



## RESEARCH ARTICLE

# Assessing the impact of age management tools on the long-term sustainable unemployment rate (NAIRU) countries with recommendations for healthy and active population aging in the Czech Republic and selected Eurozone countries

Emilie Jasova<sup>1,2</sup>

<sup>1</sup>University of Finance and Administration, a.s. teacher, researcher and scientist.

<sup>2</sup>Age Management z.s.: Expert for research, analyses, strategies of the impact of age management measures on the economic and social situation of the Czech Republic.



OPEN ACCESS

## PUBLISHED

31 October 2024

## CITATION

Jasova, E., 2024. Assessing the impact of age management tools on the long-term sustainable unemployment rate (NAIRU) countries with recommendations for healthy and active population aging in the Czech Republic and selected Eurozone countries. *Medical Research Archives*, [online] 12(10).

<https://doi.org/10.18103/mra.v12i10.5684>

## COPYRIGHT

© 2024 European Society of Medicine. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## DOI

<https://doi.org/10.18103/mra.v12i10.5684>

## ISSN

2375-1924

## ABSTRACT

The article uses the concept of age management to map the impact of active and healthy ageing of the population on the sustainability of economic and social prosperity of the Czech Republic and selected countries of the Eurozone. The ageing of society requires a change in the understanding of the elderly. In addition to the protection of older citizens, the sustainability of employment of older people should be actively promoted, e.g. by taking into account the latest age management trends in labour processes and the labour market. The results of desk research in the international and domestic literature have recommended the application of the age management principle in the form of the concept of work ability. The theoretical indicator Non-Accelerating Inflation Rate of Unemployment has emerged as a priority area of influence of age management measures on published labour market indicators. Regression analysis was applied to confirm these conclusions on data from the Czech Republic and selected Eurozone countries. The analysis confirms, for example, an above-average desirable effect on the theoretical unemployment rate for the cancer screening indicator. In the age group 25-49, both men and women with less than primary education were included. Foreign experience recommends labour market reform to increase productivity in the Eurozone, focusing primarily on workforce training. The theoretical-empirical conclusions emphasize the necessity of a balanced connection of labor market policy and health care for the prevention and maintenance of work ability, for the reduction of structural unemployment, for the prevention of early retirement and for the promotion of mental health at the workplace.

**Keywords:** Healthy and active aging of population, Population aging, age management, work ability, WAI, regression analysis, non-inflationary unemployment rate.

## 1. Introduction

According to the Action Plan for the Implementation of the Strategic Framework for Preparing for an Ageing Society 2023-2025 (Ministry of Labour and Social Affairs, 2023)<sup>[47]</sup>, Czech society is gradually changing as fewer children are born and life expectancy is increasing. Thus, the proportion of older people in the population is increasing and society is ageing.

Policies to prepare for ageing need to be cross-cutting, requiring interdisciplinary, inter-sectoral and inter-ministerial cooperation to find the best solutions. In the case of healthcare, the labor market and social policy, it is crucial to effectively address the needs of an aging population. Cooperation between the state and private actors is essential. Employers should, for example, ensure a corporate culture and age management that promotes the application of long-term experience and knowledge. This is important for their healthy and active aging in both their professional and personal lives.

In contrast to the original Strategic Framework, the Action Plan has been expanded to include, for example, digital literacy and support for housing in standard housing. Emphasis is placed on the active participation of seniors, including the adaptation of the labour market and the promotion of age management.

Consideration of age management principles can be achieved, for example, by applying the concept of work ability (Gould et al., 2008)<sup>[28]</sup>. In our research, we divide age management into 2 approaches. Age management within companies will pilot test the tool of the Finnish model, including recommendations to create an age-friendly corporate environment. Age management will use age management measures in employers to promote healthy and active ageing in the company.

These two approaches take into account the House's working ability floors. Age management in companies (leadership style, workplace and

working conditions) through employees influence active and healthy ageing in personal and working life (health and functional capacity; competences; values, attitudes and motivation). The Covid 19 pandemic focused the attention of age management on adapting the work environment and labor markets to the specific requirements of older employees with the intention of maintaining their employability in times of crisis.

The interpretation of our research is divided into the following chapters. The second chapter provides an insight into the concept of age management abroad and in the Czech Republic, maps the issues and measures arising from the strategic materials for healthy and active aging. The third chapter presents conclusions on the history of the formulation of the trade-off between unemployment and inflation, methods of its estimation, including its application, and its importance for the multidisciplinary creation of targeted age management interventions. The fourth chapter provides an overview of the results of international research on the impact of age management measures on a theoretical labour market indicator, i.e. the Non-Accelerating Inflation Rate of Unemployment (hereafter NAIRU) and derives its own recommendations for healthy and active aging from them. The fifth chapter provides a definition of the data and the methodology of the analysis. The sixth chapter focuses on the results of the impact estimation using regression analysis in the conditions of the Czech Republic and selected Eurozone countries, including recommendations for increasing efficiency for healthy and active aging. Seventh chapter summarises the discussion and key findings from the research and their comparison with international and domestic experiences, incl. recommendations for age management as an aspect of healthy and active aging. The eighth chapter derives general recommendations for labor market and healthcare policymakers to address future multidisciplinary crises in the Czech Republic, Germany, the Netherlands and Finland.

## 2. Principles of age management abroad and in the Czech Republic, issues and measures arising from strategic materials for healthy and active aging

### 2.1 THE PRINCIPLE OF AGE MANAGEMENT THROUGH THE CONCEPT OF WORKING ABILITY ABROAD AND IN THE CZECH REPUBLIC AND ITS ADAPTATION AFTER THE COVID 19 PANDEMIC

Gould et al. (2008) [28] state that with changes in the structure and size of the population, the importance of work ability will increase. Promoting the working ability of the working age population allows people to maintain health and functional capacity longer into retirement, thereby affecting the quality of life of the retired population. According to the **Balance Model** (Rohmert and Rutenfranz, 1983)<sup>[58]</sup> work stress creates tension within the individual. A person's level of stress is influenced by the interaction between work community and worker factors as well as the evolving elements of work. The **multidimensional model of work capability** according to the authors (Järvikoski, Härkäpää and Mannila, 2001)<sup>[37]</sup> is based on the individual's prerequisites for coping and survival in working life, but also on the role of work and work organization in the realization of work capability. The model defines work coping, control over one's work and participation in the work community as important dimensions of work capability.

The **multidimensional work ability model** was developed by the Finnish Institute of Occupational Health. The holistic picture of work ability consists of both individual and work-related factors and the environment outside work (Ilmarinen and Tuomi 2004; Ilmarinen, 2006)<sup>[32],[31]</sup>. The individual's resources (the first three floors of the work ability house) consist of health and functional capacity, expertise, and values and attitudes. The fourth floor consists of the work environment, job content and demands, work community and work

organization including supervision and management. The job sets the standards for other floors. When an individual's resources are balanced with this floor, work abilities remain good. The immediate house is supported by organizations (e.g., security), family, and the immediate community. Infrastructure and social, health and work policies and services form the macro environment of work capability.

Cimbálníková et al. (2015)<sup>[15]</sup> confirm that the concepts of age management, work ability and the self-assessment questionnaire WAI (hereafter Work ability index) can also be applied in the Czech Republic. The biggest obstacle is the lack of support for (smaller) companies in employing people 50+, support in the application of age management strategies and the lack of legislation. Charles University (2017)<sup>[66]</sup> states that the issue of age management is not systematically addressed in the Czech Republic. Some partial age management measures (education or health promotion) have been introduced in workplaces. The impact of these partial measures is difficult to compare with a comprehensive and long-term approach abroad. Husaříková et al. (2021)<sup>[30]</sup> state that during the ageing process, the employee's work performance capabilities change and the demands of work also change. Supporting and optimizing an individual's ability to work at each stage of the life cycle leads to maintaining an effective work capability and thus optimal employee performance.

Dobeš et al. (2022)<sup>[19]</sup> state that the current trend in European countries is to improve employees' sense of well-being. Indicators for better well-being in the workplace can be found in the house of work ability (appreciation, trust, fair treatment and support). For example, in the area of health, activities to promote work capability include, for example, prevention and treatment for the individual and occupational health and safety for the organisation. Dobeš et al. (2021)<sup>[20]</sup> state that individuals and organisations can actively enhance work capability to match the job to the employee.

Managers play a key role in modifying working conditions, level of occupational health care, occupational safety (prevention and elimination of occupational hazards).

From a theoretical-empirical perspective on the importance of age management for healthy and active aging of the population, it can be concluded for our general recommendations that working ability is a prerequisite for maintaining the quality of life, long-term employability of older workers and reducing the costs of the health system. A balanced relationship between work requirements and individual abilities, on the one hand, supports the growth of work productivity and, on the other hand, reduces the risk of health problems. Health policy should thus aim at preventive measures and effective treatment of identified health problems. Market policy should focus on the adaptability of workers, e.g. to changes in work procedures and forms of employment. The flexible response of employers and employees to changed work requirements strengthens the stability of the entire economy. The Covid 19 pandemic requires the support of workers over 50 and the involvement of health policy to reduce health costs and increase labor productivity.

## 2.2 ISSUES AND ACTIONS ARISING FROM STRATEGIC MATERIALS FOR AGE MANAGEMENT POLICY AND FOR HEALTHY AND ACTIVE AGING

### I. Age management in employers (Main objective 1)

**The National Action Plan to Promote Positive Ageing for the period 2013 to 2017** (Ministry of Labour and Social Affairs of the Czech Republic, 2014)<sup>[51]</sup> states in the case of employment of older workers and seniors that in order to ensure increasing economic competitiveness, the Czech Republic must become a country friendly to employees of different ages. **The Strategic Employment Policy Framework 2030** (Ministry of Labour and Social Affairs of the Czech Republic, 2020)<sup>[50]</sup> contains measures to support employers in setting up internal Human Resources (hereafter HR) processes to enhance integration, age management and maximise the use of the

workforce at all life stages. Another document is the **Family Policy Strategy 2024-2030** (Ministry of Labour and Social Affairs, 2023a)<sup>[48]</sup>, which, for example, talks about promoting age management and diversity of work teams in employers through subsidy support.

### II. Age management to promote healthy and active ageing (Main objective 2)

**The National Action Plan on Positive Ageing 2013-2017** focuses on health and lifelong learning. Participation in the labour market, active participation in the development of civil society and the promotion of intergenerational dialogue depend on them. **The Strategic Framework for Employment Policy 2030 on Employer Adaptation** includes measures to promote lifelong learning, inclusion, intergenerational exchange and the concept of age management. **The Family Policy Strategy 2024-2030** promotes flexible forms of work and opportunities to work from home and telework. It also speaks, for example, of supporting the creation of family-friendly public spaces for families and the elderly. **The Strategic Framework for Preparing for an Ageing Society 2021-2025 - STRAPS** (Ministry of Labour and Social Affairs, 2021)<sup>[49]</sup> formulates a strategic approach to preparing society for ageing (Part 8. Lifelong learning, labour market and active ageing). **The Action Plan for the implementation of the Strategic Framework for the Preparation for an Ageing Society 2023-2025** (Ministry of Labour and Social Affairs, 2023)<sup>[47]</sup>, which is being developed in 2023, supports the growing awareness of the principles of age management and active policy in practice.

From a theoretical-empirical perspective on the importance of age management for healthy and active aging of the population, it can be concluded for our analysis, conclusions and recommendations that adjusting the personnel approach of employers to different age groups will increase the efficiency of workers and thus also the long-term sustainability of the economy as a whole. An equal relationship between health policy and

employment policy will increase the prevention of health problems and improve the overall well-being of employees. Comprehensive and effective interventions strengthen work capacity and prepare society for an aging population.

### 3. Fundamental conclusions on the history of the formulation of the trade-off of unemployment with inflation and its importance for the multidisciplinary creation of targeted age management interventions

#### 3.1 HISTORY OF THE NAIRU CONCEPT, ESTIMATION METHOD AND THEIR IMPORTANCE FOR A MULTIDISCIPLINARY APPROACH TO AGE MANAGEMENT

Jašová (2016)<sup>[35]</sup> states that theorists, economic policy makers and users of applied macroeconomics consider unemployment, inflation and economic growth as crucial indicators. However, understanding and describing the relationship between them is only mediated by theoretical concepts such as the NAIRU and the Phillips Curve (hereafter PC). For example, McAdam and McMorrow (1999)<sup>[46]</sup> make available the possibility of using theoretical concepts in real-life decision-making (e.g., in the selection of structural reforms to increase efficiency and eliminate labour market imbalances). By comparing the NAIRU concept with the actual unemployment rate, an unemployment gap emerges that locates the phases of the business cycle in the labour market.

According to Humphrey (1985) [29], at least ten authors (e.g., Hume, Attwood) had been involved in the formulation of substitutions in the 250 years before Phillips. Phillips is considered to be the author of the PC concept. According to Jašová (2016)<sup>[35]</sup>, he also has a number of followers (e.g., Samuelson and Solow, Phelps). Tobin (1997)<sup>[65]</sup> argues that the NAIRU is the unemployment rate at which the effects of rising inflation from demand-

dominated markets offset the effects of falling inflation from supply-dominated markets. This concept will be applied to the conditions of the Czech Republic and selected Eurozone countries in the empirical part of the paper.

McAdam and McMorrow (1999)<sup>[46]</sup> consider the NAIRU to be a theoretical construct that cannot be directly measured. It is necessary to use estimates of a variety of methods. According to Jašová (2016)<sup>[35]</sup>, Richardson divides the methods into structural (e.g., Bargaining model), purely statistical (e.g., Hodrick Prescott filter - hereafter HP filter) and reduced forms (e.g., Kalman filter). Fabiani and Mestre (2000)<sup>[25]</sup> identify trend and cycle filtering methods such as HP filter. This method is used to estimate the NAIRU in the conditions of the Czech Republic and selected Eurozone countries.

From a theoretical-empirical perspective on the importance of age management for healthy and active aging of the population, it can be concluded for our analysis, conclusions and recommendations that adjusting the personnel approach of employers to different age groups will increase the efficiency of workers and thus also the long-term sustainability of the economy as a whole. An equal relationship between health policy and employment policy will increase the prevention of health problems and improve the overall well-being of employees. Comprehensive and effective interventions strengthen work capacity and prepare society for an aging population.

From a theoretical-empirical perspective on the healthy and active aging of the population, effective management of the labor market through age management is fundamental to our general recommendations. Long-term unemployment causes structural problems in the labor market, public health and social cohesion. Health policy contributes to the reduction of unemployment and the stability of the entire economy by preventing and treating diseases. The Covid-19 pandemic has revealed the importance of cross-sector collaboration to achieve optimal employment and public health. The theoretical concepts of PC and

NAIRU serve to understand the complex processes of the influence of health care on the economy, without which long-term effective age management policies cannot be formulated.

### 3.2 APPLICATION OF THE NAIRU AND PC CONCEPTS TO DATA FROM THE CZECH REPUBLIC AND ABROAD AND ITS USE IN THE CREATION OF TARGETED AGE MANAGEMENT INTERVENTIONS

Jašová (2016)<sup>[35]</sup> reports that the research on the trade-off between inflation and unemployment in the Czech economy was conducted by Flek (he extended the NAIRU and PC estimates to the conditions of a small open economy and a forward-looking inflation targeting regime). He also maps examples of the application of the concept to meso-level data (e.g. Eagly; Neumark). Jasova and Kaderabkova (2012)<sup>[36]</sup> consider the Kalman filter as the method that best captures labour market developments in periods of instability.

Jašová and Kadeřábková (2019)<sup>[34]</sup> found an increase in the NAIRU value of women aged 20-49 due to the application of work-life reconciliation instruments, e.g. maternity benefits (decrease in women's ability to enter the labour market after maternity leave, unavailability of part-time work and provision of an unsuitable job after the termination of the original one). According to Jašová (2023)<sup>[33]</sup>, for example, a higher Non-Accelerating Inflation Rate of Unemployment (hereafter NARRU) than NAIRU indicated that the vigour of the government's anti-epidemic measures did not match the depth of the impact of the Covid 19 epidemic on the labour market and the real economy. The higher NAIRU in the first period (i.e., the phase with the preponderance of months without Covid 19) confirmed that the government's anti-epidemic measures eliminated the impact of the pandemic on the labor market but failed to prevent a decline in firm performance. From a theoretical-empirical perspective on the healthy and active aging of the population, the need for an integrated approach for effective age management during the Covid 19 pandemic can

be highlighted for our general recommendations. Health measures were intended to minimize the undesirable effects on employment and maintain the working capacity of workers. The theoretical concepts we introduced explained the impact of changes on the labor market and work ability. Their understanding limited the emergence of unbalanced measures, the growth of structural unemployment and the undesirable impact on the working capacity and health of workers. Age management should focus on preventive health promotion and flexible working conditions in order to adapt to unstable economic conditions.

## 4. Conclusions of foreign research on the issue of the influence of age management on NAIRU and deriving own recommendations for healthy and active aging

IN THE CASE OF THE EXPLANATORY VARIABLE PREVENTIVE CANCER SCREENING (8), THE RESULTS ARE:

Ólafsdóttir et al. (2015)<sup>[54]</sup> reported that smoking is associated with poorer health through increased risk of various diseases. Birgisdóttir and Ásgeirsdóttir (2017)<sup>[6]</sup> expect that worsening economic conditions will negatively affect health due to increased stress or poorer access to health care due to financial constraints. Health may be positively affected in worse economic times by lower opportunity costs of leisure or financial constraints leading to better health behaviours (reducing smoking). Kondo et al. (2014)<sup>[39]</sup> state that economic recession can affect individuals' social and living conditions, physical and mental health and change behaviours (diet, drinking and healthcare use). The increase in mortality among women with the lowest incomes could be related to gender differences in working conditions.

From a theoretical-empirical perspective on the healthy and active aging of the population, our general recommendations can draw attention to

the direct influence of the economic situation on the health of individuals and their ability to work. Age management must focus specifically on health and social policies. Employers should be supported in the application of preventive health care programs in an unstable economic and health environment. Age management should address the specific needs and risks of women in the labor market, support desirable changes in employee behavior and tools to maintain health and work ability.

IN THE CASE OF THE EXPLANATORY VARIABLE OCCUPATIONAL INJURIES (11), THE FINDINGS ARE: Burgard et al. (2013)<sup>[13]</sup> confirm a procyclical relationship between the business cycle and mortality in the United States. Several studies have not found a procyclical association. Burgard and Kalousova (2015)<sup>[12]</sup> report that labor market shocks can improve health if they change time use or consumption in beneficial ways (reducing job stress or tobacco consumption). For those employed in the recession, changes in time use may have had more negative consequences. Employees stay at work even when they are sick.

Nielsen et al. (2015)<sup>[52]</sup> state that the relationship between the business cycle and injuries is driven by changes in workplace safety. These changes are likely to be a combination of task-specific factors (work pace), organisational factors (training of new employees) and demographic change (natural selection effect in the labour market). Blekesaune (2012)<sup>[8]</sup> reports that job insecurity induces more absenteeism due to stress as well as less absenteeism due to disciplinary effect. Other effects are the workload effect (higher job demands during economic booms) and the accumulation effect (more marginal workers with high absenteeism rates during booms). Policymakers should reduce job security carefully.

From a theoretical-empirical perspective on healthy and active population aging, pro-cyclicality in the relationship between the economic cycle and health can be emphasized for our general recommendations. Age management should support the health of employees during the crisis

(flexible working conditions) and ensure preventive health care. It should also ensure job security for more vulnerable groups in a crisis situation and minimize the undesirable impact on health and work ability when reducing job security.

IN THE CASE OF THE EXPLANATORY VARIABLE OF THE VACANCY STATISTICS (13), THE RESULT IS: De-Chih Liu (2021)<sup>[18]</sup> find that capital exchange is a crucial factor for men rather than unemployed women, calling into question the empirical significance of the Unemployment Invariance Hypothesis. Belman and Wolfson (2014)<sup>[4]</sup> consider that the unemployment rate changes not only with a change in the employment ratio but also with a change in the Labor Force Participation Rate (hereafter LFPR). Gordon and Stock (1998)<sup>[27]</sup> argue that if wages are driven by the difficulty of filling vacancies, a shift in the Beveridge curve towards lower unemployment confirms higher efficiency in the labor market. Brunello, Lupi and Ordine (2000)<sup>[11]</sup> posit that persistent regional differences in unemployment bring wage and price setting into line if the price setting equation is not sensitive to unemployment. Pissarides et al. (1986)<sup>[56]</sup> recommend distinguishing movements originating from changes in the NAIRU and from changes in deviations from the NAIRU to explain movements in unemployment. Stansbury and Summers (2020)<sup>[62]</sup> argue that the declining labor force hypothesis is more convincing as an explanation for the observed change than the increase in firms' market power because it simultaneously explains the declining labor share and the reduced NAIRU. Sharpe and Sargent (2000)<sup>[59]</sup> argue that expansionary monetary policy that prudently tests the limits of the NAIRU leads to a reduction in the unemployment rate (the income tax credit positively affects female employment). Bell and Blanchflower (2018)<sup>[5]</sup> report that expectations of the natural rate of unemployment depend on the degree of labor mobility. Labor market functioning is affected by the generosity of unemployment benefits, the strength of unions, and the dynamics of the housing market. Daly et al. (2012)<sup>[16]</sup> argue that high

unemployment rates when Gross domestic product (hereafter GDP) and job vacancies are rising indicate a rise in structural unemployment.

Layard and Bean (1989)<sup>[43]</sup> recommend preventing large numbers of people from falling into long-term unemployment. In the presence of hysteresis, income policy will temporarily reduce the short-term NAIRU until the experience of lower unemployment is permanently reduced. Patrick and Minford (1993)<sup>[55]</sup> argue that when expectations are rational the NAIRU does not exist. Inflation would accelerate because of a fully expected monetary expansion even if unemployment were above the natural rate.

Blanchard et al. (1989)<sup>[7]</sup> explain the current adverse shift in the Beveridge curve by the sudden increase in the growth rate of employment and vacancies. Ball and Mankiw (2002)<sup>[3]</sup> doubt that the Beveridge curve is informative about the sources of NAIRU movements. The relationship between PC shifts and the Beveridge curve is consistent but does not say much about the reasons for the shifts. Baily et al. (1977)<sup>[2]</sup> argue that if teenagers had a sufficiently flat PC, the overall NAIRU would be reduced by a shift of employment to them, but at the cost of higher adult unemployment (minimum wage reduces the degree of flexibility).

From a theoretical-empirical perspective on the healthy and active aging of the population, the importance of research into the influence of economic factors on the working capacity of older workers in an unstable period can be highlighted for our general recommendations. Age management should also be flexible and adapted to regional conditions. It should contribute to the formation of rational expectations of older workers and should take into account the influence of the minimum wage and regulation on the employment of older workers in the labor market.

IN THE CASE OF THE EXPLANATORY VARIABLE ENTERPRISES PROVIDING TRAINING (E.G. TRAINING AT CONFERENCES, WORKSHOPS, FAIRS AND LECTURES) FROM ALL ENTERPRISES (17) THE FINDINGS ARE:

Lafontaine and Shaw (2016)<sup>[42]</sup> found that prior business experience extends the life of the next open venture. Esteban Sánchez and Benito-Hernández (2015)<sup>[22]</sup> suggest that Corporate social responsibility (hereafter CSR) policies that have contributed to increased labour productivity are related to internal aspects of the company (quality of processes and products, fostering innovation, learning and employee care). Boockmann and Steffes (2010)<sup>[10]</sup> suggest that corporate boards slow down job separation and unemployment. Works councils increase employee protection but also reduce terminations (lobbying employers for better working conditions).

Malamud and Pop-Eleches (2010)<sup>[45]</sup> shifting students from vocational training to general education reduced the length of vocational courses. Men are also less likely to work in manual occupations. Eriksson and Ortega (2006)<sup>[21]</sup> found that the negative relationship between job rotation and worker heterogeneity speaks against employee learning. Rotations are more useful when employees have different sets of knowledge. Fitzenberger et al. (2008)<sup>[26]</sup> confirm a negative lock-in effect for the period after the start of programs and significantly positive effects on employment rates in the medium and long run. Kovacheva et al. (2020)<sup>[41]</sup> confirm that most Lifelong learning (hereafter LLL) support programmes are not responsive to the needs of young people and do not value informally acquired skills and competences. LLL programmes also aim to encourage young people to actively find their own subjectively meaningful ways of participating in their societies. Bol et al. (2019)<sup>[9]</sup> find that graduates who end up working in a "relevant" occupation do well. They find no evidence for this link among older workers at secondary or tertiary level.

Vandenberghe et al. (2013)<sup>[67]</sup> suggest a negative impact of a higher share of older workers on productivity that is not offset by lower wage costs. Korver and Oeij (2006)<sup>[40]</sup> argue that institutional structures and mechanisms to promote employment are lacking. Compacts would increase



employability and employers' and employees' interest in an adequate workforce. Steel et al. (2002)<sup>[63]</sup> argue that retention research can shed light on the value of standard procedures (exit interviews), offer insight into patterns and trends in employee behaviour (high and low performers). Poloski Vokic et al. (2018)<sup>[57]</sup> recommend the introduction of flexible working arrangements in organisations to improve workforce productivity at the micro level, in addition to adjustments at the macro level. Dangol and Chitrakar (2021)<sup>[17]</sup> suggest that Fair Trade Enterprises (hereafter FTE) need to innovate sustainable livelihoods for vulnerable individuals and communities. Policy makers and government are to encourage businesses to apply FTE practices as this contributes to the Sustainable Development Goals (hereafter SDGs). Noelke and Horn (2014)<sup>[53]</sup> argue that when employers are unwilling to train, school-provided training is an alternative. The shift in the provision of training from employers to schools has increased the unemployment rate of male vocational school graduates during the first 2 years after graduation.

From a theoretical-empirical perspective on the healthy and active aging of the population, our general recommendations can emphasize the importance of innovations for the long-term preservation of work ability and professional courses/training to support the competitiveness of older workers on the labor market.

IN THE CASE OF THE EXPLANATORY VARIABLE ENTERPRISES WITH A CVT (HEREAFTER COLLECTIVE AGREEMENT BETWEEN THE SOCIAL PARTNERS) (18), THE FINDINGS ARE AS FOLLOWS: Shugan (2007)<sup>[60]</sup> states that every economy faces unemployment because some individuals leave or lose their jobs. A smaller number of individuals want employment at prevailing wages but are prevented by institutional constraints. Minimum wage laws, mandatory benefits, and unions raise nominal wages without efficiency gains or innovation, and consumer prices and unemployment also rise. C. de la Cámara (2003)<sup>[14]</sup>

recalls that the Luxembourg Jobs Summit in November 1997 discussed full employment as a priority; new technologies and production models provide the potential for jobs. Training and education fill the gap between available and actually needed skills.

Simonazzi (2003)<sup>[61]</sup> argues that the continuous reduction of the NAIRU is a disgrace for macroeconomics. The basis of sluggish inflation is the loss of pricing power by firms. The increase in investment has restrained costs and increased industrial capacity faster than the growth in factory output. The resulting slack in product markets has put more competitive pressure on firms to hold down prices, despite tight labour markets. Adams et al. (2002)<sup>[1]</sup> find that supply-side flexibility has positive feedback effects in terms of increased firm competitiveness and hence increased demand for products (and labour), although there is limited evidence for this so far in terms of training for the unemployed.

Madrack (2007)<sup>[44]</sup> argues that fiscal and monetary policy should promote low unemployment rates (through welfare benefits, increasing labour demand and improving the bargaining position of workers). High wages create demand without an increase in borrowing. The Federal Reserve can take the risk of higher wage growth and inflation. Government policy can be more aggressive in supporting wages (minimum and living wage laws, labor organizing laws, more generous unemployment insurance). These policies may raise wages and business costs in the short run, but often increase productivity over time.

From a theoretical-empirical perspective on the healthy and active aging of the population, the importance of cooperation with the healthcare sector can be emphasized for our general recommendations. Prevention and rehabilitation stabilizes workers' employability (programs for mental health and burnout prevention). Company training should also include health programs to support resilience in the current labor market. Cooperation with experts in work tools and

furniture should also be part of the programs. Health promotion in the workplace as part of age management reduces morbidity, increases productivity and employability of older workers.

## 5. Description of data sources used and methodology of analysis

The explained variables used to investigate the impact (nature and intensity) of age management tools (of firms and individuals) on healthy, active ageing in the Czech Republic and in selected Eurozone countries (especially with regard to the resilience of the pension system to population ageing and the application of structural economic and financial reforms for a more stable and sustainable European Union - hereafter EU - and Eurozone) were selected labour market time series (Eurostat, 2023)<sup>[23]</sup>. Specifically, in this analysis, we will assess the impact of age management tools through the *NAIRU by sex, age and educational attainment (%)* - (hereinafter NAIRU or also NAIRU\_VZDEL\_O).

From the published measures of unemployment, NAIRU values in % were calculated using the HP filter. We apply NAIRU to the analysis as this concept shows the long-run potential of the labour market. In addition to these explained variable, time series of categorical variables (time, country - Czech Republic, Germany, Netherlands, Finland; gender - male, female; age - 15-24, 25-49, 50-64; education - lower primary, upper secondary, tertiary) and a dummy variable cycle (Great Recession, Long Boom, Covid Pandemic, Covid Reverberation, coincidence with Ukrainian conflict and Energy price increases) were constructed.

Statistically significant **explanatory (numerical) variables**, of which a total of 20 were tested in this analysis, include the following indicators published by Eurostat: *Preventive cancer screenings (%)* - (hereafter preventive cancer screenings or also \_8\_1\_NOVOTVARY\_1); *Accidents at work by sex, age and severity (number)* - (hereafter accidents at work); *Job vacancy statistics (number)* - (hereinafter

*vacancies*); *Enterprises providing training by type of training and size class (%)* - (hereinafter training enterprises); *Enterprises with CVT agreement by type of agreement, type of training provided and size class (%)* - (hereinafter enterprises with CVT agreement).

The time series used cover the period from 2010 to 2022. All the time series used were tested with the Augmented Dickey-Fuller test - hereinafter ADF test (EViews, 2013)<sup>[24]</sup>, which confirmed their stationarity. We use linear regression to assess the intensity and nature of the effect of selected age management measures on the NAIRU indicator. We then extract the effect of selected specifics of indicators representing age management tools on NAIRU by country, age, gender, education by defining **categorical variables** interacted with these explanatory variables. In this way we can specifically identify the effect of age management measures on NAIRU by e.g. country, age, gender, but also by education. In addition, a dummy (artificial) was also applied, which gives us insight into the impact of age management measures during the Great Global Financial and Economic Recession (from 2012 to 2014), the Long Boom (from 2015 to 2019), the Covid-19 pandemic (from 2020 to 2021), and the Covid-19 recession and the coincidence with the war conflict in Ukraine and the associated energy price increases (year 2022).

To select the most appropriate model (Model 1 to Model 5 in the next section of the detailed analysis) to approximate the analysed data, the adjusted R<sup>2</sup> is applied (a summary of other statistics and parameters for the selected models is given in Table Tab. 1 in the Appendix). The Jarque Ber test (EViews, 2013)<sup>[24]</sup> is used to test the normality of the residuals. To test for autocorrelation of residuals, the Breusch-Godfrey test (EViews, 2013)<sup>[24]</sup> is applied. The Wald test (EViews, 2013)<sup>[24]</sup> is used to test for heteroskedasticity of the residuals. The Variable Inflation Factor (EViews, 2013)<sup>[24]</sup> is used in the analysis to measure the multicollinearity carrying capacity. The failure of the tests of normality of residuals due to fluctuations in the

evolution of some segments of the explained variable and the interannual changes calculated from them in the case of a large number of observations allows us to assume the validity of the central limit theorem, which states that  $t$  tests are asymptotically valid. The reason for the deteriorated statistics and parameters of some models is then also due to the short and sometimes incomplete time series of the published indicators that represent age management instruments.

The impact of selected age management indicators on healthy, active ageing and on the extension of the working life of the population is examined using the Least Squares Method. The observed value of the regression coefficient then indicates the intensity of the effect of the selected age management indicators on NAIRU and the sign (+/-) indicates its nature. Specifically, the text refers to a positive influence in the case of a positive sign and a negative influence in the case of a negative sign. In case the categorical variable interacting with the selected age management indicator is not statistically significant in the model, we speak of a failure to demonstrate its impact on addressing the issue of pension system resilience and EU/Eurozone stability and sustainability.

A positive value of the regression coefficient means that the impact on the NAIRU increases as the selected age management indicator increases. A negative value of the regression coefficient means that the impact on NAIRU decreases as the selected age management indicator increases. In our analysis, regression coefficients ranging from 0.00001 to 0.99 indicate very weak sensitivity of NAIRU to age management measures, ranging from 1.00 to 2.99 indicate weak sensitivity, ranging from 3.00 to 3.99 indicate moderate sensitivity, ranging from 4.00 to 4.99 indicate strong sensitivity and ranging from 5.00 to 5.49 locate very strong sensitivity of NAIRU to age management measures. Regression coefficient values of 5.50 and above reflect extremely strong NAIRU sensitivity to age management measures.

## 6. Results of empirical testing of the impact of age management measures on NAIRU in the Czech Republic and selected Eurozone countries including recommendations for improvement

In this section, we analyse the nature and magnitude of the impact of indicators representing age management measures (firms and individuals) on the NAIRU by gender, age and educational attainment. We divide the values of the adjusted regression coefficient obtained by regression analysis into two groups.

The first group will summarize all **evidence of positive** regression coefficient values for the categorical variables country, age, gender, education, as well as the dummy variable cycle in interaction with selected age management instruments. The result will then be the **undesirable effect** of the impact of the selected age management indicator on NAIRU by gender, age, education, country, as well as the cycle dummy variable. The second group will summarize all the **proven negative values** of the regression coefficients of the categorical variables country, age, gender, education, as well as the dummy variable cycle in interaction with selected age management indicators. The result will then be the **desirable impact** of the selected age management indicator on NAIRU by gender, age, education, country, as well as the cycle dummy variable.

In the following section, we present an overview of the summary results from the detailed analysis of the impact of selected age management indicators on the NAIRU for the Czech Republic and selected Eurozone countries, which is represented by Tables 1 (in subsection 6.1) to Table 2 (in subsection 6.2).

### 6.1 COMPARISON OF THE AVERAGE POSITIVE VALUE OF STATISTICALLY SIGNIFICANT REGRESSION COEFFICIENTS IN THE CZECH REPUBLIC AND SELECTED EUROZONE COUNTRIES

In this subsection, the NAIRU by gender, age and educational attainment were the following age management measures: cancer screening

(Model\_1); workplace injuries (Model\_3); job vacancies (Model\_4); business training (Model\_2); businesses with a DOV contract (Model\_5).

Table 1 Impact of age management indicators on NAIRU by age, sex and education in the Czech Republic and selected Eurozone countries<sup>[69]</sup>

Statistically significant positive relationship					
Explained variable:	Unemployment rate by sex, age and level of education - NAIRU (year-on-year change in p.p.)				
	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Model number:</b>					
<b>Explanatory variable/Categorical variable</b>					
<b>In total</b>	x	x	x	0,031	x
<b>Age range 15-24</b>	x	x	x	0,096	x
<b>Age range 25-49</b>	x	0,0003	x	x	x
<b>Age range 50-64</b>	x	0,005	x	x	x
<b>Men</b>	x	x	x	0,042	x
<b>Women</b>	x	0,001	x	x	x
<b>Lower primary</b>	x	x	x	0,076	x
<b>Upper secondary</b>	x	0,002	x	x	x
<b>Tertiary</b>	x	0,003	x	x	x
<b>Great Recession</b>	Není	Není	Není	Není	Není
<b>Long Boom</b>	x	x	0,002	x	x
<b>Covid Pandemic</b>	x	x	x	0,030	x
<b>Covid Reverberation</b>					
<b>Energy Crisis</b>	x	0,006	x	0,319	x
<b>Czech Republic</b>	x	x	x	0,002	x
<b>Germany</b>	x	0,017	x	x	0,010
<b>Netherlands</b>	x	0,001	0,002	x	x
<b>Finland</b>	0,200	x	0,002	0,178	0,002

The only statistically significant overall positive regression coefficient was found for the indicator number of vacancies in industry for employers with 10 or more employees (Model\_4). According to Table 1, this was a very weak undesirable impact on the NAIRU (+0.03). In terms of age, it was only due to the development in the interval from 15 to 24 years (+0.10), i.e. very weak sensitivity. In terms of gender for males, a very weak positive sensitivity was mapped (+0.04). In the case of education for those below primary, the weak intensity was +0.08. The cycle dummy variable then confirmed a very weak positive sensitivity in the Covid pandemic phase (+0.03) and the period of the Covid 19 reverberation, the Ukrainian conflict the energy crisis (+0.32). The geographical perspective confirmed a very weak positive sensitivity (+0.002) in the Czech Republic and +0.18 in Finland. The highest undesirable impact (+0.32) was then found for males aged 15-24 with lower primary education in Finland during the aftermath of Covid 19, Ukraine conflict and energy crisis.

Another indicator is the % of enterprises providing training (e.g. training at conferences, workshops,

trade fairs and lectures) out of all enterprises (Model\_2). In terms of age, there was a very weak positive intensity of influence in the age group 50-64 years (+0.01) and in the age group 25-49 years (+0.0003). In terms of gender, only women were involved, with a very weak positive sensitivity of +0.001. In terms of education, both the long-term unemployed with upper secondary education (+0.002) and those with tertiary education (+0.003) were undesirable affected. The cyclical dummy variable then confirmed a positive very weak impact only in the aftermath of Covid 19, Ukrainian conflict and energy crisis (+0.01). According to the geographical perspective, in Germany the positive very weak undesirable impact was +0.02. The highest undesirable impact (+0.06) was then found for men aged 50-64 with lower primary education in Germany at the time of the Covid 19, Ukraine conflict and energy crisis.

A undesirable impact on the NAIRU was also confirmed for the indicator number of work-related injuries (4 or more days of absence) for men aged 25 to 54 in agriculture, industry and construction (Model\_3). The cycle dummy variable confirmed a

positive very weak impact only in the long-run boom period (+0.002). In the case of the **geographical perspective**, it was specifically a very weak positive impact in the Netherlands and Finland (+0.002 both countries). The highest undesirable impact (+0.21) was then found for males aged 15-24 with lower primary education in Finland during the Covid pandemic.

For the *indicator % of enterprises with a collective agreement between the social partners out of all enterprises with 250 or more employees (Model\_5)* a undesirable effect of very weak intensity was found only for the **age category** 25-49 years (+0.01). The highest undesirable effect (+0.16) was found for men aged 15-24 years with lower primary education in the Czech Republic during the Long boom.

For the *cancer screening indicator of colon, rectosigmoid junction, rectum, anus and anal canal (Model\_1)* undesirable effect of very low magnitude was found **geographically** only for Finland (+0.20). The highest undesirable impact from the point of view of the labor market (+1.16) was then found for men aged 50-64 years with lower primary education in Finland during the Covid 19, the Ukrainian conflict and energy crisis.

From a theoretical-empirical perspective on the healthy and active aging of the population, our

general recommendations include combined support on the labor market, including health and social services for young workers. Preventive health measures (e.g. cancer screening) are of fundamental importance for maintaining the ability to work. Linking vocational education, for example, with health and social support could increase the effectiveness of training provided by companies. For undesirably affected groups (young men with lower education) in periods of crisis, age management offers a balanced involvement of the labor market and healthcare. This cross-sectoral cooperation must be tailored to the specific situation of each country in order to ensure the effectiveness of the employment and health support provided to the workforce.

## 6.2 COMPARISON OF AVERAGE NEGATIVE VALUES OF STATISTICALLY SIGNIFICANT REGRESSION COEFFICIENTS IN THE CZECH REPUBLIC AND SELECTED EU COUNTRIES

In this subsection, for the NAIRU by gender, age and educational attainment, the age management measures are: cancer screening (Model\_1); workplace injuries (Model\_3); vacancies (Model\_4); enterprise training (Model\_2); enterprises with a CVT contract (Model\_5).

**Table 2** Impact of age management indicators on NAIRU by age, sex and education in the Czech Republic and selected Eurozone countries<sup>[69]</sup>

Statistically significant positive relationship					
Explained variable:	Unemployment rate by sex, age and level of education - NAIRU (year-on-year change in p.p.)				
Model number: Explanatory variable/Categorical variable	Model 1	Model 2	Model 3	Model 4	Model 5
In total	-0,594	-0,001	-0,012	x	-0,035
Age range 15-24	-0,628	-0,019	-0,007	x	-0,033
Age range 25-49	-0,756	x	-0,010	-0,001	-0,033
Age range 50-64	-0,423	x	-0,018	-0,002	-0,039
Men	-0,502	-0,001	-0,013	x	-0,033
Women	-0,853	x	-0,012	-0,001	-0,039
Lower primary	-0,699	-0,007	-0,021	x	-0,050
Upper secondary	-0,603	x	-0,004	-0,001	-0,040
Tertiary	-0,413	x	-0,012	-0,002	-0,034
Great Recession	Není	Není	Není	Není	Není
Long Boom	-0,494	-0,003	x	-0,0003	-0,053
Covid Pandemic	-0,075	-0,00003	-0,070	x	-0,072
Covid Reverberation					
Energy Crisis	-1,213	x	-0,025	x	-0,001
Czech Republic	-1,141	-0,010	-0,049	x	-0,043
Germany	-0,722	x	-0,019	x	x
Netherlands	-0,248	x	x	x	-0,135
Finland	x	-0,007	x	x	x

The highest statistically significant negative value of the regression coefficient was found for the cancer screening indicator - colon, rectosigmoid junction, rectum, anus and anal canal (Model\_1). Table 2 confirms the very poor sensitivity (-0.59). In terms of age, this was mainly due to the evolution in the interval from 25 to 49 years (-0.76), which is a very weak desirable sensitivity; in the age range 15-24 years it was -0.63. In terms of gender for both women and men, a very weak negative sensitivity was mapped (-0.85 and -0.50 respectively). In the case of education, the very weak sensitivity for lower than primary was -0.70, for upper secondary the regression coefficient was -0.60. The cycle dummy variable then confirmed the negative weak impact in the reverberation phase of Covid 19, the Ukrainian conflict and energy crisis (-1.21). From a country perspective, the highest negative desirable impact was mapped in the Czech Republic (-1.14), i.e. weak sensitivity. A very weak negative impact was confirmed in Germany and the Netherlands (-0.72 and -0.25, respectively). The highest desirable impact (-2.72) was then found for males aged 15-24 with lower primary education in the Czech Republic during the Covid 19 recession, the Ukraine conflict and energy crisis.

Another indicator is the % of enterprises with a collective agreement between the social partners out of all enterprises with 250 or more employees (Model\_5). This was a very weak desirable impact intensity (-0.04). The negative impact on the NAIRU was mainly mapped for the age group 50-64 years (-0.04), while it was the same for the age group 15-24 years and 25-49 years (-0.03). In terms of gender, very weak negative sensitivity was mapped for both women and men (-0.04 and -0.03). In terms of education, the long-term unemployed with lower primary education were the most desirable affected (-0.05), followed by the unemployed with higher secondary education (-0.04). The cycle dummy variable then confirmed a very weak impact in the Covid pandemic phase (-0.07) and Long boom (-0.05). In the case of the country, a very weak sensitivity was mapped in the Netherlands

and also in the Czech Republic (-0.14 and -0.04). The highest desirable impact (-1.00) was then found for men aged 50-64 with lower primary education in the Czech Republic during the Long boom.

Another indicator maps the number of work-related injuries (4 or more days of absence) for men aged 25-54 in agriculture, industry and construction (Model\_3). This was a very weak effect size (-0.01). A negative desirable impact on the NAIRU was mapped mainly for the 50-64 age group (-0.02), with only -0.01 for the 25-49 and the 15-24 age group. In terms of gender for both males and females, a very weak negative sensitivity was mapped (-0.01). In terms of education, the long-term unemployed with lower primary education (-0.02) and tertiary education (-0.01) were the most desirable affected (excluding the health aspect). The cycle dummy variable then confirmed a very weak impact in the Covid pandemic phase (-0.07) and the reverberation of Covid 19, the Ukrainian conflict and energy crisis, it was even only (-0.03). In the case of the country, a very weak sensitivity was mapped in the Czech Republic (-0.05) and in Germany -0.02. The highest desirable impact (-0.26) was then found for men aged 15-24 with lower primary education in the Czech Republic during the Covid pandemic.

For the indicator % of enterprises providing training (e.g. training at conferences, workshops, fairs and lectures) of all enterprises (Model\_2) the negative very weak effect was -0.001. In terms of age, this was the result of the trend for 15-24 year olds only (-0.02). In terms of gender, a very weak negative sensitivity was mapped for males (-0.001). In terms of education, a very weak desirable impact was found for lower primary education (-0.01). The cycle dummy variable then confirmed a very weak impact in the Long boom (-0.003) and the Covid pandemic (-0.00003). In the case of geography, the long-term unemployed were mainly supported in the Czech Republic and Finland (-0.01). The highest desirable impact (-0.15) was then found for men aged 15-24 with lower primary education in Finland during the Covid pandemic.

In terms of the *indicator number of job vacancies in industry for employers with 10 or more employees* (Model\_4) this was the result of trends in the **age range** 25-49 years (-0.001) and 50-64 years (-0.002). In terms of **gender** a very weak desirable sensitivity (-0.001) was mapped for women. In terms of **education** a very weak negative impact was found for upper secondary education (-0.001) and for tertiary education (-0.002). The **cycle dummy variable** then confirmed a very weak impact in the Long boom (-0.0003). The highest desirable impact (-0.003) was then found for men aged 50-64 with lower primary education in the Czech Republic during the long boom.

From a theoretical-empirical perspective on the healthy and active aging of the population, our general recommendations can emphasize the desirable influence of preventive health screening on the labor market indicator and thus confirm the suitability of connecting health policy with employment policy. Protective measures for employees (collective bargaining) must be supported by medical interventions in times of crisis. In addition to educational programs, age management should also include preventive health care in the development of workers in order to increase the effectiveness of measures for the labor market. The revelation of the influence of age management measures on economic cycles (in the phase of the end of Covid-19) confirms the indispensability of linking the flexibility of labor market policies with health care. The age management strategy must correspond to the specific situation in each analyzed country. An effective solution to challenges on the labor market can only be ensured by a balanced labor market and healthcare policy that takes regional differences into account.

## 7. Discussion and conclusions incl. recommendations for age management

Key findings of our analysis and its comparison with the findings of foreign and domestic research on

the impact of age management measures on NAIRU include:

The overall above-average statistically significant positive value of the regression coefficient for the *indicator of the number of vacant jobs in industry for employers with 10 or more employees* points to a very weak undesirable impact on the NAIRU (+0.03). Sharpe and Sargent (2000)<sup>[59]</sup> find that the social returns to education are not high. Layard and Bean (1989)<sup>[43]</sup> report that persistent European unemployment is sustained by the inefficiency of unemployed outsiders. Daly et al. (2012)<sup>[16]</sup> report that high unemployment rates with GDP growth and rising job numbers have raised concerns that the natural rate of unemployment has risen in recent years.

This was only a consequence of the very weak undesirable sensitivity in the 15-24 age group (+0.10). A very weak positive sensitivity was found for males (+0.04). For sub-primary, the intensity was weak (+0.08). Confirmed very weak impact in the Covid pandemic phase (+0.03) as well as the period of Covid 19 recession, Ukrainian conflict and energy crisis (+0.32). A very weak positive sensitivity (+0.002) in the Czech Republic was confirmed, while in Finland it was even (+0.18). Storm and Naastepad (2016)<sup>[64]</sup> argue that the measures did not work because the real cause of the Eurozone crisis lies in unsustainable private sector debt leverage, facilitated by the liberalization of European financial markets and global banking excess.

An above-average statistically significant negative regression coefficient was found for *the cancer screening indicator (colon, rectosigmoid junction, rectum, anus and anal canal cancers)*. This was a result of very poor desirable sensitivity (-0.59). This was mainly due to very poor sensitivity at ages 25-49 years (-0.76) and ages 50-64 years (-0.42). Vigezzi and Strozza (2024)<sup>[68]</sup> in the context of increasing the legal retirement age in Denmark found that individuals aged 50-65 years were persistently disadvantaged (experience, higher mortality). The sensitivity was very weak for lower

than primary (-0.70) and tertiary education (-0.41). Jovanović (2012)<sup>[38]</sup> recommends labour market reform and a focus on workforce training to increase productivity.

Confirmed negative weak impact in the recessionary phase of Covid 19, the Ukrainian conflict and energy crisis (-1.21) and weak in the long boom (-0.49). The highest desirable impact of weak sensitivity is mapped in the Czech Republic (-1.14), while very weak in Germany (-0.72). Birgisdóttir and Ásgeirsdóttir (2017)<sup>[6]</sup> suggest that mortality from neoplasms is not related to economic conditions. Ólafsdóttir et al. (2015)<sup>[54]</sup> confirmed that the positive effect of employment rate on exercise was strongest among working-age men who did not work full-time.

Another *indicator* is *the % of enterprises with a collective agreement between the social partners out of all enterprises with 250 or more employees* with a very weak intensity of impact (-0.04). Desirable negative impact mapped mainly in the 50-64 age group (-0.04). Very weak negative sensitivity mapped for both women and men (-0.04 and -0.03). The long-term unemployed with lower primary education were the most desirable affected (-0.05). Confirmed very weak impact in the Covid pandemic phase (-0.07) and in the Netherlands (-0.14). Carmen de la Cámara (2003)<sup>[14]</sup> argues, that in the case of high NAIRU, policies recommend to improve the functioning of the labour market (e.g. remove perfectly incompatible institutions from the labour market). Shugan (2007)<sup>[60]</sup> states that individuals seeking employment at acceptable wage may lack union membership. Madrick (2007)<sup>[44]</sup> says that NAIRU can be reduced by higher wages which can increase productivity over time.

Another *indicator mapping the number of occupational injuries (4 or more days absent) for men aged 25-54 in agriculture, industry and construction* had a very weak effect (-0.01). Negative impact mapped mainly in the age group 50-64 (-0.02). Most positively (disregarding the health aspect) affected long-term unemployed

with lower primary education (-0.02). Confirmed very weak impact in the Covid pandemic phase (-0.07) and in the Czech Republic (-0.05). Burgard and Kalousova (2015)<sup>+</sup> report that the Great Recession negatively affected the health because austerity has disrupted prevention. Blekesaune (2012)<sup>[8]</sup> argues that job insecurity discourages people from staying at home with milder illness.

For the *indicator % of enterprises providing training (e.g. training at conferences, workshops, trade fairs and lectures) of all enterprises* a very weak desirable effect (-0.001). This was only the result for 15-24 age (-0.02). For males a very weak sensitivity was mapped (-0.001). A very weak negative impact was also found for lower primary education (-0.01) and in the long boom (-0.003). The long-term unemployed were supported especially in the Czech Republic and Finland (-0.01). Boockmann and Steffes (2010)<sup>[10]</sup> report that works councils and the education play an important role in times of declining labour mobility. Noelke and Horn (2014)<sup>[53]</sup> argue that without an institutional framework it is difficult to keep employers to voluntarily provide training places. Poloski Vokic et al. (2018)<sup>[57]</sup> suggest the market-based philosophy of HR model in Croatia.

From a theoretical-empirical perspective on healthy and active population aging, the conclusion about the shortage of filled jobs is central to our general recommendations for policymakers in the event of multidisciplinary crises. Labor market policy should focus on supporting retraining programs and training workers in industries. The health policy should help to create a working environment that is friendly to the worker's health and reduces the risk of injury.

In the case of preventive cancer screening, the analysis confirms the desirable effect of preventive health measures on reducing the NAIRU. Increasing the support of preventive health care from the side of health policy should detect diseases early and reduce the number and length of absence from work. Labor market policy should help the health sector in promoting a healthy



Assessing the impact of age management tools on the long-term sustainable unemployment rate (NAIRU) countries with recommendations for healthy and active population aging in the Czech Republic and selected Eurozone countries lifestyle. The desirable results of companies with contract (collective contract between social partners) should be an argument for labor market policies to strengthen social dialogue, as it would stabilize working conditions. Health policy should focus on health insurance and work benefits, as they promote well-being in the workplace and reduce worker sickness. The very small desirable impact of the number of occupational accidents indicates only a limited effect of working conditions on employability. The labor market policy should therefore, for example, introduce better safety standards and checks on their fulfillment at the workplace. Health policy could speed up returns to work after occupational injuries or illnesses by applying rehabilitation programs. The very weak desirable sensitivity of companies providing training calls for labor market policies to introduce new educational programs and training. This support will increase workers' skills and adaptability to the changing labor market. Health policy should promote long-term employability and increase work performance by implementing mental health, wellness and healthy lifestyle programs.

## 8. General recommendations for labor market and health policy makers for solving future multidisciplinary crises in the Czech Republic, Germany, the Netherlands and Finland

On the basis of the previous analysis, general recommendations can be formulated for labor market and healthcare policymakers in the Czech Republic, Germany, the Netherlands and Finland in the following areas:

1. Labor market and health policy makers should develop crisis plans and regularly check their updating. The output of balanced cooperation should also be the development of several variants of crisis scenarios and a list of preventive measures.
2. Fast and efficient health care and labor market flexibility during crisis periods would be supported

by innovations in digital technologies and telemedicine.

3. The integration of age management into the concept of healthy and active aging would increase the employability of older workers and workers with chronic diseases. Specific combined measures should link preventive health retraining programs and flexible working conditions.

4. Essential measures during crisis periods are, for example, flexible working hours, remote work and part-time working hours. Specifically, policymakers should, for example, speed up legislative processes, raise awareness of these tools and their benefits for healthy and active aging through an awareness campaign. Using an awareness campaign to inform about these tools and their benefits for healthy and active aging.

5. In order to adapt the workforce to the current situation in the economy and society, it is essential to support available and high-quality educational and retraining programs. In particular, these are, for example, digital skills and new technologies.

6. The connecting link between health policy and labor market policy should be, for example, the issue of mental health. Prevention and support of mental health and the availability of online services play a vital role in preserving work ability in a period of instability.

General recommendations confirm the need for a balanced approach to age management and the concept of healthy and active aging. This harmonious cooperation is essential to ensure the resilience of the labor market and health system to future multidisciplinary crises.

### Conflict of Interest:

The author declares no conflict of interest.

### Funding Statement:

None.

## Acknowledgements:

1) University of Finance and Administration, a.s. for payment of work (within the framework of the concluded Agreement on work activity) on the subchapter evaluating the collection of foreign and domestic literature and work on the elaboration of the text of the theoretical part.

2) Age Management, z.s. and the Association of Non-Profit Organizations of the South Moravian Region, z.s. for all outputs/conclusions including

recommendations for economic and social policy makers and the legislative process in the field of age management in the Czech Republic for the period of 14 years. Also for the thorough review work on the text of this chapter for the international book.

## JEL Classification:

E24, E32, E37

## Appendix

Tab. 1 Summary of regression parameters and statistics (NAIRU by sex, age and education)<sup>[69]</sup>

Explained variable: NAIRU_VZDEL_O				
Explanatory variables/Categorical variables	Coefficient	Std. Error	t-Statistic	Prob.
C	0.012	0.030	0.414	0.679
_2_1_SAM_BEZDETI_50	-0.038	0.010	-3.936	0.000
<a href="#">_8_1_NOVOTVARY_1</a>	-0.104	0.040	-2.583	0.010
NAIRU_VZDEL_1	0.879	0.018	49.528	0.000
_11_1_M_25_54_4_3	0.003	0.001	2.925	0.004
_12_10_NEZAM_SS	0.008	0.003	2.328	0.021
_13_1_PRUMYSL_3	0.001	0.001	2.284	0.023
_16_1_KSD_REKRKULT_1	-0.384	0.090	-4.253	0.000
_17_14_CVT_KONFWORK_503	-0.005	0.001	-4.374	0.000
_18_10_CVT_KOLEKSML_202	-0.006	0.002	-2.680	0.008
_3_4_ZENA_40_44	0.004	0.002	1.869	0.063
<i>Individual combinations of the interaction of the categorical variable with the explanatory variables for the author of the article.</i>				
Included observations after adjustments	388			
R-squared	0.95			
F-statistic	30.24			
Prob (F-stat)	0.00			
Durbin-Watsonova statistika	1.48			

## Literature

1. Adams, J.; Greig, M. and R.W. McQuaid. 2002. Mismatch in Local Labour Markets in Central: The Neglected Role of Demand. *Urban Studies*, Vol. 39, No. 8, pp. 1399-1416, Published by: Sage Publications, Ltd.  
URL: <https://www.jstor.org/stable/43196928>
2. Baily, M. N.; Tobin, J.; Holt, Ch.; Wachter, M.; Tobin, J.; Juster, T.; Friedman, B.; Perry, G.; Hall, R.; Okun, A.; Feldstein, M.; Duesenberry, J. and R.J. Gordon. 1977. Macroeconomic Effects of Selective Public Employment and Wage Subsidies. *Brookings Papers on Economic Activity*, Vol. 1977, No. 2, pp. 511-544, Published by: Brookings Institution Press  
URL: <https://www.jstor.org/stable/2534409>
3. Ball, L. and N.G. Mankiw. 2002. The NAIRU in Theory and Practice. *The Journal of Economic Perspectives*, Vol. 16, No. 4, pp. 115-136, Published by: American Economic Association  
URL: <https://www.jstor.org/stable/3216917>
4. Belman, D. and P. J. Wolfson. 2014. Chapter Title: Labor Force Participation Rates, Unemployment, and Vacancies. Book Title: What Does the Minimum Wage Do? Published by: W.E. Upjohn Institute.  
URL: <https://www.jstor.org/stable/j.ctvh4zgf2.13>
5. Bell, D.N.F. and D.G. Blanchflower. 2018. The Lack of Wage Growth and the Falling NAIRU. *National Institute Economic Review*, No. 245, pp. R40-R55, Published by: Cambridge University Press  
URL: <https://www.jstor.org/stable/10.2307/48562312>
6. Birgisdóttir, K.H. and T.L. Ásgeirsdóttir. 2017. Macroeconomic conditions and population health in Iceland. *Demographic Research*, Vol. 37, pp. 769-852 Published by: Max-Planck-Gesellschaft zur Foerderung der Wissenschaften  
URL: <http://www.jstor.com/stable/26332212>
7. Blanchard, O.J.; Diamond, P.; Hall, R.E. and Yellen, J. 1989. The Beveridge Curve. *Brookings Papers on Economic Activity*, Vol. 1989, No., pp. 1-76, Published by: Brookings Institution Press  
URL: <https://www.jstor.org/stable/2534495>
8. Blekesaune, M. 2012. Job insecurity and sickness absence: Correlations between attrition and absence in 36 occupational groups. *Scandinavian Journal of Public Health*, Vol. 40, No. 7, pp. 668-673, Published by: Sage Publications, Ltd. URL: <https://www.jstor.org/stable/45150613>
9. Bol, T.; Eller, Ch. C.; van de Werfhorst, H.G. and T.A. DiPrete. 2019. School-to-Work Linkages, Educational Mismatches, and Labor Market Outcomes. *American Sociological Review*, Vol. 84, No. 2, pp. 275-307, Published by: American Sociological Association  
URL: <https://www.jstor.org/stable/10.2307/48595812>
10. Boockmann, B. and S. Steffes. 2010. Workers, Firms, or Institutions: What Determines Job Duration for Male Employees in Germany? *ILR Review*, Vol. 64, No. 1, pp. 109-127, Published by Sage Publications, Inc. Stable  
URL: <https://www.jstor.org/stable/20789057>
11. Brunello, G.; Lupi, C. and P. Ordine. P. 2000. Regional Disparities and the Italian NAIRU. *Oxford Economic Papers*, Vol. 52, No. 1, Special Issue on Unemployment Dynamics and the Natural Rate, pp. 146-177, Published by: Oxford University Press  
URL: <https://www.jstor.org/stable/3488747>
12. Burgard, S.A. and L. Kalousova. 2015. Annual Review of Sociology, Vol. 41, pp. 181-201, Published by: Annual Reviews  
URL: <https://www.jstor.org/stable/24807595>
13. Burgard, S.A.; Ailshire, J.A. and L. Kalousova. 2013. The Great Recession and Health: People, Populations, and Disparities. *Annals of the American Academy of Political and Social Science*, Vol. 650, The Effects of the Great Recession, pp. 194-213, Published by: Sage Publications, Inc. in association with the American Academy of Political and Social Science  
URL: <https://www.jstor.org/stable/24541682>
14. Carmen de la Cámara. 2003. Assessment of Employment Policies in Poland. *Eastern European Economics*. Vol. 41, No. 3, pp. 29-59, Published by: Taylor & Francis, Ltd.  
URL: <https://www.jstor.org/stable/4380338>

15. Cimbálníková, L.; Fukan, J.; Lazarová, B.; Navrátilová, D.; Novotný, P.; Odrazilová, R.; Palán, Z.; Rabušicová, M.; Rajmonová, M.; Řeháková, L. and I. Štorová. 2015. Age Management for working with the target group 50+: Methodological guide. Association of Adult Education Institutions of the Czech Republic, ESF Project "Age Management Strategy in the Czech Republic" (registration number CZ.1.04/5.1.01/51.00079) within the OP Human Resources and Employment. ISBN 978-80-904531-5-9
16. Daly, M.C.; Hobijn, B.; Şahin, A. and R.G. Valletta. 2012. Unemployment Rise? The Journal of Economic Perspectives, Vol. 26, No. 3, pp. 3-26, Published by: American Economic Association URL: <https://www.jstor.org/stable/41581129>
17. Dangol, J. and S. Chitrakar. 2021. Challenges of COVID-19 for Fair Trade enterprises in attaining Sustainable Development Goals 2030. Journal of Fair Trade, Vol. 3, No. 1, pp. 44-53, Published by: Pluto Journals URL: <https://www.jstor.org/stable/10.13169/jfairtrade.3.1.0044>
18. De-Chih Liu. 2021. the Unemployment Invariance Hypothesis. Hitotsubashi Journal of Economics, Vol. 62, No. 2, pp. 178-199, Published by: Hitotsubashi University URL: <https://www.jstor.org/stable/10.2307/27084658>
19. Dobeš, J.; Formusková, J.; Kostelníková, M.; Kříž, J.; Pokorný, B. and I. Štorová. 2022. Project Work Ability Management No. 2020-1-CZ01-KA204-078204 Erasmus+ Programme Key Action 2 Strategic Partnerships for Adult Education
20. Dobeš, J.; Formusková, J.; Kostelníková, M.; Kříž, J.; Pokorný, B. and I. Štorová. 2021. Project Work Ability Management No. 2020-1-CZ01-KA204-078204 Erasmus+ Key Action 2 Strategic Partnerships for Adult Learning
21. Eriksson, T. and J. Ortega. 2006. The Adoption of Job Rotation: Testing the Theories. ILR Review, Vol. 59, No. 4, pp. 653-666, Published by: Sage Publications, Inc. URL: <https://www.jstor.org/stable/25067562>
22. Esteban Sánchez, P. and S. Benito-Hernández. 2015. CSR Policies: Effects on Labour Productivity in Spanish Micro and Small Manufacturing Companies. Journal of Business Ethics, Vol. 128, No. 4, Special Issue on The 25th EBEN Annual Conference in Barcelona, pp. 705-724, Published by: Springer URL: <https://www.jstor.org/stable/24702900>
23. Eurostat, 2023. Data downloaded on 19 January 2024
24. EViews. 2013. EViews Version 7 Help Topics
25. Fabiani, S. and R. Mestre. 2000. Alternative measures of the NAIRU in the euro area: estimates and assessment. ECB WP
26. Fitzenberger, B.; Osikominu, A. and R. Voelter. 2008. Get Training or Wait? Long-Run Employment Effects of Training Programs for the Unemployed in West Germany. Annales d'Économie et de Statistique, No. 91/92, Econometric Evaluation of Public Policies: Methods and Applications, pp. 321-355, Published by: GENES on behalf of ADRES URL: <https://www.jstor.org/stable/27917250>
27. Gordon, R.J. and J.H. Stock. 1998. Foundations of the Goldilocks Economy: Supply Shocks and the Time-Varying NAIRU. Brookings Papers on Economic Activity, Vol. 1998, No. 2, pp. 297- 346, Published by: Brookings Institution Press Stable URL: <https://www.jstor.org/stable/2534696>
28. Gould, R.; Ilmarinen, J.; Jarvisalo, J. and S. Koskinen. 2008. Dimensions of Work Ability: Result of the Health 2000 Survey 2008. Helsinki. [cited 2023-04-21]. Available from <https://sivusto.kykyviisari.fi/wp-content/uploads/2018/09/Gould-Dimensions-of-work-ability.pdf>
29. Humphrey, T. M. 1985. The early history of the PHILLIPS CURVE. Economic Review. Federal Reserve Bank of Richmond
30. Husaříková, L.; Slováčková, M.; Spáčil, P. and J. Šulák. 2021. Assessing the level of work ability of employees in the Czech Republic. Initial analysis and identification of risk sectors. Confederation of

Industry and Transport of the Czech Republic.

TREXIMA

31. Ilmarinen, J. 2006. Towards a longer worklife! Ageing and the quality of worklife in the European Union. Finnish Institute of Occupational Health, Ministry of Social Affairs and Health, Helsinki

32. Ilmarinen, J. and K. Tuomi. 2004. Past, present and future of work ability. In Ilmarinen J, Lehtinen S, eds. Past, Present and Future of Work Ability. Finnish Institute of Occupational Health, People and Work, Research Reports 65, Helsinki, pp. 1-25.

33. Jašová, E. 2023. The Non-Accelerating Inflation Rate of Unemployment as an alternative to the Non-Accelerating Inflation Rate of Unemployment for the period of the COVID-19 pandemic: the example of the industries of the Czech Republic. Engineering Economics-Engineering Economics

34. Jasova, E. and B. Kadeřábková. 2019. Political Economy, University of Economics in Prague, Oeconomica Publishing House, Prague, 2/2019, ISSN 0032-3233

35. Jašová, E. 2016. The concept and methods of estimating the NAIRU and the labour market business cycle in the Visegrad Group countries. Dissertation. Faculty of Economics, University of Economics in Prague

36. Jasova, E. and B. Kadeřábková. 2012. Comparing NAIRU and Economic Cycle from the Perspective of Labour Market in the Countries of the Visegrad Group. Economic Studies journal, Bulgarian Academy of Sciences, p. 3-23, Sofia, Issue 4, volume XXI, ISSN 0205-3292. Bulgaria

37. Järviöskö, A.; Härkäpää, K. and S. Mannila. 2001. Moniulotteinen työkykykäsitelmä ja työkykyäylläpitävä toiminta [Multidimensional work ability concept and maintenance of work ability]. Kuntoutus 2001(3):3-11

38. Jovanović, N.M. 2012. Is the Eurozone Rescue Strategy Tantamount to the Rearrangement of the Deckchairs on the Titanic? Journal of Economic Integration, Vol. 27, No. 1, pp. 33-79, Published by: Center for Economic Integration, Sejong University

URL: <https://www.jstor.org/stable/41473731>

39. Kondo, N.; Rostila, M. and M. Å. Yngwe. 2014. Rising inequality in mortality among working-age men and women in Sweden: a national registry-based repeated cohort study, 1990-2007. Journal of Epidemiology and Community Health (1979-), Vol. 68, No. 12, pp. 1145-1150, Published by: BMJ  
URL: <https://www.jstor.org/stable/43282059>

40. Korver, T.; Peter R.A. and T.R. Oeij. 2006. Covenants, External Effects and Employability. The European Journal of Social Quality, Vol. 6, No. 1, The European Social Model and European Values - Issues of Convergence and Divergence, pp. 50-81  
Published by: Berghahn Books  
URL: <https://www.jstor.org/stable/23971871>

41. Kovacheva, S.; Jacovkis, J.; Startari, S. and A. Siri. 2020. Chapter Title: Are lifelong learning policies working for youth? Young people's voices. Book Title: Lifelong Learning Policies for Young Adults in Europe Book Subtitle: Navigating between Knowledge and Economy, Published by: Bristol University Press, Policy Press.  
URL: <https://www.jstor.org/stable/j.ctvt6rk3z.14>

42. Lafontaine, F. and K. Shaw. 2016. Serial Entrepreneurship. Journal of Labor Economics, Vol. 34, No. S2, Part 2: Special Issue in Honor of Edward P. Lazear, pp. S217-S254, Published by: The University of Chicago Press on behalf of the Society of Labor Economists and the NORC at the University of Chicago  
URL: <https://www.jstor.org/stable/10.2307/26553245>

43. Layard, R. and Ch. Bean. 1989. Why Does Unemployment Persist? The Scandinavian Journal of Economics, Vol. 91, No. 2, 90th Anniversary Symposium: Whither Macroeconomics?, pp. 371-396. Published by: Wiley on behalf of The Scandinavian Journal of Economics  
URL: <https://www.jstor.org/stable/3440117>

44. Madrick, J. 2007. Demand-Led Growth, Government Intervention, and Public Investment: Broadening the Policy Choices for America. Challenge, Vol. 50, No. 6, pp. 51-90, Published by: Taylor & Francis, Ltd.

URL: <https://www.jstor.org/stable/40722482>

45. Malamud, O. and C. Pop-Eleches. 2010. General Education versus Vocational Training: Evidence from an Economy in Transition. *The Review of Economics and Statistics*, Vol. 92, No. 1, pp. 43-60, Published by: The MIT Press Stable URL: <https://www.jstor.org/stable/25651389>

46. McAdam, P. and K. McMorrow. 1999. The NAIRU Concept - Measurement uncertainties, hysteresis and economic policy role. *European Economy - Economic Papers*, n. 136. Brussels: European Commission.

47. Ministry of Labour and Social Affairs. 2023. Action Plan to implement the Strategic Framework for Preparing for an Ageing Society 2023-2025. <https://www.mpsv.cz/web/cz/akcni-plan-k-naplneni-strategickeho-ramce-pripravy-na-starnuti-spolecnosti-na-obdobi-2023-2025>

48. Ministry of Labour and Social Affairs. 2023a. Strategie rodinné politiky 2024-2030. <https://www.mpsv.cz/documents/20142/225508/Strategie+rodinn%C3%A9+politiky+2024-2030.pdf/f256340c-9229-a4de-6f0a-90f7ad343fef>

49. Ministry of Labour and Social Affairs. 2021. Strategic framework for preparing for an ageing society 2021-2025 <https://www.mpsv.cz/documents/20142/372809/Sstrategicky+ramec+pripravy+na+starnuti+spolecnosti+2021-2025.pdf/99bc6a48-abcf-e555-c291-1005da36d02e>

50. Ministry of Labour and Social Affairs of the Czech Republic. 2020. Strategic framework of employment policy until 2030. <https://www.mpsv.cz/strategicky-ramec-politiky-zamestnanosti-do-roku-2030>

51. Ministry of Labour and Social Affairs of the Czech Republic. 2014. National Action Plan to Promote Positive Ageing for the period 2013 to 2017 Updated version as of 31.12.2014. Available at [https://www.mpsv.cz/documents/20142/372809/NAP\\_311214.pdf/0cc270fa-dbf9-fcd5-93d6-5e7b0e9376b2](https://www.mpsv.cz/documents/20142/372809/NAP_311214.pdf/0cc270fa-dbf9-fcd5-93d6-5e7b0e9376b2).

52. Nielsen, K.J.; Lander, F. and J.M. Lauritsen. 2015. The relationship between macroeconomic and industry-specific business cycle indicators and work-related injuries among Danish construction workers. *Occupational and Environmental Medicine*, Vol. 72, No. 4, pp. 271-276, Published by: BMJ

URL: <https://www.jstor.org/stable/43870049>

53. Noelke, C. and D. Horn. 2014. Social Transformation and the Transition from Vocational Education to Work in Hungary: A Differences-in-differences Approach. *European Sociological Review*, Vol. 30, No. 4, pp. 431-443, Published by: Oxford University Press

URL: <https://www.jstor.org/stable/24479905>

54. Ólafsdóttir, T.; Hrafnkelsson, B. and T.L. Ásgeirsdóttir. 2015. The Icelandic economic collapse, smoking, and the role of labour-market changes. *The European Journal of Health Economics*, Vol. 16, No. 4, pp. 391-405, Published by: Springer

URL: <https://www.jstor.org/stable/24773939>

55. Patrick, A. and L. Minford. 1993. Has Labour Market Economics Achieved a Synthesis? Reviewed Work(s): Unemployment by Richard Layard, Steven Nickell and Richard Jackman: Europe's Unemployment Problem by Jacques Drèze and Charles Bean Reviewed by: Source: *The Economic Journal*, Vol. 103, No. 419, pp. 1050-1056, Published by: Oxford University Press on behalf of the Royal Economic Society URL: <https://www.jstor.org/stable/2234721>

56. Pissarides, Ch.; Layard, R. and H. Hellwig. 1986. Unemployment and Vacancies in Britain. *Economic Policy*, Vol. 1, No. 3, pp. 499-559, Published by: Oxford University Press on behalf of the Centre for Economic Policy Research, Centre for Economic Studies, CESifo Group, and the Maison des Sciences de l'Homme URL: <https://www.jstor.org/stable/1344583>

57. Poloski Vokic, N.; Klindzic, M. and T. Hernaus. 2018. Changing HRM practices in Croatia. *Journal of East European Management Studies*, Vol. 23,

No. 2, pp. 323-344, Published by: Nomos Verlagsgesellschaft mbH

URL: <https://www.jstor.org/stable/10.2307/26617424>

58. Rohmert, W. and J.E. Rutenfranz. 1983. *Praktische Arbeitsphysiologie*. Georg Thieme Verlag, Stuttgart, New York, p. 5-29

59. Sharpe, A. and T.C. Sargent. 2000. *Structural Aspects of Unemployment in Canada: Introduction and Overview*. Canadian Public Policy / Analyse de Politiques, Vol. 26, Supplement: Structural Aspects of Unemployment in Canada, pp. S1-S5, Published by: University of Toronto Press on behalf of Canadian Public Policy

URL: <https://www.jstor.org/stable/3552500>

60. Shugan, S.M. 2007. Does Good Marketing Cause Bad Unemployment? *Marketing Science*, Vol. 26, No. 1, pp. 1-17, Published by: INFORMS

URL: <https://www.jstor.org/stable/40057070>

61. Simonazzi, A. 2003. Innovation and growth: supply and demand factors in the recent US expansion. *Cambridge Journal of Economics*, Vol. 27, No. 5, pp. 647-669, Published by: Oxford University Press

URL: <https://www.jstor.org/stable/23602114>

62. Stansbury, A. and L.H. Summers. The Declining Worker Power Hypothesis. *Brookings Papers on Economic Activity*, pp. 1-77, Published by: Brookings Institution Press

URL: <https://www.jstor.org/stable/10.2307/26996621>

63. Steel, R. P.; Griffeth, R. W.; Hom, P. W. and D.M. Lyons. 2002. Practical Retention Policy for the Practical Manager [and Executive Commentary]. *The Academy of Management Executive* (1993-2005), Vol. 16, No. 2, Theme: Achieving Competitive Advantage, pp. 149-164, Published by: Academy of Management

URL: <https://www.jstor.org/stable/4165849>

64. Storm, S. and W.M.C. Naastepad. 2016. Myths, Mix-ups, and Mishandlings. *International Journal of Political Economy*, Vol. 45, No. 1, pp. 46-71. Published by: Taylor & Francis, Ltd. URL:

<https://www.jstor.org/stable/10.2307/48539440>

65. Tobin, J. 1997. Supply Constraints on Employment and Output: NAIRU versus Natural Rate. Cowles Foundation Paper 1150. Yale University, New Haven

66. Charles University, AIVD ČR, z.s. 2017. Age management Uptake. Intellectual Output 1. Project Name: Age Management Uptake; Project No.: 2017-1 SK01-KA204-035420

[https://www.dataplan.info/img\\_upload/7bdb1584e3b8a53d337518d988763f8d/akcni-plan-prevence-domaciho-a-genderove-podmineneho-nasili-na-leta-2019-2022.pdf](https://www.dataplan.info/img_upload/7bdb1584e3b8a53d337518d988763f8d/akcni-plan-prevence-domaciho-a-genderove-podmineneho-nasili-na-leta-2019-2022.pdf)

67. Vandenberghe, V.; Waltenberg, F. and M. Rigo. 2013. Ageing and employability. Evidence from Belgian firm-level data. *Journal of Productivity Analysis*, Vol. 40, No. 1, pp. 111-136, Published by: Springer Stable

URL: <https://www.jstor.org/stable/43550102>

68. Vigezzi, S. and C. Strozza. 2024. Differences in mortality before retirement. *Demographic Research*, Vol. 50, pp. 515-546, Published by: Max-Planck-Gesellschaft zur Foerderung der Wissenschaften,

URL: <https://www.jstor.org/stable/10.2307/48766152>

Source: own calculation based on Eurostat data