 per month

<i>Annual interest rate</i>	0.5%	1%	2%	4%	6%	8%
<i>Amount saved</i>	CZK 497,644	CZK 523,687	CZK 581,339	CZK 723,280	CZK 911,145	CZK 1,161,548
<i>Monthly rent</i>	CZK 1,942	CZK 2,044	CZK 2,268	CZK 2,823	CZK 3,556	CZK 4,533
<i>Monthly pension with rent</i>	CZK 7,710	CZK 7,812	CZK 8,036	CZK 8,591	CZK 9,323	CZK 10,301

Note: Calculations are counted with savings over 20 years (from year 2016) and rent drawdown of 24 years. During the using of rent is used funds saved appreciation of 1% p.a.

Source: (Own computations)

The simulation results shown in table 15, are not as unambiguous as in previous cases. It is evident that, under these conditions, can increase of the advances to twice of the minimum social insurance, could be for self-employed individuals more profitable. In this case, it would be preferable to saving alternatively, only in cases where the self-employed individual would be willing to take the risk, associated with an annual interest rate of 6% or more.

- *Self-employed individual 4*

Self-employed individual number 4 has the same terms as self-employed individual number 3. Except that he or she, saves four times more, than is the amount of the minimal payment into social insurance.

Table 16: The amount of 24-year annuity while saving CZK 5,916 per month

Annual interest rate	0.5%	1%	2%	4%	6%	8%
Amount saved	CZK 1,493,554	CZK 1,572,370	CZK 1,746,925	CZK 2,177,071	CZK 2,747,101	CZK 3,507,876
Monthly rent	CZK 5,829	CZK 6,137	CZK 6,818	CZK 8,496	CZK 10,721	CZK 13,690
Monthly pension with rent	CZK 11,597	CZK 11,905	CZK 12,586	CZK 14,264	CZK 16,489	CZK 19,458

Note: Calculations are counted with savings over 20 years (from year 2016) and rent drawdown of 24 years. During the using of rent is used funds saved appreciation of 1% p.a.

Source: (Own computations)

Despite a late start of saving for a post-productive age is for self-employed individual number 4 more preferable usage of alternative forms of investment, if he or she can appreciate financial funds by higher annual interest rate than 0.5%, in a long-term perspective.

As is evident in previous simulations a crucial role, in deciding between both types of securing on the pension age, plays an age, in which a self-employed individual decides and begins with financial preparation, in a form of regular investing of funds. An important factor in this decision is the fact of frequent alternation of legislative power in the Czech Republic and therefore probable changes within the conditions in upcoming time. Especially with regard to the demographic trend in the Czech Republic, can expected long-term decline of pensions (some estimates suggest half amount of income in comparison with current amount). Therefore, reducing of dependency on the state is important deciding factor in the decision-making process.

5.2 Research results from the perspective of the Czech Chamber of Commerce

For reasons of data reduction, is for classifying of the relevant facts, obtained on the basis of interviews with representatives of the Czech Chamber of Commerce, in this chapter only shown the summarizing protocol. As already indicated in the introduction, the choice of this institution for this research, was based on the basis of its general representation of self-employed individuals in the Czech Republic.

A partial aim of this semi-structured guided interview is detection of the perception of the current state of the state pension system, by the major part of the self-employed individuals in the Czech Republic. The primary objective of this qualitative research is, based on these responses, obtain an opinion on potential improvements, especially in motivating of self-employed individuals to securing of their post-productive age within state pension pillar. The resulting response file, then facilitates to answer the main research question of the thesis.

Range of topics and questions, is based on the objectives of this survey. Where, the first more informative and easier questions, are focused on the perception of the current situation. The second, for respondent more difficult part, is subsequently focused on detection of particular views on potential improvements. All questions are worded neutrally, emotionally uncolored, concisely, clearly and not hypothetically, focusing on the essence of the problem. The interview was conducted with director for external communications of the Czech Chamber of Commerce, Mr. Miroslav Diro.

Assessment of current overall status and settings of the pension system in the Czech Republic is by the Czech Chamber of Commerce determined as unsustainable in long-term perspective. With regard to the state pension account is obtained amount from pension insurance insufficient. Associated minimum advance payment of social insurance is inadequate, specifically low. Up to now presented changes, related primarily with the continuous increasing of payments into health and social insurance, despite its logical essence, is poorly evaluated in a broader context. From this statement, can be derived unappreciation of made changes by Chamber of Commerce, in particular within the complexity of the issue. In this publication mentioned letter of Minister Michaela Marksová, was evaluated by Chamber of Commerce as follows: "Generally we do not think that sending letters to entrepreneurs, would have the effect of increasing their savings for pension age.". From the answer, can be evaluated the current strategy of the Ministry of Labor and Social Affairs, by representatives of entrepreneurs as ineffective. Self-employed individuals are well awarded about their future and they are preparing individually according to their financial possibilities. A high percentage of self-employed individuals, who paying only minimal advances into social insurance, is then in addition to their particular financial situation and possible tax burden, depending on their confidence in the state and interaction associated with the current degree of bureaucracy. The current perception of entrepreneurs evaluated the state Chamber of Commerce, based on media coverage of certain statements of legislators and increasing of the tax burden, rather negatively.

Assessed as positive by representatives of the Chamber of Commerce, was state aid within third pension pillar and a tax and direct support in the form of state contribution.

Within the second range of questions, are representatives of Chambers of Commerce convinced that for the vast majority of the self-employed individuals in the Czech Republic, would be higher minimal payment into social insurance acceptable, especially in connection with a possible change in the tax system. On the question of a possible motivation of self-employed individuals for paying voluntarily higher advance payments on social insurance was answered: "*By the reform of the pension system and primarily with it associated reform of the tax system*". There is a noticeable mild skepticism towards incomplete respectively partial solutions, just like the example of the letter from the Ministry. More than retirement system, is for the overall improvement of the business environment, the potential reform of the tax system, from where, it can be derived possible subsequent higher contributions to the pension account. However, a specific proposal for reform, because of its wide variety, was not presented. Within a supplementary question, outlining the possible form of the pension system, based on the Danish model, with an emphasis on high variability and a higher reduction system in comparison with the Czech pension system, representatives of Chamber of Commerce can see possible scope for discussion. However, they subsequently indicated that, in order to increase the variability of the Czech pension system, would, on its higher usage, depend primarily on the benefits accruing for a particular entrepreneur. The recent cancellation of the second pension pillar, then evaluates neutrally, because they do not believe in its appreciation by the self-employed individuals.

5.3 Research results from the perspective of the Ministry of Labor and Social Affairs

The following section provides a summarizing protocol of the interview with representatives of the Ministry of Labor and Social Affairs, specifically with the director of the Department of Social Insurance Ing. Tomáš Machanec, MBA. Conceptual arrangement then corresponds with a previous interview with representatives of the Czech Chamber of Commerce. Accordingly, the subjective evaluation of the current settings of the state pension system and the subsequent discovering of applicability and possible acceptance of the proposals described in the previous chapters.

As the most important positives of the first pension pillar evaluates the respondent: high reduce the risk of poverty among pensioners, versatility of its coverage, uniformity of the system, the possibility of parametric adjustments ensuring a long-term sustainability, tradition and public confidence in it. Among the negatives, then respondent includes: deepening of intergenerational inequity, high income solidarity (redistribution), the different position of self-employed individuals and employees in premium payment, the avoidance of paying the insurance and unlimited accumulation of all types of pensions and wages.

As strengths of the third pension pillar respondent commented: high participation of the population, security of invested funds and functionality of infrastructure of system of individual accounts, including direct state support agenda. Weaknesses of this pillar, then the representative of the Ministry of Labor and Social Affairs, presented the following: low contributions, lack of cohesion on the pension (using a lump sum settlement rather than a lifetime annuity), institutional obsolescence and extremely conservative investment strategies of funds.

Within the evaluation of current pension pillars, is possible to observe a slight tension in the differential status of self-employed individuals and employees, especially in the context of the response of avoidance of premium payments. In context of this answer arises the question of a real public confidence in the first pillar as the respondent stated in the context of the strengths of the first pension pillar. The third pillar is then evaluated by respondent, as generally positive. Low contributions of participants and extremely conservative strategies are, according to the opinion of author of this publication, due to lack of bound for wages and an investment maturity of the Czech society, which based on a negative experiences in the nineties, caused of lower trust in products with non-guaranteed non-negative yield, which have an effect on providers of such products, according to the fundamental basis of the principle of the market economy, specifically the principle of supply and demand.

Answers on a long-term vision and possible motivation, were by respondent ranked as follows: *"Conceptual longer-term intention of the Ministry in the area of pension insurance, which is the most important element of social protection, is to ensuring of pensioners by a sufficient quantity of financial resources for a dignified life and maintaining of an adequate standard of living. Achieving that the pension system would be perceived by the public as a stable, fair and sustainable over a long period"*. On subsequent supplementary question regarding to a specific approach, was then answered: *"by providing of pensions in higher age, by increasing of incomes*

and hence taxation rate of economically active generations, or for example by encouraging of small entrepreneurs to pay higher advance payments on social insurance, already implemented during February 2016, thus by sending out repeatedly mentioned letter”.

Based on the responses is evident a slight reluctance or possible abstention of concrete and coherent solutions. Similarly, the perception of effective strategy of sending of the letter.

Within the question, arising from the responses of representatives of Czech Chamber of Commerce, specifically comment on a hypothetical increase of the minimum advances of social insurance, the respondent stated: possible increase in the avoidance of premiums payments based on the discouraging rate. Within commenting on the proposal for a potential increase of the variability of the pension system, by adding additional pension pillars (again the example of the pension system of Denmark) respondents answered as follows: *"Greater diversity in the public and private securing against the risk of old age, could be one of preferred tendencies of our department"*.

Based on the last answer is obvious the positive perception of greater variability in options of securing for pension age within the state pension system. This perception is quite surprising fact with regard to the cancellation of the second pension pillar by current government, however evaluation of this step would be beyond the scope of this publication. Logical reason for its annulment, then did not have to be an attempt to reduce the diversification of the state pension system, but rather a political disagreement with its specific settings.

5.4 Summary

Based on conducted simulations can be confirmed the refutation of the main research hypotheses by the analytical part. Generally, it can be said, that the voluntary increase of social insurance advances is disadvantageous, for self-employed individuals, against saving to post-productive age within alternative form of long-term investments. Even in cases of very conservative investment strategies. The only case where the increase in advance payments of social insurance worth more for self-employed individuals, is in the case of start with saving at a later age, such as 45 years and also only in the case of doubling of the minimum premium rates.

Answering of the main research questions is no clear general answer, and as is apparent from the interviews, possible solutions must have a broader economically-social character. However,

generally it can be deduced that for motivation of small entrepreneurs to paying higher social insurance advances, may be used according to two approaches. The first by, sort of mandatory approach by the areal increase in minimum advances of social insurance, as is proposed by the Chamber of Commerce. The question that arise is than connected with a risk of reduction in the overall motivation, within the business itself, but this can be compensated, according to the results of interviews, by eventual total pension and tax reform.

The second approach is within more attractive supply from the state. It is obvious that the state cannot, in the present but also in the future, compete with other types of investing, where its main but only advantage is guaranteeing of later payouts. In contrast, the state has the tools and opportunities to implement broader and more coherent measures. One such practice is by increasing of the variability of options within the state pillars, by adding one or more other pension pillars, which was also consistently confirmed by both questioned resort, within some opportunities for improvement. More specific recommendations in terms of both, self-employed individuals and state, referring to the possible scope for improvement within this issue, is described in the following sections. Generally, it can be stated, that the self-employed individuals are able to calculate the possible future gains or losses of their investments. This fact is limiting a space for half measures, for example, sending out of letters by the Ministry.

6 Recommendations and proposals

6.1 Recommendations for self-employed individuals

Recommendation for self-employed individuals is divided according to the age groups of entrepreneurs. For the age group 45 years and over, assuming that self-employed individual did not save up for retirement age heretofore, it is recommended to consider a voluntary increase of advance payments into pension insurance to double of the minimum payment. Especially in the case of conservative conviction of a person for whom it would be unacceptable to undergo a higher investment risk, which leads to an annual appreciation of funds 6% and more.

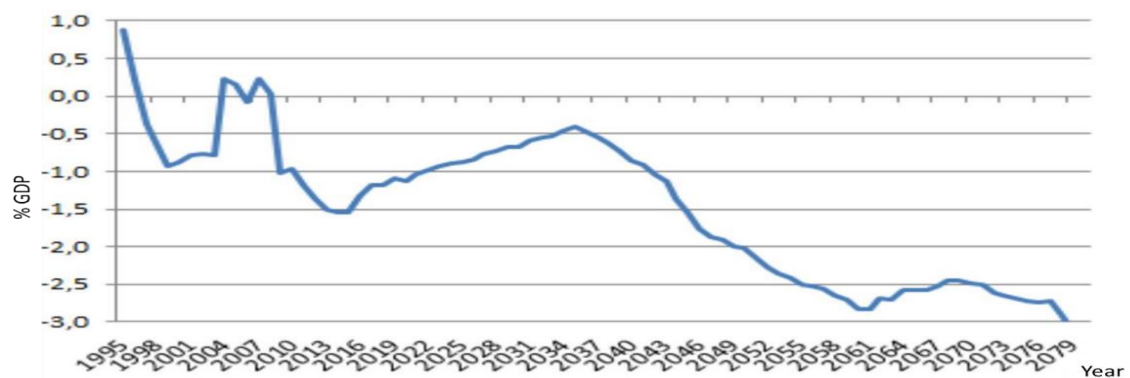
Within small entrepreneurs belonging to the group under 45 years of age, especially people younger than 40 years, it is not recommended to increase minimum advance payment into pension insurance for the purpose of financial securing for the post-productive age. It is also necessary, for attainment of successful solution of the problem, to realize that there is some problem itself. Specifically, no neglection during creation of financial reserves for retirement

age and comprehension of demographic trends and the long-term unsustainability of percentage amount of pensions in conjunction with the average wage. This publication does not state specific investment strategy based on long-term alternative investments to emphasize individuality of persons. Self-employed individual has to assess himself or herself, which strategy is for him or her the best one, even on the basis of his or her particular type of business, with regard to potential future investments. However, the general recommendation is that the distribution of his or her investment portfolio should be within the described alternative forms of investment and in accordance to the stated objective of profitability and at the same time specified degree of riskiness. On the basis of long-term investment, where diversification of a risk over time is possible, it is recommended to lower concern in the context of a percentage increase of dynamic components within the specific investment portfolio. In case of approaching retirement age, a subsequent gradual reduction of the share of dynamic components at the expense of the conservative ones should be conducted if possible.

6.2 Recommendations for the state

As follows from the actuarial report of the Ministry of Labor and Social Affairs and the demographic situation described in the literature review, it is the first pillar (PAYG) unsustainable, in its present form. As shown in Graph 13 current setup leads to long-term deficit within GDP. The necessity of pension reform is obvious, and its postponement could send out a false information to citizens about their future financial security. The consequence of postponing mentioned reform would cause deepening of intergenerational injustice.

Graph 13: The balance of the pension system



Source: (The Ministry of Labor and Social Affairs, 2012)

Specific step is not just readjustment of the pension system, but it is also increasing awareness among the general public regarding the adverse situation in the future. Not only self-employed individuals but all economically active citizens and especially those younger than 40 years must be aware of the increasing risk of poverty in their retirement, if they will not save up requisite amount of money for themselves. Awareness that they should not depend on the state in future years, is then a fundamental pillar of the entire functionality of the state pension system. Without this step, it would be impossible to ensure people's standard of living only from incomes from PAYG system, even after the eventual pension reform.

The following recommendation of settings or appearance of a pension reform targets to its higher fiscal sustainability, intergenerational distribution of burdens and increase of its usability by the self-employed individuals. Based on the results described in this publication, the conclusion of greater diversification of the state pension system, which was confirmed by both interviewed institutions, is justified. A specific variant is then adding at least one pillar and parametric adjustments of the first pillar. Setting of the third pillar is, according to output of the Melbourne Mercer Global Pension Index, in good-quality and there is no necessity of its treatment, especially in case that it will continue operating with direct government support.

Draft of parametric adjustments of the first pillar

In order to sustain long term stability of the PAYG system, it is recommended to preserve gradual increase of the retirement age, or more precisely, the decisive period according to increasing of life expectancy and gradual transition from a percentage indexation to price indexation of pensions. On bases of Danish model, it is recommended to introduce sharing of assessment bases between spouses and different level of pensions for persons living alone and reduction in insurance rates declining differing status of employees and self-employed persons. This should result in a positive impact on economic growth and the labor market, when its fiscal compensation must be supported by the second pillar and a tax reform based mainly within areal changes of value-added tax rate.

Proposal of a new second pillar

Character of second pillar should be the fund-defined. With regard to quality of banking and institutional environment in the Czech Republic, this pillar should support the resistance

towards demographics and achieve an increase in inter-generational equity. Within the critical evaluation, it is necessary to mention its high sensitivity to the international situation on the financial markets. The savings pillar should be mandatory. Specifically, it should be compulsory for all economically active citizens and funded by a percentage (units of percent) of the overall reduced insurance rates. The remaining majority of premium rate then would be logically inserted into the first pillar. Under investment management of Czech National Bank, the system should operate within the already functioning or reformed pension funds. There should be offered different investment strategies for clients according to their investment conviction. In case of very conservative clients or those with lower confidence in the chosen system, an option of saving of all inserted resources exclusively into government bonds of the Czech Republic should be given and thus, from a certain angle, safety of invested funds by credit credibility of the state secured.

Saved funds would be possible to withdraw only in a form of a life annuities. Participant would have entitlement to do so after reaching the statutory retirement age or, if occurred, differently defined social event. It would be possible within this pillar to voluntary increase contributions in excess of the mandatory tariffs, which could be used in case of employees by employers. In case of death of the participant, saved amount would be a subject of inheritance proceedings. The introduction of this pillar would be an obligatory for productive residents under the age of 45, the elderly population could continue within existing conditions, because of their reduced flexibility in terms of possibility of potential long-term investments.

The introduction of this funded savings pillar should lead to increasing variability of options for ensuring of pension age within the state pension system. Its specific setting would have been beyond the scope of this publication. Its mandatory base should help to increase share of self-employed individuals within the state pensions. That is one of possible answers for the main research question. It should be noted that the proposal of pension reform must be supported by change of the tax system of the Czech Republic. Further, it is noted positively that the possible overall increase of diversification by adding more pillars. In general, it is assumed a greater involvement of the participants in the framework of assurance for pension age with increasing number of options.

7 Conclusion

On the basis of research and data analyses conducted by this thesis author it can be concluded that the topic of financial security for persons in the post-productive age in the Czech Republic, is more relevant than ever before. This concerns especially the self-employed individuals for whom the risk of poverty in their pension age, is very high. However, this is likely mainly in the event they fail to create an adequate financial reserve during their economically active years. This scenario was highlighted by the Ministry of Labour and Social Affairs to entrepreneurs by sending out a letter in which self-employed individuals were made aware of this possible situation. The letter also included an introduction to some suggestions as to how to prevent this potential problem. Nevertheless, despite understanding the intention of this strategy, the author of this thesis evaluates this step as ineffective and inadequate to deal with the issue. The following text summarizes the main points and presents arguments that support this viewpoint, including the reasons advocating the recommendations and proposals, described in the previous chapter.

The literature review outlined in this thesis acquaints readers with the future demographic development in the Czech Republic, while the various pension systems listed in this thesis highlight the potential problems involving the Czech two pillars system. Above all, there is a long-term unsustainability of the current setting of the pension system and low variability of the options that would provide financial security for persons of the pension age within the state pension pillars.

This long-term instability and unsustainability is due to the risk of financial imbalances in the PAYG system which provides a base for the vast majority of the pension security of population of the Czech Republic, including its specific extreme solidarity settings. While maintaining the level of the replacement ratio, it creates a demographic prediction of such a high pressure on the long-term financial sustainability of pension insurance, that there is a probability of its total collapse. Neither a factor of migration is positively affecting the overall sensitivity of the scenario and, on the overall balance of the pension account, it will have a negative impact, even in the case of very positive scenarios. From the indication of the future situation arises the necessity of reform measures against the partial strategies that are supporting and advocating the current status of the pension system.

The author's analysis and follow-up simulations have shown a higher profitability of alternative forms of financial security in the post-productive age. When compared with the voluntary increases in pension advances, they bring attention to the inefficiency of the strategy implemented by the Ministry of Labor and Social Affairs. The assumption is that the self-employed individuals who, rather than relying on the state, had decided to rely on themselves in respect of their livelihood, are better able to evaluate the overall profitability of both strategies. Thus, a negative result for the first state pension pillar may lead to an increase of distrust in state institutions and the pension system as such.

Based on the calculations, analyses and simulations described above, a conclusion has been reached that the main research hypothesis can be disproved. The correctness of this decision and correct evaluation of the real situation by self-employed individuals, confirms the fact, that only a very small number of entrepreneurs voluntarily contribute a higher amount than the minimum mandatory advance payment into pension insurance. On the other hand, the author's analysis points to a very unfavorable, and when future demographic development is taken into account, even an alarming trend towards a decrease in contributions into the third pension pillar, in terms of the wages percentage. The analysis shows that primarily the participating funds, which are evaluated as a relatively profitable product, reflect an investment immaturity of the Czech society.

Invested funds which provide no guarantee generate a kind of skepticism among the Czech population which suffers from high sensitivity to potential investment risks. This is due to the absence of investment culture in the Czech Republic, since the collective investment in this country was formed in 1990s. The disappointment at the turn of the millennium and the subsequent instability on the financial markets have contributed to the bad experience of the first Czech investors, and may have resulted in an overall distrust in private investment products, with no guarantee of positive appreciation of funds.

Thus the answer to the main research question can be divided into two main directions, namely a sort of auto-motivation of the self-employed individuals and the current offer of options from the state for the post-productive age financial security. Auto-motivation can be defined as self-awareness of a future situation by specific persons, resulting from the sufficient amount of relevant and valid information. The awareness of possible future scenarios, especially in young entrepreneurs, should be followed by self-motivation which, in turn, would lead to an increase in the proportion of monthly wages to be invested in the creation of financial

reserves for the post-productive age. However, the current trend is quite the opposite. A large percentage of people relies on the social security provided by the state. This unfavorable fact may arise from the lack of awareness under the responsibility of the state, but also from an unattractive offer of options in the state pension system.

When the results of the analyses and simulations plus the specific steps of the Ministry of Labor and Social Affairs over the past 15 years, are taken into account it is possible to admit that the options offered by the state are not attractive. The long-term government policy has concentrated almost exclusively on increasing the minimum pension advances, arising from the same percentage level of wages and increasing the maximum assessment base. These actions do not give entrepreneurs any alternatives and from the long-term perspective they just underline the low flexibility of these measures.

When the future demographic development is considered, it is clear that only the continuous strengthening of the first pillar evaluated by the author in respect of the of self-employed individuals' motivation, as insufficient.

The answer to the main research question is based on the offer of new alternatives by the state, which have been described in detail in the previous chapter. A specific answer to this question does not exist because of its broad spectrum and connectivity. Possible suggestions and recommendations for motivating self-employed individuals, are based on answers to the partial aim of this evaluation. The author of this thesis recommends an increase in the variability, in other words, the risk diversification of the state pension system, by adding a third pension pillar which is based on the pension reform. The feasibility of this proposal is based on the general consensus of institutions interviewed on this point. Furthermore, the author is inclined to accept the opinion of the Czech Chamber of Commerce representatives which indicates a need for the pension reform in association with the tax reform. The specific form of this reform or setting out of the main points, is described in detail in Chapter 6.2. The described possible pension reform should be able to reduce the risks of the PAYG system, which can occur in future and to stabilize the pension system in the Czech Republic in terms of fiscal sustainability.

Successful application of the pension reform would require a significant social consensus and support of interested subjects across the political spectrum and a greater awareness among the population, both in terms of potential future scenarios and in terms of potential benefits resulting from this reform. However, it should be noted that the outlined pension reform does

not provide higher pensions within the PAYG system, but offers an alternative to a compensation in the form of a fund-oriented pillar. This thesis is so compared to partial solutions, in favor of the complex steps, resulting from unfavorable demographic development, as well as unattractive offer within the current parameters settings of state pillars, with regard to their urgency. The author of this publication believes that the described recommendations, could be a subject of serious debate, dealing with possible modifications of pension-economic policies.

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List of abbreviations

ATP - Arbejdsmarkedets Tillægspension (Danish Labor Market Supplementary Pension Fund)

CZSO - Czech Statistical Office

LTV - Loan to value

NDC - Notional defined contribution

OECD - Organization for Economic Co-Operation and Development

PAYG – Pay as you go

ROE - Return on Equity

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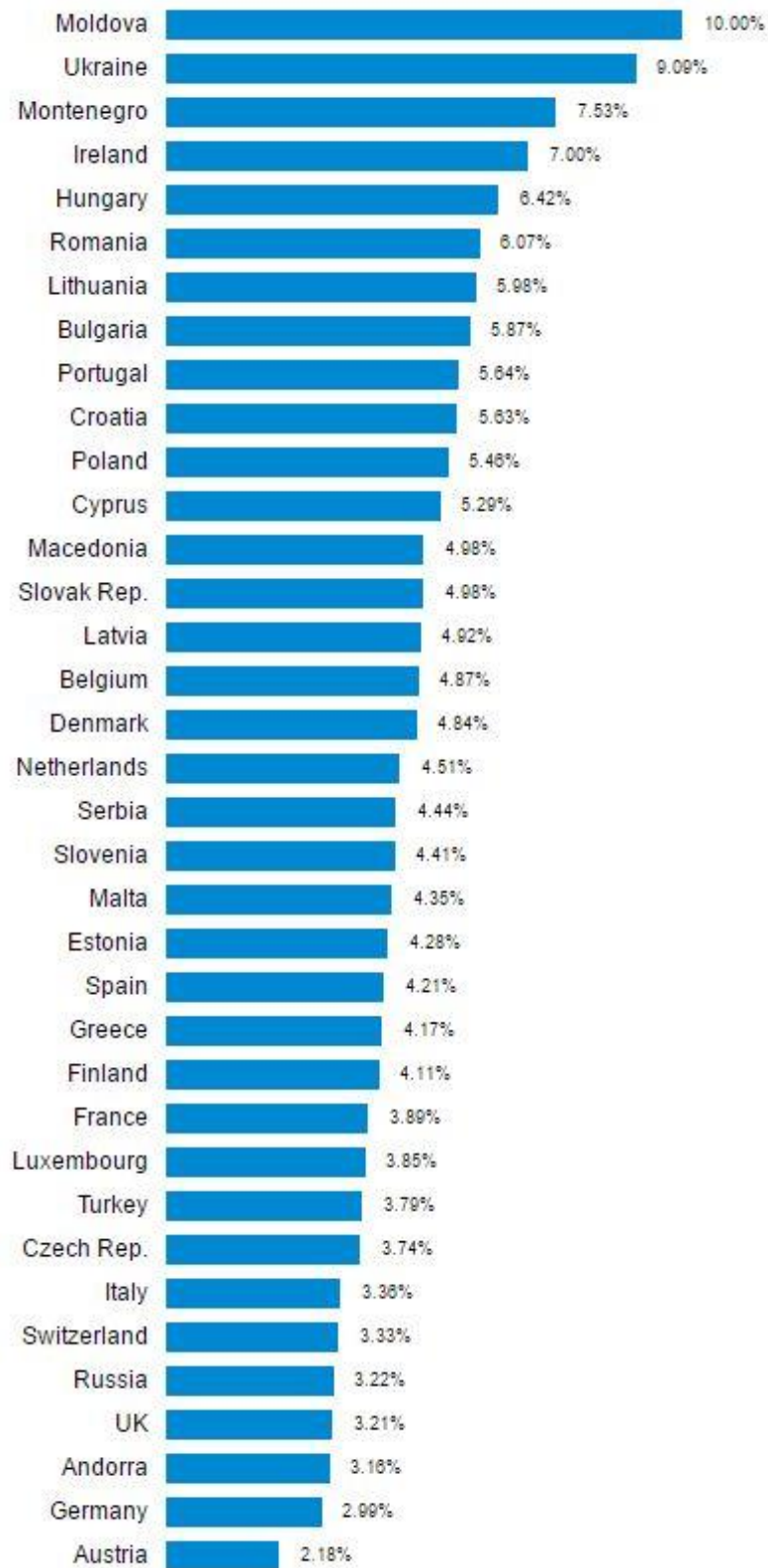
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Appendix number 1: *The Melbourne Mercer Global Pension Index for specific countries*

Country	Overall Index Value	Sub-Index Values		
		Adequacy	Sustainability	Integrity
Argentina	37.7	42.3	30.1	40.9
Australia	77.9	76.0	74.1	86.1
Austria	51.7	67.4	16.0	76.7
Brazil	55.1	67.9	29.2	70.7
Canada	66.4	68.0	58.8	74.5
Chile	66.4	56.5	68.4	79.6
China	45.2	58.2	29.7	46.0
Denmark	80.5	75.8	85.3	81.4
Finland	72.9	70.6	62.2	91.5
France	56.4	75.2	35.2	55.8
Germany	59.0	70.4	35.8	73.1
India	43.4	39.5	40.9	53.4
Indonesia	48.3	41.0	43.0	67.3
Ireland	62.0	76.2	34.8	77.3
Italy	49.5	65.5	13.5	74.4
Japan	43.2	48.5	24.4	60.9
Korea	46.0	46.5	43.9	48.1
Malaysia	55.7	40.3	57.1	78.3
Mexico	44.3	38.5	53.6	40.7
Netherlands	80.1	78.2	77.0	87.7
Poland	54.4	57.9	41.2	67.3
Singapore	67.0	61.4	66.8	76.1
South Africa	48.6	34.0	44.7	77.3
Sweden	71.4	67.6	69.5	80.3
Switzerland	68.6	60.5	67.4	83.5
UK	60.1	55.5	48.8	83.2
USA	56.4	53.5	57.1	59.9
Average	58.1	59.0	48.5	70.1

Source: (The Melbourne Mercer Global Pension Index, 2016)

Appendix number 2: *Gross rental Yields in Europe (% per annum)*



Source: (Global Property Guide Research, 2017)

Appendix number 3: *Table of retirement ages of an insured people in the Czech Republic*

Year of birth	Retirement age					
	Men	Women with the number of children				
		0	1	2	3 and 4	5 and more
1936	60y+2m	57y	56y	55y	54y	53y
1937	60y+4m	57y	56y	55y	54y	53y
1938	60y+6m	57y	56y	55y	54y	53y
1939	60y+8m	57y+4m	56y	55y	54y	53y
1940	60y+10m	57y+8m	56y+4m	55y	54y	53y
1941	61y	58y	56y+8m	55y+4m	54y	53y
1942	61y+2m	58y+4m	57y	55y+8m	54y+4m	53y
1943	61y+4m	58y+8m	57y+4m	56y	54y+8m	53y+4m
1944	61y+6m	59y	57y+8m	56y+4m	55y	53y+8m
1945	61y+8m	59y+4m	58y	56y+8m	55y+4m	54y
1946	61y+10m	59y+8m	58y+4m	57y	55y+8m	54y+4m
1947	62y	60y	58y+8m	57y+4m	56y	54y+8m
1948	62y+2m	60y+4m	59y	57y+8m	56y+4m	55y
1949	62y+4m	60y+8m	59y+4m	58y	56y+8m	55y+4m
1950	62y+6m	61y	59y+8m	58y+4m	57y	55y+8m
1951	62y+8m	61y+4m	60y	58y+8m	57y+4m	56y
1952	62y+10m	61y+8m	60y+4m	59y	57y+8m	56y+4m
1953	63y	62y	60y+8m	59y+4m	58y	56y+8m
1954	63y+2m	62y+4m	61y	59y+8m	58y+4m	57y
1955	63y+4m	62y+8m	61y+4m	60y	58y+8m	57y+4m
1956	63y+6m	63y+2m	61y+8m	60y+4m	59y	57y+8m
1957	63y+8m	63y+8m	62y+2m	60y+8m	59y+4m	58y
1958	63y+10m	63y+10m	62y+8m	61y+2m	59y+8m	58y+4m
1959	64y	64y	63y+2m	61y+8m	60y+2m	58y+8m
1960	64y+2m	64y+2m	63y+8m	62y+2m	60y+8m	59y+2m
1961	64y+4m	64y+4m	64y+2m	62y+8m	61y+2m	59y+8m
1962	64y+6m	64y+6m	64y+6m	63y+2m	61y+8m	60y+2m
1963	64y+8m	64y+8m	64y+8m	63y+8m	62y+2m	60y+8m
1964	64y+10m	64y+10m	64y+10m	64y+2m	62y+8m	61y+2m
1965	65y	65y	65y	64y+8m	63y+2m	61y+8m
1966	65y+2m	65y+2m	65y+2m	65y+2m	63y+8m	62y+2m
1967	65y+4m	65y+4m	65y+4m	65y+4m	64y+2m	62y+8m
1968	65y+6m	65y+6m	65y+6m	65y+6m	64y+8m	63y+2m
1969	65y+8m	65y+8m	65y+8m	65y+8m	65y+2m	63y+8m
1970	65y+10m	65y+10m	65y+10m	65y+10m	65y+8m	64y+2m
1971	66y	66y	66y	66y	66y	64y+8m
1972	66y+2m	66y+2m	66y+2m	66y+2m	66y+2m	65y+2m
1973	66y+4m	66y+4m	66y+4m	66y+4m	66y+4m	65y+8m
1974	66y+6m	66y+6m	66y+6m	66y+6m	66y+6m	66y+2m
1975	66y+8m	66y+8m	66y+8m	66y+8m	66y+8m	66y+8m
1976	66y+10m	66y+10m	66y+10m	66y+10m	66y+10m	66y+10m
1977	67y	67y	67y	67y	67y	67y

Note: For people born after year 1977, the retirement age is determined by follows: 67 years plus number of calendar months, which corresponds to twice the difference between the year of birth of an insured and the year 1977.

Source: (Czech Social Security Administration, 2016)



Mgr. Michaela Marksová
ministryně práce a sociálních věcí

Vážená paní, vážený pane,

dovolte, abych Vás upozornila na problémy, které Vám mohou nastat v důchodovém věku. Tento dopis vysvětluje rozdíly v důchodovém zabezpečení osob samostatně výdělečně činných (OSVČ) a zaměstnanců a poukazuje na to, že Vy jako OSVČ můžete být v budoucnu vystaven/a nepříznivým důsledkům velmi malého důchodu. Senioři s nízkým důchodem se už dnes potýkají s mnoha existenčními problémy – nemohou si zajistit kvalitní bydlení a často jsou vystaveni exekucím. Toho se musíme vyvarovat. Doporučuji Vám proto, abyste si ověřil/a, zda máte zajištěno přiměřené finanční zajištění pro sebe a své blízké na stáří.

Dovolte, abych Vás nejprve informovala o tom, jak se počítá důchod, a upozornila Vás na rozdíly mezi zaměstnanci a OSVČ.

Výše důchodu, ať už starobního nebo invalidního, příp. pozůstalostního, je určena celkovou dobou důchodového pojištění a výší vyměřovacích základů, ze kterých se platí pojistné na důchodové pojištění. U doby pojištění není v praxi mezi zaměstnanci a OSVČ prakticky rozdíl.

Velký rozdíl, a to se zásadním dopadem na budoucí důchod, je ale v určení částky (vyměřovacího základu), ze které se pojistné platí. U zaměstnance je každý rok základem celý hrubý příjem. U OSVČ vykonávající hlavní činnost je ale základem obvykle jen zákonné minimum, což je polovina daňového základu. Pokud máte jako OSVČ příjmy, které odpovídají přibližně průměrné mzdě zaměstnance, tzn., že rozdíl mezi příjmy a výdaji činí 26 tisíc Kč měsíčně, Vám se na rozdíl od něj započte jako základ pro výpočet důchodu pouze polovina, tj. 13 tisíc Kč na měsíc, neboť z této částky odvedete pojistné na důchodové pojištění.

Z pohledu budoucího zabezpečení v důchodu situaci ještě zhoršuje úprava daňových paušálů. Na jedné straně sice funguje jako pozitivní podpora podnikání, na druhé straně ale snižuje základy pro placení pojistného ve srovnání s vykazováním podle daňové evidence. V aktuální situaci je pomocí paušálů obvykle dosaženo vyššího čistého příjmu, je to proto logická strategie. Nese ale nemalé riziko v budoucnu v nízkých důchodech.

Praktický příklad

OSVČ pan Novák má za rok 2015 příjem ve výši 600 tis. Kč a výdaje uplatní výdajovým paušálem ve výši 60 %. Výdaje tedy činí 360 000 Kč. Daňový základ za rok 2015 je částka 240 000 Kč.

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- Vyměřovací základ pana Nováka za rok 2015, ze kterého odvede pojistné na důchodové pojištění, bude činit 120 000 Kč (polovina daňového základu).
- Skutečné výdaje pana Nováka mohly ale být např. pouze ve výši 50 %. Čistý příjem pana Nováka je pak 300 000 Kč, což je měsíčně 25 000 Kč (300 000 Kč : 12).
- Přestože skutečný měsíční čistý příjem pana Nováka je 25 000 Kč, tak měsíční vyměřovací základ je pouze 10 000 Kč (120 000 Kč : 12). Hodnocený měsíční „příjem“ pana Nováka pro důchodové účely je prakticky těsně nad úrovní minimální mzdy, přestože jeho čistý příjem přesahuje čistý příjem zaměstnance s průměrnou mzdou.

Každá OSVČ si může podle vlastního uvážení stanovit základ pro placení pojistného vyšší. Zkušenosti z letité praxe však ukazují, že tento postup není využíván a je naprosto výjimečný. Propad příjmů v okamžiku odchodu do důchodu a při ukončení samostatné výdělečné činnosti bude pro OSVČ daleko citelnější než pro většinu zaměstnanců.

Pro konkrétní představu uvádím tři příklady stanovení výše starobního důchodu přiznaného v roce 2015, které vycházejí z následujících údajů doby pojištění a výdělků.

Doba pojištění - 45 let pojištění má první, druhý i třetí příklad.

- Výdělky -
- minimální vyměřovací základ má první příklad,
 - dvojnásobek minimálního vyměřovacího základu má druhý příklad,
 - čtyřnásobek minimálního vyměřovacího základu má třetí příklad.

Příklad	Samostatná výdělečná činnost v období	Vyměřovací základ	Základ pro výpočet důchodu v Kč	Výše starobního důchodu
1	1990 až 2014	zákonné minimum	4 989	5 768
2	1990 až 2014	dvojnásobek minima	9 978	9 136
3	1990 až 2014	čtyřnásobek minima	19 955	11 751

Důchod byl spočten pomocí kalkulačky umístěné na webu MPSV. V období 1986 až 1990 byla místo výdělků dosazena vyloučená doba (výdělky se tím „nerozfedi“). Základ pro výpočet důchodu je průměr měsíčních vyměřovacích základů vynásobených koeficientem, který zohledňuje růst mezd.

V první situaci je za 45 let doby pojištění důchod stanoven ve výši **5 768 Kč**.

V druhé situaci je za 45 let doby pojištění důchod stanoven ve výši **9 136 Kč**.

V třetí situaci je za 45 let doby pojištění důchod stanoven ve výši **11 751 Kč**.



Důchod může být ve skutečném případě dokonce i nižší než v prvním příkladu. Pokud byl podnikatel v letech 1996 až 2003 „ve ztrátě“, nemusel v tomto období platit pojistné vůbec. U prvního příkladu by takto byla zkrácena doba pojištění na 37 let a starobní důchod by byl stanoven ve výši **4 603 Kč**.

Doporučení

Pokud nepatříte mezi OSVČ, které platily a platí významně nadprůměrné pojistné na důchodovém pojištění minimálně na úrovni cca 4 - 5 tisíc Kč měsíčně a výše, pak Vám doporučuji velmi důkladně zvážit posílení Vašeho zabezpečení na stáří¹.

K tomu můžete využít několika možností:

- především můžete zvýšit pojistné placené správě sociálního zabezpečení a tím dosáhnout vyššího průměrného základu pro výpočet důchodu (roky s placením nižšího pojistného budou vyváženy budoucími roky s placením vyššího pojistného),
- můžete využít zapojení do systému doplňkového penzijního spoření (tzv. III. pilíř), kde je spoření podporováno státním příspěvkem a daňovým zvýhodněním,
- můžete využít jiných forem úspor.

V případě Vašich dotazů nebo potřeby dodatečné informace máte možnost obrátit se na pracovníky okresních správ sociálního zabezpečení.

Budu ráda, pokud zvážíte moje doporučení, a zvolíte si takové řešení, se kterým budete v důchodu spokojen/a.

S přáním mnoha úspěchů ve Vaší podnikatelské činnosti



¹ Pro informativní výpočet svého vlastního důchodu můžete využít kalkulačku uveřejněnou na webových stránkách Ministerstva práce a sociálních věcí. Údaje potřebné pro vyplnění kalkulačky můžete získat z Informativního osobního listu důchodového pojištění, který obsahuje přehled základů, ze kterých bylo placeno pojistné v minulosti a celkový součet dob důchodového pojištění (odpracovaných let). Případně zde najdete i přehled některých náhradních dob pojištění (např. dobu vedení v evidenci úřadu práce), uložených v evidenci České správy sociálního zabezpečení (ČSSZ) a za dobu od roku 1986 obsahuje i přehled vyměřovacích základů a vyloučených dob (např. dočasné pracovní neschopnosti). Informativní osobní list důchodového pojištění můžete získat nejjednodušeji písemnou formou vlastnoručně podepsaného dopisu, který zašlete na adresu ČSSZ, Odbor správy údajové základny, Křížová 25, 225 08 Praha 5. Žádost musí obsahovat rodné číslo žadatele, jméno, příjmení, rodné příjmení a adresu nebo ID datové schránky, na kterou bude informativní osobní list zaslán.