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A Comparative Study of Retirement Age in the Czech Republic

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IDEA and SHARE at CERGE-EI

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EXECUTIVE SUMMARY

- The aim of this analysis is to identify the risks and possible obstacles associated with faster increases in the statutory and effective retirement ages in the Czech Republic. The study provides the first detailed quantitative insight on the phenomena of retirement and old-age-related departures from the labour market in the Czech Republic, and employs unique, internationally comparable data from the SHARE survey.
- Our analysis reveals that the older generations in the Czech Republic still exhibit a number of differences when compared with equivalent generations in more developed countries of Northern and Western Europe. Socio-economic conditions, educational attainment, occupational structure, and health status are still lower in the Czech population as a result of the country's historical development during the 20th century. On the other hand, there have been rapid and noticeable improvements in these areas in recent years, and these characteristics are fast approaching the standards seen in the more economically developed countries of the EU.
- Our findings provide little support for the notion that the early effective retirement age in the Czech Republic can be attributed to inferior personal and socio-economic conditions among the country's older population. Instead, our analysis indicates that early retirement and departure from the labour market are driven by the institutional setup and incentives induced by the country's tax, welfare, and pension systems, and most likely also by employment policies that affect both workers and employers' expectations.
- The prevailing lower incidence of employment among older men and women in the Czech Republic, compared to more developed EU countries, can be only very partially attributed to differences in personal characteristics. We document that individuals' health deteriorates much more slowly than the age profile at which people retire and leave labour market. We find that the local incidence of unemployment relates to retirement patterns for women, but not for men. Finally, retirement and employment age profiles are significantly affected by statutory early retirement conditions.
- Our analysis does not identify any major risks from raising the retirement age further above its current levels. Our simulations show that were the Czech population, with its demographic, health, and socio-economic characteristics, to be subjected to the Swedish institutional system, the whole employment gap for men and around 80% of the gap for women would disappear. While the efficiency and social gains from eliminating this underuse of human capacity are not directly observable, they are both substantial and essential for the sustainability of the welfare state in the Czech Republic.

SHRNUTÍ

- Cílem této analýzy je identifikace rizik a možných překážek vztahujících se k rychlejšímu prodlužování zákonného a reálného věku odchodů do důchodu v České republice. Studie přináší první podrobný kvantitativní vhled do problematiky odchodu do důchodu a věkově determinované neúčasti na trhu práce v České republice díky unikátním mezinárodně srovnatelným datům z průzkumu SHARE.
- Naše analýza ukazuje, že starší generace v České republice se v mnoha ohledech stále odlišují od srovnatelných generací vyspělejších zemí severní a západní Evropy. Socio-ekonomické podmínky, dosažené vzdělání, struktura povolání a zdravotní stav české populace jsou stále nižší v důsledku historického vývoje 20. století. Na druhé straně se v poslední době tyto ukazatele rychle a výrazně zlepšují a konvergují ke standardům v ekonomicky vyspělejších zemích Evropské unie.
- Naše zjištění jen velmi málo podporují názor, že relativně rané odchody do důchodu v České republice jsou primárně způsobeny horšími osobními a socio-ekonomickými podmínkami starších generací. Analýza naopak ukazuje, že předčasné odchody do důchodu a z trhu práce jsou hlavně důsledkem institucionálního nastavení a motivací vyvolaných daňovým, sociálním a důchodovým systémem, a s největší pravděpodobností také politikou zaměstnanosti, jež ovlivňuje očekávání zaměstnanců i zaměstnavatelů.
- Převládající nižší zaměstnanost starších mužů a žen v České republice, v porovnání s rozvinutými zeměmi Evropské unie, lze jen v omezené míře přičíst na vrub rozdílů v individuálních osobních charakteristikách. Naše studie dokládá, že zdraví jednotlivců se s věkem zhoršuje mnohem pomaleji, než jak starší lidé odcházejí do důchodu a opouštějí trh práce. Zjistili jsme, že místní míra nezaměstnanosti souvisí s odchody do důchodu žen, ale nikoliv v případě mužů. Konečně studie ukazuje, že věkové profily odchodů do důchodu a mimo trh práce jsou významně ovlivněny zákonnými podmínkami nároků na předčasný odchod do starobního důchodu.
- Naše analýza neidentifikuje žádná zásadnější rizika vyplývající z dalšího zvyšování věku odchodu do důchodu nad jeho současnou úroveň. Naše simulace ukazují, že kdyby byla česká populace se svými demografickými, zdravotními, a socio-ekonomickými charakteristikami vystavena švédskému institucionálnímu systému, rozdíl v míře zaměstnanosti mužů zcela zmizel a v případě žen by se zredukoval zhruba o 80 %. Ačkoli dodatečná efektivita a zvýšení společenského blahobytu plynoucích z eliminace nedostatečného využívání lidského kapitálu starších lidí nejsou explicitně vidět, je zřejmé, že jsou značné a podstatné pro udržitelnost sociálního státu v České republice.

INTRODUCTION

In the Czech Republic, the current demographic situation and its projection represent major challenges to the sustainability of the public pension and health system. The Czech population is aging and will be living longer than previous generations – more than twenty years ago, in 1992, the life expectancy of Czech men aged 50 was on average 72.6 years; for women aged 50 it was 78.6 years. In 2012, however, men aged 50 could expect to live another 27.3 years, while women of the same age had 32.4 years of life ahead of them. According to the Czech Statistical Office's (CSO) median prognosis, the number of people in the country over 65 years of age will double by the year 2050, and the number of people over 85 years of age will be three times higher than it is currently.

On the one hand, the Czech population is aging as a result of increasing longevity related to improvements in health and health care, physically less demanding work, and rising quality of social care and life in general. On the other hand, there has been a long-term decline in fertility – after 1992, when the overall birth rate was 1.72 children per woman, this indicator steadily declined to 1.45 in 2012 (CSO, 2014). According to the CSO, the proportion of the population of active age (15-64 years) will fall from 68 percent today to below 54 percent in 2050.

These demographic changes represent one of the main challenges for the sustainability of public finances and the pension system. They are reflected in the EU Council's findings that the Czech Republic is facing long-term sustainability risks, largely due to projected increases in pension and healthcare expenditures. In its recommendations, the EU Council requested that the Czech Republic speed up the pace of increasing the statutory retirement age¹, promote the employability of older workers, remove public subsidies for early-retirement decisions, significantly improve the cost-effectiveness of healthcare expenditure, and implement standardized procedures for regular increases in the statutory retirement age. Needless to say, Sobotka's government has expressed disagreement with proposals for such a rapid increase in the statutory age.²

One of the few major policies available with the aim of prolonging older workers' productive and socially bearable participation in the labour market is the

¹ *Ensure the long-term sustainability of the public pension scheme, in particular by accelerating the increase of the statutory retirement age and then by linking it more clearly to changes in life expectancy. Promote the employability of older workers and review the pension indexation mechanism. Take measures to improve significantly the cost-effectiveness and governance of the healthcare sector, in particular for hospital care.* Internet: http://ec.europa.eu/europe2020/pdf/csr2014/csr2014_council_czech_en.pdf

² Government press release, June 2014: *The Government has a negative attitude to the draft of recommendations on accelerating the retirement age. The Government considers even the current pace relatively high, and this brings with it many social problems. Such a fundamental systemic change in the pension system is unacceptable for the Government.*

postponement of the effective retirement age, accompanied by measures addressing working conditions (so-called age management), health care and other social policies.

This study provides detailed quantitative evidence on the transition of older generations of the Czech population into non-activity and retirement, providing insights into both recent trends and international comparisons. The findings presented here complement those of a parallel study (Šatava, 2015), which explores the public and private financial consequences of retirement decisions.

This study's major contribution is the provision of detailed quantitative descriptions of important features related to retirement and employment decisions among the older population, which are not available from standard aggregate statistics. Using a unique dataset from the Survey of Health, Ageing and Retirement in Europe (SHARE), we present indicators which have not previously been made available. Since we investigate many possible dimensions and since a great deal of the patterns revealed are self-explanatory, we discuss here only the key patterns. It should be noted that this study does not aspire to identify causal relationships.

Data and Methodology

The data source for this study is the Survey of Health, Ageing, and Retirement in Europe (SHARE), a multidisciplinary and cross-national longitudinal database of micro data on the health, socio-economic status and social and family networks of more than 85,000 individuals aged 50+ (approximately 150,000 interviews) from 20 European countries (+Israel) and their partners. The survey is focused on issues such as demographics, family and social networks; education; health and health care; work and retirement; income, consumption, wealth; help and financial transfers in the family; housing; activities; expectations; life history; quality of life; social networks; physical and biomarker measurements, the last year of life of any deceased respondents, and many other topics. Importantly, the survey also contains measures of physical and mental health and cognitive functions. The longitudinal study follows the same respondents every two years. The result is a unique dataset providing information about the state, history and development of Czech and European society. The Czech Republic has participated in all waves of data collection since 2006, on a panel sample of 6,000 respondents.

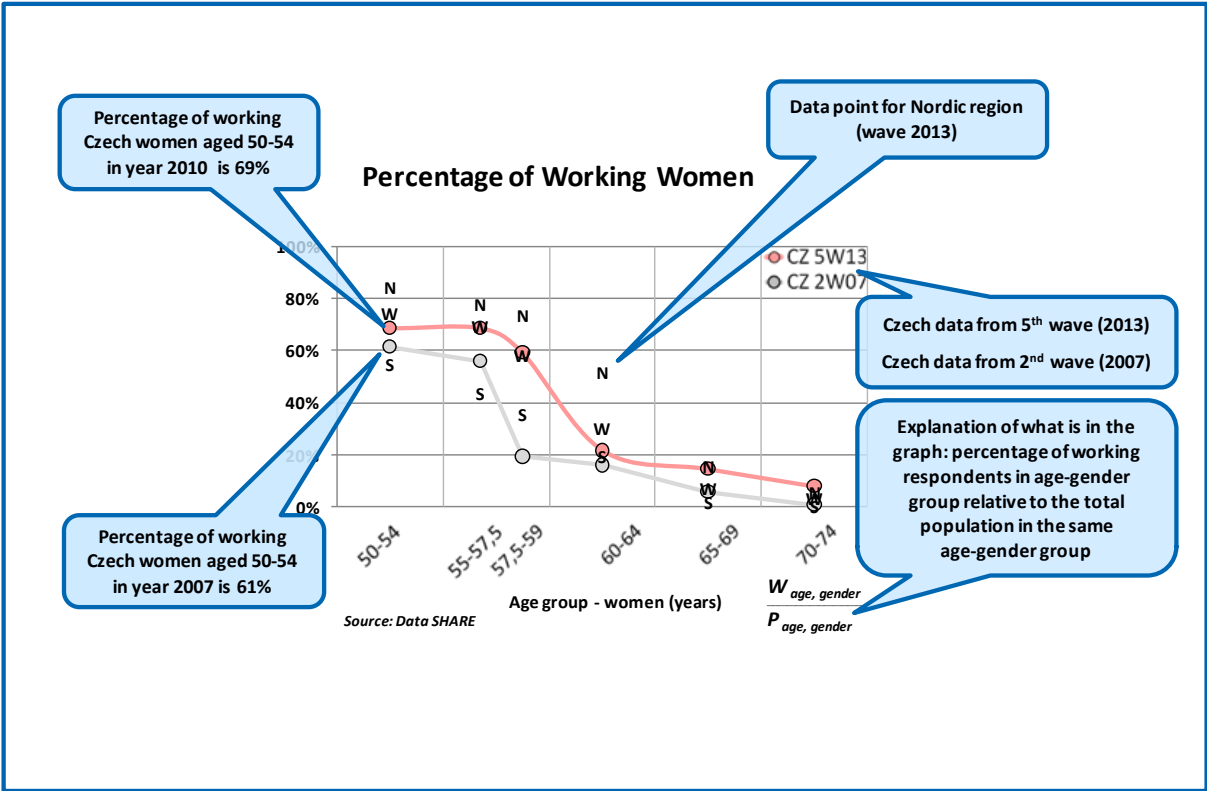
A Graph Example

Most of the results of this study are presented in the form of graphs comparing the Czech Republic with four groups of European regions labelled as follows: **Nordic countries** (N: Sweden, Denmark and the Netherlands), **Western countries** (W: Belgium, France, Germany, and Austria), **Southern countries** (S: Italy and Spain),

and **Eastern countries** (E: Hungary, Poland and Slovenia). This division of countries is common in other studies based on SHARE data and reflects the similarities of their institutions and policies with respect to pension and health policies. In the core text of this paper we focus on major issues; the Appendix presents more detailed results and statistics for all countries. For the Czech Republic, the graphs also compare the indicators based on data from the first wave of SHARE data collection in 2007 and from the last available data collected in 2013.

All the graphs show the indicators separately for men and women, with age on the horizontal axis. This division is necessary due to substantial differences between genders. For statistical accuracy, only respondents aged 50-74 were considered. The indicator values were averaged for five-year age categories; however, in order to better capture their retirement decisions, we divided the age category in which the actual retirement age most commonly falls (for men between 60-64 years of age, and for women 55-59) into two parts. Finally, at the bottom of each graph we present a formula clarifying the calculation of the relevant statistics.

GRAPH 0.1



CHAPTER 1: DEMOGRAPHIC PATTERNS

This chapter provides a comparison of the most important demographic patterns in the Czech Republic with other countries. First, we present an overview of the statutory retirement age in the Czech Republic and in the rest of Europe. Next, we compare the statutory retirement age to actual retirement decisions taken by respondents in the SHARE data.

Statutory Retirement Age

Table 1.1 (below) presents the statutory retirement ages in all the countries included in this analysis in 2009 and 2020, and as projected after the year 2020. The statutory retirement age varies across countries in the range 60 to 70 years of age: in most countries, the projected retirement age increases to 67 years or higher, depending on the evolution of life expectancy. A trend towards balancing the retirement age for both genders is apparent in all countries.

It should be noted that the Czech Republic has one of the lowest retirement ages in both 2009 and 2020 (France and Sweden have flexible retirement ages, with higher actual retirement). The projected retirement age after 2020 converges for most countries, including the Czech Republic, at around the age of 67 years.

TABLE 1.1

Retirement Age in Europe

Area	Country	Retirement age in 2009			Retirement age in 2020			Further increases in retirement age after 2020			
		Men	Women	note	Men	Women	note	Men	Women	note	Year
N	Denmark	65	65		66	66		67+	67+	(a)	
N	Netherlands	65	65		66+8m	66+8m		67+	67+	(b)	
N	Sweden	61-67	61-67	(c)	61-67	61-67	(c)				
W	Austria	65	60		65	60		65	65		2033
W	Belgium	65	65		65	65					
W	Germany	65	65		65+9m	65+9m		67	67		2029
W	France	60-65	60-65	(d)	62-67	62-67	(d)				
S	Italy	65+4m	60+4m		66+11m	66+11m		67+	67+	(e)	
S	Spain	65	65		65-66+4m	65-66+4m	(d)	65-67	65-67	(d)	2027
E	Hungary	62	62		64	64		65	65		2022
E	Poland	65	60		67	62		67	67		2040
E	Slovenia	63	61		65	65					
CZ	Czech Republic	62	56+8m-60+8m	(f)	63+10m	60+6m-63+10m	(f)	67+	67+	(g)	2044

Source: Eurostat, *Adequacy and Sustainability of Pensions*

(a) Adjusted to life expectancy gains every 5 years, starting 2030

(b) Adjusted to life expectancy gains every year, starting 2022

(c) Flexible retirement age linked to benefit level

(d) If qualifying period completed - and if not completed

(e) Linked to life expectancy

(f) Depending on the number of children raised

(g) Increased by 2 months annually until further amendments

Life Expectancy

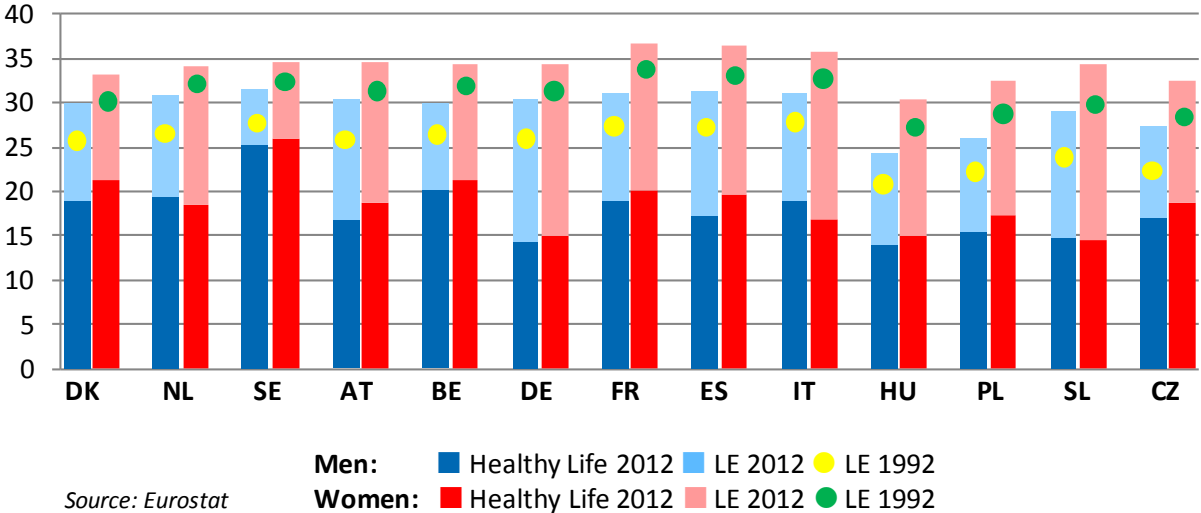
Given their rapidly changing demographics, several countries have linked their statutory retirement age to life expectancy (Denmark, Netherlands, Italy, and France). In the Czech Republic, the Committee on Pension Reform established by the Czech government has recommended a similar policy.

Graph 1.1 shows that the life expectancy of individuals at age 50 has increased by about four years for men and about three years for women over the past 20 years. In an international comparison, France, Sweden and the Southern countries exhibit the highest expected longevity. Currently, at age 50 Czech men have on average 27.3 years of life ahead of them, and Czech women have 32.4 years.

An important complementary measure of quality of life is the number of years the individual is expected to live in good health at age 50. In this respect, the healthiest life duration is observed in Sweden: 25.2 years for men and 26 for women. In the Czech Republic, the corresponding durations are around 17.2 years for men (i.e. 57% of their expected longevity) and 18.6 years for women (63%), which is not only notably more than in other Eastern European countries, but also more than in Germany. These data show that on average, the senior population in Europe maintains good health until at least the age of 65, and in many countries until 70 years of age. Women not only live longer than men but also enjoy longer healthy lives.

GRAPH 1.1

Life Expectancy and Life in Good Health at Age 50



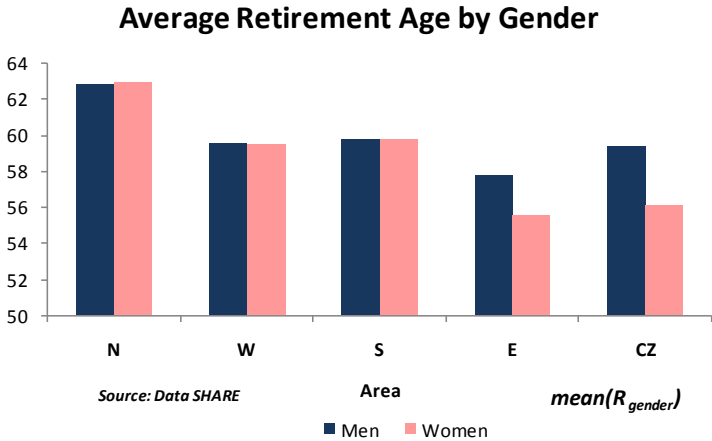
Retirement Decisions in SHARE Data

In the rest of this Chapter, we analyse respondents' retirement decisions in the SHARE, a longitudinal study of a representative sample of respondents aged 50+ and their partners. The results are based on three waves of data collection in 2007, 2011 and 2013. A detailed description of our sample in each wave is provided in the Appendix and in the SHARE methodological and analytical publications, Borsch-Supan et al. (2011) and Borsch-Supan et al. (2013).

Because the SHARE data only include limited data on early retirement and disability pensions (the sample size for these is too small) we only analyse old-age retirement decisions. Column graph 1.2 depicts the average effective retirement age for all already-retired respondents aged 50-74 years. Four main patterns can be observed with respect to geographic regions: first, in Western, Northern, and Southern Europe men and women retire at the same age; second, in Northern Europe the effective retirement age is much higher than in other regions; third, women retire very early in Eastern Europe and in the Czech Republic; fourth, Czech men retire at the same age as men in Southern and Western Europe.

In particular, the average retirement age in Nordic countries is more than three years higher than in Southern and Western countries and the Czech Republic (for men only). In Eastern European countries and the Czech Republic, there is a marked difference in the effective retirement of women, primarily due to legislation allowing for early retirement based on the number of children raised. In the Czech Republic, the average effective retirement age is 59.4 years among men and 56.1 years among women.

GRAPH 1.2



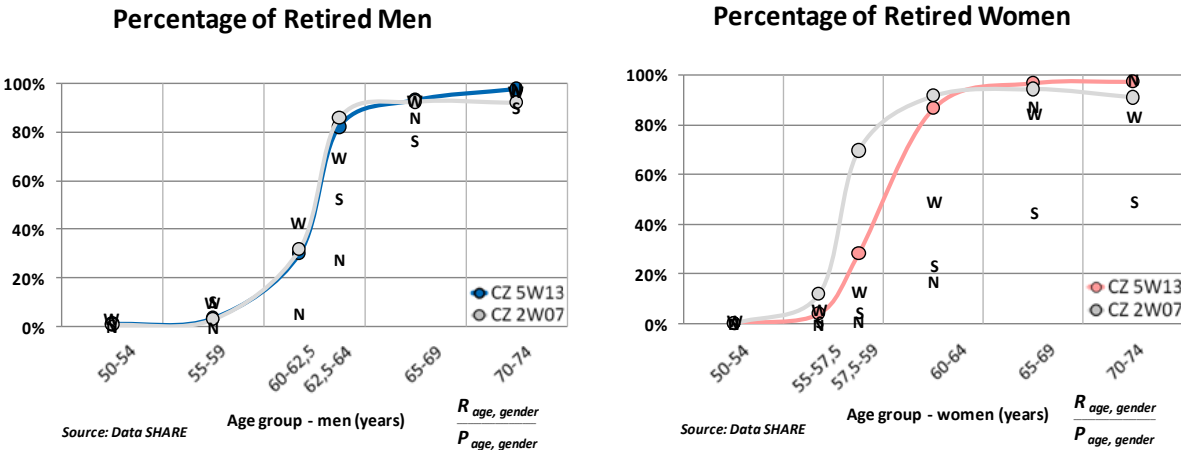
An important question to consider is whether these differences in retirement decisions are due to underlying demographic or health differences, or whether they are driven by institutional provisions for retirement and policies in particular countries that generate different incentives. If individuals differ between the

populations, and some for example suffer from worse health conditions or have lower productivity skills in the labour market, then a policy of increasing the statutory retirement age might result in welfare losses (although many people provide care for family members). On the other hand, as Angelini et al. (2009) and Borsch-Supan et al. (2009) show, if individuals are similar across different countries, then early retirement in some countries represents an economic inefficiency in terms of unused labour capacity, and represents a burden for the sustainability of the pension system.

Effective Retirement by Age Cohorts

Graph 1.3 (below) shows the proportion of retired individuals as a percentage of the total population in each respective age group. The Czech data illustrate the changes in the statutory retirement age between 2007 and 2013 (the shift from the grey to the blue and red lines). Most of the changes in effective retirement age during these six years occurred at early retirement ages of women before the age of 60: the extremely steep downward slope with respect to the retirement age between age 57 and 58 became more gradual. While the male retirement pattern has been stable and very close to patterns observed in Western European countries, the effective retirement ages are still far below those seen in the Nordic countries. In Southern Europe, the low percentage of retired women reflects their low participation in the labour market and subsequent ineligibility for retirement pensions (they are only eligible for a survivor’s pension). Overall, the changes observed in the Czech Republic during the last six years provide convincing evidence that the postponement of the statutory retirement age for women has translated into effective retirement age shifts, though this has not been the case where men are concerned.

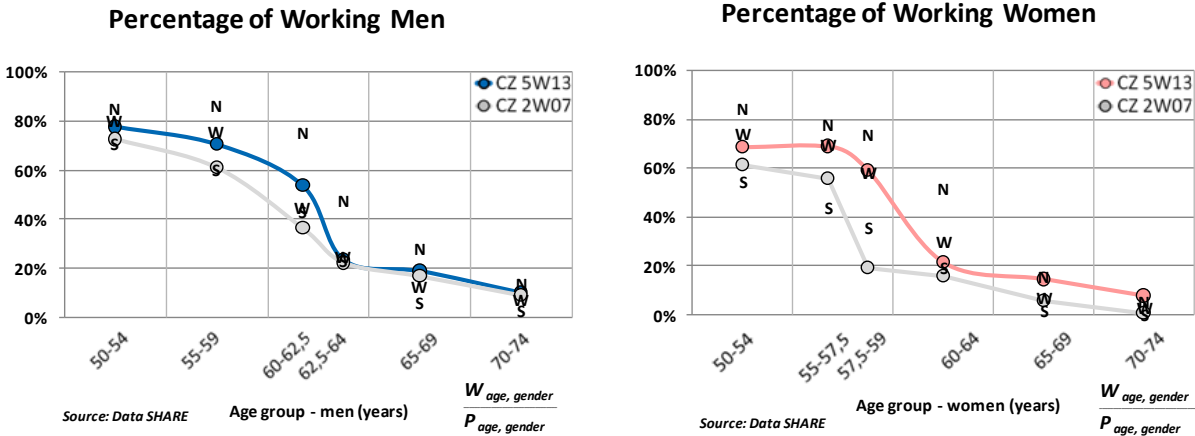
GRAPH 1.3



Labour Market Participation by Age Cohort

The working population in the SHARE sample consists of all respondents who stated that they had performed any paid work during the last 12 months (even if this was for only a few hours a week). These may be retirees who work in addition to collecting their old-age pension. The proportion of working individuals decreases rapidly in all countries after the population reaches the statutory retirement age, and can be seen to steadily decrease with increasing age. Nordic countries have a high proportion of working persons, even at a higher age; this is primarily due to a combination of partial pensions and reduced workloads. The time shift in the Czech data provides an illustration of the effects of the increased statutory retirement age for women in the 55-59 age category. For many retired individuals, however, reaching the statutory retirement age does not mean leaving the labour force. Around 20% of Czech men and women work at least several hours a week during the initial years of their retirement, and this is the largest proportion of working pensioners after the Northern European countries. Among those aged over 70, the percentage of working retirees declines to around 10%. Compared to the situation in 2007, there is now (in 2013) higher labour market participation in the Czech Republic; this difference is once again more pronounced for women, where the differential is around 10% even for the cohorts aged 65-74.

GRAPH 1.4

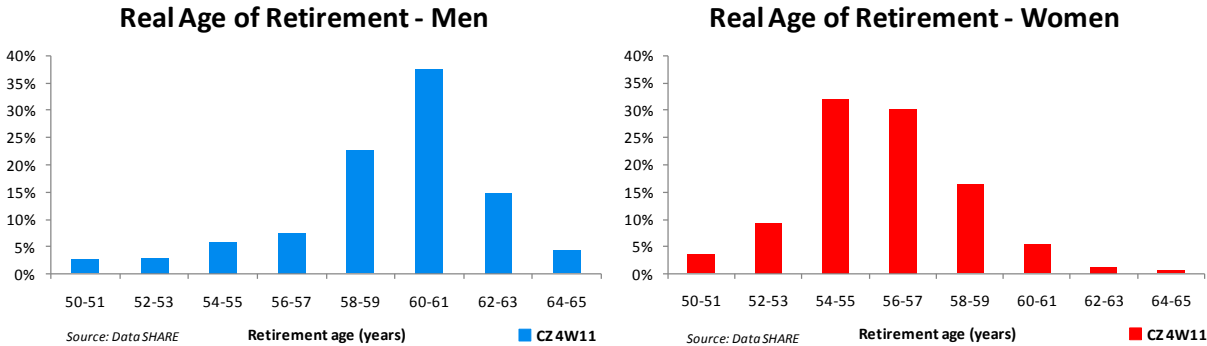


Reasons for Retirement

Finally, we present the age distribution of actual retirement decisions and the reasons for retirement among Czech men and women in the SHARE sample. These data are taken from all Czech respondents in the SHARE sample who entered retirement between 2000 and 2011. The left panel in graph 1.5 below shows that the largest proportion of men (38%) had retired at around the age of 60-61 years. For women, the decision about when to retire was most commonly related to the number of children they had: the largest share of women retired at ages 54-55 (32%) and 56-57

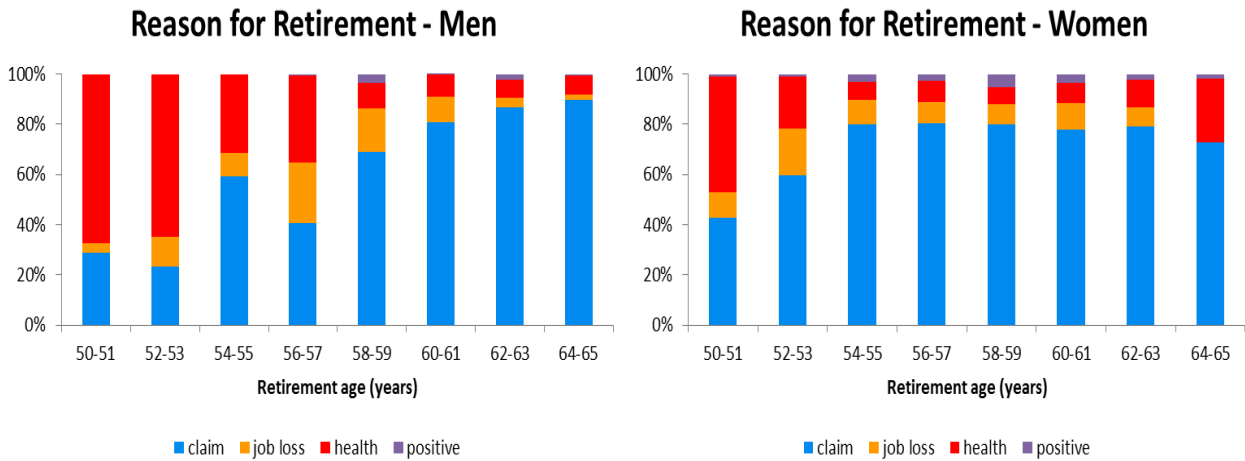
(30%). Note that very few men and even fewer women retired later than the statutory retirement age (see also Kalwij, 2010).

GRAPH 1.5



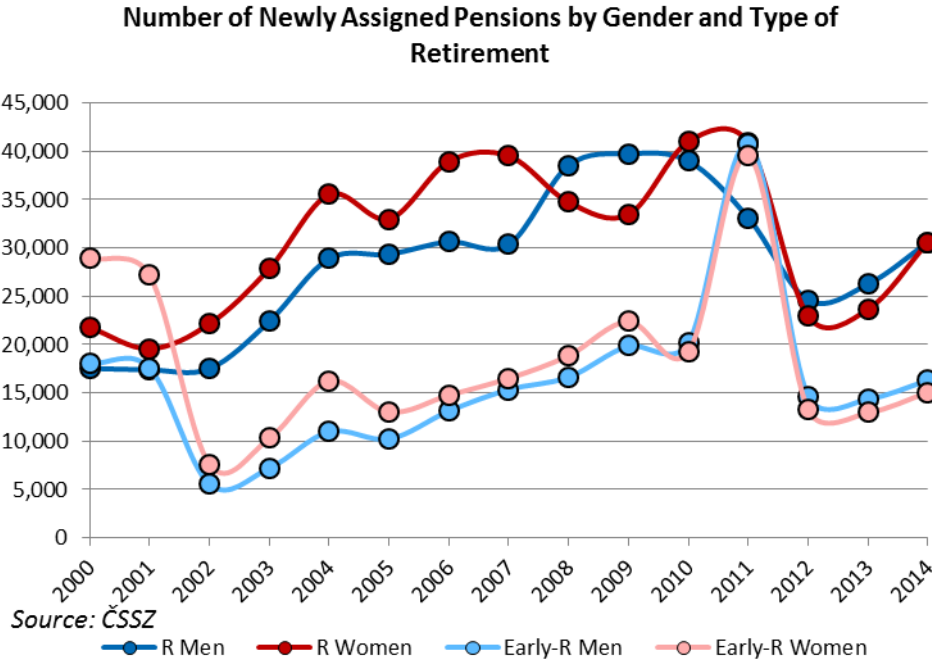
Graph 1.6 describes reasons for retirement, expressed as fractions of all respondents who retired at a given age. In the data, we identify the four most prevalent reasons given: *claim* (the individual became entitled to an old-age pension, i.e. reached the statutory retirement age), *job loss* (the individual lost a job and chose to enter retirement rather than be unemployed), *health reasons*, and *positive* (the individual wanted to retire together with a spouse or a partner, wanted to spend more time with their family, etc.). It is apparent that the prevailing reason for early retirement is health, especially among men (more than two-thirds of those who retired below age 54 cited this reason). Job loss seems to be correlated with retirement just before the statutory retirement age for both men and women. However, the main reason for retirement for both genders comes from reaching the statutory retirement age (see also van Erp, 2014). In other words, around 80-85% of all older people retire primarily because they have become entitled to an old-age pension. This finding is not specific to the Czech Republic: it is also observed in other countries with clearly determined statutory retirement ages.

GRAPH 1.6



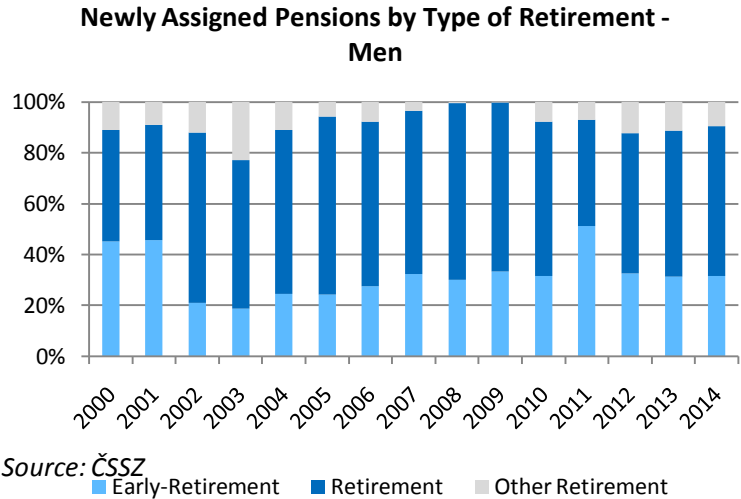
Since the SHARE survey does not provide a detailed insight into the phenomena of early retirement, we refer to the registry statistics. Graph 1.7 shows trends over the last 15 years in the number of regular retirements (at statutory ages) and early retirements (allowed for by the law). We observe growing trends in both, reflecting the increasing size of the cohorts reaching retirement age. It should be noted that the number of early retirees has been growing at a faster rate.

GRAPH 1.7



This can be better seen in Graph 1.8, which displays the relative proportions. In the most recent period, 2014, early retirements constituted about one third of all old-age related retirements, for both men and women.

GRAPH 1.8



It is important to recall that the year 2011 saw parametric changes in the pension system (known as the small pension reform), which temporally affected the influx of early retirees. The prospect of parametric changes being introduced motivated a notable number of individuals to opt for early retirement during 2011. This explains the temporary increase in the registry figures for 2011. The retirement rate, both regular and early, naturally declined in the following years 2012-2014, but the proportion of early retirement remains at about one third. This unique and temporary event in 2011 also affects the SHARE statistics presented in most of our other graphs. In principle, it contributes to a somewhat higher proportion of retired and non-working individuals at ages close to the statutory retirement age. Given the nature of the SHARE data, we cannot separate this one-off phenomenon from the age profiles.

CHAPTER 2: EFFECTS OF EDUCATION AND OCCUPATION ON RETIREMENT

In this chapter, we analyse the associations between education, occupation and retirement decisions in the Czech Republic and compare these with patterns from other countries. All indicators are based on individual level data from the SHARE survey, collected between 2007 and 2013.

Education

One of the most relevant socio-economic determinants of health and retirement behaviour is educational attainment. It is arguably the best approximation of lifetime income and the only measure of socio-economic status that does not change over the life cycle. It has been shown (at least in the USA) that this is the measure of socio-economic status that really matters for mortality and other health outcomes. It is arguably a good proxy of socioeconomic status, being the most widely available and with the lowest measurement error. With respect to the diverse history of educational systems across European countries, the respondents' highest attained level of education was classified according to the international classification ISCED 97. Table 2.1 shows the levels of education recorded in three basic categories: lower (up to ISCED 2 level), middle (ISCED 3 and 4) and higher education (college/university degree).

TABLE 2.1

ISCED 97 Classification: the Czech Education System

Level	Level of education	Czech education system	Study
0	Pre-primary education, No education	Nursery schools	Lower
1	Primary education	Basic school (first stage)	Lower
2	Lower secondary education	Basic school (second stage), Lower grades of gymnasium, Lower grades of conservatory, Special basic school	Lower
3	Upper secondary education	Gymnasium, Secondary technical school, Secondary vocational school*, Conservatory	Middle
4	Post-secondary education (non-tertiary)	Follow-up courses, Shortened courses with apprenticeship certificate or school-leaving exam	Middle
5	First level of tertiary education	Higher education institution (Bachelor or Master degree), Tertiary professional school	Higher
6	Second level of tertiary education	Doctoral study programs	Higher

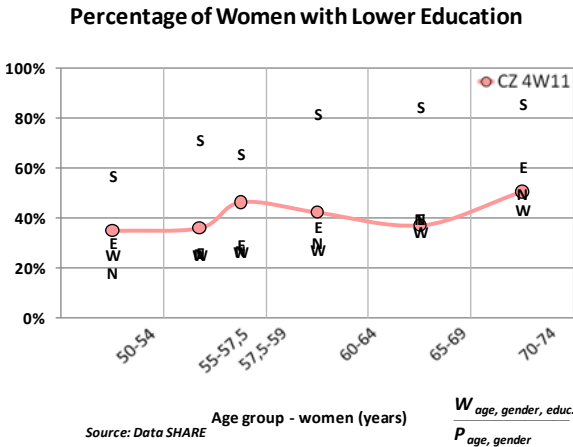
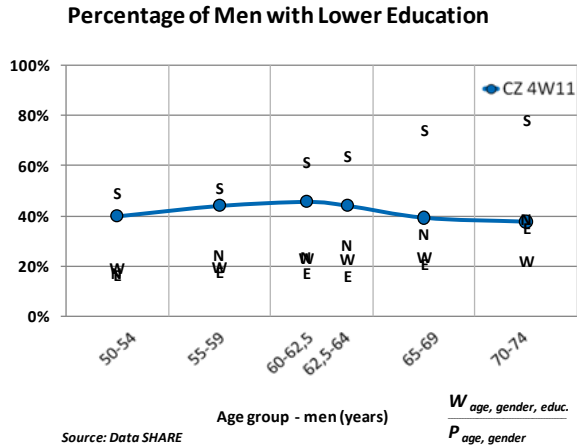
Source: Eurydice.org 2010. Notes: *Secondary vocational school is counted as Lower education.

Educational structure and its pattern relative to age are important factors in ageing and retirement decisions. The following graphs, 2.1-2.3, show the distribution of educational attainment among men and women of different ages. About 40% of men above 50 years of age in the Czech population have lower level education, and the equivalent number is similar for women. Almost half of the Czech respondents (both men and women) achieved middle level education, and around 18% of the sample has higher level education (somewhat less among women). In Nordic and Western

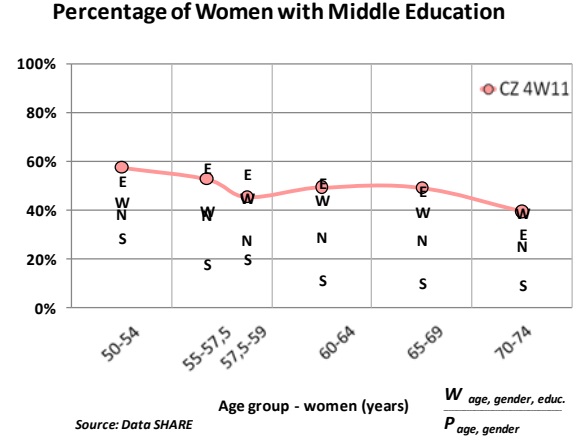
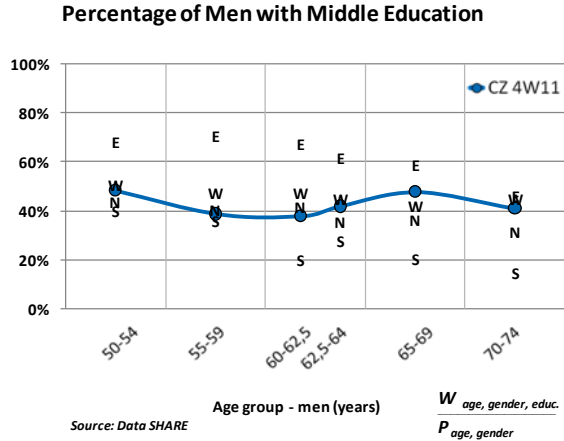
countries a higher proportion of the populations are more highly educated (about a third of respondents achieved higher level education); on the other hand, in the Southern countries there is a much higher proportion of individuals with lower level education (at age 50–54 years, around half the respondents; for older cohorts, as many as 80%).

In sum, the Czech Republic exhibits lower educational attainment than Western and Nordic countries. Its pattern of higher educational attainment is similar to that seen in other Eastern European countries. Southern Europe has the lowest levels of educational attainment.

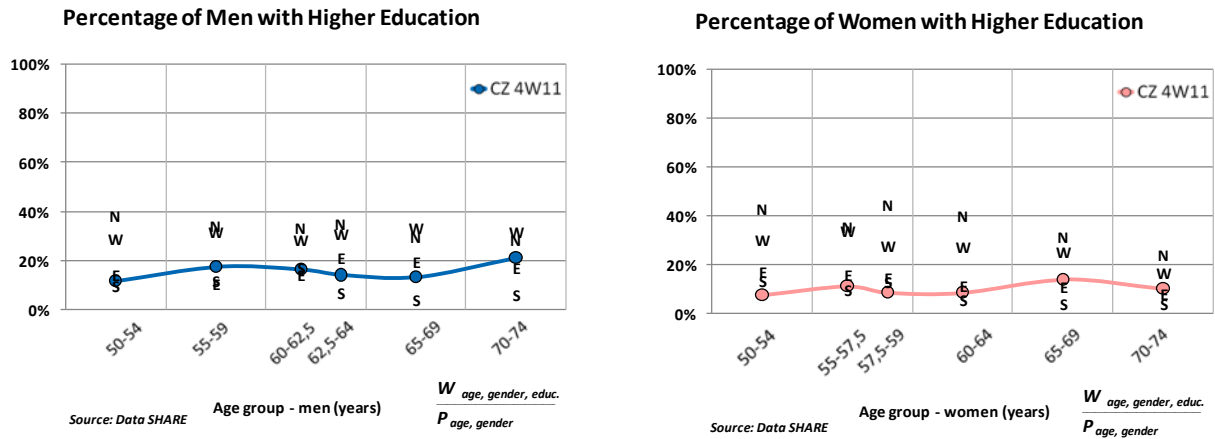
GRAPH 2.1



GRAPH 2.2



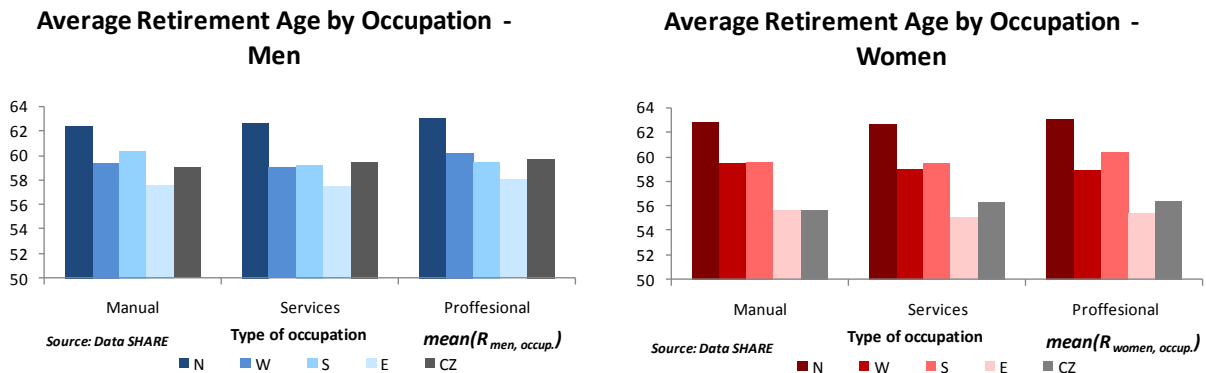
GRAPH 2.3



Retirement Decisions and Education

Column graph 2.4 depicts the average effective retirement age for people aged 50-74 years. In the Nordic countries, the average retirement age is three years higher than in Western and Southern countries. In East European countries and the Czech Republic, there is a marked difference in the effective retirement of women, primarily due to legislation allowing for women who have had children to retire earlier. Importantly, this gap is smaller among Czech women who have higher education.

GRAPH 2.4



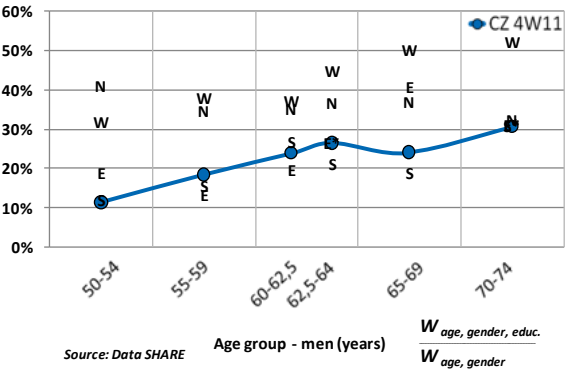
Labour Market Participation and Education

Labour market participation is significantly related to education. More educated individuals live longer, are healthier, have physically less demanding jobs, earn more, and on average retire later than individuals with lower educational attainment. Graph 2.5 shows the percentage of working men and women with higher education. In all the countries, labour market participation among individuals with higher education is greater than their share in the population (the two being almost equal at age 50-54, when almost everyone is working). Although the Czech Republic has the lowest share

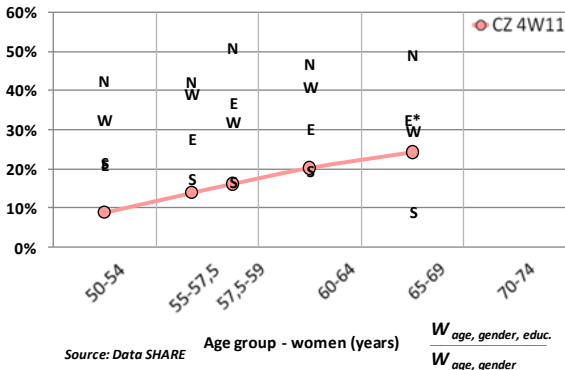
of highly educated working individuals, their labour market participation increases to 30% among men and to 24% among women at older ages (although the data are not statistically reliable for the age cohort 70-74 for women and for a number of regions). Note that in Western and Northern Europe the proportion of working men and women with higher education is much higher.

GRAPH 2.5

Percentage of Working Men with Higher Education



Percentage of Working Women with Higher Education



Classification of Occupations

Occupational choices during the life cycle represent an important determiner of employability, productivity, income, and health. The SHARE survey asks respondents about the type of occupation they currently perform, or performed prior to leaving work. The international classification of occupations (ISCO) divides occupations into ten categories. For the purposes of this study, we simplify the classification into three basic occupational types – *professional*, *services*, and *manual* – in table 2.2.

TABLE 2.2

ISCO Classification of Occupations

Class	Recoded
1 Legislator, senior official or manager	Professional
2 Professional	Professional
3 Technician or associate professional	Professional
4 Clerk	Services
5 Service worker and shop and market sales worker	Services
6 Skilled agricultural or fishery worker	Manual
7 Craft and related trades worker	Manual
8 Plant and machine operator or assembler	Manual
9 Elementary occupation	Manual
10 Armed forces	Armed forces*

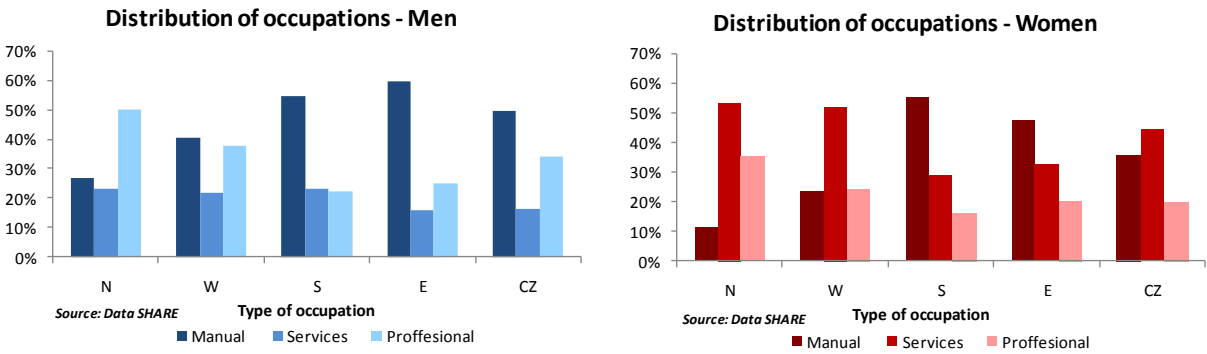
Source: SHARE. Note: *Excluded from analysis

Distribution of Occupations

The distribution of these three occupational groups for men and women is shown in graph 2.6. As education determines occupational choice to a great extent, the distribution of jobs is related to educational attainment levels in the various countries.

We observe very large differences for both genders across the four regions. In Northern Europe, approximately half of the male population is employed in professional occupations. In Western countries and in the Czech Republic, this proportion is around one third. On the other hand, the vast majority of men in Southern and Eastern Europe work in manual occupations. For women, the dominant occupations are in services, except in Southern and Eastern Europe, where women are more often employed in manual occupations. In general, the more developed the region is, the fewer people work in manual occupations (note the small fraction of women working in such occupations in the Nordic countries). These differences are very important, since people with higher education and non-manual jobs are generally more flexible in the labour market, with lower incidence of unemployment, higher wages, and less physically demanding working conditions than people in manual occupations.

GRAPH 2.6

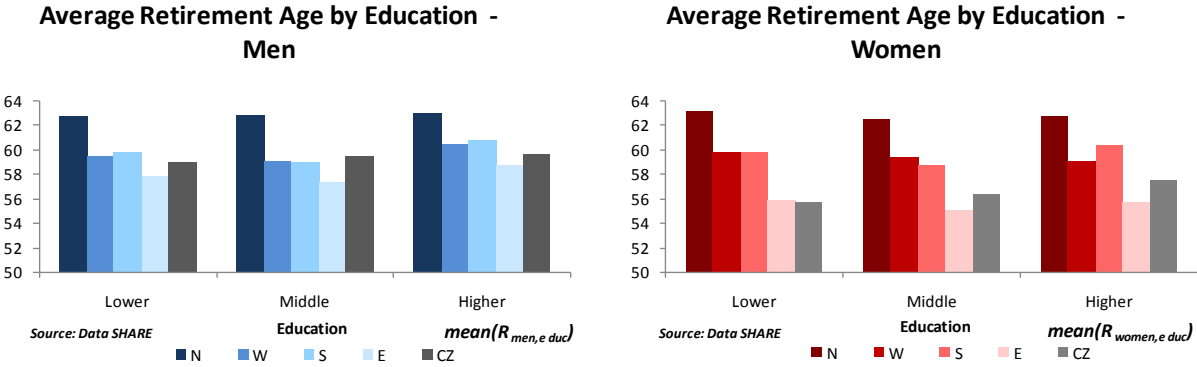


Retirement Decisions and Occupation

Column graph 2.7 shows the average effective retirement age for people aged 50-74 years in our three occupational categories. In general, the average retirement age is higher for those working in services and professional occupations. At the same time, however, the differences are not large enough to reveal early retirement for workers in physically demanding manual occupations, even in the most generous welfare systems of Northern Europe. While the average retirement age for men is similar across Europe (with the exception of Nordic countries), substantial differences are seen between the average retirement ages of women in Eastern and Southern Europe, who retire around 5 years earlier than women in Western Europe and around 8 years earlier than women in Northern Europe. In the Czech Republic, this is the

consequence of long-term policies allowing for early retirement among women with children. Note that the difference is smaller for occupations than for education.

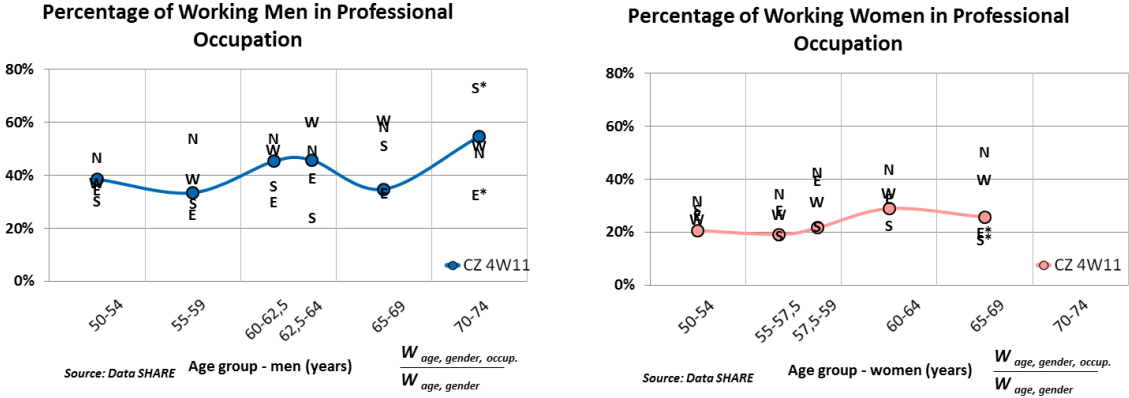
GRAPH 2.7



Labour Market Participation and Occupation

As occupation is closely related to educational attainment, labour market participation increases with age for women and men in professional occupations (who generally have a higher educational level). In the Czech Republic, over 50% of men who continue to work after the statutory retirement age are employed in professional occupations. For women, it is 28%. This is more than the overall share of this occupation in the labour force described above in graph 2.6.

GRAPH 2.8



CHAPTER 3: HEALTH AND RETIREMENT

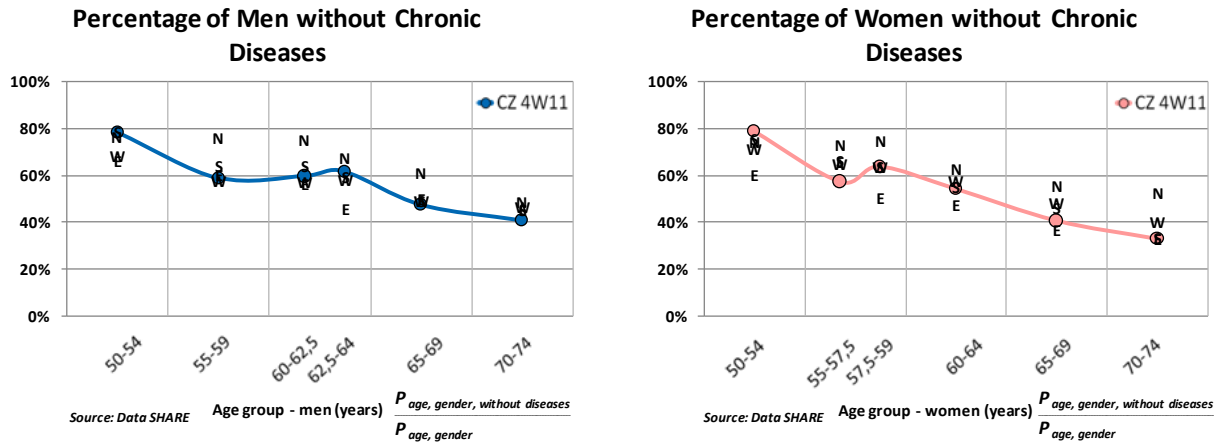
This chapter examines the health of the respondents in relation to their retirement and labour market participation, especially with respect to the health potential of those who are retired or not in the labour market despite being both physically and mentally healthy (see Coe and Zamarro (2011)). The SHARE data are a unique source of internationally comparable information about respondents' subjective and objective health status in relation to other activities.

Health status is measured in terms of internationally comparable indexes. General health is measured by the number of chronic diseases, functional health by the so-called ADL index (Activity of Daily Living), and cognitive ability by a memory recall test. The graphs show the proportion of healthy individuals in each age category and gender. In the Appendix, we also show graphs for the EURO-D scale of depression and an objective measure of health by grip strength.

General Health: Chronic Diseases

A measure of general health is the number of common chronic diseases respondents suffered from during the 12 months immediately preceding their SHARE interview (see the Appendix for details). Graph 3.1 shows the age profile of the portion of the population reporting fewer than two chronic diseases. The graphs show that all regions are rather similar in their general health, with the Czech Republic performing very well for men and women under the age of 55. Thereafter, the Nordic countries maintain their general health at a higher level, although Czech men and women have health levels very closely comparable to Western European levels. The oldest women in Northern Europe suffer from far fewer chronic diseases than women of a similar age in the other countries studied. The health index decreases smoothly without any sudden drop around the statutory retirement age. On the contrary, there is a marked improvement in health around or after the statutory retirement age, most likely caused by less physically and mentally demanding activities in the initial years of retirement. It should be noted that mortality and morbidity has substantially improved since 1989 in the Czech Republic and most Eastern European countries. Their convergence to EU levels is likely to continue in the next decades.

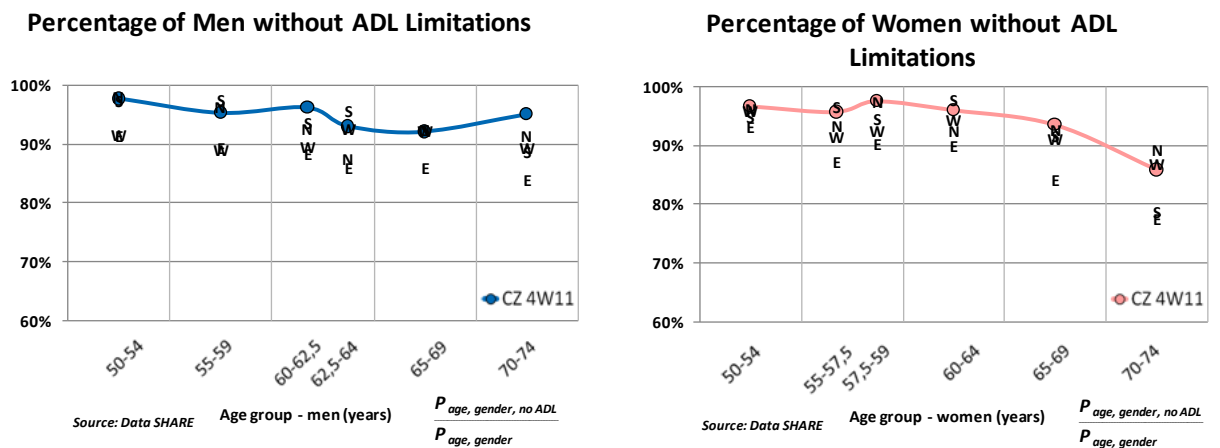
GRAPH 3.1



Functional Health: ADL Index

The ADL index (Activity of Daily Living) depicted in graph 3.2 captures the respondents' difficulties in performing a total of five everyday activities, including getting dressed, walking across the room, taking a shower/bath, eating meals, getting in and out of bed, and using the toilet. If the respondent has difficulty with one or more of these activities, he/she is regarded in the analysis as a person with an ADL limitation. As with chronic diseases, we find that the ability to perform these daily activities is not dramatically reduced around the statutory retirement age. Even in the oldest cohort, more than 80% of men and women can perform all these activities. Interestingly, there are no major differences across countries except for Eastern Europe.

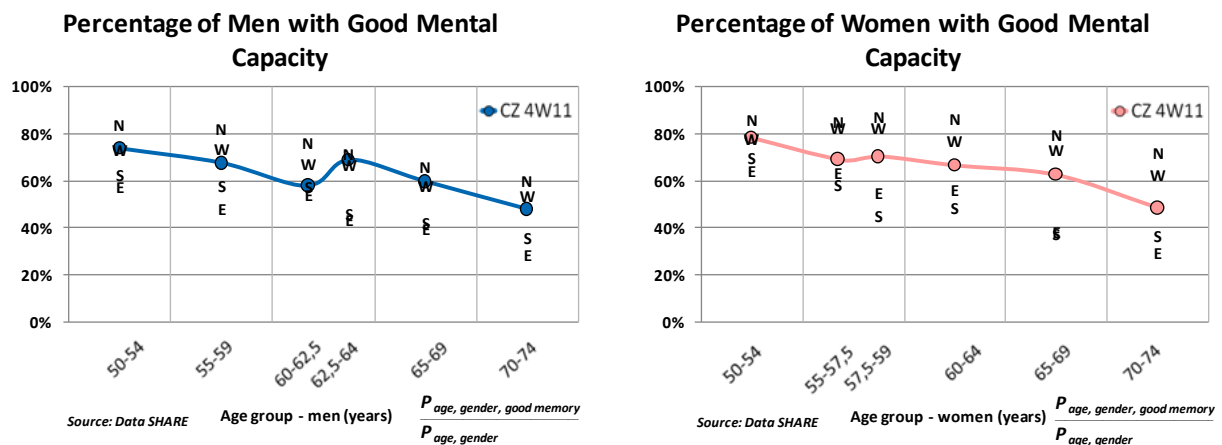
GRAPH 3.2



Mental Health: Cognitive Ability

Cognitive ability is measured by a memory recall test. The respondents were read a list of 10 common words in a random sequence. Approximately five minutes later, they were asked to repeat the words. A derived variable is generated indicating individuals with a good memory, who could recall at least four words. As in the previous graphs, graph 3.3 shows no shift in mental capacity around the statutory retirement age. Both men and women in Southern and Eastern European countries perform much worse than the rest of the sample. Czech men perform very similarly to men in Western Europe, while Czech women perform slightly less well than women in Western and Northern Europe.

GRAPH 3.3



Retirement Decisions and Health Problems

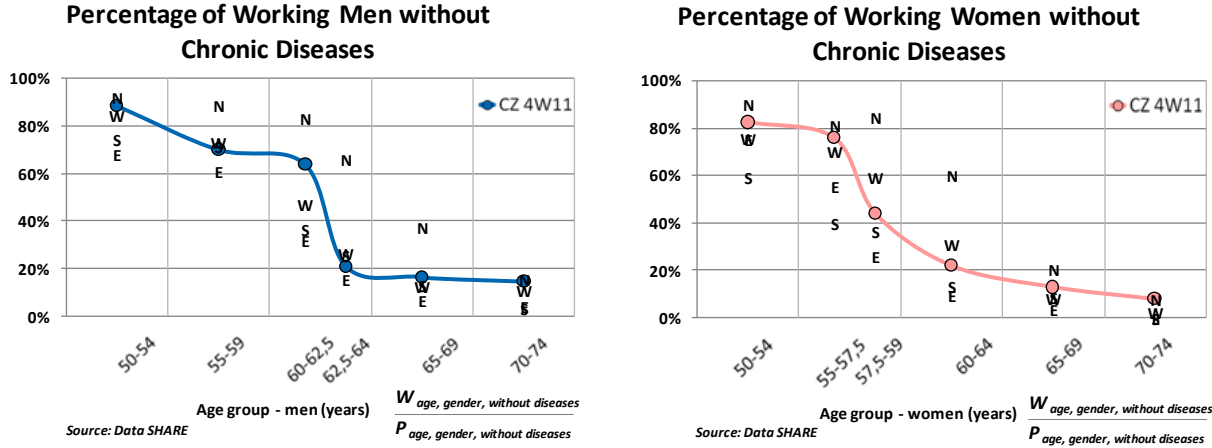
In the above graphs, we see that in all countries men and women are generally healthy around the statutory retirement age. Although the health indexes naturally decline with age, the decline is fairly smooth and there is no factual evidence that health deteriorates fast over a short time period. In other words, retirement decisions are very weakly related to real health conditions. This fact is further illustrated below by the share of the population that does not work despite being healthy in terms of their general health, functional or mental abilities.

Retirement and Chronic Diseases

The graph 3.4 shows that despite not being affected by any chronic diseases, the majority of men and women retire at the statutory retirement age. In the Czech Republic, but also in Western, Eastern and Southern Europe, less than 20% of men without chronic health conditions continue to work after the age of 60. In the Nordic

countries, the equivalent proportion is greater than 60% and declines at much slower pace to 40% at age 65-69. For women, the decline in labour market participation is more gradual but at similar levels.

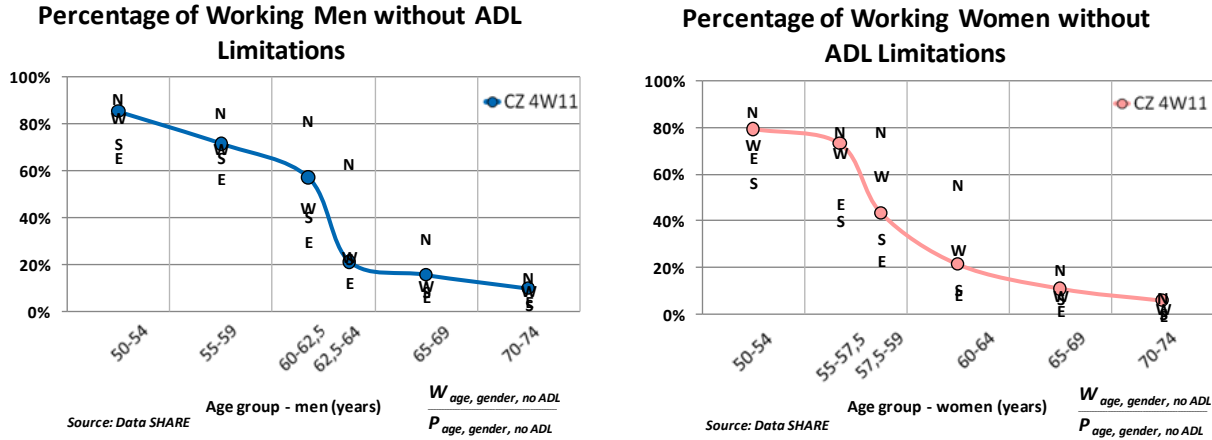
GRAPH 3.4



Retirement and Average Daily Activities

The same pattern emerges from the share of men and women who work and do not suffer from any ADL limitations in graph 3.5. For Nordic countries, there is a gradual decline from 80% around age 60 to 20% at age 70-74. In all other countries, including the Czech Republic, there is a sudden drop in labour market participation around the statutory retirement age.

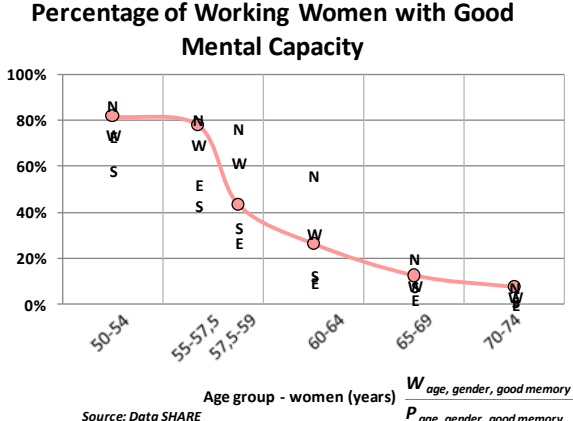
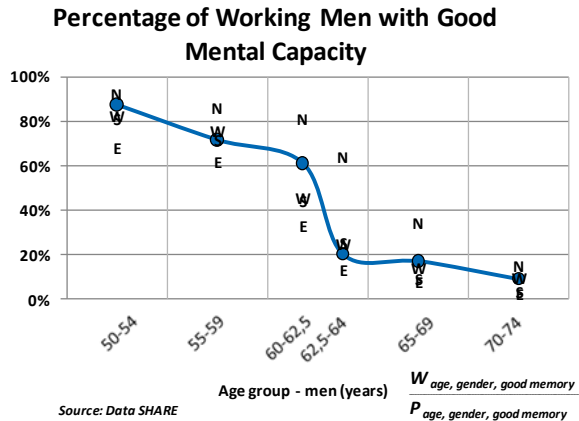
GRAPH 3.5



Retirement and Cognitive Abilities

Graph 3.6 shows that labour market participation falls rapidly among people with good cognitive abilities after they reach the statutory retirement age (see Mazzonna and Peracchi (2012)). It should be noted that, for both men and women, the Czech Republic and Western countries share a similar index after age 60.

GRAPH 3.6

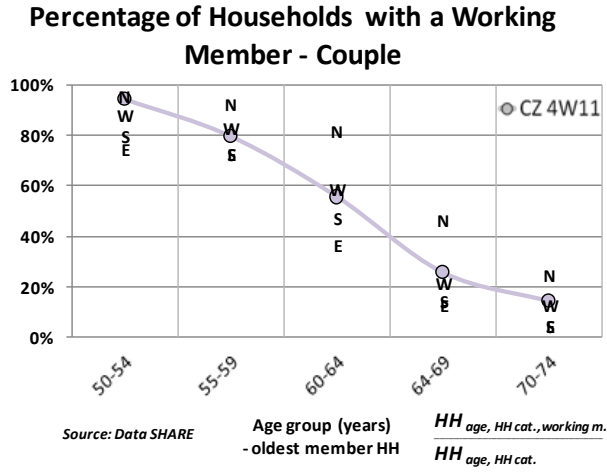


CHAPTER 4: RETIREMENT AND SOCIO-ECONOMIC STATUS

An important co-determinant of retirement decisions and quality of life is the individual's family situation and the composition of their household. A household is defined as an economic unit of persons living and jointly managing the home. We distinguish three household categories: respondents living in a couple, single women and single men. Other persons living in the household (children, grandchildren, other relatives) were not considered in the categorization. The analysis focused on households in which the oldest member was between 50 and 74 years old.

Around two thirds of Czech individuals aged 50-74 live in a couple; around 20% are single women and around 12% of households consist of single men. Around a third of older Czech couples live together with another person, usually their children. In Nordic countries and in the West this proportion is lower (22% and 31% respectively), while in Eastern and Southern countries the number of households with three or more members is significantly higher (50% and 59%, respectively). Detailed tables describing these figures can be found in the Appendix.

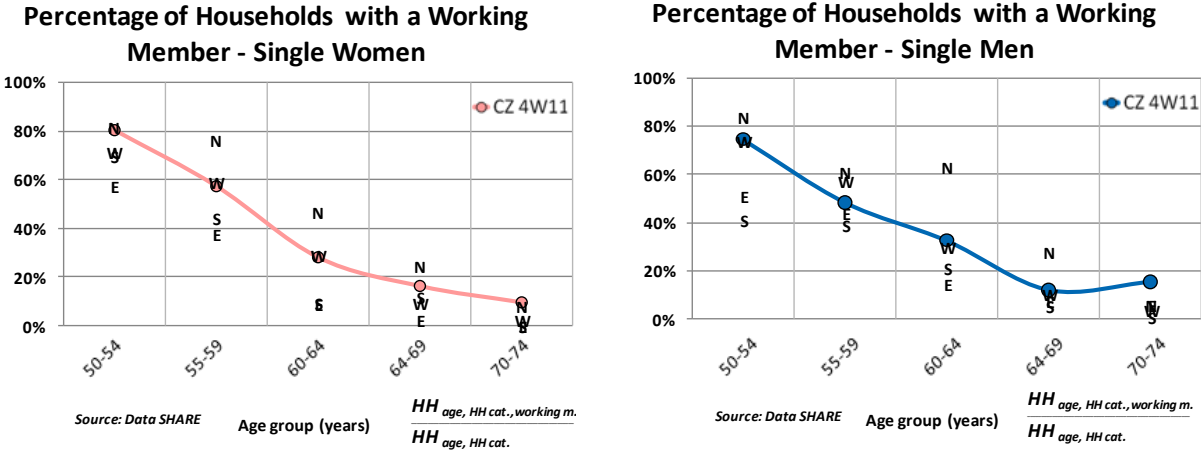
GRAPH 4.1



Graphs 4.1 and 4.2 show the presence of a working household member aged over 50 in households composed of couples, single women, and single men. The trend seen on these graphs depicts gradual departure from the labour market with increasing age. In Nordic countries, this happens later due to the higher statutory retirement age. The mirror image of these graphs would depict the proportion of households that have at least one retired member.

We see that the Czech Republic is very similar to Western Europe across all household categories.

GRAPH 4.2



Household Income

Finally, we analyse the SHARE respondents' financial situations in terms of their total household income and their ability to manage that income.

The SHARE questionnaire asks each respondent (i.e. each person aged 50+ and his/her partner) about their entire income during the preceding 12 months. The derived measure of the total household income includes (in annual terms): *net income from employment/self-employment, income from old-age pensions, unemployment benefit, other social and welfare benefits, other income (rents) and lump-sum payments*. The total household income equals the sum of the net (after tax) incomes of all *household members*. Because households differ in size, we derive the weighted net household income per member by dividing the total net household income by the number of consumer units in the household (as used in OECD statistics³).

Index of Total Household Income

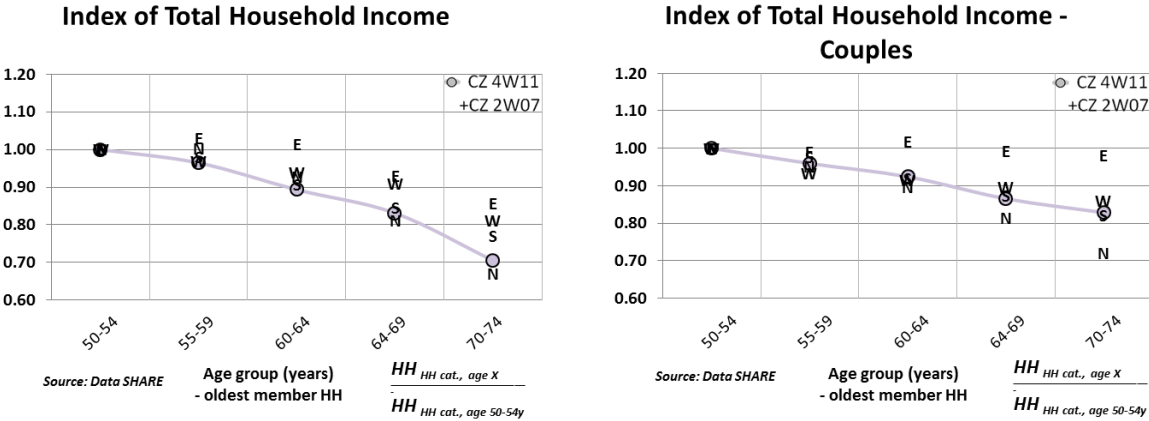
The following graphs illustrate the household income on an index that relates the average weighted household income for each age band to the average income at age 50-54 (before retirement). For example, the average household income for a Czech couple aged 70-74 is around 30% lower than the average income of couples before they retire (aged 50-54). This is because older people's ability to secure income from other sources than pensions declines with age and their pensions also decrease due to indexation policies linking pensions to average wages, and cohort effects.

The left hand panel of graph 4.3 provides summary information about the age development of incomes across all households. Total income at later ages decreases relative to the reference income at age 50-54 (before retirement). The most pronounced decreases are observed in the Czech Republic and the Nordic countries,

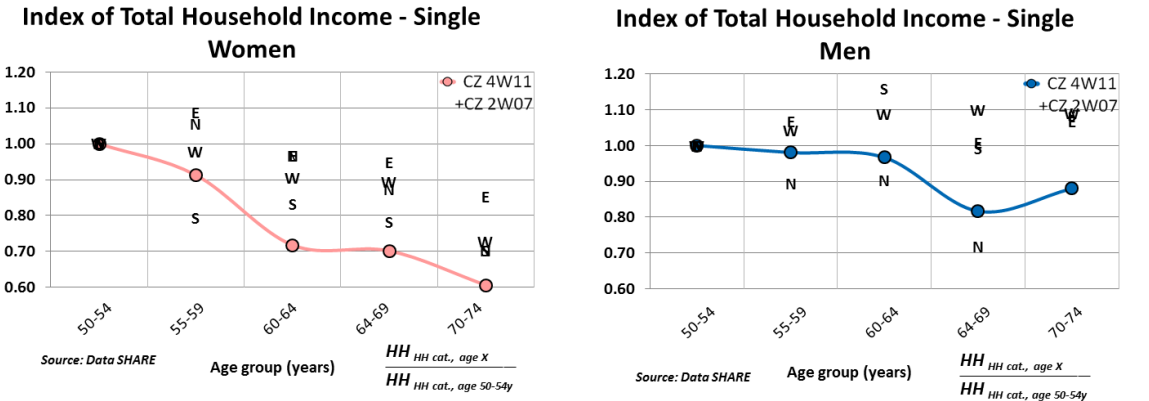
³ The first member has weight 1, every subsequent member has weight 0.5; a child under 13 has weight 0.3.

where family cohabitation and support are lower than in the Southern and Eastern countries. This is apparent especially for single women, as seen in graph 4.4. In general, couples have higher incomes than single individuals, and single men have higher incomes than single women.

GRAPH 4.3



GRAPH 4.4



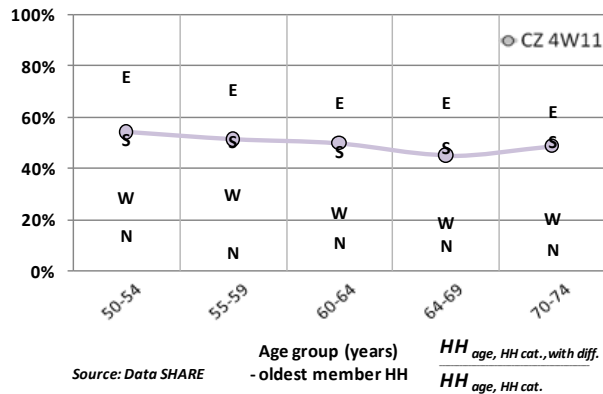
How Do Households Manage their Income?

The SHARE survey asked each household to evaluate how well it is able to make ends meet. The following graphs 4.5 and 4.6 show the fraction of households that manage their resources *with some or great difficulty*. As many as half the Czech couples studied reported difficulty in managing their income. An even worse situation can be seen in the Eastern countries, while respondents in Western and Nordic countries evaluated their situation much more positively. Single women have the greatest difficulties – in the 50-54 age category, 4 out of 5 Czech households consisting of single women declare difficulty with managing their income, and this situation can be seen to be worse in Eastern countries. This fact may be due to women's lower level of work activity in pre-retirement age, their lower average wages, and their resulting

lower average pension. Single men are worse off at the age of 55–59 (64% of households consisting of single men have difficulties at this age). Importantly, the retired individuals' economic situation is not found to worsen over time and seems relatively stable, depending mainly on the respondents' career history. This means that retirement decisions are not explicitly related to individuals' present or future economic situation, and that retirement does not lead to a worsening of an individual's economic status. Also, there appears to be scope for policies that would provide incentives for postponing retirement.

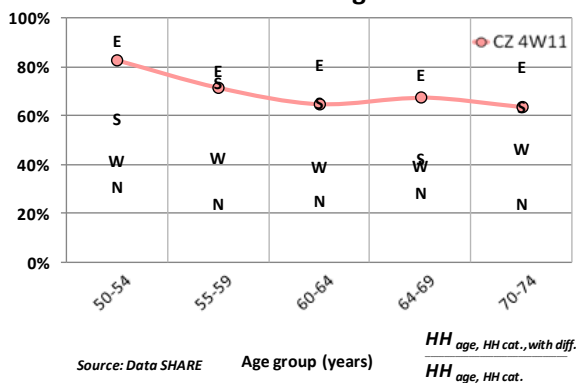
GRAPH 4.5

Percentage of Households with Difficulty to Make Ends Meet - Couples

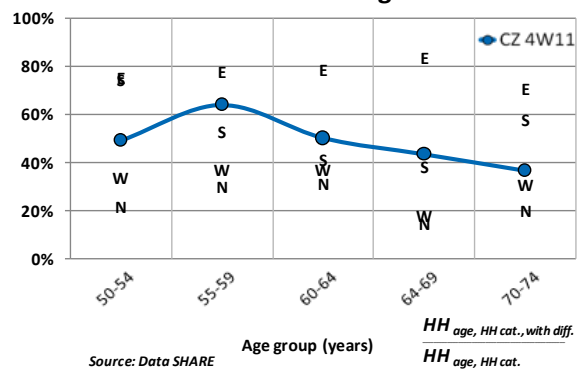


GRAPH 4.6

Percentage of Households with Difficulty to Make Ends Meet - Single Women



Percentage of Households with Difficulty to Make Ends Meet - Single Men



CHAPTER 5: SIMULATIONS

In this chapter we conclude our explorations with quantitative simulations based on regression analysis. In particular, we simulate the effect on statutory retirement and employment status in the Czech Republic if the Czech population (with its existing personal characteristics, demographics, education, health and so on) were subject to the policy environment of another country or another period of time. In doing so we partly overcome the limits of the partial insights explored in the previous chapters, and address the possible critique that retirement and working decisions are not only driven by the institutional setup of the retirement scheme in individual countries, but also by a population's socio-economic and health conditions.

For these simulations we use SHARE data collected in 2007 and 2011. As in the rest of the analysis, we use the original weights in order to ensure that our simulations are representative at the country level. We explain our approach using an example for women and men in the Czech Republic and Sweden. We employ the same approach considering two other countries: the Netherlands and Austria, for which we have sufficiently large samples of SHARE data.

Key findings from simulations

Here we summarize our key factual findings from these simulations. Further technical and methodological details are provided at the end of this chapter.

- Despite differences in socio-economic history between the Czech Republic and Western countries during the second half of the 20th century, and despite the Czech Republic's inferior average socio-economic conditions, we do not find many differences in employment or incidence of retirement between these countries.
- Differences between the Czech Republic and Sweden in educational structure (lower average educational attainment), health conditions (inferior physical and cognitive health status), occupational structure (higher proportion of manual work), number of children raised, and the composition of households, contribute relatively little to the wide gap in employment rate and the incidence of retirement. The single major influential factor in retirement decisions seems to be institutional incentives represented by the statutory retirement age and the tax-benefit scheme.
- Controlling for different personal characteristics, the employment and retirement gaps between both countries persist both for women (greater) and men (lesser).

- Our comparative simulations show that Austria's situation is similar to that of the Czech Republic (including many other similarities such as its schooling system, educational attainment levels, unemployment rate, etc.). The Netherlands seems to occupy an intermediate position between the Nordic and the Western European countries.
- In the Czech Republic, unemployment has a statistically and economically significant impact on employment (negative) and retirement (positive) among older women but not among older men. The impact is stronger at younger ages (close to 50) and diminishes with increasing age. Nevertheless, the impact on unemployment is relatively small and does not seem to be a strong factor in explaining the gap between Sweden and the Czech Republic. Retirement and employment decisions in Sweden do not exhibit any association with the incidence of unemployment.
- Comparing retirement and employment in the Czech Republic in 2007 and 2013 we find that the single most important determinant is the shift in the statutory retirement age, rather than any changes in the personal characteristics of the Czech population.
- Simulating the impact of hypothetically higher educational attainment among the older population (as expected in the coming decades), we find that this has only a small direct impact on the employment rate and retirement. This is in line with our findings on the Czech-Swedish educational attainment gap's relatively small contribution to both the employment rate and the incidence of retirement.

Technical description of simulations

For our simulation exercise we have chosen Sweden as a country representing the Northern regions of Europe, with a developed and effective system of old-age policies, as demonstrated in the first two parts of this study. The Swedish pension system possesses the key features of the Scandinavian welfare state, which is considered by many countries to be a pattern to follow.

Swedish Benchmark

The Swedish pension system reflects the type of Scandinavian welfare state which is considered by many countries to be a pattern to follow. The Swedish government's aim is to ensure pensions are sufficient for future generations. The national retirement pension system consists of three tiers; the first tier has three components: an income-based pension, a premium pension and a guaranteed pension. The income-based pension is financed on a pay-as-you-go basis and is independent of the

national budget. The mandatory premium pension is the funded part of the earnings-related old-age pension, based on individual accounts in mutual funds. Swedish pensioners (older than 65 years) with low incomes have a guaranteed minimal pension, financed by the government's budget. The second tier is a compulsory occupational pension covered by nationwide collective bargaining agreements for certain occupations, or voluntary pension plans organised by employers without collective agreements. The statutory retirement age in Sweden is flexible, at between 61 and 70 years. Retirees choose their age of retirement and a premium is awarded for postponed retirement (early retirees at 61 years receive 72% of the average pension, late retirees at 70 years receive 157% of the average pension). The value of pension income is derived on the basis of the life expectancy of Swedish men and women.

Regression Model

We estimated a linear probability model⁴ of employment ($E_i=1$ if *person i* is employed and 0 otherwise) as

$$E_i = A + DEMOGRAPHIC_i * B1 + HEALTH_i * B2 + AGE_i * B3 + e_i \quad (1)$$

Explanatory variables are represented by three row vectors DEMOGRAPHIC, HEALTH, and AGE. The descriptors contained in the vector DEMOGRAPHIC_{*i*} are indicator types of variables of educational attainment (lower, middle and higher education), last occupation (professional, services, manual), family status (living single or with a spouse/partner) and number of children raised (none, one, two, more than two). Individual health situation is captured by indicator variables in the vector HEALTH_{*i*} for the variables described in chapter 3 and in the Appendix (chronic diseases, ADL, cognitive abilities, self-perceived health, grip strength, depression). The impact of age is captured by a linear spline function with kinks set at ages 55, 60, 65, 70, 75.

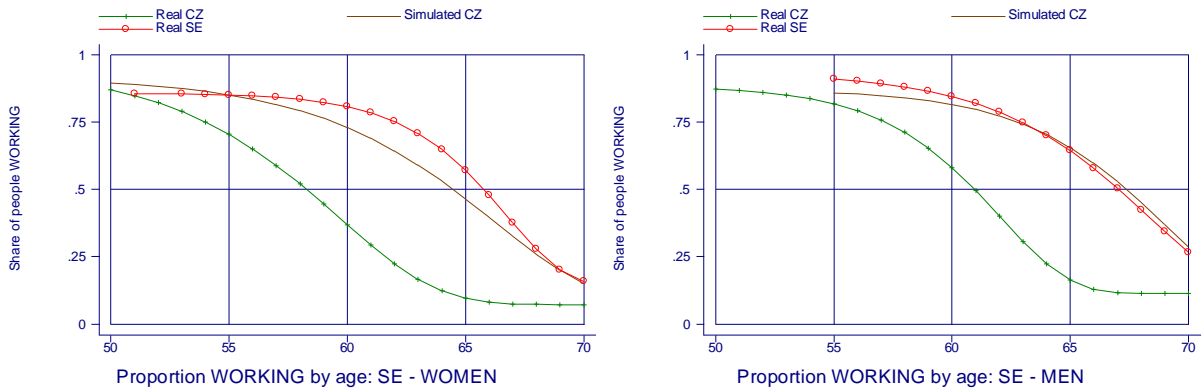
We estimate model (1) using the SHARE sample of women in the Czech Republic and in the comparison country Sweden in wave 2013. Using estimates of the Swedish coefficients A, B1, B2, and B3, we computed fitted values for the sample of Czech women and men (separately) using their actual (Czech) personal, health and age characteristics. In this way we simulate the Czech women's hypothetical employment probability (with their real individual characteristics) in the Swedish environment.

Graph 5.1 depicts three age profiles of average employment probability (share of employed persons in the population): the real employment probability profile in the Czech Republic (denoted as Real CZ and marked by “+”), the real employment probability profile in Sweden (denoted as Real SE and marked by “o”), and the simulated employment probability profile for the Czech sample of women using Swedish coefficients (denoted as Simulated CZ and not marked).

⁴ As an alternative we used a Probit model, and the key patterns in the resulting simulation were not affected.

GRAPH 5.1

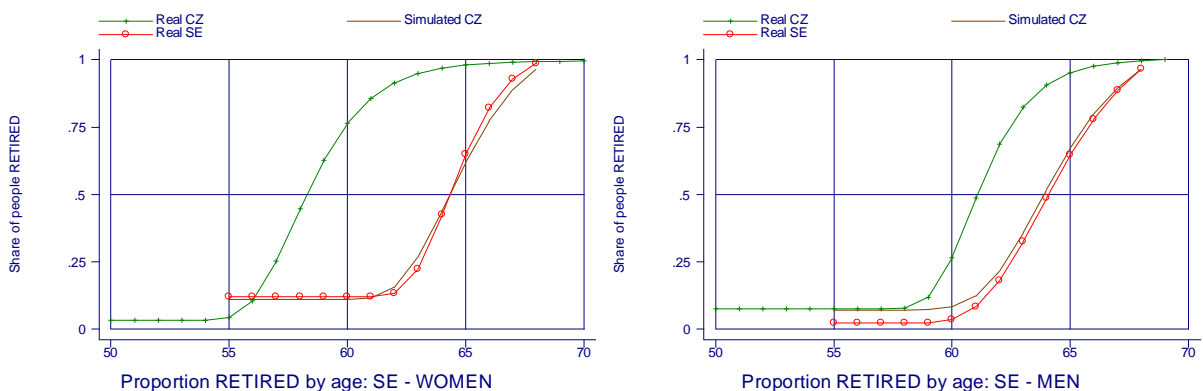
Employment probabilities in the Czech Republic and Sweden in 2013



We see that younger women in both countries exhibit a high employment rate at close to 90%, and a negligible employment rate after 70 years of age. In the age range 60-65 we observe a substantially higher employment rate in Sweden. In particular, the employment rate among Swedish women aged 65 years old is almost 50 percentage points higher than the equivalent rate among Czech women. The simulated profile for Czech women in a Swedish-type context is about 10 percentage points below the true Swedish one, which indicates that personal and health characteristics contribute only partially to the real lower employment rate among Czech women, controlling for their age. In other words, if Czech women were exposed to Swedish institutions, legislation, and incentives, their employment would be around 40% higher, and this means that institutions, legislation and incentives explain roughly four fifths of the actual difference between these two countries.

GRAPH 5.2

Retirement probabilities in the Czech Republic and Sweden in 2013



Graph 5.2 presents results of the same approach to simulate statutory retirement status R_i as a dependent variable in equation (1) instead of E_i (i.e. $R_i=1$ if *person i* is retired and $R_i=0$ otherwise). Note that R_i captures the decision to enter retirement irrespective of any possible work carried out during the subsequent retirement years. We simulate this alternative model too, since employment after statutory retirement

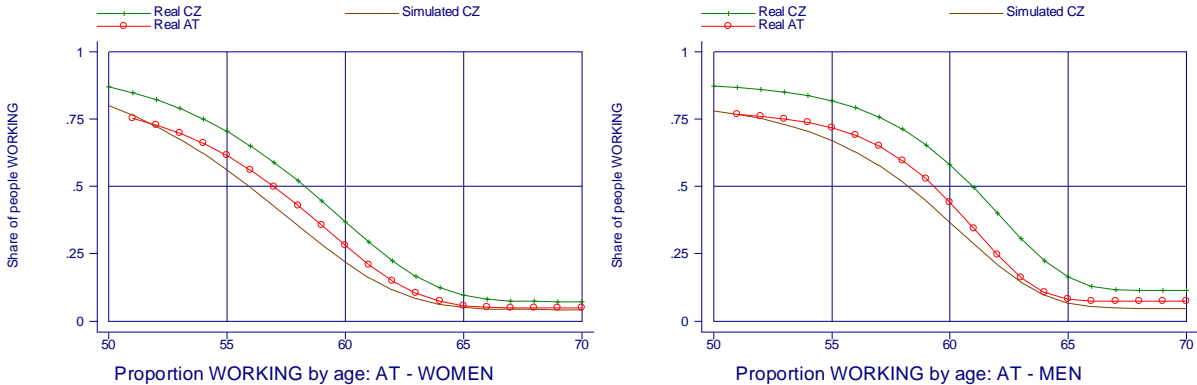
is becoming a widespread phenomenon in the Czech Republic. The difference between the two countries in the incidence of retirement among women is notable. The difference in the retired share at the age of 60 years is almost 70 percentage points, and at the age of 65 is still about 40 percentage points. Note that personal and health conditions play a negligible role in the decision to enter retirement for any given age, and the only key determinant is the institutional environment.

Using the same methodological approach, we produced simulations for Czech and Swedish men. The resulting profiles are shown in the right-hand panels in graphs 5.1 and 5.2. The patterns are very similar to those for women. The differences are similar, but are notably smaller. For employment probability and retirement decisions, we would observe almost no difference in behaviour between Czech and Swedish men if the former lived in the latter’s welfare state system.

In the same way, we ran simulations for the Czech Republic and Austria. As graphs 5.3 and 5.4 show, the Austrian social and pension systems are much closer to the Czech Republic's systems, although employment probability for both genders is greater and retirement among men is lower in the Czech Republic. Adopting Austrian policies related to retirement would lead to a decrease in labour force participation among men and women and to a higher uptake of retirement among Czech men.

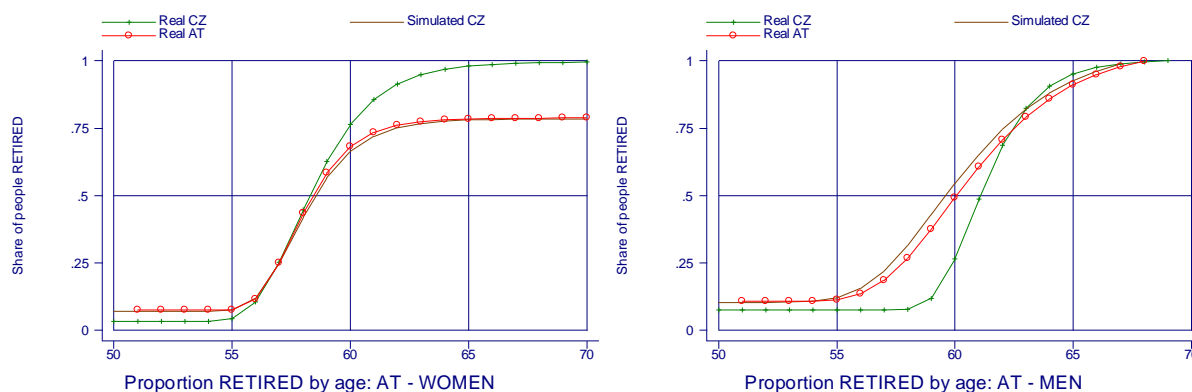
GRAPH 5.3

Employment probabilities in the Czech Republic and Austria in 2013



GRAPH 5.4

Retirement probabilities in the Czech Republic and Austria in 2013



The intermediate case simulating an institutional shift from the Czech Republic to the Netherlands' policy context is shown in the Appendix.

The Impact of Unemployment

For the Czech Republic and Sweden, we were able to match district specific unemployment indicators. In particular, we constructed district-level unemployment rates, gender specific unemployment rates, and the share of 50+ year-olds in the district population. Since all these variables turned out to be highly correlated, we estimated model (1) augmented only by total unemployment rate and unemployment rate interacted with age.

In the Czech Republic we identified that unemployment has a significant effect on employment and retirement among women but no effect among men. As expected, the impact of unemployment on the probability of female retirement is positive and its effect on the probability of employment is negative. In particular, for 50 year-old women, one percentage point difference in the unemployment rate implies an employment rate difference of around 3.3%. Each additional 10 years of age lower the marginal impact of an additional year of age by about half (by 1.7 pp. to about 1.7%). The corresponding impact on retirement probability is smaller (1% difference in probability at the age of 50). It should be noted that the unemployment rate across Czech districts ranges from 5 to 18%. This implies that the maximum difference in the impact on employment rate is about 20 pp. (13×1.5) and on retirement probability 10 pp. (13×1.0). In Sweden, we did not find any statistically significant impact. These estimates are summarized in table 5.1 below.

TABLE 5.1**Employment probability model: estimated coefficients on unemployment**

	Czech Republic 2013		Sweden 2013	
	Women	Men	Women	Men
Unemployment rate (in %)	-.0337961 (0.000)	-.0050227 (0.484)	.0157916 (0.364)	-.0082 (0.634)
Unemployment rate * (age – 50)	.0017539 (0.000)	.0002334 (0.656)	-.0010848 (0.366)	-.0011167 (0.344)
adjR2	.43	.41	.44	.44

p-values in parenthesis denote statistical significance of estimated parameters

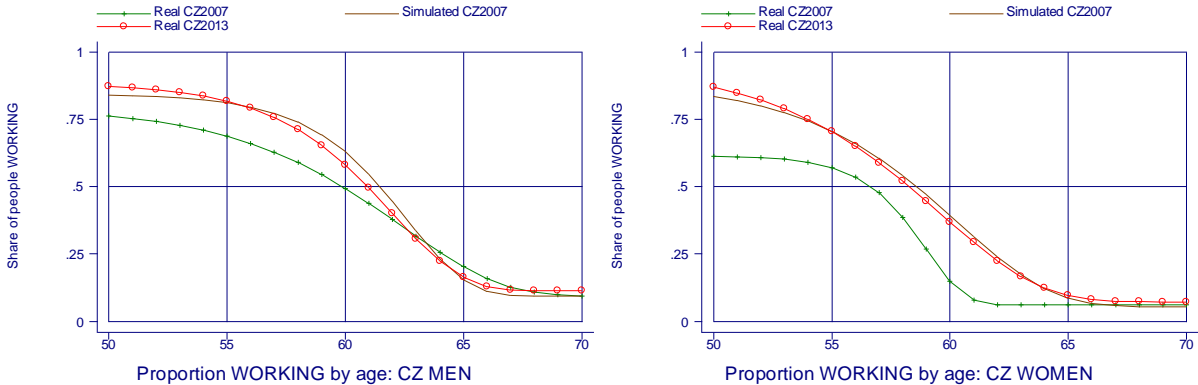
Overall, unemployment's explanatory power and its interaction with age on the two models we estimated for the Czech Republic is relatively low (the adjusted R² statistics are almost unaffected). Given these results and the fact that the average unemployment rate in the Czech Republic (5.9%) is the 4th lowest within the EU countries (with the exception of Austria (4.8%) and Germany (4.7), all other countries in our study have a higher unemployment rate, for example Denmark (6.2%), Sweden (7.8%), and the Netherlands (7.2%)), it does not seem that the incidence of unemployment in the Czech Republic represents a significant omitted variable in our simulations. Going beyond the evidence provided by our analysis, empirical literature does suggest, however, that early retirement has negative long-term effects on health, cognitive ability and socio-economic conditions (see Mazzonna and Peracchi (2012)).

Comparing the Czech Republic in 2007 and 2013

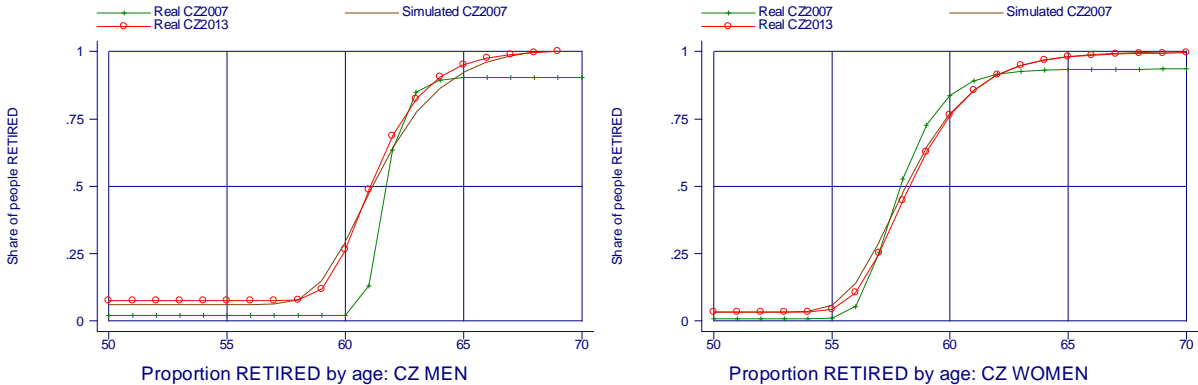
Finally, we explore recent developments in the Czech Republic. In particular, we estimated model (1) for the Czech Republic on the 2013 sample. We used the estimated coefficients and personal characteristics in 2007 to predict hypothetical employment and retirement probability in year 2007. Graph 5.5 shows the real profile in the Czech Republic in 2007 (denoted as Real CZ2007 and marked by “+”), the real profile in the Czech Republic in 2013 (denoted as Real CZ2013 and marked by “o”), and the simulated profile in the Czech Republic in 2007 using estimated parameters from 2013 (denoted as Simulated CZ2007 and not marked). There is very visibly no effective difference between the Simulated CZ2007 and Real CZ2013 profiles, which implies that the changes observed in employment and retirement between 2007 and 2013 in the Czech Republic were not driven by changes in personal characteristics, but by the institutional setup. It should also be noted that in the case of men, the section of employment profile bounded by ages 58-62 moved from right to left between 2007 – 2013, probably due to a one-off influx, or a larger proportion of men retiring early, due to the incentivising effect of the “small pension reform” in 2011, as discussed at the end of section 1.

We also simulated the impact of an increasing level of educational attainment in the Czech population in future decades, as built into the current demographic structure. We found that the direct impact of a rise in educational attainment on the employment rate and retirement age profiles is very small; a much greater role is played by the interaction of age and the institutional setup of statutory retirement ages. This is in line with our findings concerning the Czech-Swedish level of educational attainment's low impact of the on the employment rate and the retirement profiles.

GRAPH 5.5



GRAPH 5.6



Notes on Data and Regressions

Our set of explanatory variables contains about 50 variables, most of them indicator variables 1/0. Since we are not interested in identifying causal effects (this is methodologically impossible) nor in the partial impact of particular variables, we do not deal with possible multicollinearity among our explanatory variables. The adjusted R2 of our regressions ranges between 0.40 - 0.70.

We used linear splines to fit the age profile, which has a sigmoid functional shape. This enables us not to use non-linear regressions, which can be sometimes cumbersome to estimate (due to convergence and the choice of initial conditions).

The samples for Sweden do not have enough observations for the youngest population and therefore the simulations are not presented for this age group.

CHAPTER 6: CONCLUSIONS

This study provides the first very detailed quantitative insight into the phenomena of retirement and old-age-related departures from the labour market in the Czech Republic. Of course, it should be kept in mind that our quantitative analysis has its own natural empirical limits imposed by the amount of information provided by the SHARE survey. While the data enable us to control for many important and typical individual and environmental factors, we are unable to test numerous other factors that may play a role too. Similarly, neither the overall unemployment rate nor the age specific unemployment rate necessarily capture enough job opportunities available to older people. A more rigorous analysis of this topic would require additional data and a more demanding methodological approach. Furthermore, our simulations do not identify where the different retirement and employment behaviours among Czechs come from, other than the extent to which they are accounted for by observable personal characteristics. Finally, it should be recognised that our analysis is primarily descriptive and comparative and does not aspire to identify the causal effects of human actions or government policies.

Our analysis reveals that despite the legacy of the Czech Republic's historical development, there is a tendency to convergence with Western countries in terms of the socio-economic conditions and health of the older generations. As a result, institutions and incentives induced by the tax, welfare, employment, and pension policies are the major drivers of early retirement and departure from the labour market at older ages. We did not identify any major risks from further raising the statutory retirement age above its current level.

The results show the importance of data collection in internationally comparable surveys, like SHARE and SILC. With high quality data, empirical research into ageing is possible, and can provide a factual basis for the formulation of government policies. Formulating optimal government policies based on factual evidence brings greater efficiency and social benefits that are essential for the sustainability of the welfare state in the Czech Republic.

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APPENDIX

SAMPLE DESCRIPTION

Our dataset covers the three waves in which the Czech Republic participated in the survey (the 2009 wave was devoted to the respondents' life history, with different questions). Most countries participated in the second wave in 2007, the fourth wave in 2011 and the fifth wave in 2013. Some Eastern European countries only joined SHARE for one wave in 2011. Tables A1-A4 present the sample composition across age categories, gender, household types, countries and geographical regions.

TABLE A1

SHARE Survey Sample: Age 50 to 74 by Wave of Data Collection

Area	Country	2W07		4W11		5W13	
		Men	Women	Men	Women	Men	Women
N	Denmark	983	1062	852	932	1532	1742
N	Netherlands	995	1196	984	1227	1451	1805
N	Sweden	977	1143	632	777	1544	1823
W	Austria	436	599	1824	2360	1421	1845
W	Belgium	1143	1268	1877	2185	1940	2298
W	Germany	1005	1092	557	648	2140	2341
W	France	1006	1230	1951	2319	1423	1777
S	Italy	1076	1290	1236	1539	1600	1946
S	Spain	766	872	1137	1329	2070	2300
E	Hungary	0	0	1118	1380	0	0
E	Poland	887	1092	581	759	0	0
E	Slovenia	0	0	964	1177	0	0
CZ	Czech Republic	999	1287	2116	2743	1869	2575

Source: Data SHARE

TABLE A2: Sample sizes by age categories

Number of Respondents by Age - Men 2W07

2W07	Men - age group (years)						Total
Area	50 - 54	55 - 59	60 - 62.5	62.5 - 64	65 - 69	70 - 74	
N	439	548	390	202	450	375	2404
W	503	723	370	229	576	480	2881
S	236	307	214	109	335	317	1518
E	172	182	93	43	125	112	727
CZ	177	212	128	69	132	124	842

Source: Data SHARE

Number of Respondents by Age - Men 4W11

4W11	Men - age group (years)						Total
Area	50 - 54	55 - 59	60 - 62.5	62.5 - 64	65 - 69	70 - 74	
N	332	482	307	326	584	437	2468
W	1106	1419	795	703	1126	1061	6210
S	335	477	268	267	521	504	2372
E	340	706	371	310	545	392	2664
CZ	352	460	271	252	469	312	2116

Source: Data SHARE

Number of Respondents by Age - Men 5W13

5W13	Men - age group (years)						Total
Area	50 - 54	55 - 59	60 - 62.5	62.5 - 64	65 - 69	70 - 74	
N	599	841	614	444	1216	813	4527
W	1206	1439	988	698	1379	1214	6924
S	504	745	502	357	819	743	3670
CZ	171	381	285	176	509	347	1869

Source: Data SHARE

Number of Respondents by Age - Women 2W07

2W07	Women - age group (years)						Total
Area	50 - 54	55 - 57.5	57.5 - 59	60 - 64	65 - 69	70 - 74	
N	598	400	230	690	521	352	2791
W	708	502	312	695	672	502	3391
S	356	224	156	373	370	303	1782
E	243	146	90	178	141	115	913
CZ	205	173	93	258	188	134	1051

Source: Data SHARE

Number of Respondents by Age - Women 4W11

4W11	Women - age group (years)						Total
Area	50 - 54	55 - 57.5	57.5 - 59	60 - 64	65 - 69	70 - 74	
N	504	269	309	756	635	463	2936
W	1520	859	844	1730	1303	1259	7515
S	492	317	288	654	575	542	2868
E	515	446	429	815	584	528	3317
CZ	468	291	305	676	624	379	2743

Source: Data SHARE

Number of Respondents by Age - Women 5W13

5W13	Women - age group (years)						Total
Area	50 - 54	55 - 57.5	57.5 - 59	60 - 64	65 - 69	70 - 74	
N	856	655	459	1201	1310	889	5370
W	1600	1027	799	1876	1551	1408	8261
S	763	530	384	921	913	735	4246
CZ	285	305	223	621	671	470	2575

Source: Data SHARE

TABLE A3: Sample sizes by household type

Overview of Households in SHARE

Area	Country	2W07			4W11		
		Couple	Single women	Single men	Couple	Single women	Single men
N	Denmark	934	250	158	825	205	148
N	Netherlands	1137	228	118	1081	238	138
N	Sweden	1077	247	136	615	194	102
W	Austria	361	212	63	1654	874	378
W	Belgium	1105	334	154	1786	659	396
W	Germany	1028	192	108	555	135	80
W	France	1007	378	137	1890	715	362
S	Italy	1112	228	93	1267	296	111
S	Spain	742	147	80	1068	246	135
E	Hungary	0	0	0	1011	426	158
E	Poland	989	263	132	514	198	85
E	Slovenia	0	0	0	1147	302	154
CZ	Czech Republic	971	436	148	1995	875	326

Source: Data SHARE

TABLE A4: Sample sizes by household types

Number of Households by Age - Couple 2W07						
2W07	Couple - age of older partner (years)					Total
Area	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	
N	529	758	811	592	458	3148
W	621	888	759	698	535	3501
S	265	396	414	396	383	1854
E	185	256	230	164	136	971
CZ	212	265	207	159	146	989

Source: Data SHARE

Number of Households by Age - Single Women 2W07						
2W07	Single women - age group (years)					Total
Area	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	
N	126	148	156	142	153	725
W	170	227	220	257	242	1116
S	55	50	71	91	108	375
E	66	82	107	82	99	436
CZ	56	54	47	55	51	263

Source: Data SHARE

Number of Households by Age - Single Men 2W07

2W07	Single men - age group (years)					Total
Area	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	
N	92	87	97	69	67	412
W	99	116	97	84	66	462
S	43	34	26	37	33	173
E	28	48	23	21	28	148
CZ	47	26	21	25	13	132

Source: Data SHARE

Number of Households by Age - Couple 4W11

4W11	Couple - age of older partner (years)					Total
Area	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	
N	287	519	683	604	428	2521
W	979	1341	1494	1047	1024	5885
S	296	495	537	522	485	2335
E	290	709	708	562	403	2672
CZ	294	421	512	468	300	1995

Source: Data SHARE

Number of Households by Age - Single Women 4W11

4W11	Single women - age group (years)					Total
Area	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	
N	70	102	162	147	156	637
W	393	470	529	458	533	2383
S	65	82	112	118	165	542
E	78	202	228	186	232	926
CZ	98	162	191	239	185	875

Source: Data SHARE

Number of Households by Age - Single Men 4W11

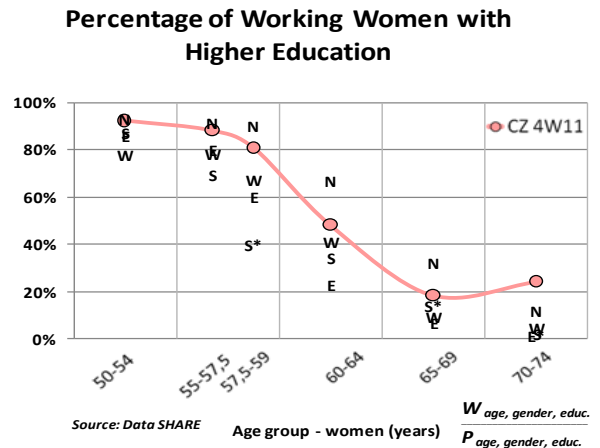
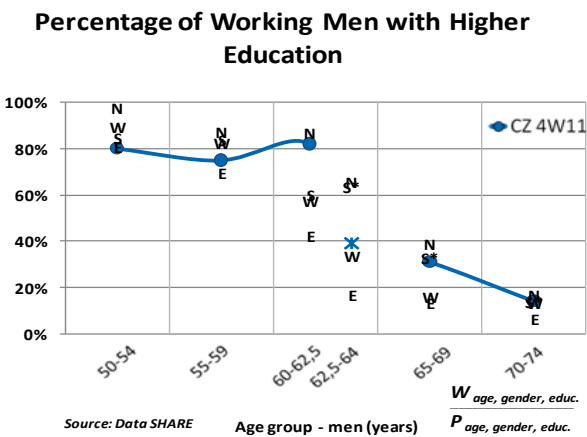
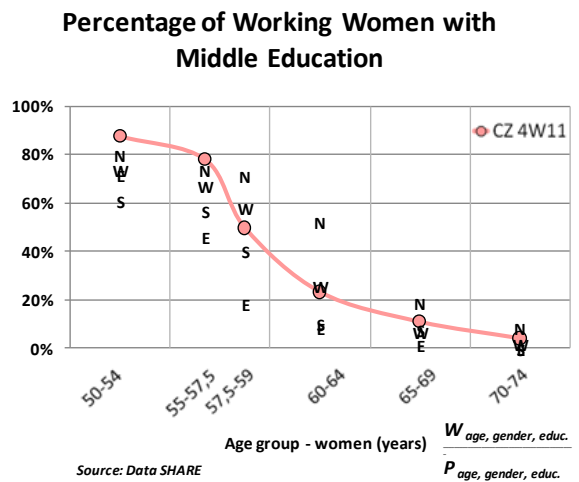
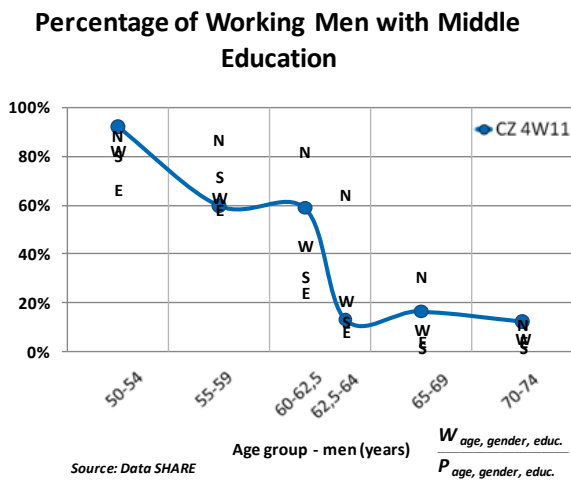
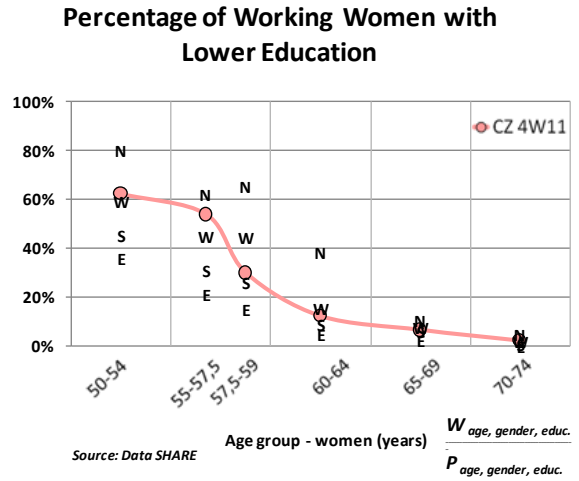
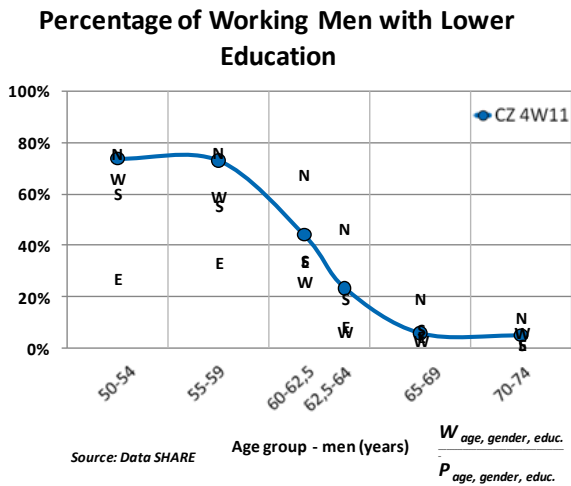
4W11	Single men - age group (years)					Total
Area	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	
N	70	63	76	103	76	388
W	267	281	266	221	181	1216
S	47	44	53	46	56	246
E	62	117	91	69	58	397
CZ	61	74	76	66	49	326

Source: Data SHARE

EDUCATION AND OCCUPATION

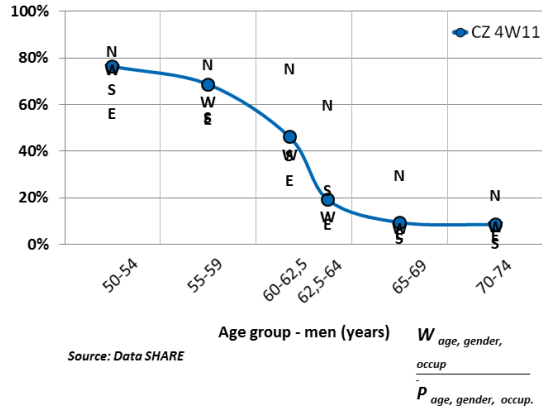
Graphs A1 and A2 display the percentage of working men and women according to their educational attainment and occupational classification.

GRAPH A1: Percentage of working respondents by education

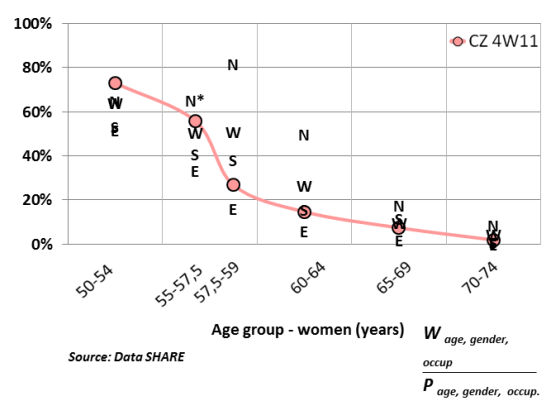


GRAPH A2: Percentage of working respondents by occupation

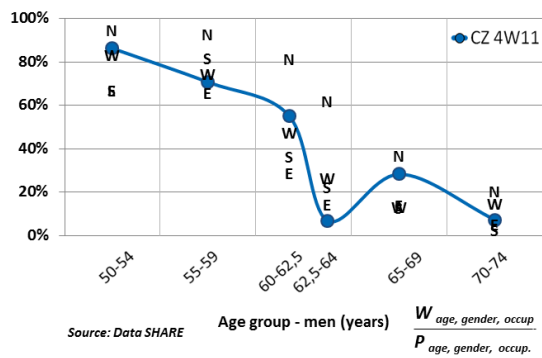
Percentage of Working Men in Manual Occupations



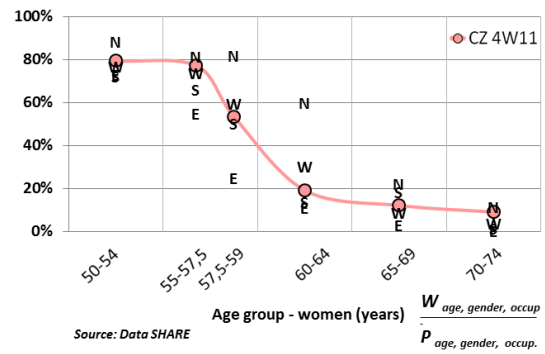
Percentage of Working Women in Manual Occupations



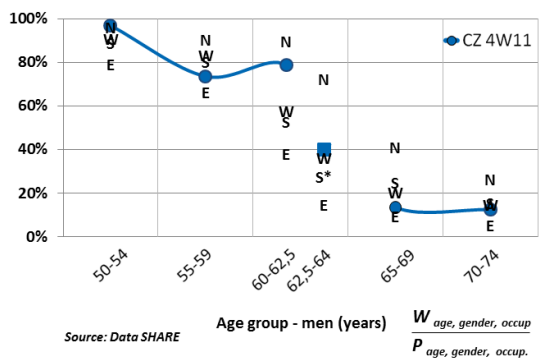
Percentage of Working Men in Services



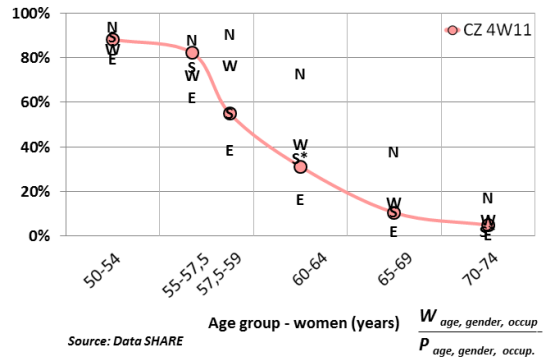
Percentage of Working Women in Services



Percentage of Working Men in Professional Occupations



Percentage of Working Women in Professional Occupations



HEALTH VARIABLES

General Health: Chronic Diseases

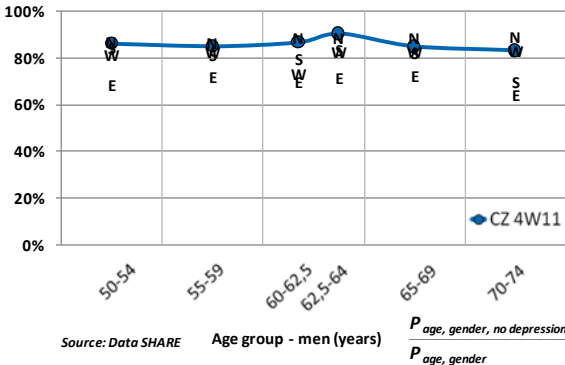
The list of chronic diseases consists of: 1. A heart attack including myocardial infarction or coronary thrombosis or any other heart problem including congestive heart failure; 2. High blood pressure or hypertension; 3. High blood cholesterol; 4. A stroke or cerebral vascular disease; 5. Diabetes or high blood sugar; 6. Chronic lung disease such as chronic bronchitis or emphysema; 7. Asthma; 8. Arthritis, including osteoarthritis, or rheumatism; 9. Osteoporosis; 10. Cancer or malignant tumour, including leukaemia or lymphoma, but excluding minor skin cancers; 11. Stomach or duodenal ulcer, peptic ulcer; 12. Parkinson's disease; 13. Cataracts; 14. Hip fracture or femoral fracture; 15. Other fractures; 16. Alzheimer's disease, dementia, organic brain syndrome, senility or any other serious memory impairment; 17. Benign tumour (fibroma, polypus, angioma).

Mental Health: EURO-D Depression Scale

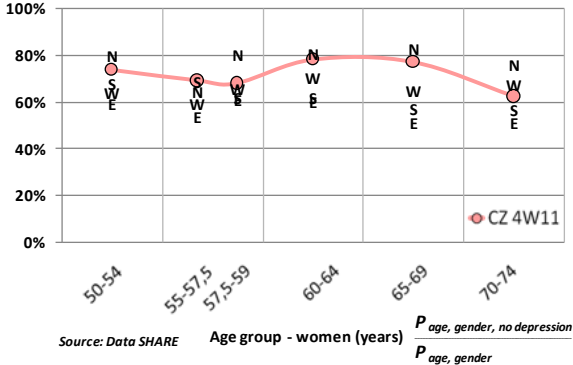
Variables include: depression, pessimism, suicidal tendency, guilt, sleep, lack of interest, irritability, appetite, fatigue, concentration, enjoyment, and tearfulness. The EURO-D index equals one if one of the variables is indicated. Graphs A3 and A4 show the percentage of men and women without depression and their labour force participation.

GRAPH A3

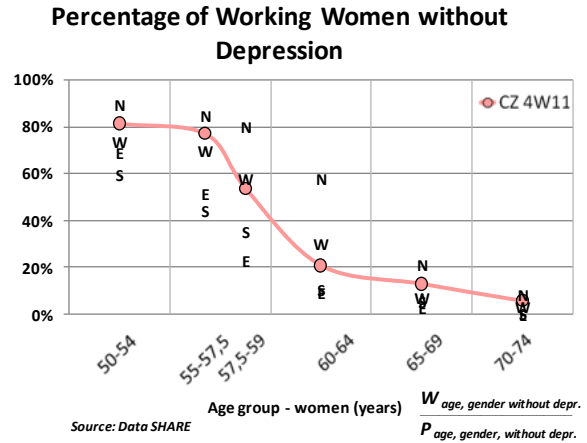
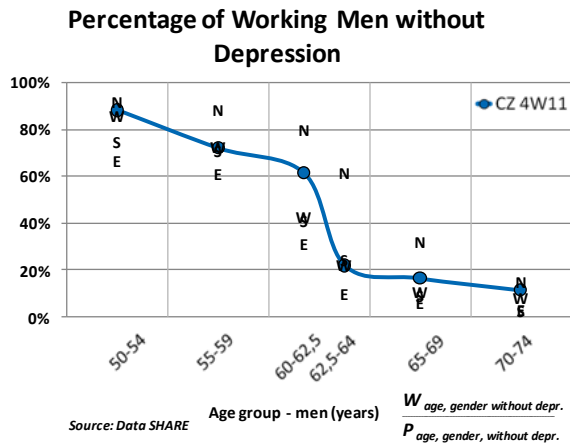
Percentage of Men without Depression



Percentage of Women without Depression



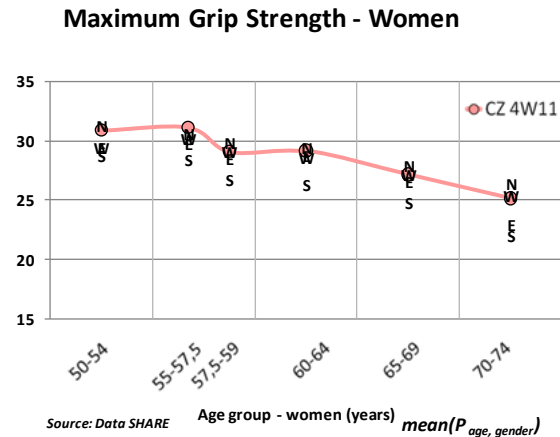
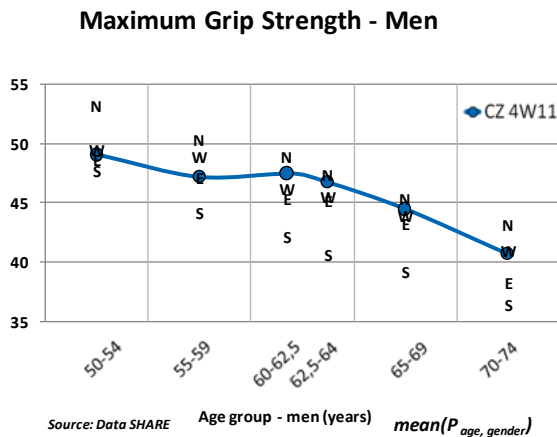
GRAPH A4



Objective Measurement of Physical Health: Grip Strength

Two grip strength measurements on each of the respondents' hands are recorded with a dynamometer. Maximum grip strength is defined as the maximum grip strength measurement of both hands (2x2) or of one hand (1x2). The following two graphs A5 and A6 show the grip strength performance for each age group.

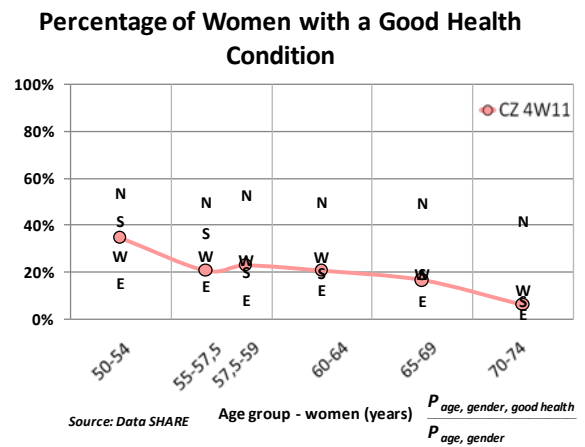
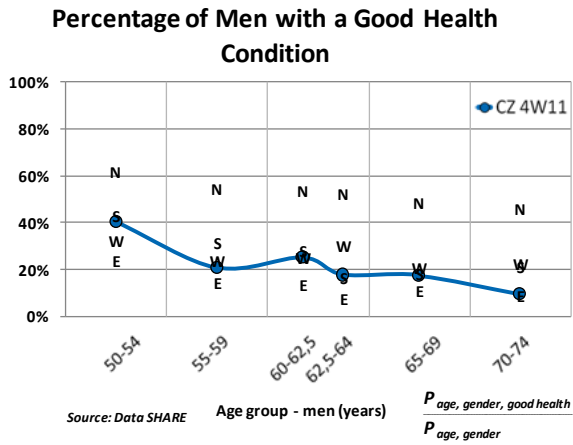
GRAPH A5



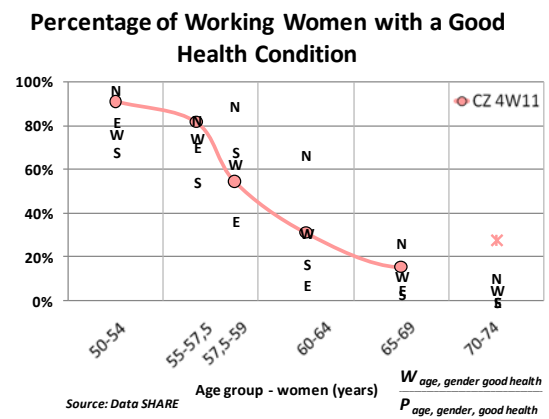
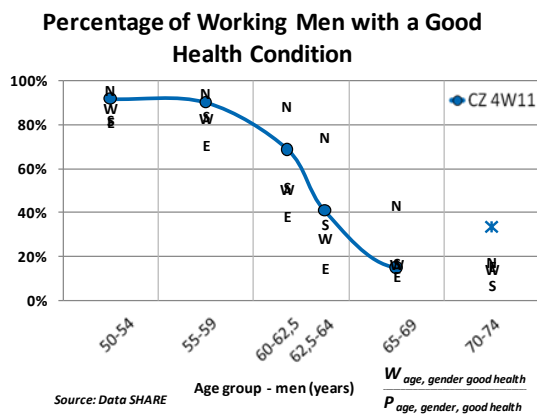
Self-Perceived Health

This measure of general health is adopted from the Health and Retirement Study in the United States, SPHUS (Self-perceived health US version). The derived index dichotomises the US version of self-perceived health into two categories: (0) very good and excellent and (1) less than very good, shown in graphs A7 and A8.

GRAPH A6

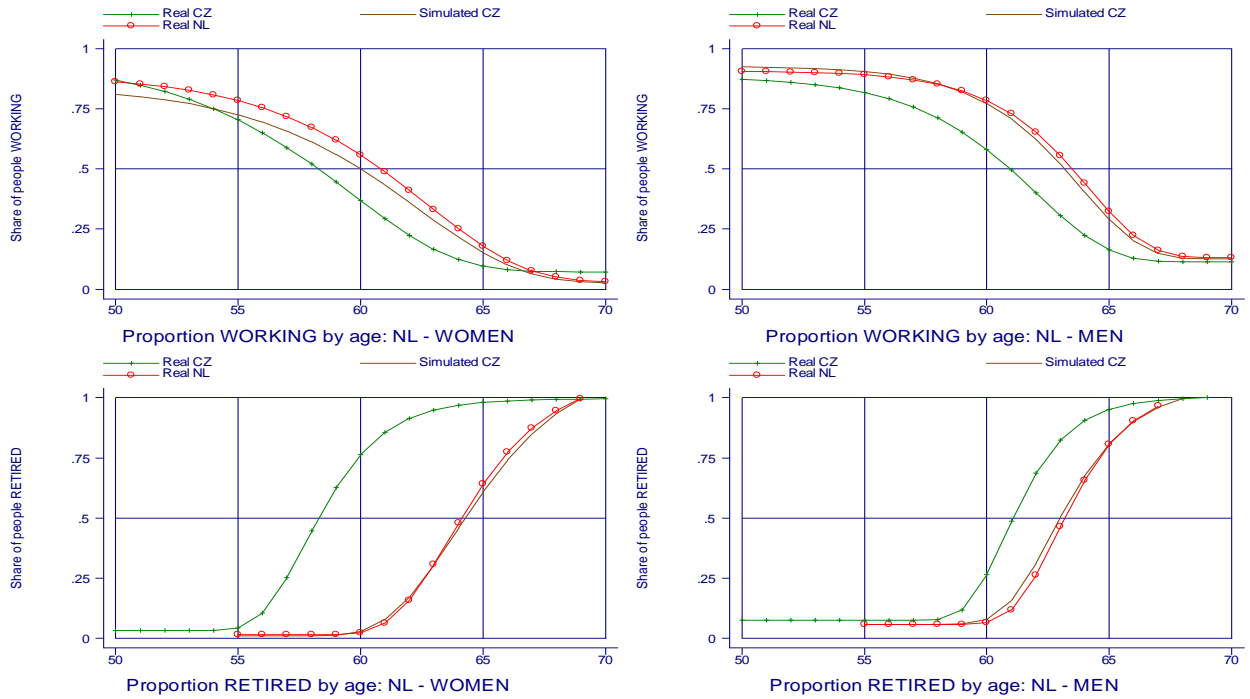


GRAPH A7



GRAPH A8

Employment and retirement probabilities in the Czech Republic and Netherlands in 2013



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Warning: This study represents only the views of the authors and not the official position of the Charles University in Prague, Center for Economic Research and Graduate Education as well as Economics Institute ASCR, .v.v.i.

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DATA FOR THIS STUDY WERE USED FROM SHARE



The Survey of Health, Ageing and Retirement in Europe (SHARE) is a multi-disciplinary and cross-national panel database of micro data on health, socio-economic status and social and family networks of more than 110,000 individuals (approximately 220,000 interviews) from 20 European countries (+Israel) aged 50 or over.

SHARE data are accessible for free after registration at the data archive. Please see www.project-share.org or <http://share.cerge-ei.cz> for downloading data, examples of statistical software codes, methodology and all other information.

For further information contact radim.bohacek@cerge-ei.cz

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Study of the Institut for Democracy and Economic Analysis

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