

Hana Stojanová

Mendel University in Brno
Faculty of Business and Economics, Department of Management
Brno, Czech Republic
E-mail: hana.stojanova@mendelu.cz

Kateřina Bittnerová

Mendel University in Brno
Faculty of Business and Economics, Department of Management
Brno, Czech Republic
E-mail: hana.stojanova@mendelu.cz

THE EMPLOYMENT OF WORKFORCE AGE 50 plus IN THE V4 COUNTRIES

Preliminary communication

UDK: 331.522.4-053.8

JEL classification: M51, M54, O15, J14, J21

Abstract

From an economic perspective, the current trend of European population aging, perceived as a serious problem, because of the rising costs of social security, pension policy of the state, long-term health care, employee training and not least the growth of unemployment benefits. The aim of paper was to identify and compare factors affecting age management and employment of workers age category 50+ in the V4 countries. On the basis of secondary data gained from statistical portals were assessed the current employment situation of workforce category 50+ in the V4 countries, the Czech Republic, Hungary, Poland and the Slovak Republic. The obtained data were organized and processed into graphic form. To determine differences and dependent variables of interest were used two-dimensional contingency tables. For the analysis of contingency tables were used chi-square test, and the actual and expected values were compared. Results of testing and validation of hypotheses were discussed and processed into conclusion.

Keywords: age management, employment, workforce 50+

1. INTRODUCTION

Countries of Visegrad agreement (hereinafter V4), the Czech Republic, Slovakia, Hungary and Poland, but also other countries in Europe, currently extending the age of retirement. The age of retirement is increasing mainly due to the demographic changes and increasing life expectancy (Boldrin, Montes, 2005). Thanks to these demographic changes also increases the proportion of people who have valuable experience, specialized professional knowledge, greater responsibility, reliability, maturity. (Cervellati, Sunde, 2005). If the Czech Republic wants to achieve economic growth and stabilize its pension system will have to take into account the potential of older workers (Dufek, Minařík, 2009, Blankenau, Simpson, Tomljanovich, 2007, Gonzales-Eiras, Niepelt, 2012, Boons, Montalvo, Quist, Wagner, 2013). It is argued repeatedly in the literature that there is several factors influencing the employment growth. A wide range of authors study the implications of demographic aging on economic growth (Börsch-Supan et al., 2007), the regional disparities (Ludwig, 2005), the influence of workers aging (Gonzalez-Eiras, Niepelt, 2008), Schimke 2014), the workforce age distribution (Lévesque, Minniti, 2005, Acemoglu, Johnson, 2007).

The aim of paper was to identify and compare factors affecting employment of workers age category 50+ in the V4 countries and assessed the current employment situation of workforce category 50+ in the V4 countries, the Czech Republic, Hungary, Poland and the Slovak Republic. The research questions were focused to the relation between minimum wage and the employment rate and the relation between unemployment rate to the education level in V4 countries among people aged 55 or over.

1.1. Labor market of V4 countries

Despite setting the European Economic Community main goal, the common market, characterised by free movement of goods, services, people and capital, there are still economic and labour market differences among the states (Barro, 2008, Ehrenberg, Smith, 2011, Bohlander, Snell, 2012, Eurostat, 2016). The European labour market is perceived as less flexible than labour market of United States, which is caused by many regulations of the companies by state, avoiding immediate adaption to market changes and trends (OECD, 2016, Hopkins, 2007, Di Domenico, Spattini, 2008, Hall, Lieberman, 2012). The large proportion of US labour force belongs to labour unions, which accomplish to push the gross wage above the market equilibrium level, causing the higher unemployment rate. (Mankiw, 2012, Carbaugh, 2011, Baumol, Blinder, 2012, Arnold, 2013). The Czech Republic (hereinafter Czechia) has represented the V4 countries with the highest unemployment rate for the past decade (MPSV, 2015). Within that time employment rate hasn't dropped below 64%.

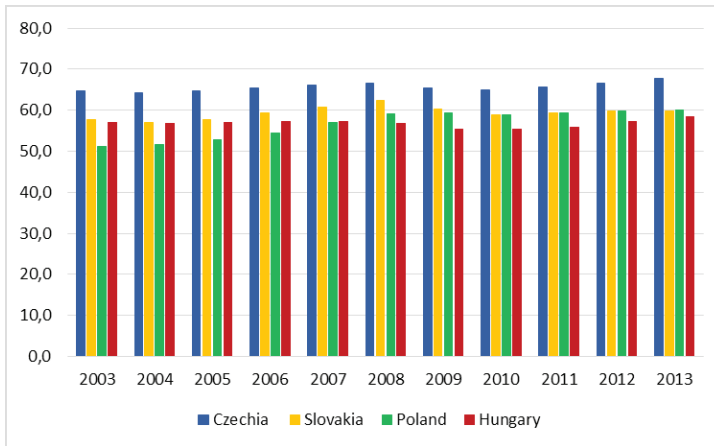


Figure 1 The employment rate for persons 15-64 years of all countries (in%)

Source: Eurostat, 2015, the own processing

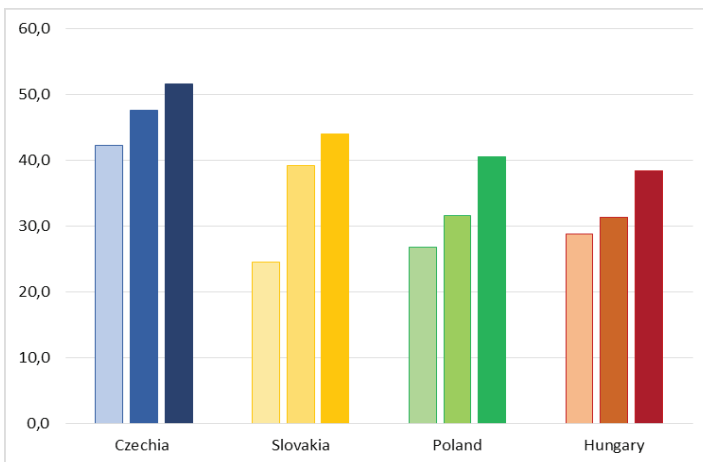


Figure 2 The employment rate for people 55 and older in the years 2003, 2008 and 2013

Source: Eurostat, 2015, the own processing

The most visible change was recognised in Slovakia, where the rate almost doubled within five years (from 24,6% in 2003 to 44% in 2008). Outcome of this change caused that Slovakia shifted from the last place to the one before Poland and Hungary (WBJ, 2014, Eurostat, 2015). The least significant growth was found in the Czech Republic, amounting to less than 10% in ten years due to high employment rate it had kept among people aged 55 and older. Based on data displayed in the figure number 2 can be concluded that the Czech Republic had a lot older workforce than the rest of studied countries.

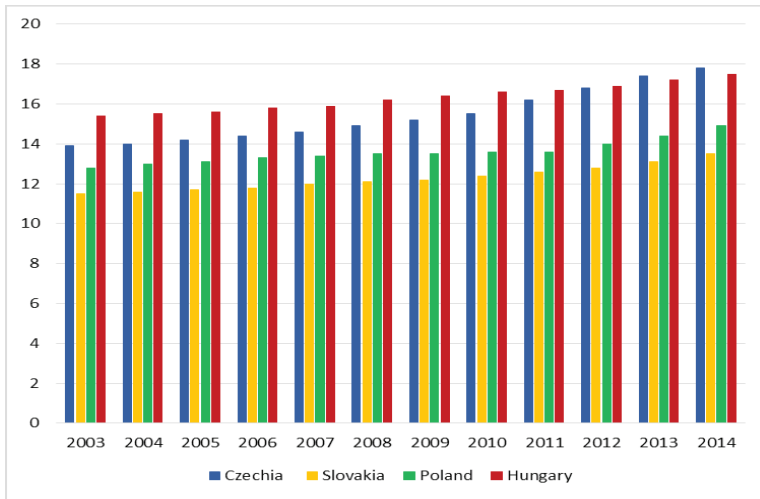


Figure 3 Percentage of the population 65 years and older in the total population (in%)

Source: Eurostat, 2015, own processing

In every V4 country can be observed a trend of increasing number of people aged 65 and older within the total population. In case of Slovakia and Poland numbers had been growing at a slow pace (2% per studied time period), while in the Czech Republic the number of people aged 65 and older increased from 13% to 18% among the overall population.

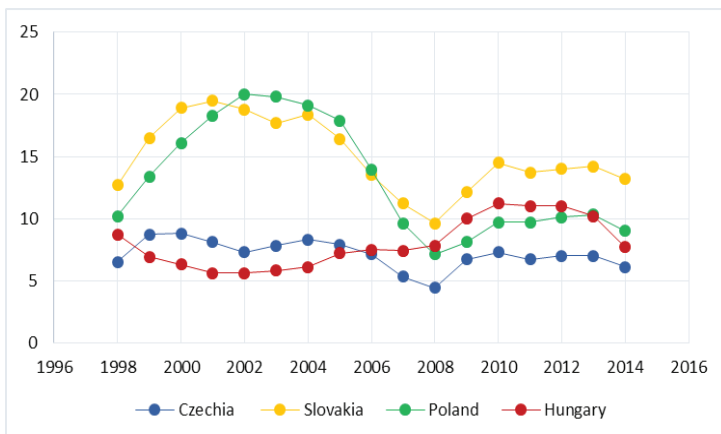


Figure 4 The unemployment rate of surveyed countries (in %)

Source: Eurostat, 2015, own processing

The unemployment rate, displaying into the figure number 4, within the studied countries can be divided to two time periods. Before 2008 there had been two pairs of countries with similar data: Czechia + Hungary and Poland + Slovakia. While data for Czechia and Hungary remained rather stable and below 10%, the latter amounted to approximately 20%. Second time period would be the post 2008, when unemployment rate of these four countries equalized. Average unemployment rate amounted to 7% in Czechia, approximately 10% in Hungary and Poland, and 15% in post-crisis Slovakia.

1.1.1. The unemployment in relation to the education level

People over 50 years old, along with women and graduates belong to the segment of the labor market most threatened by unemployment. (Schneider, Kallis, Martinez-Alier, 2010). The unemployed in the 50 plus age group are on the increase. The greatest difficulty in finding work can be observed especially among elderly people with low education. The graphic figure number 5 showed level of employment in relation to the education level among people aged 25-64 years and proved the widely known claim that the higher the level of acquired education the better opportunities employee has on the job market.

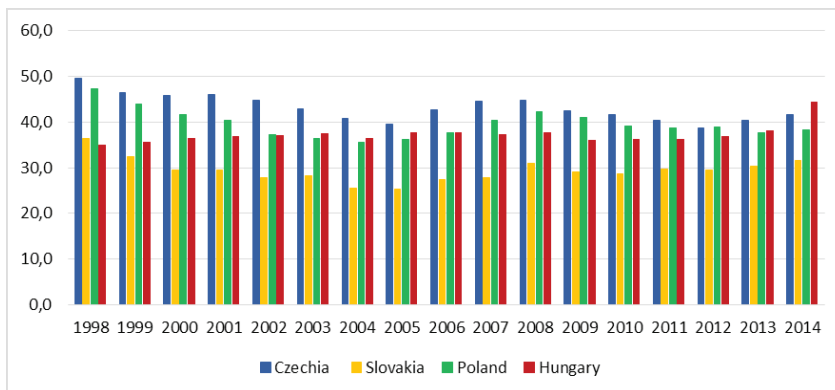


Figure 5 Employment rate by educational attainment 25-64 (in%), Pre-primary education, primary education and lower secondary education

Source: Eurostat, 2015, own processing

Therefore people with lower education level would become more dependent as their qualifications allow them a very limited range of employment opportunities. It can be observed a 5% increase in one year (Hungary 2013-2014) or a 10% decrease within four years (Poland 1998-2002). Individuals with high school education were less dependent on such changes and average employment rate amounted to 65%. The employment rate among people aged 25-64 years with higher secondary education in Poland rose to more than 68% in 1998. In 2002-2006 it dropped below 60%. In Czechia, employment rate in this segment did not drop below 71% within the studied period.

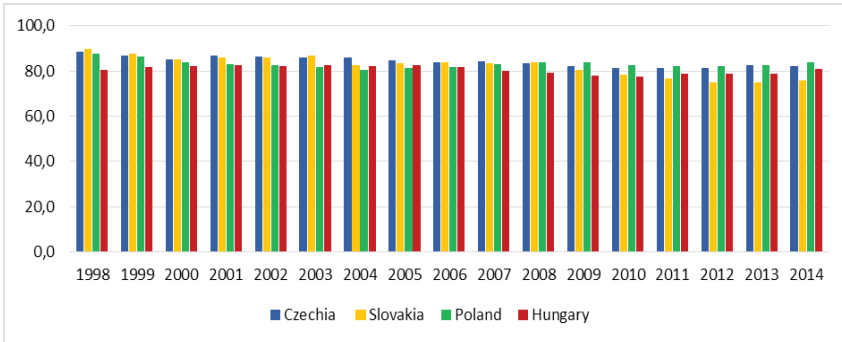


Figure 6 Employment rate by educational attainment 25-64 (in %) - Tertiary education

Source: Eurostat, 2015, own processing

Employment rate among the working age population 25-64 years with tertiary education in all observed countries remained stable and amounted to approximately 80%. When comparing the three graphs, data for Slovakia had specific characteristics during the time period 2004-2006 with the most significant difference between 82% employment rate among people with tertiary education and 37% employment rate among people with primary education. Following graphs display levels of employment from the highest acquired education among the age group 25-64 years.

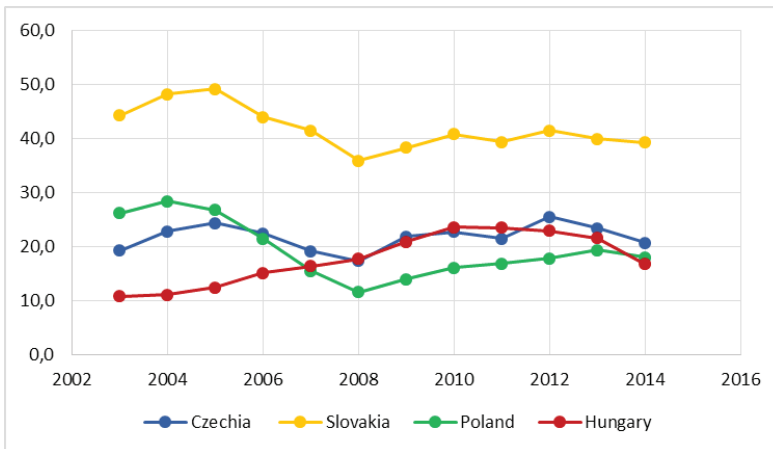


Figure 7 Unemployment rate by educational attainment 25-64 (in %) - Pre-primary education, primary education and lower secondary education

Source: Eurostat, 2015, own processing

The Figure number 7 with unemployment rate data among people in the age group 25-64 years with primary or secondary education showed differences

between Slovakia and other Visegrad countries. Comparison between Slovakia and Hungary in 2004 showed almost fourfold unemployment rate in Slovakia, 11% compared to 49%. Graphic figures showing unemployment rate of people in the age group 25-64 with higher secondary education can be divided into two time periods. Before 2008 a significant difference could be seen between Czechia - Hungary and Poland – Slovakia. Since 2004 the Polish-Slovak couple have been trying to decrease the employment rate and catch up with the Czech-Hungarian model. In 2008 figures of these four countries equalized the most and on top of that it was the year with the lowest unemployment rate for the past decade for three out of four countries, with 3,3 % in Czechia, 7,4% in Slovakia, 6,3% in Poland and Hungary. The “pairs” disappeared but similar graphs remained after 2008, where Czechia had best results at around 6%, while Slovakia had the worst results at around 12%.

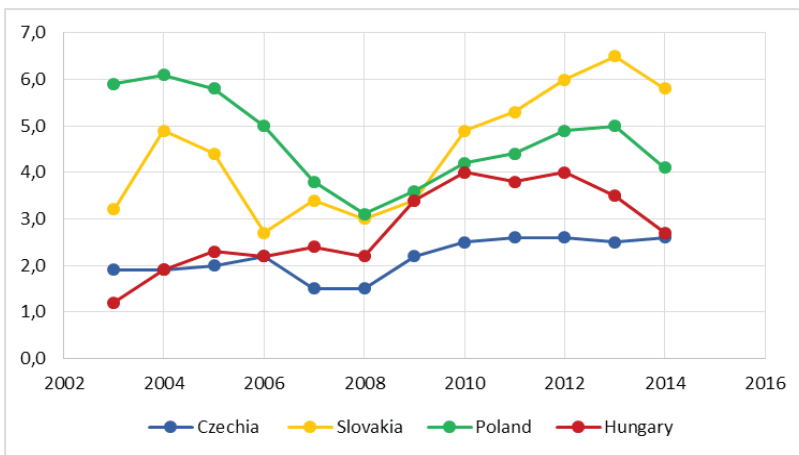


Figure 8 Unemployment rate by educational attainment 25-64 (in%) - Tertiary education

Source: Eurostat, 2015, own processing

The last figure number 8 with observed age group 25-64 displays a group with tertiary education. There could be founded the lowest rates within all three graphs, where differences were even tenfold. It was worth to mention the relative constancy in Czechia, which remained around 2%.

2. DATA AND METHODS

Testing of hypotheses included two hypotheses, the null hypothesis (H_0) and alternative hypothesis (H_1). The null hypothesis considered independence of variables and the alternative hypothesis falsified the null hypothesis. For the verification process level of significance of chi-square was set to 5% ($\alpha = 0,05$). Two pivot tables were used to identify the difference and dependence of observed variables, while dependency between variables was derived from their values.

In order to analyse the pivot tables the chi-square test χ^2 about independence was used, which further compared the real and expected values. Formulas for testing criteria were as following:

$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^s \frac{(n_{ij} - n'_{ij})^2}{n'_{ij}} \quad (1)$$

- n_{ij} theoretical/expected frequency,
- n'_{ij} calculated conditional frequency,
- i row number in the pivot table,
- j column number in the pivot table,
- r number of rows in the pivot table,
- s number of columns in the pivot table.

Pearson correlation coefficient was used for identifying levels of dependency between variables:

$$r = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \sum_{i=1}^n (y_i - \bar{y})^2}} \quad (2)$$

- x independent variable,
- y dependent variable,
- \bar{x}, \bar{y} averages of individual variables,
- n frequency

According to the calculated values of testing criteria of the chi-square test it was possible to further decide verification or falsification of the null hypothesis. Level of dependency was identified based on the correlation coefficient. Program STATISTICA was used for calculations. Before data collection, were provided the following hypotheses.

2.1. Hypothesis Testing Results

The First Hypothesis

The hypothesis was raised with the aim to prove whether:

H0: Minimum wage is not influenced by the employment rate in relation with the acquired education.

H1: Minimum wage is influenced by the employment rate in relation with the acquired education.

P-values of the Pearson's chi-square test per each country and level of acquired education were used for testing of the first hypothesis.

Table 1

The first hypothesis testing results

Country	p-value	correlation coefficient R	result	rejection H0
CR - primary	0,003651	0,6639	$p < 0,05$	yes
CR - secondary	0,070779	0,4488	$p > 0,05$	no
CR - tertiary	0,00000	0,9397	$p < 0,05$	yes
SK - primary	0,001449	0,8331	$p < 0,05$	yes
SK - secondary	0,247356	0,3812	$p > 0,05$	no
SK - tertiary	0,000295	0,8849	$p < 0,05$	yes
PL - primary	0,822687	0,0816	$p > 0,05$	no
PL - secondary	0,015737	0,7336	$p < 0,05$	yes
PL - tertiary	0,144971	0,4959	$p > 0,05$	no
HU - primary	0,308566	0,3823	$p > 0,05$	no
HU - secondary	0,627789	0,1882	$p > 0,05$	no
Country	p-value	correlation coefficient R	result	rejection H0
HU - tertiary	0,206451	0,4657	$p > 0,05$	no
V4 - primary	0,022376	0,3436	$p < 0,05$	yes
V4 - secondary	0,822233	0,0348	$p > 0,05$	no
V4 - tertiary	0,051012	0,2961	$p > 0,05$	no

Source: author's calculations

Based on the calculations displayed in the table, there could be concluded that in case of nine options was the calculated value higher than the level of significance, and therefore in these cases the null hypothesis couldn't be falsified. In another six cases the null hypothesis was falsified and the alternative hypothesis was verified. In such cases, results were highlighted in bold letters and showed that minimum wage was influenced by the employment rate in relation with acquired level of education among the respective population.

The Second hypothesis

The hypothesis was raised with the aim to prove whether:

H0: Employment rate among people aged 55 or over is not influenced by population aged 65 or over.

H1: Employment level among people aged 55 or over is influenced by population aged 65 or over.

Table 2

The second hypothesis testing results

	Czechia	Slovakia	Poland	Hungary	V4
p-value	0,000002	0,000049	0,000004	0,000162	0,007769
correlation coefficient R	0,9539	0,9059	0,9443	0,8797	0,3797
result	$p < 0,05$	$p < 0,05$	$p < 0,05$	$p < 0,05$	$p < 0,05$
rejection H ₀	yes	yes	yes	yes	yes

Source: author's calculations

When testing the second hypothesis, p-value of Pearson's coefficient calculated for V4 countries was lower than the level of significance. In such case the null hypothesis could be falsified. There could be concluded, with 5% risk, that the employment rate among people aged 55 or over was influenced by population aged 65 or over. According to the correlation coefficient, which amounted to more than 90% in three countries, and reached almost 90% in the fourth country, there could be concluded that there was a very high level of dependency.

2.1.1. Summary of results

In case of the first hypothesis compliance was found between Czechia and Slovakia. Minimum wage in these countries was influenced by employment rate with regard to the highest acquired education. Completely different results were found in Poland, where minimum wage was influenced only by the employment rate among people with high school education. In case of Hungary the null hypothesis was valid, which showed independence between these variables in relation to all three types of acquired education. Findings based on testing the second hypothesis showed that the employment rate among people aged 55 or over was influenced by the population rate of people aged 65 or over. Increasing number of people in retirement age and the overall aging population have led to growing number of people of the same age group, who were still working, although they had the right to retire. Based on these findings, there could be concluded that growing population rate among people in retirement age led to growing number of working population aged 55 or over, and therefore use of senior workforce within the V4 countries. When comparing the Visegrad countries, the best results in relation to the employment rate were found in the Czech Republic. Overall employment rate did not go below 64% within the studied period, employment rate among people aged 55 or over in 2013 exceeded 50%. Overall average unemployment rate was 7%. Although the V4 countries showed rather balanced results, research data identified some differences. Slovakia had the highest results with regard to the unemployment rates among primary education and lower secondary education, where it reached 40%. Within the V4 countries, Hungary was hit the most by the financial crisis in 2008 and hasn't caught up on its pre-crisis employment rate.

2.1.2. Discussion

The Czech population, as well as the European population, is aging. Simultaneously with the improvement of medical care, life expectancy also increases. The age limit for retirement is prolonged. Despite the problems of maintaining and finding employment in older age, widely discussed in the literature, people over 50 are an integral part of the overall labor market and holders of values. Workers seniors bring companies a clear vision, goals, experience and knowledge of the processes (Casey, Metcalfand, Lakey, 1993, Goudswaard, De Nanteuil, 2001, Ilmarinen, Tuomi, 2004). Individual countries are taking measures to reduce unemployment in this age group. Whether it is an active employment policy tools, retraining, support for community work,

counselling or individual contributions to the establishment and operation of socially useful jobs (The world of labour, 2013) However, it faces the fears and prejudices of employers that older classes are less learning new things, adapting to change, slowing down, and failing to keep up with technological developments. (Glomm, Ravikumar, 1992, Finnish Institute of Occupational Health, 2014). Part of the perception is shared by the candidates themselves. They suffer from feelings of inferiority, they do not believe, they cannot adapt and neglect lifelong learning. The solution can be assembling teams across age groups, the so-called diversity team in order to keep these workers in the labor market, share their experiences and bring benefits to all interested parties (Rašticová,2013).

3. CONCLUSIONS

The aim of the paper was to determine the factors affecting the employment of workforce segment age 50 plus in the labor market in the countries of the Visegrad agreement, comparing individual countries, examined their differences and similarities.

The significant impact has been proven in the segment of educational attainment as well as high dependency between employment rates among people aged 55 and the population rate. In the hypotheses examined in this work, we have made the surprising result in the minimum wage, depending on the unemployment rate. The result was, however, reversed in three states: a rising minimum wage, companies are reluctant to hire fewer employees and thus increasing unemployment in the country. Therefore the Czech Republic has many open questions in the future how to approach towards western European countries, their developed economies and highly set up remunerations. Further research is necessary in order to delineate essential versus optional steps in the age management process to avoid unemployment into workforce segment age 50 plus.

REFERENCES

Acemoglu, D., Johnson, S. (2007). 'Disease and development: The effect of life expectancy on economic growth', *Journal of Political Economy* 115(6), 925–985.

Arnold, R. (2013) *Macroeconomics*. 11. edition. USA: Cengage Learning. 616 p. ISBN 978-1-133-18974-9.

Barro, R. (2008) *Macroeconomics: A modern Approach*. USA: Thomson Learning. 512 p. ISBN 13:978-0-324-17810-4.

Baumol, J. W., Blinder, A. S. (2012) *Microeconomics: Principles & Policy*. 12. edition. USA: Cengage Learning. 514 p. ISBN 978-0-538-45362-2.

Blankenau, W. F., Simpson, N. B. & Tomljanovich, M. (2007). 'Public education expenditures, taxation, and growth: Linking data to theory', *American*

Economic Review, Papers and Proceedings 97(2), 393–397.

Bohlander, G. W., Snell, S. A. (2012) *Managing Human Resources*. 16. edition. USA: Cen-gage Learning. 832 p. ISBN 978-1-111-53282-6.

Boldrin, M., Montes, A. (2005). ‘The intergenerational state: Education and pensions’, *Review of Economic Studies* 72, 651–664.

Boons, F., Montalvo, C., Quist, J., & Wagner, M. (2013). Sustainable innovation, business models and economic performance: an overview, *Journal of Cleaner Production*, Volume 45, April 2013, Pages 1–8

Börsch-Supan, A., et al. (2007) Der Zusammenhang zwischen Alter und Arbeitsproduktivität: Eine empirische Untersuchung auf Betriebsebene, Mannheim: Mannheimer Forschungsinstitut für Ökonomie und Demographischer Wandel, Abschlussbericht zum Forschungsschwerpunkt “Erwerbsarbeit im Wandel” der Hans-Böckler-Stiftung, (Stand: 27/06/11) Retrieved from: www.boeckler.de/pdf_fof/S-2004-697-3-5.pdf

Carbaugh, R. J. (2011) *Contemporary economics: an application approach*. 6. edition. USA: M. E. Sharpe. 454 p. ISBN 978-0-7656-2488-8

Casey, B., Metcalf, H., & Lakey, J. (1993). *Human Resource Strategies and the Third Age: Policies and Practices in the UK*. Age and Employment, London, Institute of Personnel Management. ISBN 08-529-2517-4.

Cervellati, M., Sunde, U. (2005). ‘Human capital formation, life expectancy, and the process of development’, *American Economic Review* 95(5), 1653–1672.

Di Domenico, G., Spattini, S. (2008) *New European Approaches to Long-term Unemployment*. Netherlands: Kluwer Law International. 280 p. ISBN 978-90-411-2614-6.

Dufek, J., Minařík, B. (2009) *Age of population and development of population ageing in regions of Czech Republic. Agricultural Economics-Zemedelska ekonomika*. sv. 6, č. 55, s. 259--270. ISSN 0139-570X.

Ehrenberg, R. C., Smith, R. S. (2011) *Modern Labor Economics: Theory and Public Policy*. 11. edition. USA: Prentice Hall. 672 p. ISBN 978-0-132-54064-3.

Eurostat, *European Commission* (2016) [online]. [cit. 2016-02-04] Harmonised Indices of Consumer Prices. Retrieved from: <http://ec.europa.eu/portal/page/portal/hicp/introduction>

Eurostat, *Employment statistics*, (2015). Retrieved 2015-11-25 from http://ec.europa.eu/eurostat/statistics_explained/index.php/Employment_statistics/cs

Finnish Institute of occupational health. *Multidimensional work ability model*, (2014), Retrieved 2015-07-27 from: http://www.ttl.fi/en/health/wai/multidimensional_work_ability_model

Glomm, G., Ravikumar, B. (1992), 'Public versus private investment in human capital: Endogenous growth and income inequality', *Journal of Political Economy* 100(4), 818–834.

Gonzales-Eiras, M., Niepelt, D. (2012) Aging, government budgets, retirement, and growth. *European Economic Review*, 56 (1), pp. 97–115

Gonzalez-Eiras, M., Niepelt, D. (2008), 'The future of social security', *Journal of Monetary Economics* 55(2), 197–218.

Goudswaard, A., & De Nanteuil, M. (2001). *Flexibility and working conditions: a qualitative and comparative study in seven EU member states*. Loughlinstown, Co. Dublin: European Foundation for the Improvement of Living and Working Conditions. ISBN 92-828-9767-2.

Hall, R. E., Lieberman, M. (2012) *Macroeconomics: Principles and Applications*. 6. edition. USA: Cengage Learning. 552 p. ISBN 978-1-111-82235-4.

Hopkins, M. (2007) *Corporate Social Responsibility and International Development*. USA: Earth scan. 243 p. ISBN 978-1-84407-356-6.

Ilmarinen, J., TUOMI, K. (2004). *Proceedings of the 1st International Symposium on Work Ability: past, present and future of work ability*. Helsinki: Finnish Institute of Occupational Health. ISBN 95-180-2581-9.

Lévesque, M., Minniti, M. (2005). The effect of aging on entrepreneurial behaviour. *Journal of Small Business Venturing* 21 (2), 177–194

Ludwig, A., (2005). *Aging and Economic Growth: The Role of Factor Markets and of Fundamental Pension Reforms*, MEA Discussion Paper 094-05

Mankiw, N. G. (2012) *Principles of Macroeconomics*. USA: Cengage Learning. 464 p. ISBN 978-1-285-16591-2.

MPSV. *Employment policy strategy until the year 2020*. (2015) Retrieved 2015-11-17 from https://portal.mpsv.cz/sz/politikazamest/strateg_zam_2020/strategiep2020

OECD (2016) [online] [cit.2016-03-10] *Labour Statistics*. RETRIEVED FROM: <http://www.oecd.org/std/labour-stats>

Rašticová, M. (2013). *Managing Diversity with the focus on Ageing European Population*. In *Psychology for Business Success. Institutional Equity and Compliance*. Santa Barbara, California: Praeger ABC Clío, 2013. s.23-44. ISBN: 9780313398032.

Schimke, A. (2014). Ageing workforce and firm growth in the context of "extreme" employment growth events, *Structural Change and Economic Dynamics* 30 (2014) 86–100

Schneider, F., Kallis, G., & Martinez-Alier, J. (2010) Crisis or opportunity? Economic degrowth for social equity and ecological sustainability. Introduction to this special issue, *Journal of Cleaner Production* 18 511–518

The world of labour. *The most important challenges for the labour market in Poland 2013*. RETRIEVED. 2015-12-05 from <https://laboureconomics.wordpress.com/2013/05/12/the-most-important-challenges-for-the-labour-market-in-poland>

WBJ. *Poland's labor market increasingly balanced, Hays 2014*. RETRIEVED 2015-12-05 from: <http://wbj.pl/polands-labor-market-increasingly-balanced-hays/>