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**Choice Architecture and the Pension System
in the Czech Republic.**

Bachelor thesis

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Abstract

This thesis analyzes the influence of behavioral economics on a pension system. The research was performed in order to compare Czech and Swedish pension plans from behavioral economics' point of view. Survey logistic regression was applied to analyze the differences and similarities in the opinions of Czech and Swedish citizens. Data used for the analysis were obtained from Eurobarometer 76.2 (2011). The results show that both nations have similar opinions regarding basic questions about pension. Yet, regardless the fact, that both nations support the idea of elder people delaying the retirement, the number of employed Czech seniors is sustainably lower, than the same number for Swedish elder residents. This supports the idea that Swedish pension plan, to which policymakers had applied some behavioral economics' principles, is doing better than Czech scheme in maximizing employment. Therefore, in fulfilling one of the retirement policy's main goals. And proves, that people can be influenced to postpone the retirement. Furthermore, the analysis shows that people tend to have unrealistic expectations and consequently cannot evaluate some situations correctly, and need to be given a "nudge" to prevent unwelcome impact on an individual's life and on a whole country's economy.

Keywords

Czech pension reform, behavioral economics, Swedish pension system, choice architecture, retirement age, fiscal pressures

Abstrakt

Předmětem této práce je výzkum vlivů behaviorální ekonomie na důchodový systém. Analýza je provedena se záměrem porovnání českých a švédských penzijních plánů z pohledu behaviorální ekonomie. Aplikace průzkumové logistické regrese slouží ke zkoumání rozdílů a podobností v názorech českých a švédských občanů. Jako zdroj dat jsme využili Eurobarometr 76.2 (2011). Výsledky ukazují, že oba státy mají podobné názory na fundamentální otázky týkající se důchodu. Bez ohledu na fakt, že oba národy podporují myšlenku, že starší lidé by mněli odkládat odchod do důchodu na později, je počet zaměstnaných českých seniorů nižší v porovnání se seniory ve Švédsku. Můžeme se tedy domnívat, že švédský důchodový plán, na nějž politici uplatnili některé zásadní principy behaviorální ekonomie, funguje při maximalizaci zaměstnanosti lépe, než český systém. Lepší funkčnost švédského systému možná očekávat i při plnění hlavního cílů penzijního systému, co následně slouží jako důkaz, že lidé mohou být ovlivněni různými faktory při odkladu odchodu do důchodu. Analýza dále poukazuje na tendenci lidí k nereálným očekáváním, které vedou k situacím kdy selhává lidská schopnost správně vyhodnotit dané okolnosti. Právě takové momenty vyžadují "šťouch", aby se zabránilo nežádoucímu dopadu na život jednotlivce a na ekonomiku celé země.

Klíčová slova

Česká důchodová reforma, behaviorální ekonomie, Švédský důchodový systém, architektura výběru, důchodový věk, fiskální tlaky

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Prague, May 9, 2019

Daria Polenova

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Bachelor thesis proposal

Bachelor's Thesis Proposal
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Proposed Topic:

Choice architecture and the Pension System in the Czech Republic

Preliminary scope of work:

Research Question: How can implementations of choice architecture change the current retirement system? How can the population of the Czech Republic benefit from the use of some techniques taken from behavioral economics?

Motivation:

For years countries have been trying to find the best ways to ensure their citizens' well-being after retirement. The structure of pension systems has been one of the most important and complicated questions that appears during many meetings of politicians at all administrative levels. It is really hard to evaluate its importance, as wrong decisions can lead to horrific consequences not only for particular households, but for countries as a whole and in some extreme cases for the global economy. As a result of this, ensuring financial security for elderly citizens is one of the main obligations and goals for policy makers. Unfortunately, due to diverse factors like increasing longevity, low birth rates and financial crises, this goal is even harder to achieve. (European Union pension systems: Adequate and sustainable?, David Eatock, 2015) Because of these factors the pension system in which pensions are paid out of the taxes collected from the earnings of a nation's employed sector is not effective anymore. Therefore this system is in great need of restructuring and additional investments. The world financial institutions are in constant search of the solution for this problem, which would strengthen social security around the world. In 2005 the World Bank introduced a brand new recommendation for countries - a five-pillar framework. This concept was afterwards changed and adapted to the needs of different nations according to specific features of the individual countries. Nowadays, systems with combinations of two, three or five pillars can be found in many European countries. Unfortunately, despite these reforms nations still have to face a huge number of problems with pensions.

In this paper I would like to focus on the retirement system in the Czech Republic. The problem of the retirement system there has constantly been the cause of worries, as for many years the Czech pension account has been in deficit. Czech policy-makers have to consider a lot of issues, characterized for the country. But their main concern has remained the same for decades. The population is aging and it does not renew itself. According to a preliminary official report in 2015, 110,764 citizens were born, 11,173 died, 34,992 immigrated and 18,945 left the country. In other words the natural increase of population

was equal to -409 and net migration was 15,977. (Summary data on the Czech Republic, Czech statistical office).

As a consequence the Czech Republic can one day find itself in a situation when there will be more seniors than employed citizens. If the population renews itself only by immigration, measures for changing the system have to be taken, because the existing plan will not work. The Czech Republic's retirement system now consists of two pillars. However, the system has survived through quite a lot of complex changes during the last 22 years. In 2013 the government introduced the second pillar, which was warmly welcomed by the IMF. The economists believed, that this reform can bring a lot of positive changes to the condition of the Czech pension system, (IMF Country Report No. 12/115, May 2012, Czech Republic: 2012 Article IV Consultation—Staff Report: Staff Supplements; Public Information Notice on the Executive Board Discussion; and Statement by the Executive Director for the Czech Republic). Unfortunately the expected success never happened and after July 2015 people could not participate in it anymore, even though it works quite well in other countries. The official explanation of cancelling this pillar is the lack of citizens' interest. So it can be said that the government did not manage to properly introduce the new policy to people or to make the conditions of participation good enough to satisfy needs of an ordinary person. As it is a proven fact that the design of the policy has a great impact on the whole outcome. For example, Madrian and Shea (2001) stated that the default choice can lead to disastrous consequences for citizens' savings.

In this work, I would like to analyze how such failures can be foreseen and abolished with the help of the correct choice architecture. I will try to study how the system in the Czech Republic can benefit from methods used in behavioral economics. I will analyze what steps can be made to gain public interest, as not all people know that they can for example willingly participate in retirement planning if they work abroad and afterwards return to the Czech Republic, or that even students can save for the future. I believe that the right policy structure can change the existing situation for the better and prevent another projects from failing.

Hypotheses

1. Choice architecture strongly affects the pension system.
2. A properly introduced policy leads to better outcomes, than a poorly proposed one.
3. People, being positively influenced to think about their future, are more likely to contribute earlier and more.

Methodology

I will design a questionnaire, consisting of common questions about for example level of education, sex, and questions about some saving plans. Part of them will be based on the real pension system, while others would be created using the existed pension possibilities with implications of some choice architecture's methods. I understand that I will not be able to obtain enough data to construct an experiment that will describe a real condition of the situation. However, I will try to get as much data as possible. To analyze the collected data I expect to use statistical methods, like for example a linear probability model. Moreover, I will try to use the probit model. The model will be estimated using the analytical weights from the dataset, which I will get with the questionnaire. While doing my quantitative research I will inspire by Ivonne Honekamp (2014) and Gordon L. Clark, Kendra Strauss, Janelle Knox-Hayes (2012). Furthermore, in my work I will analyze the data from the Czech Statistical Office and from the World Bank's reports.

Outline:

1. Introduction
2. Pension reform in Czech Republic
3. Second pillar
4. Effects

5. Role of the behavioral economics. Libertarian paternalism.
6. Implications of choice architecture
7. Comparison with another country
8. Conclusion

List of academic literature:

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1. Introduction

The aim of my thesis is to look at the structure of the Czech pension system and compare it with the Swedish system, world's frontrunner in retirement systems from behavioral economics' point of view. Although the Czech retirement system has been discussed by the government for years now, according to Úřad České Republiky (2018) there is still no proper alternative to the existing plan, which would work and satisfy the needs of the nation in the nearby future without increasing the fiscal burden. The system undergoes different small adaptations from time to time. But the two-pillar scheme is nowhere near the solution of the current issues evolved around the aging population. According to the previous analyses the age of retirement should be raised by two months for males and by four to six months for women till year 2044, when individuals of both genders would retire at age 67, after reaching that point the age of retirement should continue its growth to maintain the present system (Český důchodový systém v kontextu EU, MPSV). However, the government has recently capped the age of retirement at 65 years old (Law n. 155/1995 Sb.). But there are many sceptics, who believe that this decision would not last for long and the age will continue its growth in the overseen future. As it is stated in "European Semester National Reform Programme of the Czech Republic 2018" it was approved by the government on 30th April of 2018, that the ageing of population will continue to put too much pressure on the pension system, which with the existing wages growth and with the pension payments fees may result in increase of 3.6 % of GDP on spending on pensions by 2060. As a result, it was decided to assess the retirement age every five year, as it plays the crucial role in the total pension spending.

One of the latest major steps, undertaken by the government, took place in 2013, when they introduced the second pillar. Unfortunately, it lasted only for few years to be cancelled and permanently shut down in year 2016 due to the lack of interest from the citizens (OECD, 2015).

In contrast to the Czech Republic, Sweden has recently undergone a massive change in retirement system and is now placed among the most successful schemes in the world (Melbourne Mercer Global Pension Index, 2018). According to Cronqvist, Thaler & Yu (2018), the system succeeded not only thanks to the financial instruments, but also thanks to applying of some behavioral economics' methods.

Despite being a young field of economics behavioral economics proved to become an important player in the 21st century with few Nobel prizes winners. This field manages to efficiently integrate psychology into economics and to explain some things that are hardly interpreted by the classical economic theory (Camerer & Loewenstein, 2004). Nowadays, governments have started to acknowledge the existence of the behavioral economics, for example, the Behavioral Insights Team (BIT) was founded in 2010 in the United Kingdom as a part of government to work on raising the efficiency and on optimizing the government's work. With time passing it becomes harder to ignore the benefits that can be brought by behavioral economics.

The main feature and the reason why behavioral economics was invented is a belief, that people do not always make rational decisions (Thaler & Sunstein, 2008). In other words, the basic rationality assumption of economic theory cannot be applied to the world's population. Surely, a person, who spends hours or maybe days in queue to buy a new Iphone on the first day of sale, can hardly be called rational. Moreover, it is known that the greatest utility from a present will be received, if it is given in money rather than in some other form (book, electronics, clothes, etc.). However, majority would prefer to be given something more personal rather than a few banknotes (Thaler, 2015).

In this paper I want to look at the existing Czech and Swedish pension plans, the changes they have faced most recently and the differences and similarities between them. Moreover, I want to analyze these changes from the behavioral perspective. For this purpose I am also examining people's attitudes to some questions regarding elder people in both countries.

The thesis starts with a brief presentation of the pension as a worldwide issue and description of the existing types of pension schemes. It is followed by a presentation of the current Czech economic situation, the development of the pension plan through years and the existing Czech retirement plan, where we go in more details for a better understanding. It is followed by description of Swedish pension system and a brief comparison of the two plans. In the Chapter 3 I present the main concept of behavioral economics, the basic methods used and discuss how and they can be implemented into the policy. Being inspired by Cronqvist, Thaler & Yu (2018) I am analyzing the behavioral methods applied in the Swedish Pension Plan and afterwards discussing if anything can be learnt from Swedish experience. It is followed by the hypotheses the thesis is based on. In the Chapter 4 I describe the methodology I used to

analyze the research questions. After that we interpret and discuss our empirical results. Consequently, our findings are summarized in the conclusion.

2. Pension systems

2.1 Pension as a worldwide issue

Pension is one of the basic parts of social security and the most important budgetary expenditure item, which nowadays poses a modern worldwide issue (Clements et al., 2012). It is hard to find a country which government has not stumbled on a thing called retirement crisis or at least on a prospect of it. Although the pension reforms have recently slowed their pace as it is stated by OECD (2017), retirement systems have undergone extensive reforms during last decades and continued to be one of hot topics in the official's cabinets in different states.

The main problem that requests all those new implications and threatens the financial stability and solvency of pension systems is the demographics. By 2060 the EU population structure is predicted to move drastically from around four working-age (15-64) people for every person aged over 65 years (EPRS | European Parliamentary Research Service, 2015). Some pension systems are more resistant to the risks posed by the aging population, whereas others less. Among the less defended are the pay-as-you-go model based (OECD-A, 2018). This model has to be ready for the pressure from demographic and from labor market. However, these are not the only factors that maintain the pension plans among reform agenda. Short-term fiscal pressures, insufficient resilience of systems for longer time perspectives and the already mentioned aging all play quite a role in worsening the situation. Moreover, the inadequate solutions help a lot in maintaining the issues.

History can also be blamed for the pension crises, all the social and economic changes which have taken place during last century have influenced existing pension plans. As well as even some cultural and mental features of nations have formed the retirement reforms (Clements et al., 2012). Though there are almost universal models, which features can be found in many countries, but the plan in one country is not absolutely the same as in some other.

Moreover, with the development of society, the number of pressures, put on pension systems, has increased. Globalization and integration make governments to consider their steps more cautiously and wisely. However, the reduction of birth rates, not sufficient reproduction with the prolonging lifespan create the biggest fears and uncertainties about the retirement plans' sustainability.

2.1.1 Types of pension schemes

Pension schemes vary widely from country to country, as it was mentioned above. There is no universal solution to the complex pension scheme issues (World Bank, 2008). Plans differ by the roles of private and public sectors, by the financing (whether it is a pay-as-you-go type or funded), by the indexation rules, age of retirement, etc. But the existing schemes can be more or less divided into different groups.

First of all, the retirement plans differ in the benefits origins on the Defined Benefit (DB) and Defined Contribution (DC). In DB pension systems the benefits are determined according to the number of years of contributions and the mean of the incomes (Clements et al., 2012). These plans are severely regulated by governments and country's institutions. The other type of plans is DC, which are generally referred to as "individual account schemes". Here retiree's benefits depend on contributions and the returns from them. Although DB plans represent massive percentage in pensions of some large markets like Canada, the United States and Switzerland (OECD-B, 2018), more countries have started to shift to DC schemes. The main recent problem with the DB is that the liabilities have grown much faster than the assets, which resulted in the deterioration of the funding ratio of DB. Unfortunately, the efficient solution to that problem is not found yet.

Furthermore, the schemes diverse by the methods of financing or in other words Pay-as-you-go versus Funded scheme.

PAY-AS-YOU-GO

The plan is based on labor force's contributions being used to pay pensions to the retired population. Basically, the retirement scheme relies on government and younger generation. The biggest problem with this so popular scheme is the inability to deal with demographic pressures (longevity increases, while fertility rates decrease) and to offer adequate replacement rates. Replacement rates - the ratio of the average pension to average wages (Clements et al., 2012). That is the main reason for countries to revise their plans.

Funded Scheme

In this scheme the contributions are used to acquire assets and in time the retirement benefits are gained from these investments. Funded schemes are divided into

fully-funded - all pensions are paid from accumulated funds and partially-funded - benefits are paid not only from accumulated funds, but also from the recent contributions (Barr and Diamond, 2008). One of the main advantages is the ability to deal better with the demographic dangers. For example, by allowing investments abroad countries can decrease the influence of lower fertility and longer lifespan on the pension plan (Clements et al., 2012). It is also not as politicized as an unfunded plan. But it produces its own dangers like high dependence on economic situation in the world, as a financial crisis is capable of destroying the investments and leaving some retirees in poverty.

Most of countries have invented some hybrid of funded and unfunded schemes in forms of different multi-pillar plans. As a result, it is quite hard to find a pure PAYG or fully-funded scheme. Moreover, it is strongly advised by the World Bank to deliver some multi-pillar system, which incorporates features of more than one type of plan, for higher flexibility and better diversification of the risks coming from the separate elements (World Bank, 2008).

The World Bank has begun to address the issue of the pension planning since 1980s, which led to the introduction of so called Conceptual Framework in 2005, in which the initial conditions, targets and methods of the evaluating the pension schemes were described. The framework provides an overview of 5-pillar scheme which can be modified according to country's needs. The zero-pillar should address the low-income or non-working individuals to protect them from poverty. The first pillar is basically a pay-as-you-go plan. The second pillar should be an individual savings account with large set of options. In comparison with first two pillars, the third one is voluntary, and can be designed in many different ways. The fourth non-financial one is about the support and diverse social programs. All in all this multi-pillar structure or some plan based on it should be adequate, affordable, sustainable, equitable and predictable.

Moreover, specialists from World Bank describe the Pension reform as a long-term project, which should be on the government's agenda, where the politicians' main goal is to produce something universal, user-friendly and well-designed. All in all the population should be interested in "buying" this new product. (World Bank, 2008).

2.2 Brief economic situation in the Czech Republic

Nowadays the Czech economic performance is at its best condition. It can be straightforwardly seen from the Europe 2020 targets set by European Commission. The

figures speak for themselves with the employment rate being 78.5% and target at 75% level. The number of people, facing risk poverty, has gradually decreased during last ten years. According to the publicly available statistics it can be said that the target of -380 will be reached before 2020, if the economics continue with the current pace (Úřad České Republiky, 2018). In 2017 Czech Republic showed its second fastest rate in the decade. Thanks to all demand components positive contribution to GDP, the economy increased by 4.3%. Despite some obstacles, the forecasts for the growth are 3.0% and 2.9% for years 2018 and 2019 respectively. It is predicted that the inflation will continue to be slightly above the central bank's target and that households consumption will stay high (Úřad České Republiky, 2018).

Unfortunately, the GDP growth cannot solve all issues for citizens. According to European Commission one of the main concerns in the Czech Republic's economic development is the long-run fiscal outlook. Due to the absence of acting fiscal council and increasing pressures on the budget, caused by increased spending on pension benefits and the healthcare sector, the country may encounter some great challenges in the future.

Thanks to the economic growth salaries grow, as well as the prices (OECD-C, 2018). Some prices increase with the inadequate speed, which cause a lot of pressure on individual's budgets. A nice example would be the housing prices (OECD-C, 2018). During last five years they raised with higher speed than the nominal income. It can now take 20 years or more to repay the mortgage. Basically, the biggest part of person's most active years. And not long after that an individual finds himself receiving pension.

2.2.1 Development of the pension system in the Czech Republic

Since the Czech Republic has become an independent state, its government has paid great attention to the pension system. During 90s the population embraced quite a number of different changes regarding their pension benefits, including the increase of the retirement age (Ministry of Labor and Social Affairs, 2001). With one of the biggest amendment coming into force in year 1994, when a voluntary private pension was introduced. This way the pension system was transformed into two-tier structured one.

While preparing to become a member state of the EU to meet all obligations, politicians tried their best to minimize the medium and long-run fiscal risks, imposed by

high pressures on the budget and increasing liabilities. However, they could not find a solution to escape all possible dangers, like the demographic changes. Therefore, the pension has continued to be on reform's agenda.

In 2013 the government introduced the so called second pillar. The change was highly criticized even before the introduction. After the government's trials to improve the low interest of the nation, it was decided to close the pillar till the end of 2016 (MF, 2016). Despite being one of the major changes in the pension system, the pillar was prepared in a rush. As a result in March 2015 there were only 84,383 participants (Vostatek, 2016). Among the problems of the pillar was its voluntary nature, absence of possible opt-out, the contracts were provided only by 5 out of 8 pension funds. The regulatory framework was done in a way, that it was too complicated for a new fund to enter the scheme. Furthermore, due to the disagreement inside the government the product was not only not "sold" to the nation, but one party promised to cancel the pillar before it even came into force. Another issue was the low contribution rate, being equal to 3%. In contrast to in Poland and Hungary the rate was equal to 8% and 7.3%, in Latvia 6% (Klepárník, Štípek, Bittner & Pícl, 2017).

Another big change in the retirement system was the introduction of the rising retirement age, signed on 30th September 2011. The document presented the nation with a gradual increase in pension age. Therefore, it also introduced a gradual increase in the required years of coverage from 25 to 35 years, or 30 years, if an individual did not have any time breaks in contribution (OECD, 2015). This way the Czech Republic did a drastic move, becoming the country with highest increase in retirement age in OECD. However, this decision was reviewed and policymakers had recently capped the age at the point of 65 years (OECD, 2017). But it was stated, that a reassessment of the situation is required every 5 years.

2.2.2 The current pension system in the Czech Republic

The current Czech Republic's pension plan is a two-pillar system, where the first pillar is a defined-benefit PAYGO scheme. Being a pay-as-you-go it is universal, easy to understand without any besides complications for an ordinary citizen. The pension benefits differ a little for some kind of professions, like soldiers, policemen, etc. The

pillar aims to cover whole nation, with the legally stated requirements for an individual to start receiving the benefits. One of the main goal of this tier, as well as for any PAYG is to prevent the elder poverty.

The second pillar is a voluntary additional insurance, which is a defined contribution one. It is more widely known, as the third pillar despite the absence of the second (MPSV, 2019). Being a voluntary plan it is doing quite well, with a coverage equal to 52.6 % (OECD, 2017).

Last year the balance between the contributions and pension expenses finally reached a neutral point first time since 2013, when the balance was closed with something around minus 50 Billion CZK. However, the main reason for that was the increase of wages and consequently an increase in contributions. Sadly, it is predicted that the pension benefits' pressure on the budget will grow in the future and result into 11.6 % of GDP by 2060 (European semester, 2018). Consequently, some steps must be done to decrease the possible future pressures on fiscal policy (OECD, 2018).

2.3 The pension system in Sweden

In different indexes of pension schemes around the world Swedish retirement system occupies one of the highest ranks. For example, specialists working on Melbourne Mercer Global Pension Index (2018), which evaluates the performance of pension systems in 34 countries, granted the Swedish system with mark B (with no country receiving B+). The index is based on the assessment of system's adequacy, sustainability and integrity. According to the report the system is not suffering from worldwide issues like age-related spending increases and pension spending huge increase as a percent of GDP. Furthermore, the system is safe from the possible risks, that can harm other countries' plans, like low labor force participation and high longevity (Clements et al., 2012). According to the "Pensions at a Glance" (OECD, 2017), Sweden was among 6 countries, which unlike many other countries did not face any big fluctuations in the pension spending as a proportion of GDP from 1990 till 2013. Such a result was gained thanks to the massive reforms, which have taken place in the country.

In 1994 the country adopted a whole new version of pension plan, going from PAYGO and DB to a nonfinancial (notional) defined contribution plan (NDC) and financial defined contribution plan (FDC) (Könberg, Palmer & Sunden, 2004). In 2003 last steps of new rules, aiming at improving the flexibility and stability of retirement system, came into force (European Commission, 2018). Among the main reasons for the reform was the financial instability of the former system, its lack of flexibility in responding to economic and demographic changes in society (Könberg, Palmer & Sunden, 2004).

NDC scheme is a type of defined-contribution system, which was invented due to the need to address the demographic and fiscal pressures. Among the main advantages of this scheme are its financial stability and the equality between citizens (the people born the same year, contributed equal amounts will receive equal benefits). The scheme shows quite good results in keeping a balance between the liabilities and assets thanks to the life expectancy inflation on annuities. One of the basic ideas of the scheme is to solve the demographic issues even without government's intervention. Furthermore, unlike FDC schemes it is not so influenced by the financial crises, which make the first one less attractive to the policymakers around the world (Holzmann, Palmer & Robalino, 2012).

Basically, a NDC scheme is a variation of pay-as-you-go plan. In comparison with financial defined contribution scheme the individual's contributions are determined according to fixed rate, put on the citizen's account, but not invested in the market (Holzmann and Palmer, 2006). Surely, such a huge and rapid transformation instead of gradual reforms was a risky step to take and it did take some time to evaluate the consequences, however, it was done this way on purpose (Holzmann, Palmer & Robalino, 2012).

2.3.1 Main features of the modern Swedish pension system

The current system consists of two public parts: a NDC pension scheme and a FDC scheme, the premium pension. Both of them are mandatory for the Swedish labor force. Individual's contribution rate is equal to 18.5% of earnings, 16% of which go to NDC and other 2.5% to FDC. Furthermore, low-income or no-income people are guaranteed to receive a minimum standard of living.

As it was mentioned above NDC has some common features with PAYGO, as the contributions done by the labor force are recorded and then used to pay the current pensions, in contrast to FDC. Thanks to its features NDC is successful in making the pension more fair towards a citizen, by eliminating privileges, that are given to some groups in case of traditional schemes (Holzmann, Palmer & Robalino, 2012). However, being similar to PAYGO the scheme is exposed to some problems, which require to be solved. For this reason there are automatic mechanisms implemented, which adapt the system accordingly (Könberg, Palmer & Sunden, 2004).

The second part is FDC scheme, which is also mandatory, with a default fund in case of individual's procrastination or hesitation. In the beginning citizens could choose from five domestic and international funds, which had met the criteria's established by the government. Nowadays, the number of funds is much greater, than five. According to European Commission (2018) currently there are more than 800 funds. The main reason for the introduction of FDC was to decrease the pressure on the budget and to increase the nation's savings (Könberg, Palmer & Sunden, 2004).

Apart from public parts Swedish system also consists of quasi-mandatory occupational scheme. Thanks to the occupational plan, which covers 90% of workers, the replacement rates are higher than the average OECD figure (OECD, 2017).

Despite, the benefits of the reforms, they also brought new challenges. Giving a wide choice to the society, the policymakers had to implement adequate regulations and steps to defend the citizens from new risks. Among one of the main problems was the need to inform the citizens in a proper way, which was solved by a massive campaign (Könberg, Palmer & Sunden, 2004).

2.4 Comparison of the Czech and Swedish pension plans

As it can see from above pension systems in two countries strongly differ from each other. Despite NDC having many common features with PAYGO, it is still not the same thing. While in the Czech Republic the second existing tier is voluntary, Sweden's policymakers decided to escape the possible low participation by making the funded scheme quasi-mandatory. The results of both decisions can be seen from Figure 2.1, where the figures show percentage of coverage for citizens, aged 15-64 years.

Figure 2. 1 Coverage of private pension plans by type of plan, 2016

	Mandatory / Quasi- mandatory	Voluntary		Total
		Occupational	Personal	
Czech Republic	x	x	52.6	52.6
Sweden	PPS: ~100 QMO: ~90	x	24.2	24.2

Note: QMO = Quasi-mandatory occupational; PPS = Premium Pension System; "x" = Not available; The coverage rate of voluntary plans in Sweden is calculated on income earners aged 20 to 64 in 2015. OECD(2017)

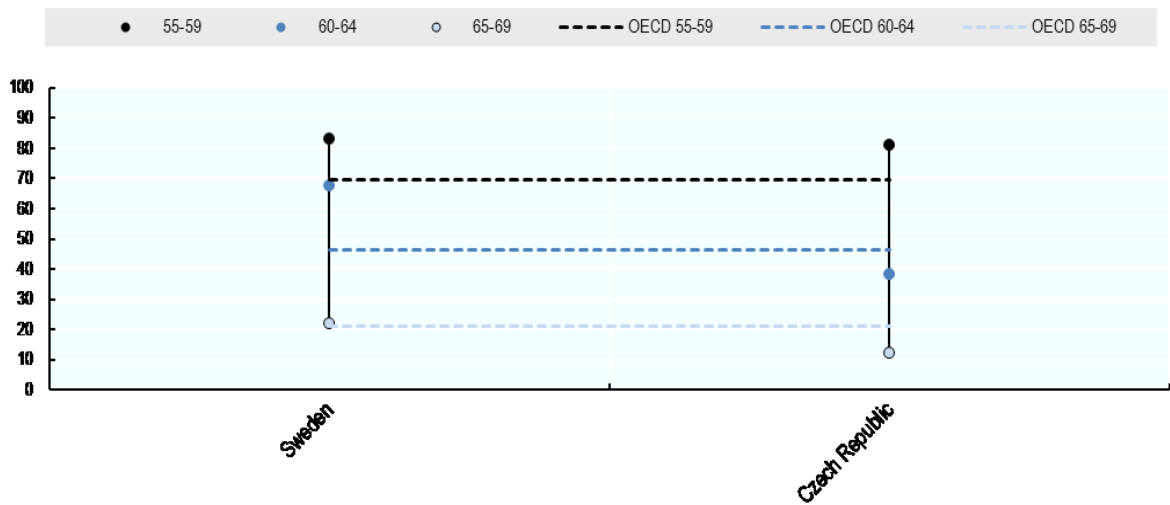
While whole Swedish nation is covered by premium pension system and 90% by quasi-mandatory with 24.2% also participating in voluntary scheme, a little more than 50% of Czech citizens enjoy benefits from the voluntary pillar.

However, there are some common features between two countries' pension schemes. For example, Swedish and Czech pensioners are eligible to withdraw partial pensions and combine it with income from work, in case they decided to postpone the whole retirement (OECD, 2017). However, it should be not forgotten here, that Swedish retirement age has already been equal to 65 years, while in the Czech Republic the age was moving, for example in 2016 the normal age for retirement for Czech citizen with full career was 61.2 (OECD, 2017). So it should be kept in mind, that what was working years for Sweden, was already years in retirement for the Czech Republic. Unlike Czech Republic, which "penalizes" early retirees, Sweden allows early retirement, but the guaranteed pension will be paid only after reaching 65 years, before that a person (from age 61) can receive only the earnings-related pension benefits. Consequently, the numbers from Figure 2.2 are not so surprising. According to it employment rate among Czech citizens aged 60-64 are slightly less than OECD's average (with majority of OECD countries having retirement age equal to 65 years), while rate for people 55-59 years old is 10% above the average. As it can be seen the differences between two countries are not really dramatic in case of the youngest category, however, for people aged 60-64 there is almost a 30% difference. Furthermore, a 10% difference for people,

who reached their retirement age in both countries, shows that Swedish residents are more likely to postpone whole retirement than Czech.

Moreover, it should be stated, that the Czech Republic has recently shown a great increase in growth of employment rates of older workers. According to figure 2.3 the increase was higher, than the OECD’s average and the Swedish one. According to the last policy changes, further increase can be awaited in the future.

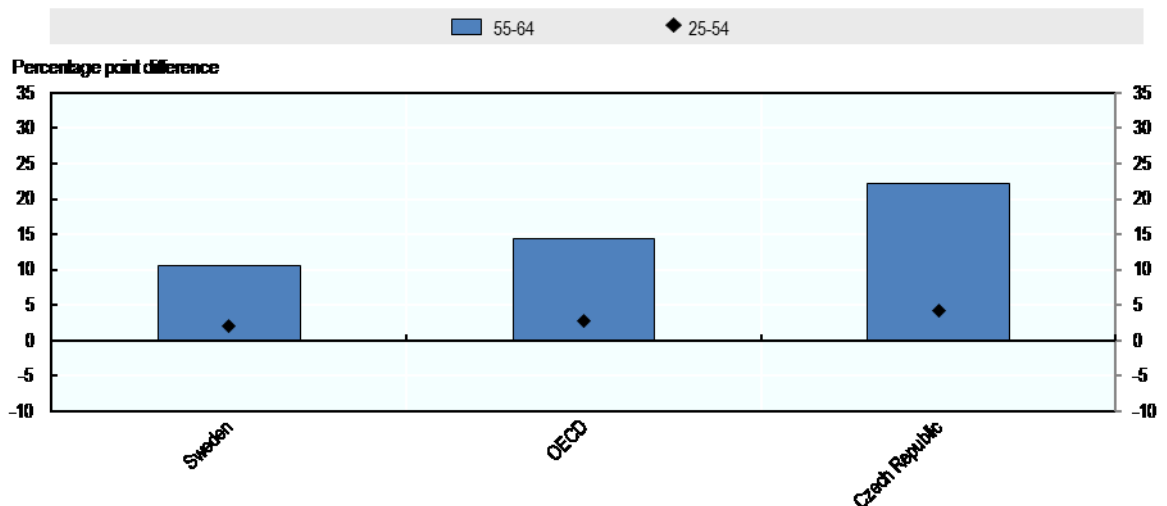
Figure 2. 2 Employment rates fall sharply with age
Employment rates of workers aged 55 to 59, 60 to 64 and 65 to 69 in 2016



OECD (2017).

Moreover, it should be stated, that the Czech Republic has recently shown a great increase in growth of employment rates of older workers. According to Figure 2.3 the increase was higher, than the OECD’s average and the Swedish one. According to the last policy changes, further increase can be awaited in the future.

Figure 2. 3 Growth of employment rates of older workers has been strong
Change in employment rates, 2000-2016, percentage points



Other figures of interest are gross replacement rates, which presents the pension benefits from public and private schemes relative to wages, when people were employed. Figure 2.4 presents us the rates for our countries of interest, where 0.5= low-income, 1= average income and 1.5= high-income worker. According to the figure, it can be concluded, that the Czech Republic has a highly society-targeted program. Furthermore, it can be said that the pressures on budget are much stronger, than in Sweden or in OECD on average, as the gross replacement rates from mandatory schemes are substantially bigger in the Czech Republic.

Figure 2. 4 Gross pension replacement rates from mandatory public, mandatory private and voluntary private pension schemes

	Percentage of individual earnings														
	Mandatory Public			Mandatory private (DB & DC)			Total mandatory			Voluntary (DB & DC)			Total with voluntary		
	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5
Czech Republic	74.1	45.8	36.4				74.1	45.8	36.4				74.1	45.8	36.4
Sweden	36.6	36.6	27.6	19.2	19.2	36.9	55.8	55.8	64.5				55.8	55.8	64.5
OECD	52.6	40.6	36.0				64.6	52.9	48.4				70.3	58.7	54.4
EU28	54.9	45.9	42.2				69.6	58.3	54.5				73.0	61.7	57.8

DB=defined benefit; DC = defined contribution.

OECD(2017).

All in all, as it is stated by Clements et al. (2012) the Czech pension scheme is exposed to the dangers of high longevity and low labor force participation, the Swedish system is believed to be sustainable and in no foreseen danger.

3. BEHAVIORAL ECONOMICS AND PENSION SYSTEMS

Despite behavioral economics' current increasing popularity, it is not something new. According to Camerer & Loewenstein (2004) the majority of its ideas goes back to the classical economic theory's roots. Furthermore, a person who starts to learn behavioral economics, should not be mistaken by considering that this type of economics rejects the neoclassical one. The right of behavioral economics to exist had not been acknowledged by academic circles for decades. And it was just not long ago, that it was finally recognized as an economic discipline.

3.1 The concept of behavioral economics

The main idea of behavioral economics is to incorporate some psychological aspects into a classical economic approach to make the analyses more realistic. According to Camerer & Loewenstein (2004) the behavioral economics' methods do not change the situation drastically, as only non-central assumptions of neoclassical approach are touched. Moreover, the authors illustrate that the behavioral economics meet all three assumptions of economic theories based on Stigler's (1965) - generality, reality and tractability. Furthermore, behavioral economics has recently adopted all methods used in standard economics.

However, behavioral economics shows that some basic ideas of neoclassical approach are violated and explains why it happened. For example, it is proved that peoples' preferences can be influenced by the way an individual receives a bundle to choose from, determining the "revealed" preferences. Or "anchoring effect", which is basically a proof, that people given limited information can make incorrect assumptions due to having some anchor. Another phenomenon, which rejects the fact that preferences are "predefined sets of indifference curves represented in microeconomics books", is a context effect (Camerer & Loewenstein, 2004). All of the above led to introduction of different theorems and ways of how people can be influenced or in other words "nudged".

While making any decisions about savings, or work, people strongly rely on their mental accounting, which is the basis of choice-making. According to Thaler

(1999) it can be described in three steps: benefit analyses, assigning expenditures and spending to different needs, frequency of the required analysis of the action. However, here comes the issue that people want to get advantages immediately. And this can unfortunately influence the mental accounting in a great and undesired way. Immediate rewards or immediate costs can play a huge role in an individual's life, whether a person can foresee his future actions or naively prefer to ignore the possible outcomes. Another issue can present Time discounting, the analysis of how citizens evaluate costs and benefits through different time periods. In contrast to neoclassical approach behavioral economics does not support the idea that the discount factor is decreasing exponentially:

$$d(t) = \left(\frac{1}{1+r}\right)^t,$$

but believe that

$$d(t) = \frac{1}{1+kt}$$

can explain the concept much better. The idea was tested by Thaler (1981). In his study he concluded that the discount rates fall linearly with the time of delay. Moreover, the results of postponing the possible "immediate" benefits were really dramatic. Furthermore, it was proved that people are more or less okay in making plans for events, when both benefits and costs would be in the future, but much worse in other case. When people make decisions about savings or postponing their retirement, time discounting is an important player. If a citizen stays longer in labor force, he willingly prefers to decrease his leisure time, which is a really hard decision to take. Therefore, behavioral economics offer some solutions to improve the pension system's performance.

Automatic enrollment has a special place among them, making an individual choose to quit rather than to enroll, makes a huge change. And thus finding benefits in peoples' inertia. Default choice provides a more simple decision in case individual have issues with making a choice. Simple choices and a proper formulation can bring outstanding results.

Quasi-mandatory approaches are also partly results of taking behavioral aspects into account. According to Schwarz and Omar (2014) voluntary schemes in many countries fail to achieve the required level of participation. It was also proved by Madrian (2013), that the effects of financial instruments are less significant in this case than the methods I mentioned above.

3.2 Swedish pension system through behavioral economics lens

The Swedish pension is a good example of how the behavioral methods can be applied to the policy and influence its effectiveness or at least escape some dangers, which can be brought by changes. After the reform came into force, Swedish citizens found their selves in front of the huge variety of different possibilities. Because the reform stated that any fund can enter the FDC part if it meets European Union's UCITS Directive. This could have led to an enormous disaster if not for a great choice architecture.

As it was mentioned in the previous chapter the second part of the "new" reform is FDC scheme, which is mandatory. That means that people, working in Sweden, are automatically enrolled in the program. It can be speculated that if the plan was not mandatory, the participation rates would be much smaller.

Moreover, while giving citizens a choice to choose from different funds, the default fund was set up, so that if the citizen cannot or is not willing to decide where to invest, then he would be automatically enrolled in the default fund called AP7. To ensure the protection of client's money the fund largely indexed, low fee and globally diversified (Cronqvist, Thaler & Yu, 2018).

Also, the government spent a lot of money on the advertisements to lower the number of default fund's participants. They wanted to "sell" the new possibilities to the nation. Despite being an expensive instrument it produced the wanted results: 66.6% of people, had preferred construction of their own portfolio to the default choice. But due to the costs, the advertising was chosen only during the first year, as it was aimed at 4.4 millions of people. Furthermore, the influence from that advertising campaign was shortly effective and managed to impact only those in 2000 cohort. On the other hand, the effect of advertising stayed in place for years, as only 2.9% participants changed their plans from their own portfolio to the default choice, as it was proved by the analysis of Cronqvist, Thaler & Yu (2018). A set up of another campaign would be inefficient, as the target group will consist only of approximately 200 000 people. But it can be concluded, that the "nudge" was efficient, as about 2.9 million decided on their own portfolio and only a small percent of them had changed their mind in the meantime.

Although, the new reform introduced many new opportunities, it has brought the new obstacles, which, however, were efficiently overcome. One of the main challenge

was the financial literacy level. Campbell (2006) concluded, that a great number of Swedish households are not educated enough to make complicated financial decisions. But Swedish policymakers were successful in escaping this problem. First of all, people are protected from falling too low despite their investment decision-making. Secondly, the quasi-mandatory occupational part, that provides the widest variety of possibilities to choose, would not make a high percent of pension savings for low-income individuals. And the NDC does not offer much choice for individual to be able to make fatal error. Thirdly, the government paid a great deal of attention to people being informed and regularly updated on the pension and their retirement savings. Once a year an individual receives his/her Orange Envelope- pension statement (Almenberg and Säve-Söderbergh, 2011).

3.3 Research questions

Being inspired by all above and by Thaler & Sunstein (2008), where they analyze how the individual's behavior can be influenced and prove that Homo Sapiens are just Homo sapiens and not Econs (how they call an individual with strictly rational decisions), I formulated 3 questions for my research to analyze if the pension system plan in the Czech republic can be influenced by the behavioral economics, like it was done in Sweden.

1. Choice architecture affects the way people are engaged with the pension system.

According to the main assumption of standard economic theory, it is believed that whole decision-making process is based on the individual's rationality. However, during last few decades this has been highly doubted by some brilliant economists, who were awarded with the Nobel Prize. For example, Richard H. Thaler did receive the prize for challenging peoples' rationality in year 2017.

The behavioral economics advocates the opinion that our decisions and even preferences can be altered and even changed with little unseen actions. A good example is study about organs donors done by Johnson & Goldstein (2003). To explain the power of default choice they compare the participation in organ donation in Germany, where an individual can choose to participate, and in Austria, where the individual can

choose to opt-out. The results were really interesting. 12 % of Germans decided to participate in the program, in comparison with 99% of Austrian citizens.

The power of automatic enrollment and peoples' unwillingness to change something, if it is already set, was also proven by Swedish pension policymakers, which was described above. The participation number in the occupational pillar of Swedish system could be so much different from the current one, if not its quasi-mandatory nature. Furthermore, in the second chapter we did compare the coverage of voluntary scheme in the Czech Republic and quasi-mandatory in Sweden.

2. Failure of the 2nd pillar is connected with the absence of properly designed policy from the behavioral economics' perspective.

As it was mentioned above in year 2013, the 2nd pillar of pension system was introduced in the Czech Republic. Law was amended, money were spent, and some people participated in it, only for it to be cancelled shortly and closed permanently. The cancellation was also followed by other issues. The reform was highly argumentative with many critics and supporters. However, even some critics were quite skeptical about the rapid cancellation. Why? Because the problem lied not only in the pillar itself. The multi-pillar systems work in other European countries and show wide interest from the citizens. But maybe the issue was also in the way it was introduced. There was no surprise that so small part of nation was interested in something with so many limitations and with such time perspective.

The main problem was that nobody explained citizens the main aspects and possible benefits. Little was done to "sell" the newly-introduced pillar to the nation. Furthermore, as we had already stated the low contribution rates made the whole scheme less attractive.

In contrast to Sweden, where the policymakers preferred a rapid change to gradual reforms, but still succeed. The massive advertising was done there to introduce, to explain the changes in the pension policy. Despite being expensive, it proved to highly efficient. The goals were reached. In spite of people's financial illiteracy and procrastination government has created a system with a big variety of choices and managed to influence around 2.9 million to do a choice themselves rather than be enrolled into a default fund. The policymakers were interested in "selling" the pension to the nation and they succeeded. The financial illiteracy was taken into the account, and

reform was done in a way, that people, who are not able to make proper financial decisions, would not get themselves trapped in poverty.

3. People, being positively influenced to think about their future, are more likely to save greater amount for their retirement.

The economic theory presents a rational and well-economically educated person, who is able to make appropriate choices even for longer time prospects. Unfortunately, the reality is not so optimistic, otherwise the Earth's population would not need to face the crises once in a while. And surely there would be nothing like economic "bubbles". But people can be trained and "influenced" so that they have a better understanding of the economic surroundings. People should be alert about their expenses, the possibilities of savings. I believe, if people are informed about their pension savings on regular basis, like it is done in Sweden, they will have a better understanding of their future income and start to think more about what should be done in order to have proper income in elder years.

People can be influenced in many ways due to our psychology. There was a very interesting study supporting this idea conducted by Hal Hershfield, a social scientist at New York University, and six of his colleagues (Hershfield et al., 2001). It was an experiment, where participants were asked to imagine a hypothetic situation, that they were given 1000 USD. The question was how they are going to allocate the sudden revenue. The choices were given as follows:

1. Use it to buy something nice for someone special.
2. Invest it in a retirement account.
3. Plan a fun and extravagant occasion.
4. Put it into a checking account.

The results were quite intriguing. Half of respondents chose to put much more money to the second option, than the other half. Well, it was not just a miracle or weather influence. The explanation is more than simple. All participants were given 3D-glasses and asked to look at their images in the mirror before answering the question. While the second half saw just themselves without anything strange in the mirror. The first half were looking at themselves, but with a little adaption. Themselves in their retirement age. The individuals have a hard time visualizing themselves in retirement. So the conclusion is that people can hardly depict themselves in winter of their lives. But when they succeed in doing so, they start considering their savings. However, this is

the situation, when government's help could be needed, to prevent the situation, when people understand that they are old and that they do not have any savings. A good example here again would be a quasi-mandatory and voluntary scheme, if a resident thinks he has a whole life ahead of him, he would not want to bear the immediate costs for delayed rewards.

Furthermore, people can be encouraged to postpone their retirement, this way the fiscal pressures may decrease a little bit. People should be offered some choices and incentives to prolong their labor active years. In the Czech Republic only 63.4% of citizens from the age group 55-64 are employed. Though it is slightly above OECD's weighted average, which is equal to 60.8%, it is still far from Iceland's 83% or Sweden's 76.4% (OECD-C, 2018).

4. Research methodology

The aim of my research is to analyze if citizens' behavioral preferences are in line with the retirement decisions' they make. And if they are not, could there be a way to succeed with retirement system at all. In this work the Czech Republic is compared with Sweden. As it was mentioned above Swedish government introduced an impressive change in the retirement system, which results continue to gain attention from policymakers across the world. Therefore, in this work I would like to analyze some differences and similarities in mindsets of citizens of these two European nations and how they influence the results of the retirement systems performance. As far as I know, these two countries have never been looked at in this way before. I would like to understand if there are any lessons from Swedish example which can be learnt by the Czech Republic.

4.1 Data

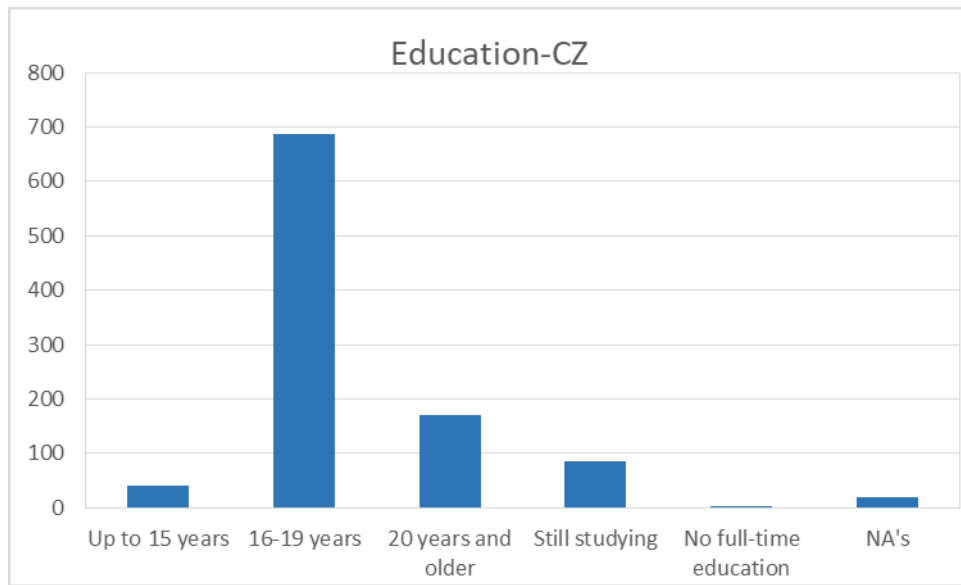
Although, an experiment is a more common method of analyses in behavioral economics in this work I use the survey data obtained with Eurobarometer 76.2 (2011). Unfortunately, it is the latest released Eurobarometer, which provides data on the relevant topic. Furthermore, this publication is one the few publicly available sources of the required research data. In contrast with a conduction of my own survey, an older version of Eurobarometer is presenting still applicable, more unbiased and truthful information, which can be used in the research without dangers of violating the basic requirement of a sample being random. In case of this work the experiment could face the same problem as a personally conducted survey, as it would be very complicated, if even possible, to obtain enough cases to satisfy the randomness assumption. Moreover, Eurobarometer is a widely-known and respected provider of public opinion across Europe. Furthermore, Eurobarometer provides the appropriate weights, essential for a proper survey data analyses.

One of the main advantages of Eurobarometer is its multi-level random sampling's character. A regular sample size for every country in Eurobarometer is approximately $n=1000$, which satisfies the implication of Law of Large numbers, that a sample of size $n=1000$ is very likely to be representative. Moreover, according to

Thomas Lumley (2010) in practice the bigger the sample the more efforts are required to deal with issues like missing values, etc. The Eurobarometer used in this thesis is aimed at analyzing people's opinions about active ageing, social policy and labor conditions. The interviews were done face-to-face in some countries and via special IT system, where it was possible. This survey was conducted under strict rules to eliminate the possibility of final sample being biased. Moreover, the responses were pre-checked for possible incompleteness, missing and duplicate values by the responsible agency. Another advantage of Eurobarometer is that the weights (sampling weight is equal to $1/\pi_i$, where π_i represents probability of an individual being chosen and this individual represents $1/\pi_i$ individuals in the whole population), required for a thorough data research can be found in the dataset, therefore there is no need in further tough calculations. In my research I am using the post-stratification weight, which is required for a separate comparison of individual samples (countries or regions on sub-national level).

Furthermore, as the survey contains a lot of questions which may be hard to answer for an ordinary citizen, for the dataset to be useful for a reliable analysis I should have addressed the issue. According Hosmer, Lemeshow & Sturdivant (2013) one of the method is to delete the incomplete values from the analyzed dataset, though the estimates can become less precise, the results will still be valid and this simplistic approach can save the analyst from far more complicated solutions, like for example, redistributions of statistical weights of deleted values among the new version of dataset. In this work I decided to implement this "simplistic" approach to eliminate the influence of missing values and outliers. For example, it can be seen from Figure 4.1 there was just one respondent without full-time education in the Czech Republic, if not dealt with, such an outlier could have strongly influenced the empirical results, which is unwelcome for the analysis.

Figure 4. 1 Age when finished full-time education (CZ)



Eurobarometer 76.2 (2011)

After removing the mentioned values the dataset for the Czech Republic dropped from $n=1003$ to $n=827$. For Sweden the number of trustworthy answers went from 1035 to 948 (see Appendix A for original datasets). The updated datasets for both countries are still of sufficient sizes for logistic regression models.

Table 4.1 presents us with the whole updated dataset for the Czech Republic after taking care of missing values and outliers. As it was stated above, I needed to delete the individual's responses with no full-time education. Unfortunately, this is a result of the fact that Eurobarometer still provides researches with limited information, which leads to the restrictions in the research and its empirical results. The Czech dataset used in the model would not provide any details on how absence of full-time education in the moment of survey being carried out can influence the relation towards the introduction of the threshold after reaching which an individual should stop working. Another outlier, which was dealt with, is the "not at all confident" category in the question number qa8 (job confidence), the outlier was removed from both (Czech and Swedish) datasets.

Table 4. 1 Dataset for the Czech Republic

Czech Republic n=827											
Gender (d10)				Age (d11r1)							
female		male		15-24 years old		25-39 years		40-54 years		55+ years	
463		364		100		259		200		268	
Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
0.5599	0.017	0.44	0.017	0.1209	0.0113	0.31318	0.0161	0.2418	0.0149	0.32406	0.0163
Age when finished full education (d8r2)											
up to 15 yrs			16-19 yrs		20 yrs and older		still studying		no full-time education		
32			567		155		73		0		
Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
0.038694	0.0067	0.6856	0.0162	0.187424	0.0136	0.0883	0.0099	0	0	0	0
Size of community (p6cz)								Would you say that people should be allowed to continue work. Once they have reached off. Ret. Age or should they have to stop?(qb19)			
up to 5000			5001 to 100 000		more than 100 000		To continue (Yes)		To stop (No)		
307			308		212		555		272		
Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
0.37122	0.017	0.3724	0.0168	0.25635	0.0152	0.6711	0.0163	0.3289	0.0163		
Would you say that you are very/fairly/not very/not at all confident in having a job in 2 years? (qa8)											
Very confident			Fairly confident		Not very confident		Not at all confident		Not looking for		
124			364		89		0		250		
Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
0.14994	0.012	0.4402	0.0173	0.10762	0.0108	0	0	0.3023	0.016		
To what extent do you dis/agree that the official ret. Age will need to increase in your country by 2030?(qb16)											
Totally agree			Tend to agree			Tend to disagree			Totally disagree		
31			126			218			452		
Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
0.037485	0.0066	0.152358	0.0125	0.2636	0.0153	0.546554	0.0173				
Occupation of respondent (d15a_r1)											
Self-employed			Employed				Not working				
76			406				345				
Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
0.091898	0.0101	0.490931	0.0174	0.41717	0.0172						

Because here we are dealing with categorical data R does not provide the usual summary statistics, but gives us the numbers of the categories. With the help of survey package I was able to obtain mean values and standard errors. In this case it means, for example, that the expected proportion of females in gender variable is 55.99% with standard error equal to 1.7% (Xu, Feng & Burdine, 2010). Moreover, in question number qb16 we can see that the responses are highly skewed with percentage of “totally agreed” people just 3.75% (SE= 0.66%), “tend to agree” – 15.23% (SE=1.25), “tend to disagree”- 26.36% (SE= 1.53%) and “totally disagree”- 54.66% (SE= 1.73%).

Table 4.2 provides us with the similar dataset, but for Sweden.

Table 4. 2 Dataset for Sweden

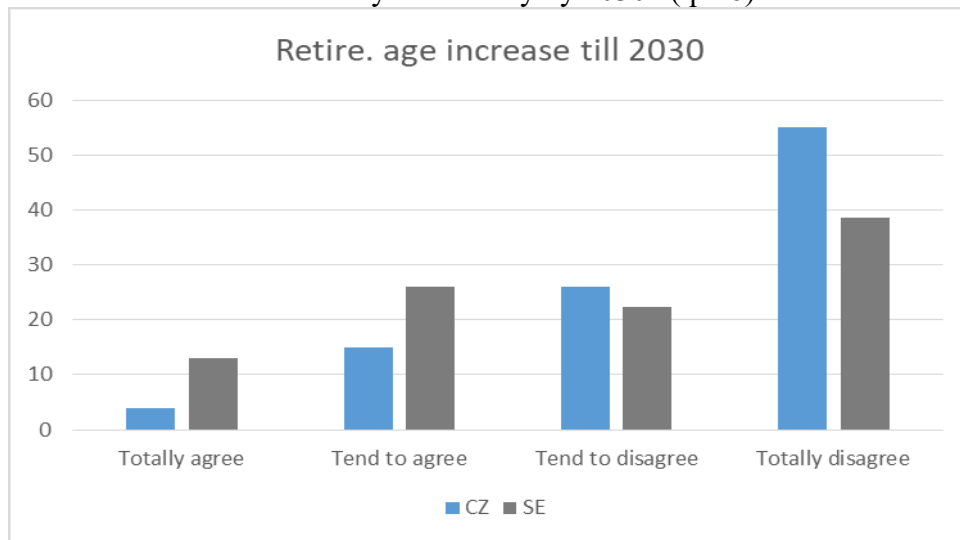
Sweden n=948											
Gender (d10)				Age (d11r1)							
female		male		15-24 years old		25-39 years		40-54 years		55+ years	
448		500		51		132		222		543	
Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
0.473	0.016	0.527	0.016	0.0538	0.0073	0.13924	0.0112	0.2342	0.0138	0.5728	0.0161
Age when finished full education (d8r2)											
up to 15 yrs			16-19 yrs			20 yrs and older		still studying		no full-time education	
92			242			569		45		0	
Mean	SE		Mean	SE		Mean	SE		Mean	SE	
0.097046	0.0096		0.2553	0.0142		0.60021	0.0159		0.0475	0.0069	
Size of community (p6se)								Would you say that people should be allowed to continue work. Once they have reached off. Ret. Age or should they have to stop?(qb19)			
up to 5000			5001 to 100 000			more than 100 000		To continue (Yes)		To stop (No)	
119			508			321		824		124	
Mean	SE		Mean	SE		Mean	SE		Mean	SE	
0.12553	0.011		0.5359	0.0162		0.33861	0.0154		0.8692	0.011	
Would you say that you are very/fairly/not very/not at all confident in having a job in 2 years? (qa8)											
Very confident			Fairly confident			Not very confident		Not at all confident		Not looking for	
333			177			39		0		399	
Mean	SE		Mean	SE		Mean	SE		Mean	SE	
0.351266	0.016		0.1867	0.0127		0.04114	0.0065		0	0	
To what extent do you dis/agree that the official ret. Age will need to increase in your country by 2030?(qb16)											
Totally agree			Tend to agree			Tend to disagree		Totally disagree			
131			232			215		370			
Mean	SE		Mean	SE		Mean	SE		Mean	SE	
0.13819	0.0112		0.24473	0.014		0.2268	0.0136		0.3903	0.0159	
Occupation of respondent (d15a_r1)											
Self-employed				Employed				Not working			
51				454				443			
Mean	SE			Mean	SE			Mean	SE		
0.053797	0.0073			0.478903	0.0162			0.4673	0.0162		

In the table we can again see the proportions and standard errors. For example, it can be seen that in contrast with the Czech dataset, in Sweden there were more male respondents. Furthermore, we can say that a percentage of Swedish respondents with higher level of education is greater, than in the Czech Republic.

It can be seen that the responses to the question about possible rise of retirement age are highly skewed, with less than 10% Czech people, believing in possible rise.

Figure 4.2 shows us how the responses differ across the countries. It is worth to keep it in mind, as we will return to this question in next part of the thesis.

Figure 4. 2- To what extent do you dis/agree that the official ret. Age will need to increase in your country by 2030? (qb16)



4.2 Methodology

In this thesis one of my objective is to analyze whether the same variables influence the people's opinions on the same issues in Sweden and in the Czech Republic in similar way or not. Furthermore, due to very limited information regarding the second pillar of the Czech pension system, it is hard to look at my second research question, because of that I decided to prove once again that people's expectations are often wrong, and that sometimes governments need to intervene in individual's decision-making process, whether by increasing the retirement age or by introducing quasi-mandatory schemes. For that I decided to analyze question qb16 from the datasets the same way it was done for another question. Based on Eurobarometer I had chosen two questions (qb16 and qb19) of interest:

1. "Would you say that people should be allowed to continue working once they have reached the official retirement age, or should they have to stop working?"

and

2. "To what extent do you agree or disagree that the official retirement age in (OUR COUNTRY) will need to increase by the year 2030? (IF NECESSARY, FOR EVERYONE, MEN AND WOMEN)"

Eurobarometer 76.2 (2011).

Both questions were chosen as dependent variables for my logit models. For which I started with looking of how it is explained by different independent variables for Sweden and the Czech Republic separately. As the explanatory variables were selected the basic things like gender, age, education level, this choice was inspired by Litwin, H., Achdut, L., & Youssim, I. (2009). Following the more specific questions like job confidence or confidence of finding the job if the respondent would be hired. All of used variables and their distributions are presented in Tables 4.1 and 4.2. Thanks to the diversity and quality of Eurobarometer I was able to try and investigate many more relations. However, not all of the variables were significant enough to be included in the final version of the model, this issue would be referred more to in the next part of this thesis.

As it was already mentioned despite its high quality and many advantages Eurobarometer still cause some limitations in the research. Furthermore, working on survey data in R had raised further complications, which were solved thanks to Thomas Lumley (2010).

Another issue was the ordinal character of the dependent variable I had chosen for one of the logit models, designed for the research. Ordered logit is far more complicated to regress and interpret than a binary regression model due to requirements for some more complicated programming steps, like for example creation of replicate weights. According to Wooldridge (2012), this problem can be eliminated by converting an ordinal variable into binomial one, which is considerably easy thing to do in R. However, the analyst should be ready to face the possible loss of information, due to the reason that ordered model is basically an extension of binary. Consequently, it can pose a problem, depending on if the categories did play a really important role in the model's outcome or not. Keeping this in mind, I decided to proceed with the conversion and regression.

All in all, it was a challenge to find some data in publicly available sources, as the needed data is connected with some sensitive topics, which are strongly protected by the law, a good and widely-known of a law of this type is GDPR.

Moreover, logistic regression requires special interpretation. One of the most widely used technique to interpret logistic model is the application of odds ratios, which are equal to e^{β} (Thomas Lumley, 2010). For example, if we use odds ratio for interpretation of the model, we get that the odds for female to be in favor of people

being allowed to continue working after reaching the retirement age are $\exp(-0.196) = 0.822$ (Table 4.4) or in plain English it means that the odds of $y=1$ are 17.8% lower for the female respondent, than for a similar male respondent. Unfortunately, despite the easiness in calculations this method is far from being an intuitive one. For a better understanding it is good to look at the formula before we start with the interpretation. A general formula of OR is:

$$OR = \frac{\frac{\pi(1)}{1 - \pi(1)}}{\frac{\pi(0)}{1 - \pi(0)}}$$

Odds ratio allow analysts to present audience with a somewhat more meaningful empirical results, the measure of association gives the odds of probability being equal to 1 to probability being 0. Unfortunately, as it is emphasized by Hosmer, Lemeshow & Sturdivant (2013) and by Lumley (2010) it is a common thing to incorrectly interpret the results, forgetting the fact that the odds ratio give odds and not probabilities. Furthermore, for a more precise interpretation researcher is highly advised to obtain the confidence intervals for odds ratio (if not given by software automatically), which are calculated with the following formula:

$$\exp(\hat{\beta}_i \pm t_{1-\frac{\alpha}{2}} * \widehat{SE}(\hat{\beta}_i)) ,$$

Where $i=0, \dots, n, n \in N$.

4.3 Model

In this thesis I had decided to apply logit model. Firstly, because as it is stated in Wooldridge (2012) unlike linear model it overcomes two issues:

1. the fitted probabilities being less than 0 or greater than 1
2. constant partial effect of categorical explanatory variable.

Secondly, there was a possibility to use probit model, because both logit and probit are binary responses model. However, due to a more complicated interpretation of the probit regression results I had decided to give a preference to the logistic model. Moreover, logit is more frequently used with survey data as it is mentioned by Thomas Lumley (2010). Furthermore, probit must be tested for normality, whereas logit can work with non-normal errors.

A general form of logistic model is:

$$\text{logit}P(Y = 1) = \alpha + \beta_1x_1 + \beta_2x_2 + \dots + \beta_px_p,$$

where $p = 1, \dots, n, n \in N$.

Logit in the model is equal to:

$$\text{logit}(p) = \log\left(\frac{p}{1-p}\right)$$

While constructing the required logit models, I strongly relied on the recommendation of Heeringa, West and Berglund (2010) by following the Hosmer and Lemeshow's (2000) process:

- detect the significant independent variables (with p-value < 0.25),
- use the Wald test to analyze the influence of explanatory variables (easily obtained with survey package in R),
- test for linearity assumption for continuous variables, in case of categorical variables look if the sample size is sufficient,
- add the possible justified interactions of the independent variables, analyze if they are significant for the model (returning to the first bullet point), for example age*gender or gender*education.

Unfortunately, even nowadays software is still not fully-equipped to provide users with the methods to test the correctness of the requirements mentioned. All of the procedures to evaluate the correctness demand strong matrix programming skills. Because of this limitation there is not much that can be done to check the model. As it is stated by Hosmer, Lemeshow & Sturdivant (2013) much work needs to be done to improve the situation for survey-analyses. However, it is still possible to perform Wald tests for the variables for the model's better assessment. Moreover, we can still analyze the model's summary statistics, though, in this work's case without graphics as scatterplots do not produce any value in case of binary data (Thomas Lumley, 2010). Furthermore, one of the steps of the offered process is certainly fulfilled: because of the fact that all selected variables have categorical character, there is no need in checking for the possible nonlinearity. I also did assess the model with Archer-Lemeshow test, which is basically an extension of Hosmer-Lemeshow test and which was created to assess sample survey data (Archer& Lemeshow, 2006).

While constructing the models, some things should have been taking into the consideration. First of all, as it was mentioned above Eurobarometer offers a wide range of different variables, which can be used for the analysis, but not all of them were useful for comparison of people's attitudes towards the questions to see if there are any huge discrepancies. Unfortunately, some of them contained quite a lot of missing values or outliers, which can influence the model in a bad way, for example enlarging the estimated error terms, and therefore resulting in all results being quite doubtful. Secondly, not all variables are significant enough to be incorporated into the final model. Due to that reason this model does not include some basic terms like education level or income level (there was not a specific question in the Eurobarometer, however, questions like owning a paid apartment/ house and paying for apartment/ house were tested for significance, while building the model), or some more exclusive ones like person's own perception of his/her age, etc.. Furthermore, the model was checked for the justified interactions. For example, gender*age term was at first added to the model, but after the computation of the Wald test, testing the hypothesis if the added terms are equal to zero, the interaction was deleted from the model. Final model was specified, as following:

$$\text{logit}P(qb19 = 1) = \alpha + \beta_1 d10 + \beta_2 d11r1 + \beta_3 qa8 + \beta_4 p6cz + \beta_5 d8r2,$$

for the Czech Republic. According to the Archer-Lemeshow test, mentioned above, the model is adequate, with a p-value equal to 0.92 (the test in question requires a higher p-value).

$$\text{logit}P(qb19 = 1) = \alpha + \beta_1 d10 + \beta_2 d11r1 + \beta_3 qa8 + \beta_4 p6se + \beta_5 d8r2,$$

for Sweden. Where the variables were described in the datasets (see Tables 4.1 and 4.2). For this model the p-value, being 0.619, for the test also confirmed the model's adequacy.

The second model was constructed, as following for the Czech Republic:

$$\text{logit}P(qb16 = 1) = \alpha + \beta_1 d10 + \beta_2 d11r1 + \beta_3 qa8 + \beta_4 p6cz + \beta_5 d8r2 + \beta_6 d15a_r1.$$

And the same one, but with a little amendment was performed for Sweden:

$$\text{logit}P(\text{qb16} = 1) = \alpha + \beta_1 d10 + \beta_2 d11r1 + \beta_3 qa8 + \beta_4 p6se + \beta_5 d8r2 + \beta_6 d15a_r1$$

For both of them I performed the Archer-Lemeshow test, with p-values being equal to 0.53 and 0.768 accordingly.

4.4 Empirical results

4.4.1 First model's results

Below we can see a table with regression estimates for the Czech model. According to it we can conclude that “Fairly confident”, “Not looking for”, “More than 100 000” and “20 years and older” have significant effects on the model.

Table 4. 3 Logit qb19-CZ

	<i>Dependent variable:</i>
	qb19
d10Female	-0.196 (0.156)
d11r125 - 39 years	-0.287 (0.428)
d11r140 - 54 years	-0.314 (0.432)
d11r155 years and older	-0.246 (0.446)
qa8Fairly confident	0.708*** (0.253)
qa8Not very confident	0.440 (0.336)
qa8Not looking for (SPONT.)	0.621** (0.310)
p6cz5.001 to 100.000	-0.103 (0.172)
p6czMore than 100.000	-1.127*** (0.217)
d8r216-19 years	-0.618

	(0.381)
d8r220 years and older	-0.836**
	(0.420)
d8r2Still studying	-0.888
	(0.588)
Constant	0.022
	(0.574)
<hr/>	
Observations	827
<hr/>	
<i>Note:</i>	* ** *** p<0.01

According to what was mentioned above we need to calculate Odds ratios in order to discuss the model's results. Furthermore, we must obtain confidence interval for a proper interpretation (see Table 4.7).

Table 4. 4 Odds Ratio CZ

	Estimate OR	
(Intercept)	0.022	1.022
d10Female	-0.196	0.822
d11r125 - 39 years	-0.287	0.750
d11r140 - 54 years	-0.314	0.731
d11r155 years and older	-0.246	0.782
qa8Fairly confident	0.708	2.030
qa8Not very confident	0.440	1.552
qa8Not looking for (SPONT.)	0.621	1.860
p6cz5.001 to 100.000	-0.103	0.902
p6czMore than 100.000	-1.127	0.324
d8r216-19 years	-0.618	0.539
d8r220 years and older	-0.836	0.433
d8r2Still studying	-0.888	0.412

As it can be seen there is a decrease in odds for participant from a big city, to be more precise the decrease can range from 50.4% to 78.8% with 95 % confidence. Confidence in having job has a great impact on the model, with 2 levels being highly significant. Due to the fact that level „not at all confident” of the variable is an outlier, it was removed from the model. The odds for agreeing for a respondent fairly confident are 2.03 times greater than the odds for a respondent with same answers on other questions but with the different level of confidence. The same interpretation is valid for a person not looking for a job in 2 years, but the odds would be 1.86 times greater. The

confidence intervals for the odds ratios for the belief in being employed suggests that the change in odds for $y=1$ can vary from 1.236 to 3.333 times with 95 % confidence for fairly confident person and from 1.014 to 3.416 times for person not interested in a job search. For a person, who finished education, when she/he was 20 years and older, we can see a decrease in odds, equal to 56.7% with a very wide range from 1.3% till 81%.

Table 4. 5 Logit qb19 SE

	<i>Dependent variable:</i>
	qb19
d10Female	0.187 (0.203)
d8r216-19 years	-0.396 (0.331)
d8r220 years and older	-0.940*** (0.311)
d8r2Still studying	-0.314 (0.946)
d11r125 - 39 years	0.895 (0.936)
d11r140 - 54 years	0.971 (0.937)
d11r155 years and older	1.076 (0.964)
qa8Fairly confident	0.616** (0.271)
qa8Not very confident	0.360 (0.498)
qa8Not looking for (SPONT.)	-0.125 (0.269)
p6seSmall town/populated area	-0.212 (0.276)
p6seBig city	-0.748** (0.316)
Constant	-2.082** (1.031)
Observations	948
<i>Note:</i>	* ** *** $p < 0.01$

The similar model was constructed for Sweden. However, due to the character of the data there are some discrepancies from the Czech version, the regression results also differ a little bit. For example, constant is significant, whereas “not looking for” is not. Here we again calculate Odds ratio.

Table 4. 6 Odds Ratio SE

	Estimate OR	
(Intercept)	-2.082	0.125
d10Female	0.187	1.205
d8r216-19 years	-0.396	0.673
d8r220 years and older	-0.940	0.391
d8r2Still studying	-0.314	0.730
d11r125 - 39 years	0.895	2.448
d11r140 - 54 years	0.971	2.642
d11r155 years and older	1.076	2.932
qa8Fairly confident	0.616	1.851
qa8Not very confident	0.360	1.434
qa8Not looking for (SPONT.)	-0.125	0.882
p6seSmall town/populated area	-0.212	0.809
p6seBig city	-0.748	0.473

The estimated odds ratio for a person, who finished his/ her education in 20 years and older, shows 0.391 times decrease in odds of agreeing with people staying in the labor market even after being entitled for pension payments or 60.9% decrease in the odds of prolongation and this decrease can be as little as 28.2% and as great as 78.7% with 95% confidence interval. Furthermore, from the attached table we can also see a high significance of being fairly confident in having job in 2 years. The odds for agreeing for such a respondent are 1,851 times greater than the odds for a similar respondent but with the different level of confidence. The confidence intervals for the odds ratios for the belief in being employed suggests that the change in odds for $y=1$ can vary from 1.088 to 3.15 times with 95 % confidence. The confidence interval demonstrates a typical feature of odds ratio intervals, when the OR is higher than 1, the interval is skewed to the right (Hosmer, Lemeshow & Sturdivant, 2013). There is a decrease in odds for a resident of big city equal to 52.7%, which can range from 12 % to 74.5%. For a male in his 19-24 years, who had finished education till 15 years old, living in a small area, who is also very confident about his work future there is 87.5%

decrease in odds for supporting older people staying in the labor force. Though, the decrease ranges widely from 6.1% to 98.3% with 95% confidence, meaning that for one respondent there can be a decrease in odds equal to 10% for example, while for another it can be 90%.

Table 4. 7 CZ vs SE

variable	Czech Republic			Sweden		
	Odds ratio	CI-lower	CI-upper	Odds ratio	CI-lower	CI-upper
Intercept	Insign.			0.125	0.017	0.939
Qa8Not looking for	1.86	1.014	3.416	Insign.		
D8r220 years and older	0.433	0.19	0.987	0.391	0.213	0.718
Qa8 fairly confident	2.03	1.236	3.333	1.851	1.088	3.15
P6cz/se Big city	0.324	0.212	0.496	0.473	0.255	0.88

As it can be seen from empirical results and from Table 4.7, the regressions and datasets have some common features. First of all, while performing both regressions responses with lack of confidence in finding job in 2 years should have been eliminated, because in datasets for both countries the number of so pessimistic people was very low. Secondly, residents of big cities in either country have a decrease in the odds. Though, the range for Swedish respondents is quite wider, than for the Czech, the estimated odds ratios are not too far from each other, influencing the results in the same way. Another similarity can be found between figures for fairly confident people, the odds of $y=1$ are influenced likewise, the increase is observed for both countries. Even confidence intervals report figures, which are not far away from each other. Moreover, while constructing the model I analyzed the significance of many other variables, which did not show any level of observed impact on neither Sweden, nor the Czech Republic. Furthermore, the education age subcategory is significant in both countries, influencing the models in a same way.

Surely, there are some differences, but there are less of them, than of similarities. The “Not looking for job” variable is significant for the Czech Republic, but not for Sweden. Here it can be speculated that the significance was provoked by the fact, that the Czech Republic’s citizens may be more afraid of the burden put on social systems

by the elder people. The reason for an increase in odds for seniors postponing pension can be that, if a respondent does not plan to search for a job, he/ she is not nervous about elder people not retiring and occupying the labor market and maybe thinks, that it would be more effective for economic situation and for elder people to work longer. Moreover, In Sweden's case there were less respondents looking for a job in 2 years, approximately 58% out of the dataset would be seeking job, whereas in the Czech Republic this percentage is equal to 69.2%.

Overall, it can be said that the two countries resemble each other more than differ from each other according to the regression analysis performed. However, despite absence of large discrepancies between the attitudes towards the question whether elder people should be allowed to work even after reaching the retirement age or not, there is a huge difference in the outlook of elder people working in the countries in reality, as it was discussed in the second chapter. Though, in both countries majority of respondents supported the idea of continuing working and while more than 50% of Swedish respondents and more than 30% of Czech respondents were older than 55 years. In reality while a high percentage of elder Swedish respondents is in line with their attitude towards the possibility of working, in the Czech Republic we have a really different picture.

As I had stated before, by performing this analysis I wanted to see if there are serious differences between people's opinions in the Czech Republic and in Sweden. Because I wanted to test the hypotheses that choice architecture can influence the way people are engaged with the pension system and that people can be positively influenced to save greater for their retirement (in this case by postponing the pension). By looking at the regression results I would wait for a similar numbers of Czech and Swedish people being active in labor force in elder years. However, from what we had seen in the second chapter of this thesis, the employment rates for Swedish seniors are bigger, than for Czech (Figure 2.2). Due to this unexpected dissimilarity it can be speculated that the reasons for this is hidden in the Swedish choice architecture (guaranteed pension being paid only once reached the retirement age or because of policymakers were successful in creating a system, where a citizen is ready to face some immediate costs in order to enjoy other benefits).

4.4.2 Second model's results

Table 4.8 provides us with the regression results for the Czech Republic. According to it, variables, providing information about community's size and individual's confidence in having a job in 2 years, are significant on two levels.

Table 4. 8 Logit qb16 CZ

	<i>Dependent variable:</i> qb16
d10Female	0.016 (0.186)
d11r125 - 39 years	0.199 (0.524)
d11r140 - 54 years	-0.002 (0.529)
d11r155 years and older	0.079 (0.558)
qa8Fairly confident	0.606** (0.247)
qa8Not very confident	0.308 (0.361)
qa8Not looking for (SPONT.)	0.773** (0.351)
p6cz5.001 to 100.000	0.837*** (0.211)
p6czMore than 100.000	0.795*** (0.238)
d8r216-19 years	0.027 (0.503)
d8r220 years and older	-0.294 (0.544)
d8r2Still studying	-0.172 (0.801)
d15a_r1Employed (10-18 in d15a)	0.072 (0.312)

d15a_r1Not working (1-4 in d15a)	-0.167 (0.395)
Constant	0.468 (0.813)
<hr/>	
Observations	827
<hr/>	
<i>Note:</i>	* ** *** p<0.01

The table below shows us with the required Odds ratio.

Table 4. 9 Odds Ratio qb16 CZ

	Estimate OR	
(Intercept)	0.468	1.596
d10Female	0.016	1.016
d11r125 - 39 years	0.199	1.220
d11r140 - 54 years	-0.002	0.998
d11r155 years and older	0.079	1.082
qa8Fairly confident	0.606	1.833
qa8Not very confident	0.308	1.361
qa8Not looking for (SPONT.)	0.773	2.166
p6cz5.001 to 100.000	0.837	2.309
p6czMore than 100.000	0.795	2.214
d8r216-19 years	0.027	1.028
d8r220 years and older	-0.294	0.746
d8r2Still studying	-0.172	0.842
d15a_r1Employed (10-18 in d15a)	0.072	1.075
d15a_r1Not working (1-4 in d15a)	-0.167	0.846

From the results we can state that all four significant variables increase the odds in believing in increase of the retirement age by 2030. A resident of big city has odds 2.214, than a similar respondent, living in a smaller town or village. The odds can be 1.39 or even 3.53 times greater. Moreover, a fairly confident in being employed person's odds are approximately 83.3% higher, than for example not confident one. These can also be from 1.129 to 2.974 times higher with 95% confidence.

As well as the previous model this model was performed in order to compare it with the same one but for Sweden, however thanks o results obtained from Table 4.10 we can conclude that the models constructed for the dependent variables has much less

in common, than the models constructed for the variable regarding the postponed retirement.

Table 4. 10 Logit qb16 SE

	<i>Dependent variable:</i> qb16
d10Female	0.630*** (0.202)
d8r216-19 years	-0.113 (0.392)
d8r220 years and older	-0.365 (0.366)
d8r2Still studying	0.576 (0.893)
d11r125 - 39 years	0.106 (0.743)
d11r140 - 54 years	0.277 (0.750)
d11r155 years and older	-0.001 (0.735)
d15a_r1Employed (10-18 in d15a)	0.573 (0.376)
d15a_r1Not working (1-4 in d15a)	0.514 (0.486)
p6seSmall town/populated area	-0.516 (0.361)
p6seBig city	-0.742* (0.381)
qa8Fairly confident	0.347 (0.297)
qa8Not very confident	0.326 (0.570)
qa8Not looking for (SPONT.)	0.128 (0.391)
Constant	1.642* (0.897)
Observations	948
<i>Note:</i>	* p ** p *** p<0.01

From the results we can see that the only significant variables are constant, female and “Big city”. In contrast to the Czech model, job confidence does not have a significant impact on the model in Swedish case.

From the table below we can say that even the only variable, which is significant for both countries, influence the result in opposite ways. In Sweden a respondent living in a big city has a decrease in odds equal to 52.4%, which can vary widely from 0.4% to 77.44% decline.

Table 4. 11 Odds Ratio qb16 SE

	Estimate OR	
(Intercept)	1.642	5.166
d10Female	0.630	1.878
d8r216-19 years	-0.113	0.893
d8r220 years and older	-0.365	0.694
d8r2Still studying	0.576	1.778
d11r125 - 39 years	0.106	1.112
d11r140 - 54 years	0.277	1.320
d11r155 years and older	-0.001	0.999
d15a_r1Employed (10-18 in d15a)	0.573	1.774
d15a_r1Not working (1-4 in d15a)	0.514	1.672
p6seSmall town/populated area	-0.516	0.597
p6seBig city	-0.742	0.476
qa8Fairly confident	0.347	1.415
qa8Not very confident	0.326	1.385
qa8Not looking for (SPONT.)	0.128	1.136

The interesting thing about this question is that despite the increasing odds in case of the Czech Republic, if we go back to Figure 4.2, we will see that the majority of respondents did not believe in the possible increase of retirement age. While Swedish citizens were not so optimistic about the situation. However, because of many research’s limitations we can assume, that there can be other variables, which were not included in the model, which can influence the results in this way. But based on the Table 4.8 and on the recent Czech pension system’s condition and worldwide trend it can still be said, that people’s expectations tend to underestimate the situation and therefore may benefit from some help.

Moreover, the Eurobarometer fieldwork had been conducted since September till November 2011. It means that the introduction of the rising retirement age, signed on

30th September 2011 (since 1.1.2018 the maximal age to retire is 65 years), could have escaped attention of at least part of the respondents. And if we assume that, then respondents' disbelief in the possible increase was a huge mistake and had little in common with the reality. Then it is the case, when peoples' expectations are very far from the real outcomes (55.1% totally disagreed with a possibility of an increase in age till 2030). The situation in Sweden, where government had put a lot of effort in increase of financial literacy and whole awareness among citizens, is a bit better. 39.1% believes that there is a possibility of the rise till 2030. Surely, number is still small, but still twice bigger than the Czech one. This example may present peoples' ignorance or unawareness of the problems, faced by the modern society. Longevity has been increasing, medicine has been developing, so it can lead to further increases, as with these benefits, the number of years person spends in pension rises. Consequently, increases burden on country's social system. And retirement age rise presumes to be one of the most effective solutions. So belief of no-increase for next 10-20 years is really hopeful. Therefore, it was really optimistic from the policymakers to believe that something not well-advertised with so many limitations like second pillar could have gain popularity among people, who are not ready to believe in the increase in the retirement age, which was already there. Moreover, in the country with the retirement age, which was lower than in majority OECD countries.

From what we discussed in the second chapter, it can be concluded, that there is a huge difference among percentage of working people aged 60-64 in Sweden and in the Czech Republic, despite the recent increase in working seniors in the Czech Republic. As I had mentioned this difference exists partly because of the higher retirement age in Sweden. By having a higher retirement age Sweden takes some pressure from the budget. Ordinary people sometimes need to be said what to do, whether by increasing the retirement age to make people stay in the labor force or by introducing a quasi-mandatory scheme, rather than voluntary, in order to prevent some undesired consequences for the people themselves and for a country's economy.

5. Conclusion

Pension reform in the Czech Republic constantly undergoes different gradual changes. Unfortunately, the best way of how to create a pension system, which would satisfy all requirements of the nation has not been found yet. Among these requirements is adequacy and sustainability. A good retirement plan should ensure adequate incomes in elder years, financial sustainability and support the delayed retirement (European Commission, 2016). However, according to what we had seen in the Chapter 2 of this thesis, the Czech plan is still putting too much pressure on the budget, and this pressure would only increase with time (European semester, 2018). Moreover, the latest reforms can positively influence the pension adequacy, but worsen the financial-sustainability in a long-term outlook (European Commission, 2018).

In contrast to the Czech retirement system, Swedish plan is a good example of the adequate, sustainable and integral scheme (Melbourne Mercer Global Pension Index, 2018). Furthermore, as it is stated by European Commission (2018) there are prerequisites for future improvement of the adequacy. But all of these would not be possible, if not for the massive reforms. The previous scheme suffered from a number of issues, for more details please refer back to Chapter 2. However, the reforms succeed partly thanks to the behavioral economics' principles, being taken into account by the policymakers, as it is stated by to Cronqvist, Thaler & Yu (2018).

In this study I analyzed how the opinions on some basic questions regarding pensions differ in Sweden and in the Czech Republic. Because I wanted to see if these differences are the reasons for such discrepancies in the performance and, therefore, the choice architecture does not have any impact on the situation. Or if they are similar, I wanted to see if the reasons behind the official statistics, having so many dissimilarities, are the results of a thorough implementation of behavioral economics' knowledge. From my findings it can be seen that Czech and Swedish citizens have quite similar points of view on the question, if people should be allowed to postpone the retirement. But Figure 2.2 shows, that the percentages of working people in elder years differ between two countries in a great way for some age categories. Because of that we can speculate that Swedish residents have more incentives, given by the policy, to postpone the leisure time. Moreover, it can be assumed, that the higher pension age in Sweden plays the same role in here, as the quasi-mandatory nature of the Swedish funded pillar.

People are made to participate in the funded schemes and to retire later (in other case, they would receive only earnings-related pension benefits till they reach 65 years).

Furthermore, we did see that people in both countries did not expect any increases in the retirement age, but these expectations were too optimistic. Especially for the Czech Republic, which used to have the retirement age lower than in most of OECD countries. And it again proved that people can fail to make correct predictions regarding such an important issue, like pension. And this is one of the causes of the failure of the second pillar of the Czech retirement plan. Because it was too optimistic from the Czech government to believe, that people, who are not ready to believe in a possible increase, taking place during almost 20 years, when all official reports have stated that due to increasing longevity, the increases are required in order to decrease the fiscal pressures, would embrace something so time-limited, controversial and voluntary. Furthermore, people face difficulties in understanding the need of saving for retirement (Hershfield et al., 2001), and the low rates offered in the second pillar were not a great incentive to participate in it and an absence of possible opt-out also worsened the situation.

Unfortunately, as it was stated in the third chapter, the analysis was complicated by some data and programming limitations. But taking into account all above, we can still say that despite peoples' preferences or knowledge, they can be influenced in a way required by the society at least to some extent. It was proved by Swedish reforms that a pension system can benefit from a proper integration of some behavioral economics' principles, which can help the plan in reaching the goals stated by European Commission (2018).

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Appendix A: Additional Tables

Table A. 1- Original dataset SE

Sweden n=1035						
Gender (d10)		Age (d11r1)				
female	male	15-24 years old	25-39 years	40-54 years	55+ years	
531	504	60	141	230	604	
Age when finished full education (d8r2)						
up to 15 yrs		16-19 yrs	20 yrs and older	still studying	no full-time education	N/A
98		265	607	55	0	10
Size of community (p6se)				Would you say that people should be allowed to continue work. Once they have reached off. Ret. Age or should they have to stop?(qb19)		
up to 5000		5001 to 100 000	more than 100 000	To continue (Yes)	To stop (No)	N/A
123		549	363	882	134	19
Would you say that you are very/fairly/not very/not at all confident in having a job in 2 years? (qa8)						
Very confident		Fairly confident	Not very confident	Not at all confident	Not looking for	N/A
341		187	42	20	432	13
To what extent do you dis/agree that the official ret. Age will need to increase in your country by 2030?(qb16)						
Totally agree		Tend to agree		Tend to disagree	Totally disagree	N/A
141		245		226	399	24
Occupation of respondent (d15a_r1)						
Self-employed			Employed		Not working	
54			483		498	

Table A. 2 – Original dataset CZ

Czech Republic n=1003						
Gender (d10)		Age (d11r1)				
female	male	15-24 years old	25-39 years	40-54 years	55+ years	
564	439	118	292	238	355	
Age when finished full education (d8r2)						
up to 15 yrs		16-19 yrs	20 yrs and older	still studying	no full-time education	N/A
41		686	170	86	1	19
Size of community (p6cz)				Would you say that people should be allowed to continue work. Once they have reached off. Ret. Age or should they have to stop?(qb19)		
up to 5000		5001 to 100 000	more than 100 000	To continue (Yes)	To stop (No)	N/A
377		378	248	644	327	32
Would you say that you are very/fairly/not very/not at all confident in having a job in 2 years? (qa8)						
Very confident		Fairly confident	Not very confident	Not at all confident	Not looking for	N/A
133		405	93	22	299	51
To what extent do you dis/agree that the official ret. Age will need to increase in your country by 2030?(qb16)						
Totally agree		Tend to agree		Tend to disagree	Totally disagree	N/A
38		146		250	545	24
Occupation of respondent (d15a_r1)						
Self-employed		Employed			Not working	
86		479			438	