

# Why Women Leave Earlier: What Is Behind the Earlier Labour Market Exit of Women in the Czech Republic\*

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**Abstract:** The article examines the factors that intervene in decisions to leave the labour market in the Czech Republic from a gender perspective. It uses binary logistic regression to identify the variables that predict the economic inactivity of men and women at the age of 60 plus and the interactions of variables to examine whether the factors that determine when people exit the labour market are the same for men and women. The analysis uses data from the Labour Force Study (LFS) collected in the fourth quarter of 2017 and focuses on people between the ages of 60 and 69 and five independent variables: gender, education, pension eligibility, marital status, and type of job. It studies how gender intersects with other characteristics in the decision to retire from the labour market. Although pension eligibility is the central predictor of economic inactivity after the age of 60, when eligibility is controlled for here, it is evident that gender, education, job type, and marital status all influence the timing of labour market exits. Women leave work earlier than men, and this is found to be true even when we control for their education or pension eligibility. They are also more likely than men to leave work even if they are not yet eligible to collect a pension. The effect of education is not as straightforward for women as for men: women with the lowest and with the highest levels of education are more likely to continue to work than men with the same educational attainment. Policies to prolong people's working lives may thus have a different impact on each gender.

**Keywords:** retirement, pension, gender, ageing, extended working lives

*Sociologický časopis/Czech Sociological Review, 2022, Vol. 58, No. 3: 257–283*

<https://doi.org/10.13060/csr.2022.014>

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\* This text was published with the support of the project 'Dynamics of Accumulated Inequalities for Seniors in Employment', (Acronym: DAISIE), funded by EU NORFACE programme Dynamics of Inequality Across the Life-course (DIAL), project no. 462-16-113. This article was written with the support of grant project no. 21-08447S of the Czech Science Foundation titled 'Digitalisation on the Labour Market: Challenges, Opportunities and Inequalities for Older Workers'.

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The Czech Republic, together with all the countries of Europe and North America, is experiencing rapid demographic ageing. Declining fertility, which leads to a shrinking working-age population, and rising life expectancy are resulting in a growing imbalance between the proportion of the population who are collecting a pension and the proportion who are paying into the pension system. Older people are being repositioned in the public discourse as a 'dependent group' [Biggs and Powell 2001], and individuals are expected to manage their own risks by managing their pensions themselves [see Powel and Paul Taylor 2016].

In recent decades, population ageing has caused the most developed nations to recognise the need to promote longer working lives. Most countries have shifted their policies towards the concept of 'active ageing' [Axelrad and Mcnamara 2018; Moore 2001]. Although 'active ageing' is a multidimensional concept, it is often reduced to 'working longer' [Walker 2006]. On the macro level, the labour market participation rates of older workers have risen in many countries, including the Czech Republic. In many cases, however, these changes have led to an increase in the risks people are facing. There may be negative financial implications for those who, for various reasons, cannot work longer [Powell and Taylor 2016]. As a consequence, old age poverty will probably increase because of persistent or even growing labour market inequalities at the time of transition to retirement [Schilling 2016]. In the Czech Republic, the proportion of seniors at risk of poverty is rising: whereas 8.1% of persons aged 65 and over were at risk of poverty compared to 9.7% of the total population in 2016, this was 16.6% of seniors and 10.1% of the overall population in 2019 [CZSO 2020]. Some categories of older people are more at risk than others – especially older women and persons living alone [Rašticová, Bédiová and Žiaran 2018].

Because of the way social security systems in European countries like the Czech Republic are set up, (extended) employment is one of the most important factors protecting people from significant loss of income and poverty. It protects them both directly – delivering (extra) income and allowing for savings – and indirectly – as the number of years of contributions plays a role in the amount of benefits received in most pension systems. However, certain groups are less able or less willing to continue to work at an older age. In many countries, there are significant gender differences in retirement timing and economic activity in later age. According to some authors, the policies of extending working lives may be detrimental to women [König 2017; Léime and Street 2017; Radl 2012].

In the Czech Republic in 2018, the average age of people exiting the labour market was 63.2 years for men and 61.3 years for women [OECD 2019]. Reaching the statutory retirement age is the most common reason for leaving the labour market. The difference between the retirement age of men and women can be explained by the lower age at which women are entitled to draw a state pension; the gap has been gradually closing with every cohort as the statutory retirement age of women has been rising faster than that of men. Although other individual characteristics, such as education, health, or job satisfaction, mediate the effect

of pension eligibility, it is eligibility that continues to be the main predictor of labour market exit [Pertold and Federičová 2019]. In this article, we ask whether the factors that intervene in the decisions to leave the labour market are identical for women and men, and whether the earlier labour market exit of women is driven solely by their earlier eligibility for retirement benefits or whether there are other factors at play. We use binary logistic regression to identify the variables that predict economic inactivity at the age of 60 plus and their interactions. This allows us to study how gender intersects with other characteristics in the decision to retire from the labour market. It is crucial to see whether the predictors of retirement are the same for men and women, because if the 'pull' and 'push' factors [see Vidovičová 2016] work differently for each gender, this may lead to the further disadvantaging of women in later age.

### Theory and context

According to existing studies, the decision to continue working or to retire depends on several factors.<sup>1</sup> Pension eligibility affects participation in the labour force since many older workers tend to retire at the age at which they become eligible for retirement benefits [Axelrad and Mcnamara 2018]. Pertold and Federičová [2019] showed that the vast majority of older workers in the Czech Republic retire when they become entitled to a pension, whether that means early or standard retirement. Only a very small percentage of workers leave later after reaching the statutory retirement age. The Czech Republic is one of the European countries in which the difference between the actual and the statutory retirement age is small (the latter being around 63 years for men and 62 years for women; OECD [2019]). This may indicate that people, as rational actors, will decide to retire once they receive a sufficient income in the form of a pension and, at the same time, there are no significant motivations for them to go on working longer [see Šatava 2015]. Employers may more easily lay off people who have reached the official age of pension eligibility. Employees and/or employers may see reaching a pensionable age as a signal that a person should leave work.

In 2004 Ladislav Rabušic addressed the paradox of middle-aged Czechs indicating in surveys their preference for early retirement while being aware that their level of income would decrease substantially. He explained this paradox as the result of a mentality about retirement that was formed by the specific characteristics of the state-socialist labour market. Lucie Vidovičová [2016] argued that in the Czech Republic, the perception of retirement as a 'natural' right keeps the pre-

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<sup>1</sup> The term 'decision' does not imply that people choose freely to remain in or to leave the labour market. Choices are always dependant on social structures, institutions, and norms, and thus are constrained by the context in which they are made [see Hašková and Dudová 2017].

ferred retirement age low. Repeated parametrical changes to the pension system, strongly felt age discrimination, and unemployment in the 50+ age group produce feelings of uncertainty and 'push' older workers out of the labour market.

Pension rules and labour market and welfare policies present mechanisms that push people out of employment and/or pull them into retirement and thereby guide their decisions on when to leave work [Kohli and Rein 1991]. Their effects, however, are mediated by and depend on individual characteristics that represent sources of inequality with respect to one's position in the labour market. Among these characteristics are: gender [Ní Léime 2017], class [Radl 2012], education [Potočník, Tordera and Peiró 2009], health [Heponiemi et al. 2008; Krejčová and Žiaran 2018; Mein et al. 2000], job satisfaction [Axelrad and McNamara 2018], and family situation and care obligations [Ciccarelli and Van Soest 2018; Ogg and Renaut 2007]. We assume that these characteristics intersect and that their effects are never isolated from one another, as they form a matrix of social positions and inequalities. It is therefore necessary to study the process of the labour market exit from an intersectional perspective [see Choo and Ferree 2010]. This approach uncovers how sources of inequalities become significant in relation to one another and how they jointly (re)produce various multidimensional hierarchies [Choo and Ferree 2010; Collins and Bilge 2016].

In most EU countries, women usually retire earlier than men [OECD 2019]. We can partly explain this by the lower statutory retirement age of women that existed until recently in five European countries. Older women are also less likely to be registered as unemployed, which probably means that unemployed women are more likely than unemployed men to leave the labour force or retire [Axelrad and McNamara 2018]. Women are particularly more likely to retire early under adverse economic conditions; this, however, depends substantially on their education level, economic status, family background, and country context [Ní Léime 2017; Radl 2012]. Conversely, in some countries, such as the UK and Switzerland, women are more likely than men to extend paid work beyond the state pension age. Finch [2014] explains this by the fact that women are less able to build pension income because of their caregiving role within the family. They remain in paid employment for financial reasons, to make up for the 'opportunity costs' of their family roles, namely career breaks to care for children or parents, or the increased expense of being divorced and raising children as a single parent [Finch 2014]. Analysing Western European SHARE datasets, Radl [2013] found that when other characteristics are controlled for, women do not retire significantly later or earlier than men. He assumed that there may be two opposing mechanisms that cancel each other out: while gender stratification and gendered preferences push women towards an early exit, pension constraints and mid-career selection effects pull them towards later retirement.

Gender structures more than just the economic resources that are available to individuals. Different gender roles and identities also influence individuals' social capital, non-labour market activities, care commitments, and even their

attachment to paid work. For women who are less likely to have strong occupational identities it can be easier to move out of work, while men with traditional gender identities are rather ill-suited to adapting to retirement [Barnes and Parry 2012]. Women also more often experience job discrimination, are subject to ageism [Itzin and Phillipson 1995; Duncan and Loretto 2004], and earn less than men, even when they occupy the same positions [Křížková, Penner and Petersen 2009]. This may play a role in the decision of some women to leave the labour market.

A low education level was found to be positively associated with the odds of being retired for both men and women. This may be because higher levels of education often translate into more attractive and higher-income occupations and possibly into better working conditions [Potočník et al. 2009]. McNamara and Williamson [2004], using the 1998 US Health and Retirement Study, showed that female gender moderated the effect of low education – the effect was stronger for women than for men. Women with low education may have had more difficulty finding employment than men with equivalent levels of education. Moreover, education intersects with health: higher education is usually reflected in better health. Ross and Wu [1996] found that the gaps in self-reported health, in physical functioning, and in physical well-being among US residents with high and low educational attainment increased with age: the health advantage of the well-educated was larger in older age groups than in younger ones. Social class was also found to impact strongly on retirement behaviour – the push and pull factors affect workers in different class positions in different ways. According to Radl's analysis of Western European countries in the SHARE database [2012], those who retired the latest were at the upper and lower ends of the occupational ladder. The way in which social class influenced retirement timing was largely the same for men and women. The fact that women are pushed out of the labour market at a younger age than men thus seemed largely due to their disadvantaged class position [Radl 2012].

Poor physical health is a strong predictor of early retirement [Heponiemi et al. 2008; Mein et al. 2000]. However, the many studies examining the relationship between health and retirement have failed to agree on the relative importance of health compared with financial variables [see, e.g., Leinonen et al. 2016]. The difficulty of correctly measuring health status hampers such efforts. Much of the concern centres on the suspicion that subjective reports of health are biased by individuals using poor health as a justification for early retirement. Another concern is that the direction of causality in the relationship between health and retirement is unclear and difficult to assess [Jones, Rice and Roberts 2010]. The analyses of the Czech sample of Wave 6 of SHARE (2016) by Krejčová and Žiaran [2018] and Bédiová, Šácha, and Žiaran [2018] identified two health factors to be significant for seeking early retirement: the fear of health limits and the number of chronic diseases. At the same time, Martina Rašticová et al., in their analysis of EU-SILC waves 2010 and 2015 discovered that the health status of Czech economically active seniors in the age groups of 50–59 and 60+ was worse than

among economically inactive seniors, and it was worse in the 2015 wave than in 2010 [Rašticová et al. 2018]. Mazzonna and Peracchi [2017], analysing the first two waves of SHARE, discovered that, on one hand, retirement enhanced the age-related decline of health and cognitive abilities for most workers, and that, on the other hand, there was a positive immediate effect of retirement from jobs characterised by a high level of physical burden.

The likelihood of people working in older age is greater if they are satisfied with their job. Axelrad and McNamara [2018] in their analysis of SHARE Waves 4 and 5 found that a lack of job satisfaction had a stronger negative effect on labour force participation among women compared to men [Axelrad and McNamara 2018]. A lack of job satisfaction was also one of the most significant factors driving people to 'look for early retirement' in the analysis of the Czech sample of Wave 6 of SHARE by Krejčová and Žiaran [2018]: the more unsatisfied people were with their job the more likely they were to be looking for early retirement. In this sample, high job satisfaction strongly moderated the tendency to seek early retirement. It was accompanied by a strong tendency to remain in the labour market despite workplace adversity – stemming from the stress and/or physical demands of the job [Bédiová et al. 2018].

Family situation and care obligations also affect decisions about retiring from the labour force, and their impact is different for men and women. Based on data from the first wave of SHARE (2004), Ogg and Renaud found that women who were living with a partner had substantially lower employment rates in later age than men living with a partner; these rates, however, differed significantly across countries [Ogg and Renaud 2007]. Ciccarelli and Van Soest found a significant and negative effect of daily and almost-daily caregiving on employment status and working hours in the 50+ population in 15 European countries. This effect was particularly strong among women and did not differ across European regions. They concluded that the negative effects of informal caregiving on women hamper policies aiming at increasing the labour force participation of women in the 50+ age group [Ciccarelli and Van Soest 2018]. We may also expect that being a grandparent would impact the decision to retire, especially among women, as gendered role differences mean that there is a greater tendency for grandmothers to care for grandchildren compared to grandfathers [e.g. Albertini et al. 2007]. The analysis of SHARE data by Hochman and Lewin-Epstein [2013] confirmed that being a grandparent increases an individual's chances of looking forward to retiring early. However, their findings provided no confirmation of the expected tendency of women to be more subject to the effect of grandparenting than men because of their stronger familial commitments, irrespective of the family policy regime.

Aine Ní Léime and Debra Street [2017] argue that most of the policies to extend working life rest on a number of assumptions in the ungendered adult worker model. First, they assume that work is readily available to older workers; second, that older workers are and have been free to work; third, that they

are healthy enough to work; and fourth, that they earn enough to contribute to a pension. These assumptions, however, do not hold for everybody, and especially not for many women. Most countries (including the Czech Republic) have significant gender wage gaps, as women are segregated horizontally into low-paid occupations and vertically into low-paid positions. Moreover, women typically experience gaps in employment and pension-building because they must usually fit employment around unpaid family care. The result is the gender pension gap and higher risk of poverty and social exclusion for older women [Léime and Street 2017]. Reliance on private pension funds or savings again disadvantages those whose life-long incomes were too low to generate reserves.

While there are intentions to eliminate pension policies that (re)produce inequalities, the pension reforms introduced during the last several decades led to the individualisation of the risks of ageing [Wainwright and Kibler 2014] and to the extension of working lives, with different impacts on different groups of people. We therefore need an intersectional perspective to capture the specific situations of people at the intersections of various dimensions or axes of (dis)advantage, such as gender, class (job position), education, and age. Research also indicates that the combination of these axes of disadvantage with various other situations and conditions (health status, care obligations, relationship status, and household composition) significantly impacts employment and economic inequality in later life.

The transition from work to retirement represents a critical life event with long-term consequences for economic well-being in old age. While early retirement is a privilege for some, for others it means involuntary exclusion from gainful employment [Vickerstaff 2010]. Not all workers are equally able or likely to continue working. Making (early) retirement less affordable puts these vulnerable groups at a disproportionate risk of poverty or financial dependence in old age. In other words, if women leave the labour market earlier (solely) because they became eligible for the retirement pension earlier, the postponement of statutory retirement age may in theory equalise the situation of women and men, and thereby also help narrow the gender pension gap. If they leave earlier for other reasons, i.e. their labour market exit is mediated by other factors, such as caring for dependent family members, fewer work opportunities, or worse health, then the postponement of statutory retirement age may lead to their further disadvantaging.

In this paper, we are interested in how gender moderates the role of other predictors of labour force participation in later age, especially eligibility for retirement benefits (an exceptionally strong factor in the Czech Republic; see Pertold [2019: 10]), but also education, job position or job characteristics, family status, and age. We aim to discover whether the role these factors play in decisions about retirement are the same for men and women in the Czech Republic.

## **Question and methods**

In the following sections, we will analyse the relations between characteristics linked to the timing of the labour market exit among Czech employees aged 60 plus, such as gender, education, eligibility for retirement benefits, family status, and their type of job. First, we will present a descriptive analysis of the factors that may influence the timing of the labour market exit and the reasons for retirement. Then, using binary logistic regression analysis, we answer the first research question:

- (1) Which personal and employment characteristics are linked to an earlier labour market exit when other characteristics (such as gender, education, and the eligibility to retirement benefits) are controlled for?

This will give us insight into the relative weight of the pension eligibility factor (which is presumably the strongest predictor of labour market exit in the Czech Republic) and other factors, such as gender, education, and the type of job a person has, that mediate its effect. We will thereby look at whether the fact that women leave work earlier than men is just a consequence of their earlier eligibility for a pension, their lower education, or the greater share of them working in low-qualified, blue-collar, and physically demanding jobs, or whether there are any other factors at play. We will examine whether women are just as likely to remain in the labour market (or leave it) when they become eligible for a pension if they have the same education and job type.

Using an analysis of interactions in the binary logistic regression model, we will then answer the second research question:

- (2) Do the characteristics of earlier labour market exits (such as pension eligibility, education, job type, etc.) interact in the same way for men and women? That is to say, do the predictors of an earlier labour market exit have the same weight?

This will reveal whether other characteristics mediate the influence of pension eligibility on labour market exit (as the main 'pull' factor) similarly or differently for women and men. More generally, we are interested in whether the decision to retire from work is determined by the same factors for men and for women, or by different factors, or by the same factors but with different weight.

## **Data**

We use Labour Force Study (LFS) data collected in the fourth quarter of 2017 for the analysis. The advantage of this dataset is that it contains detailed information on job position and labour market status (including history), retirement status,

and the type of pension drawn. This allows us to discern individuals both in active employment and eligible for a pension, something most other datasets do not allow. Absence of information on individual or household income and health status is an important disadvantage of the data. Furthermore, it would be highly beneficial for our topic to know why someone who is not yet eligible for an old-age pension is no longer working, or why someone who is eligible for a pension is still working. Such extensive and complex data allowing a much more precise and in-depth investigation of the subject matter is, unfortunately, not yet available for the Czech population. The SHARE database, usually used for research on the 50+ population in Europe, does contain answers to more detailed questions, but it has a much smaller number of observations. This makes it impossible to examine who is working despite being eligible for a pension or who is not working despite not being eligible (for more information about SHARE data, see Börsch-Supan [2020]). Even so, SHARE allows us to answer some specific questions to guide our subsequent interpretation of the results of the analysis. For this reason, we used it alongside LFS data to describe the situation. The dataset's limitations constrain the analysis presented below. The analysis leaves much room for improvement or supplementation from other sources, but it strives to decipher the workings of those important aspects that can be tested on the data.

### Description of the situation

According to the 2017 LFS data, one-third of all employed persons in the Czech Republic were aged 50+. There was a significant – 19% – gender gap in employment rates. While the employment rate of men aged 55–64 was 71.7%, only 53% of women in the same age group were employed. The largest decline in economic activity occurred between 61 and 64 years for men and between 58 and 62 years for women. The employment rate of men aged 65+ was only 8.7%, compared to 4.7% for women. Although the decline was slightly more gradual for women, it occurred very quickly for both groups, at about the time of their legal right to draw the state old-age pension.

Education was a significant determinant of staying economically active: people with secondary education who had completed a graduation exam (*matuřita*) and especially people with higher education were significantly more likely to be economically active in the cohorts aged 50 and older. Concerning job position, men working as professionals, technicians and associate professionals, and services and sales workers were significantly more likely than other groups to continue working after the age of 60. Conversely, men working as craft and related trades workers, plant and machine operators and assemblers, and elementary occupations (thus mainly blue-collar workers) were significantly more likely to be out of the labour market by the age of 60 and over. While 70% of craft workers and plant and machine operators were inactive at that age, only 41% of professionals aged 60+ were out of work. Concerning women, those more likely to be

**Table 1. Reasons for retirement in the Czech Republic**

Main reason for retirement; percentage of all retired persons	All (%)	Men (%)	Women (%)
Eligible for state retirement benefits	76.9	79.7	74.9
Eligible for employer retirement benefits	0.2	0.0	0.3
Eligible for private retirement benefits	0.1	0.0	0.1
Early retirement offer with benefits	5.3	4.8	5.7
Became unemployed	6.8	5.5	7.7
Personal health	10.0	10.3	9.8
Poor health of a parent or friend	1.3	0.2	2.2
To retire at the same time as a partner	0.2	0.4	0.1
More time with the family	2.1	2.5	1.8
To enjoy life	2.0	1.9	2.0

Note: Share Wave 5, N = 1268.

out of the labour market were, similarly to men, in the categories of craft and related trades workers and plant and machine operators and assemblers, but also clerical support workers. Unlike men, women who worked in elementary occupations were significantly more likely to be employed than other categories.

Among the total unemployed population (people registered with the Public Employment Office), 29% of men and 33% of women were between the ages of 51 and 60. Although the unemployment rate was generally low in 2017 (2.3%), it was the highest in the 51–60 age group (4%). This age group was also more often affected by long-term unemployment (longer than 1 year).

At the age of 65, 22% of working men and 29% of women were self-employed, compared to 15.5% of men and 11% of women aged 40. This probably reflects two different trends: first, self-employment serves as a ‘bridge job’, allowing for flexible work and partial retirement in later age, and second, self-employed persons retire later because they do not yet meet the eligibility criteria (e.g. a minimum number of years worked). The share of fixed-term contracts was also significantly higher in the cohorts above middle age: 23% of employed men and 36% of women at the age of 65 were on fixed-term contracts, most of them short-term contracts, compared to 4% of men and 10% of women at the age of 40. These employment characteristics indicate the precarious position of older people in the Czech labour market, with women being at a greater risk than men of early labour market exit, unemployment, and precarious working conditions.

According to Wave 5 of SHARE (2013),<sup>2</sup> eligibility for state retirement benefits was the main reason why people retired in all the European countries that took part in the survey except Denmark and Estonia. However, the Czech Republic ranked among the countries where the largest share of retired people considered this the most important reason (together with Austria, Spain, Italy and Slovenia). In the Czech Republic, almost 80% of retired men and three-quarters of retired women chose this option, while only 10% said that the main reason was their health (see Table 1). Health was stated by 18.8% of the respondents in Germany and 17.3% in Austria.

The analysis of the 2015 SHARE data (Wave 6) for the Czech Republic revealed that the employment income of individuals aged 50 and older was correlated with education and the type of job. There were statistically significant differences between working men and women aged 60–69 in how satisfied they were in their main job. While 94% of both groups were satisfied at work, women were ‘highly satisfied’ much more often than men (40% of women compared to 23% of men, total N = 248). However, there were no differences in job satisfaction between working men and women aged 50–59. There may be a specific group of women who continue to work after the age of 60 and are highly satisfied in their jobs. Working men and women in their sixties also differed in how they felt about any health limits to their ability to work: men more than women were concerned about poor health preventing them from working before they became eligible for a pension. This was also the case of the younger age category of fifty-somethings. However, no statistically significant differences in subjective health or in the number of chronic illnesses were observed between men and women aged 50–59 (N = 793) or 60–69 (N = 1936) in Wave 6 of SHARE. Therefore, these factors likely cannot explain the earlier labour market exit of women.

Based on LFS data, we find that after the age of 60, men are more likely to remain in paid work than women, people with a higher (university) education are more likely to be employed than people with a secondary or lower education, and people working mostly blue-collar jobs leave work earlier than managers, professionals, and technicians. In the following section, we will try to determine how these factors are connected.

### Binary logistic regression

The following section of the paper presents the results obtained from binary logistic regression (BLR) and binary logistic regression with interaction terms. This analysis is recommended for intersectional studies of combinations of various (dis)advantaging factors [Křížková, Hašková and Pospíšilová 2018]. It is also suit-

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<sup>2</sup> The results are similar in SHARE Wave 6 (2015), but the N of observations in Wave 6 is small.

able in the present case where the disadvantaging factors of continued labour market participation include gender (female), low education, blue-collar job, and having attained pension eligibility. In BLR, the dependent variable can have only two values (0, 1) and the odds of the phenomenon of interest occurring (1) or not occurring (0) are predicted. For categorical explanatory variables, one category is always selected as a reference and the odds calculated for the other categories are compared to those of the reference category. The dependent (explained) variable here is the economic activity of people aged 60+, namely whether they are working (1) or not (0). 'Working' means being economically active and at the same time not being unemployed. This construction of the dependent variable is based on the fact that unemployment in the 60+ age group may conceal a labour market exit: a person who has only a few months or years left until they are eligible for a statutory pension may find unemployment benefits more advantageous than early retirement. At the same time, they no longer expect to find a new job. This construction of the variable therefore seems better than the economic activity variable. The independent (explanatory) variables, then, are those expected to correlate with a person continuing to work at a later age. They include gender (male, female), education (primary, secondary with no school leaving exam – *maturita*, secondary with the school-leaving exam – *maturita*, tertiary), eligibility for an old-age pension, early retirement, or a disability pension (yes, no), job type (blue-collar, white-collar, see Křížková, Hašková and Pospíšilová [2018]),<sup>3</sup> marital status (single, married, widowed, divorced). Age and region were tested as control variables. Because of the high multicollinearity with the pension eligibility variable, age was eventually excluded from the model (pension eligibility was found more beneficial for the model).

Thus, the BLR model helped us to test whether the independent variables show a statistically significant correlation with staying in employment after the age of 60 when controlling for the other variables in the model. In the following steps, interaction terms were used to test the relationships between gender and each independent variable to reveal whether those relationships hold independently of gender or whether there are any differences between women and men. When an interaction term proves statistically significant, this procedure allows us to quantify the differences between men and women as the odds that the phenomenon of interest (work after sixty) will occur for a specific combination of explanatory variable categories compared to the reference category.<sup>4</sup>

Individuals aged 60+ (i.e. those several years before pension eligibility and older) enter the analysis. Most of the analyses are conducted on a sample of 7175

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<sup>3</sup> Job type refers to the person's current job in the case of working respondents and their most recent job in the case of unemployed and economically inactive respondents. White-collar jobs are deemed to include CZ-ISCO categories of 1–5, blue-collar jobs CZ-ISCO 6–9 ([https://www.czso.cz/csu/czso/klasifikace\\_zamestnani\\_-cz\\_isco-](https://www.czso.cz/csu/czso/klasifikace_zamestnani_-cz_isco-)).

<sup>4</sup> For more on calculating the odds for interaction terms, see Křížková et al. [2018].

**Table 2. Dataset description**

Variable	Categories	Distribution (%)
Economic activity	Employed	37
	Unemployed and inactive	63
Gender	Male	54
	Female	46
Education	Primary	10
	Secondary, no school-leaving exam ( <i>maturita</i> )	42
	Secondary, with school leaving exam ( <i>maturita</i> )	31
	Tertiary	17
Pension eligibility	No	18
	Yes	82
Job type	Blue-collar (ISCO 1–5)	57
	White-collar (ISCO 6–9)	43
Marital status	Single	3
	Married	71
	Widowed	11
	Divorced	15
Region	Prague	8
	Central Bohemia	12
	South Bohemia	16
	West Bohemia	10
	North Bohemia	17
	East Bohemia	16
	South Moravia	11
	North Moravia	10

Note: Only 60+ individuals who completed all this information.

individuals aged 60+ who completed all the information needed for the analysis.

Unfortunately, the dataset does not contain variables for a number of factors of possible significance for people continuing to work even after they attain state pension eligibility (e.g. health status, income level, or job satisfaction). While their effects cannot be controlled directly in the analysis, we draw some information from the SHARE database, which does cover such variables.

Table 3. Binary logistic regression, odds of continuing to work after 60 – first part

Independent variable	Categories	Exp(B), baseline model	Gender × education	Gender × pension eligibility	Gender × job type
Gender	Male (ref.)	1	1	1	1
	Female	0.854*	1.557	0.880	1.094
Education	Primary (ref.)	1	1	1	1
	Secondary, no maturita	1.169	1.988*	1.158	1.259
	Secondary, with maturita	1.976***	3.101***	1.961***	2.118***
	Tertiary	3.494***	5.090***	3.474***	3.641***
Pension eligibility	Yes (ref.)	1	1	1	1
	No	87.639***	88.054***	111.799***	89.697***
Job type	Blue-collar (ref.)	1	1	1	1
	White-collar	1.318**	1.365***	1.324***	1.534***
Marital status	Married (ref.)	1	1	1	1
	Single	0.702	0.711	0.707	0.709
	Widowed	1.151	1.154	1.146	1.144
	Divorced	1.358***	1.356***	1.356***	1.362***

Table 3. Binary logistic regression, odds of continuing to work after 60 – second part

Independent variable	Categories	Exp(B), baseline model	Gender × education	Gender × pension eligibility	Gender × job type
Region	Prague (ref.)	1	1	1	1
	Central Bohemia	0.796	0.800	0.796	0.796
	South Bohemia	0.948	0.954	0.945	0.941
	West Bohemia	1.042	1.050	1.041	1.039
	North Bohemia	1.010	1.022	1.006	1.003
	East Bohemia	0.892	0.896	0.890	0.885
	South Moravia	0.866	0.873	0.862	0.860
	North Moravia	0.848	0.852	0.848	0.845
Gender and education	Female, sec., no m.	–	0.445**	–	–
	Female, sec. w/ m.	–	0.540*	–	–
	Female, tertiary	–	0.632	–	–
Gender and pension eligibility	Female, no eligibility	–	–	0.478*	–
Gender and job type	Female, white-collar	–	–	–	0.697*
Constant		0.166***	0.103***	0.165***	0.145***

Source: LFS for the 4th quarter of 2017.

Notes: N = 7175 respondents aged 60+. Rows labelled (ref.) = reference categories; \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001. Model characteristics: The Chi-squared test is statistically significant for all models (the model with explanatory variables explains the dependent variable better than the constant-only model), the Hosmer-Lemeshow test is statistically non-significant for all models (all models are a good fit to real data). Nagelkerke R<sup>2</sup> = 0.457 for the baseline model, 0.458 for all models with added two-way interaction terms.

## Binary logistical regression – baseline model

The BLR model predicts an individual's odds of still working for pay after the age of 60. The baseline model results (see Table 3) indicate that gender is statistically significant. Even when controlling for other model variables, women are 15% less likely than men to work. Women seem to retire or exit into inactivity earlier even when controlling for the effects of their earlier pension eligibility, education, job, and marital status. Hence, other reasons not accounted for in the present model are probably responsible for their earlier exit.

The effect of education also proved significant. While there is no statistically significant difference between people with secondary education without a school leaving exam (*maturita*) and those with only primary education, the odds of working are twice as high among high school graduates with *maturita* and 3.5 times higher among college graduates. A close association can be expected between educational attainment and job type as well as level of career orientation, with the latter more likely found among college graduates.

It comes as little surprise that pension eligibility is the most important predictor of employment in this age group. Even when controlling for all other variables, a respondent who is not yet eligible for a pension is 88 times more likely to work after 60. Becoming eligible for a pension is the most important predictor of retirement and drives the decisions of an overwhelming majority of women and men. Job type also proved to be statistically significant. When controlling for other variables in the model, white-collar workers are 32% more likely to continue working after 60. This may partly have to do with the worse physical health that blue-collar workers often experience over time as a result of hard manual labour and with the fact that white-collar jobs are more often held by career-oriented individuals, who remain active even after becoming eligible for a pension.

As for marital status, single and divorced individuals do not show any statistically significant difference from married people (the reference category), but widowed ones do, as they are 36% more likely to be working after 60. We could speculate that their higher rate of labour market participation has to do with the absence of a partner and someone to spend their leisure time with, but the same hypothesis does not hold for singles. Economic difficulties may also play a role, as the death of a partner does not lead to any significant decrease in household expenditures (e.g. housing), so people have to remain economically active to make up for the lost income.

Geographic region was included as control variable in the baseline model. It did not, however, prove to be associated with continuing to work.

The results of this model can be summarised as follows: those who most often remain economically active after the age of 60 are men, people with *maturita* or a college degree, people who are not yet eligible for a state pension, current or past white-collar workers, and people who are widowed, even when controlling for the other variables.

The following table presents the results of both the baseline model and the same model supplemented in each case by a two-way interaction term that proved statistically significant. Presented are the individual odds ( $\text{Exp}(B)$ ) of working after the age of 60, with statistical significance indicated by asterisks.

It is reasonable to assume that different factors affect labour market exits for women and men, or that the same factors affect each gender differently. For that reason, we dedicate the next step to the stepwise testing of the interaction terms between gender and all the explanatory variables. The interactions between gender and education, gender and pension eligibility, and gender and job type proved statistically significant. We present their results in the table above. We will discuss each interaction separately and quantify the differences for each combination of explanatory variables. Since the rest of the model remains the same as the baseline, it does not need to be interpreted again (the added interaction terms did not significantly change the significance or strength of the effects of the other variables).

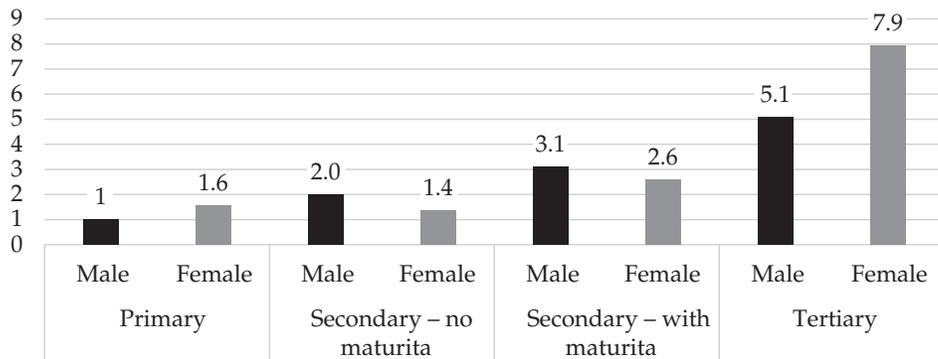
### The gender and education interaction

Table 4 contains all the combinations of gender and education and quantifies for each combination the odds that a 60+ person with these characteristics will still be working compared to the reference category, defined here as a man with primary education. The odds are calculated from the model results (Table 3, the gender  $\times$  education interaction column). The interaction results suggest that men's odds of remaining economically active after age 60 grow considerably with education. High school graduates without the school-leaving exam (*maturita*) are twice as likely to continue working, those with *maturita* are three times as likely, and college graduates as much as five times as likely to be working after age 60 than men with only primary education. The situation of women is different. Above all, the effect of education is less apparent for lower education levels. The interaction term also shows that women with primary education are as much as 56% more likely to work than men with primary education. Women with secondary education without *maturita* are 38% more likely and women with *maturita* 2.6 times more likely to be working than men with primary education; in both cases, however, the odds are lower than those of equally educated men. In contrast, there is a specific group of female college graduates who are almost 8 times more likely to work after the age of 60 than men with primary education, their odds exceeding those of male college graduates. Women aged 60+ with a post-secondary education thus exhibit a strong professional orientation. Thus, while women overall exit the labour market earlier than men, this is not necessarily the case of women with primary or tertiary education (these relationships hold even when controlling for the other model variables that for their redundancy are not presented in this table; see Table 3).

**Table 4. Binary logistic regression with the gender × education interaction – odds of continuing to work at age 60+**

Gender	Education	B	Exp(B)
Male	Primary	0	1
Male	Secondary, no maturita	0.69	1.99
Male	Secondary, with maturita	1.13	3.10
Male	Tertiary	1.63	5.09
Female	Primary	0.44	1.56
Female	Secondary, no maturita	0.32	1.38
Female	Secondary, with maturita	0.96	2.61
Female	Tertiary	2.07	7.93

**Figure 1. Gender x education interaction – odds of continuing to work at age 60+**



Note: reference group – male with primary education.

### The gender and pension eligibility interaction

As mentioned above, pension eligibility is the strongest predictor of a respondent continuing to work after the age of 60. However, the gender × pension eligibility interaction proved significant as well. Hence, we can expect the variable to work differently for men and women.

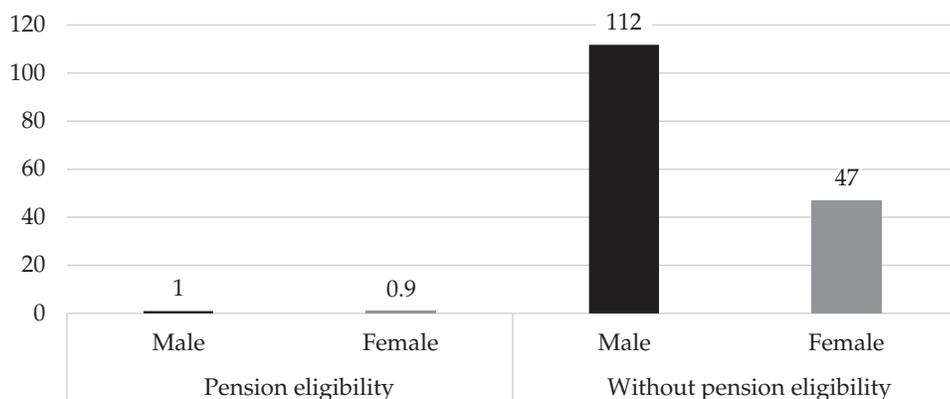
Table 5 quantifies the odds for all the combinations of the gender and state pension eligibility categories. Men eligible for a pension are the reference category here. The difference between men eligible and those ineligible for a pension is

remarkable: those who are not yet eligible are almost 112 times as likely to remain economically active after age 60 than those who are eligible. The effect of eligibility on women is also very strong but still somewhat weaker than in the case of men. Eligible women are 12% less likely to continuing working than eligible men, while ineligible women are 47 times more likely to continue working than eligible men (however, the odds are almost 50% lower than for ineligible men). Therefore, while pension eligibility is absolutely key for men and women alike, its effect is considerably stronger among men; other factors seem to have a stronger effect on women's labour market exit.

**Table 5. Binary logistic regression with the gender  $\times$  pension eligibility interaction – odds of continuing to work aged 60+**

Gender	Pension entitlement	B	Exp(B)
Male	Yes	0	1
Male	No	4.717	111.798
Female	Yes	-0.127	0.880
Female	No	3.851	47.051

**Figure 2. Gender and pension eligibility interaction – odds of continuing to work aged 60+**



Note: reference group – male with pension eligibility.

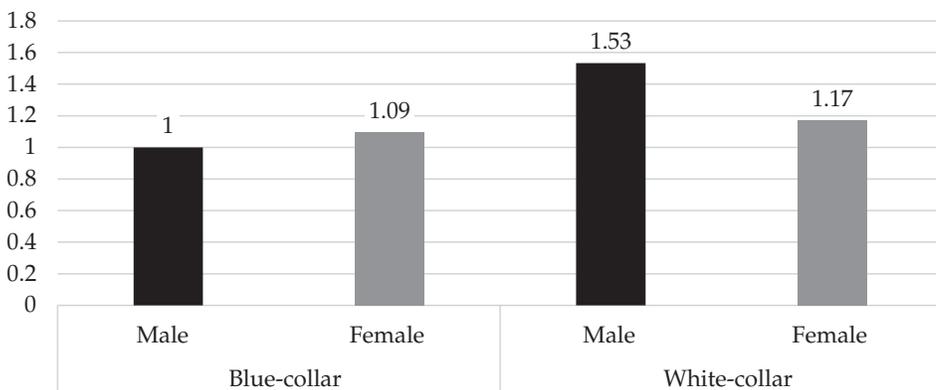
### The gender x job type interaction

The last statistically significant interaction term concerns gender and job type. Table 6 presents the quantified odds for all the combinations of the variable categories, with men who have or had a blue-collar job being the reference category. Compared to them, white-collar men are 53% more likely to work after the age of 60. Blue-collar women are 9% more likely to work than blue-collar men and white-collar women are 17% more likely to work than the reference category. Thus, blue-collar women’s odds of working are slightly higher than blue-collar men’s, but this is not true of white-collar workers. In other words, a white-collar job is a predictor of remaining in the labour market and the difference is more pronounced among men. This is likely caused by the different types of blue-collar jobs that are held by women and those held by men.

**Table 6. Binary logistic regression with the gender x job type interaction – odds of continuing to work after the age of 60**

Gender	Job type	B	Exp(B)
Male	Blue-collar	0	1
Male	White-collar	0.428	1.534
Female	Blue-collar	0.089	1.094
Female	White-collar	0.156	1.169

**Figure 3. Gender and job type interaction – odds of continuing to work aged 60+**



Note: reference group – males who have or had a blue-collar job.

## Discussion and conclusion

Our analysis supports the prior finding that becoming eligible for a state pension is decisive for determining when a person exits the labour market. In the Czech Republic, this central factor determines when people retire. It has a much stronger effect than the other factors of interest here – gender, education, job type, or marital status – while the latter are also associated with the timing of the exit. This means that government policies, and pension policies in particular, are crucial in determining when people leave the labour market.

Although becoming eligible for a state pension is a key factor for both genders, it plays a more important role among men. Women are more likely to leave work before they obtain their pension eligibility and the effect of the gender variable exists when controlling for education. There are therefore other factors besides being eligible for a pension at a younger age and having a lower level of education that lead women in the Czech Republic to leave the labour market earlier than men. These factors may include the high rate of unemployment among women of pre-retirement age, their difficulty finding a new job, caring responsibilities such as looking after grandchildren or another loved one, synchronising their retirement with that of their husband/partner, or other reasons.

Conversely, lower-educated and blue-collar women who are eligible to retire continue to work after age 60 more often than lower-educated and blue-collar men who are eligible. The analysis of variable interactions revealed that women with primary education are 56% more likely to work than men with primary education, when controlling for the other variables. We can interpret this finding as follows: as Finch has shown [2014], low-educated women are highly likely to have experienced low income and career interruptions throughout their lives. When they reach pensionable age, their savings and assets are low and the pension benefit calculated for them is insufficient to guarantee a decent standard of living; this is why they continue to work. This may be exacerbated by the fact that the jobs available to older women with low education, such as personal services, cleaning, or various auxiliary occupations, are not as physically demanding as the jobs typically held by low-qualified men. Although this is open to further discussion [see, e.g., Messing et al. 2018], something similar is suggested by another finding of our analysis, namely that blue-collar women are slightly more likely to continue working than blue-collar men. Thus, in the year 2017, it was easier for low-qualified women than low-qualified men to participate in the labour market (in contrast to the findings of McNamara and Williamson [2004] in the United States). The question is, however, whether the jobs they found were not in most cases precarious jobs in terms of pay and working conditions [see Hašková and Dudová 2017; OECD 2019], so those women were only able to take them up because they had at least some guaranteed pension income.

In contrast, when we control for the other variables, including pension eligibility, we find that women with secondary education were more likely to exit the

labour market than equally educated men. Hence, this group of women is more often either 'required' or 'able to afford' to leave work before becoming eligible for a pension – for instance, if they leave to care for a loved one (according to the SHARE Wave 5 of 2013, 2.2% of Czech women retired because of a relative's or friend's ill health). Then again, female college graduates were more likely than men with primary education to continue to work and those odds were even higher than for male college graduates. In this age category (60–69 years old in 2017), the proportion of college graduates among women was lower than among men (10.3% compared to 15.5%). This was probably a specific group of professionally oriented women who continued working even after reaching their statutory retirement age.

Therefore, our first question, namely which personal and employment characteristics are linked to an earlier labour market exit when other characteristics (such as gender, education, and the eligibility for retirement benefits) are controlled for, can be answered as follows: Pension eligibility is the central predictor of economic inactivity after age 60. When pension eligibility is controlled for, however, gender, education, job type, and marital status still play an important role in determining when a person leaves the labour market. Even when we control for education, we find women leave work earlier than men, regardless of whether they are eligible for a pension. The answer to our second research question, namely whether the characteristics that determine labour market exits (such as pension eligibility, education, job type, etc.) interact in the same way for men and women, was provided by our analysis of interaction terms in the binary logistic regression model. In the case of education, higher attainment increases the odds of continuing to work for both groups, but the effect is less pronounced for women. Women with primary and post-secondary education are more likely to continue to work than men with the same educational attainment. Pension eligibility is key to both men's and women's decisions about leaving work, but the effect is stronger among men. Women are more likely than men to leave work even if they are not yet eligible for a pension. Similarly, the effect of having or not having a blue-collar job is stronger among men than women. Blue-collar women are slightly more likely to work than blue-collar men. In short, the factors that shape the odds of continuing to work longer are similar for men and women, but their weight is lower for women.

Thus, the earlier labour market exit of women in the Czech Republic is primarily driven by their earlier state pension eligibility and partly also by their lower education, but a role is also played by other factors that are not as substantial for men. Policies designed to extend working lives must take these factors into consideration and go beyond a sole focus on balancing the state budget by deferring pension eligibility to a later age. For low-qualified women, continuing to work, even if the work is underpaid, is a necessity and they do it to avoid falling into poverty. Later pension eligibility could force them to depend on other welfare benefits. In general, it is more common for women than men to stop working even if they are not yet eligible for a pension; this could become even more

common if the pensionable age rises. In contrast, college-educated women may be more inclined than college-educated men to continue working even after they are eligible to retire; the question, however, is how this trend is going to evolve in cohorts where the proportion of women with post-secondary degrees is similar to that of men.

Data availability is the primary limitation of our analysis. We were unable to find a suitable dataset that had a large enough number of observations with which to investigate labour market exits before or at a later time after becoming eligible for the state old-age pension and that, at the same time, covered all the variables that could influence an exit from the labour market. For example, the dataset we used did not allow us to assess the effects of health status and health-related limitations on a person's work ability. It is clear from other analyses that health does influence retirement timing, yet the effect is not unequivocal. In the SHARE datasets of 2013 and 2015, only about 10% of the respondents stated health as their main reason for retirement. The analyses of the Czech sample of Wave 6 of SHARE (2015) by Krejčová and Žiaran [2018] and Bédiová, Šácha, and Žiaran [2018] identified concerns about health limitations and having multiple chronic diseases as significant for seeking early retirement. However, according to our analysis of Wave 6 of SHARE (2015), the indicators of health did not differ significantly between men and women. Moreover, working women were less likely than men to indicate a concern about having to leave work due to health issues before becoming eligible for a pension. Lower job satisfaction may be another reason for earlier exit not covered by LFS data [see Krejčová and Žiaran 2018; Axelrad and McNamara 2018]. According to our analysis of Wave 6 of SHARE (2015), working women aged 60+ more often than men strongly agreed that they were satisfied in their jobs, while there was no such gender difference in the 50–59 category. This may suggest that women who are strongly satisfied with their jobs are more likely to continue to work after age 60. Unfortunately, the SHARE database does not provide enough observations to compare the effects of men's and women's health and job satisfaction on the real timing of their labour market exit while controlling for state pension eligibility.

Another possible reason for an earlier exit that we could not cover in the present analysis is the fact that women are more often than men subject to workplace ageism and discrimination based on age and gender. As shown, for example, by Itzin and Phillipson [1995] and Jyrkinen and McKie [2012], older women more often than men face ageism and discrimination at work in consequence of the intersection of gender and age, and therefore are victims of multiple disadvantage. Women who are not under economic strain and at the same time have weaker professional identities (typically middle-educated married women) may prefer to exit a labour market in which they face age discrimination, lower pay than their male colleagues, and limited career prospects.

Another limitation of the present analysis is that we are aiming at a moving target: every cohort changes in terms of both the statutory pensionable age and the distribution of the factors influencing people's labour market exit deci-

sions. A suggestion for future research would be to investigate the relationships between gender and the effects of health, job satisfaction, and other potential reasons (e.g. caring for loved ones) on labour market exit and how those effects evolve in time.

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