

PRODUCTIVITY OF ELDERLY IN THE CENTRAL EUROPE

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Abstract

Population ageing presented in the Czech Republic and in the Central Europe will affect the productivity in the following few decades. The fundamental question is, how the labour productivity will be influenced. There can be found negative factors such as the loss of physical capacities of older people, but they are contradictive positive factors, as well. We expect that the role of the positive factors such increasing knowledge and skills in the society, increased level of education and technological progress may ease negative expectations from ageing phenomena. We can obtain some inspiration from Nordic countries that have been facing the ageing for many years and up to now no negative effects in their economies can be observed. In our study we focus on the distribution of average hourly earnings broken down by different age groups. The wage rate and income and unit labour cost are often used as a proxy for the development of the gross valued added. Connected with the employment, the labour productivity can be obtained.

Key words: population ageing, productivity, unit labour costs

JEL Code: J11, J21, E24

Introduction

Labour force of all European countries is ageing, and this process certainly has consequences on the economic output and productivity. This issue has been widely discussed in the Western countries for several years, but deep economic and social discussion is missing in the Czech Republic.

Demographic projections show the shift in the composition of the population from relatively young to relatively old people and increase in the old-age dependency ratio. The same shift will also be seen in the labour force, from relatively young to relatively old workers. Ageing of population and labour force will bring a number of consequences, not only in the economy. We can measure the impact on the economy in two ways, the first is the supply side covering production based on labour and capital (production factors) and the second is the

demand side respecting changing habits of households and government policy that is reflected in their consumption expenditures.

In this paper, we deal with the supply side of the economy in the Czech Republic as well as neighbouring countries in Central Europe. We point out the differences in labour productivity by age through the distribution of average hourly earnings broken down by different age groups. Similar analyses are common in western European countries, but not in the Czech Republic, here they are rare.

2 Literature overviews

Key question is, if older workers are productive than younger ones, if labour force ageing has impacts on average output per workers or not. There are a lot of studies about the relationship of ageing of labour force and productivity, at individual level (Skirbekk, 2008), organization level (Aubert and Crépon, 2003), national level (Prskawetz et al., 2007), industry level (Mahlberg et al., 2013a) or occupational level (Oster and Hamermesh, 1998). According to Venn (2008), productivity may also differ across different occupations and aggregated impact would be sensitive to the industrial structure of the economy. We can find professions in which the productivity increases with age, with neutral impact and with negative impact on the productivity. According to Aiyar et al., 2016, the impact of labour force ageing on the total factor productivity is about 0.1 percentage point. In other words, it means that growth of the TFP will be lowered by population ageing annually by 0.1 percentage points.

Most studies confirm that ageing of labour force has direct impacts on labour productivity (e.g Aiyar et al., 2016, Prskawetz et al., 2005, Grönqvist, 2009 or Mahlberg et al., 2013b). They confirm, that worker's productivity varies over his or her working life. There are several reasons to worry about lower productivity of older workers compared to younger workers, e.g. the accumulation of experience over time, depreciation of knowledge, and age-related trends in physical and mental capabilities. Older workers have higher average levels of work experience with potentially positive effects on productivity (Disney, 1996). On the other hand, labour force skills also depend on the knowledge gained before entering the labour market (Dixon, 2003). Another significant reason could be different ability to adopt of new technologies. Younger workers are beneficiaries of new technologies that are usually more productive than older ones. The similar situation can occur for computer skills and internet use (Newburger, 2001).

The wage and income are often used as a proxy indicator for the development of the gross valued added¹ and then for labour productivity, connected with the employment. We focus on the distribution of mean hourly earnings² by age groups and industry. Our aim is to identify differences in labour productivity by age in individual industries, with respect to mentioned research about different impacts of the age composition of the labour force in the industries.

3 Labour Force Ageing

Macroeconomic impacts of ageing population can be considered in two different ways, through old dependency ratio or through labour force ageing. The old age dependency ratio is high in a most of European countries and expected to rise. Demographic projection points to an ageing of the European labour force (Aiyar et al., 2016).

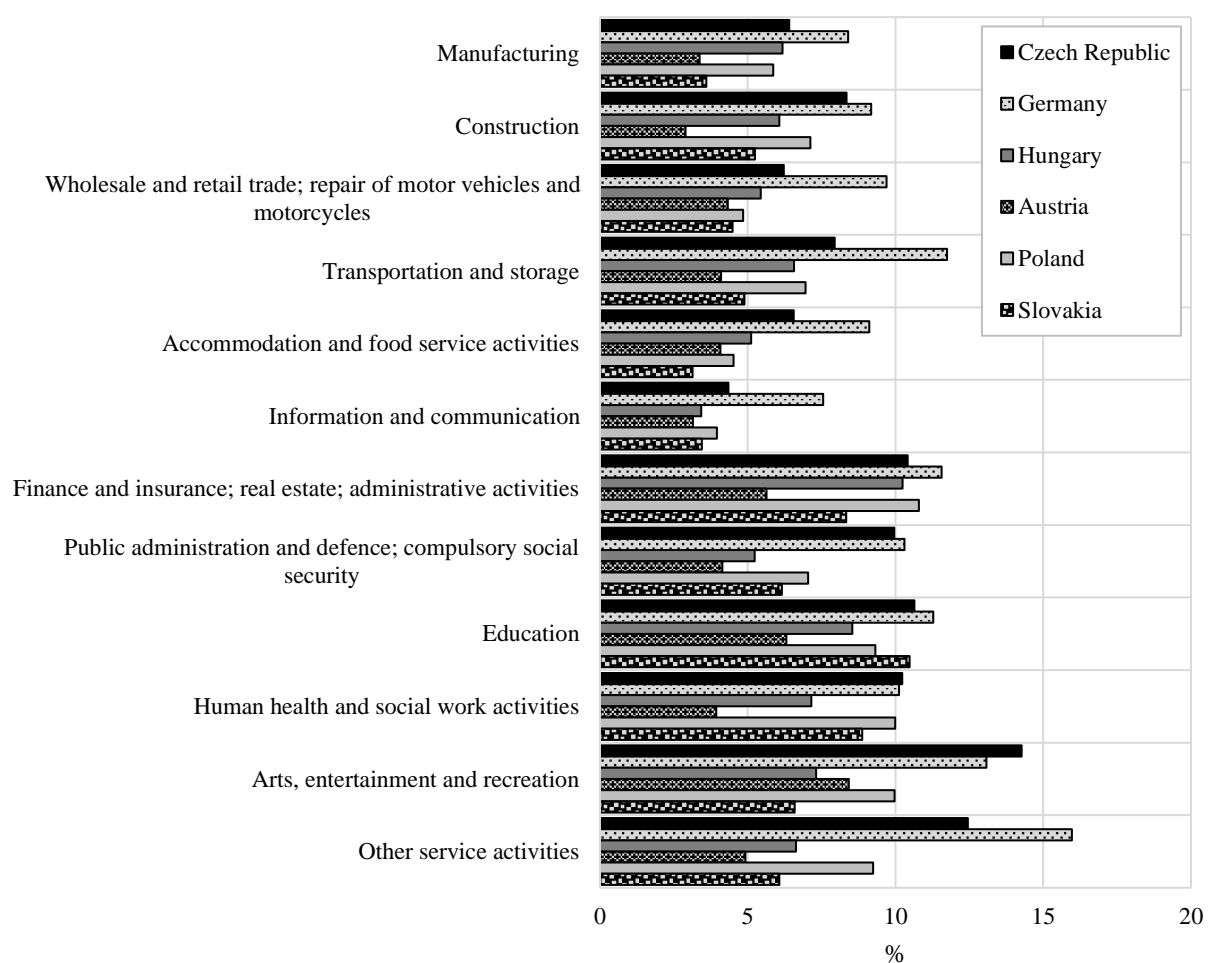
The composition of the labour force has been changing from relatively young to relatively old workers, see Fig. 1. In all monitored countries in central Europe, older workers are mainly in the service sector.

In 2017, the share of workers aged 60+ ranged from 4% to 14%, depending on the industry, in the Czech Republic. Most workers over 60 years are in Arts, entertainment and recreation (14.3%), in Education (10.6%) or in Human health and social work activities (10.2%). In Slovakia, the highest number of workers over 60 years is in Education (10.5%). Poland and Hungary have the highest number of workers over 60 years in Finance and insurance, real estate and administrative activities (10.8%, resp. 10.2%).

¹ In terms of national accounts' methodology ESA2010, we assume that gross valued added is proportionally linked to compensation of employees (resp. wages and salaries) and the rate of operating profit is the same for all age groups, i.e. both taxes and depreciation of the property (consumption of fixed capital) is not dependent on the age structure of the employees (Eurostat, 2013).

² The data come from the Structure of Earnings Survey (SES). For more see: https://ec.europa.eu/eurostat/cache/metadata/en/earn_ses2014_esms.htm

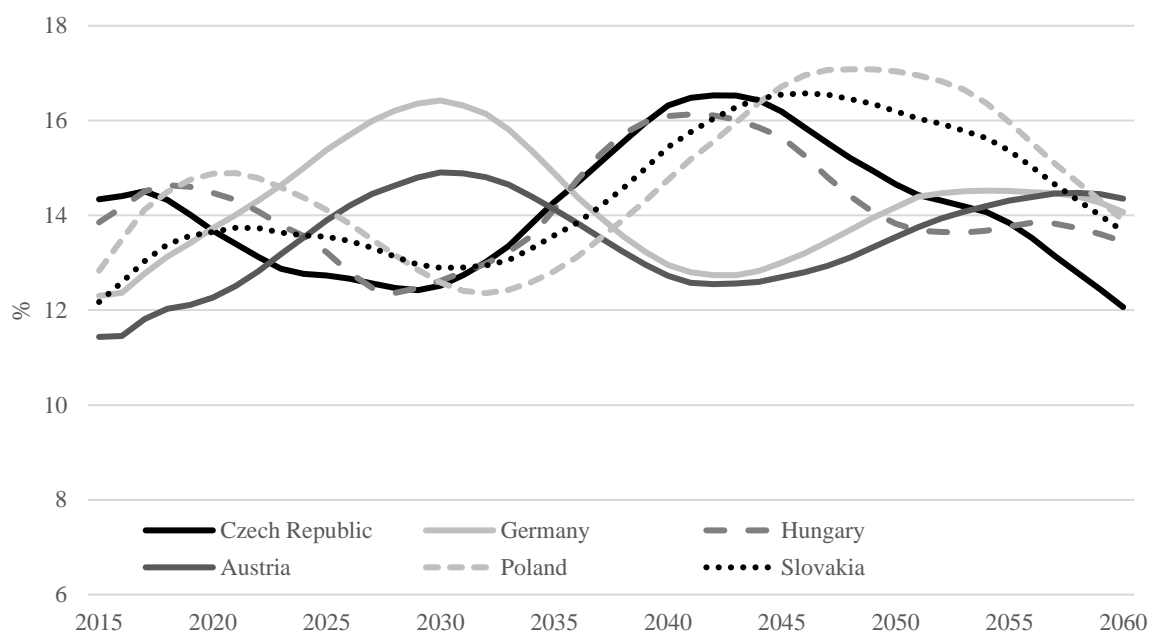
Fig. 1: Workers aged over 60 years (% of total labour force, 2017)



Source: Eurostat, authors' calculations

The share of workers aged 60+ in the labour force is expected to increase substantially over the next few decades. Demographic projections suggest that the proportion of people aged 60-70 years in Central Europe will slightly grow. However, it depends on demographic waves, see Fig. 2. In the Czech Republic as well as Hungary, we can expect more workers aged over 60 years in the 2040s (over 16% people of total population). In Germany and Austria, the peak of the proportion of people over 60 years will occur earlier, in the 2030s. In Poland and Slovakia, the peak will occur later, in 2050s.

Fig. 2: Projection of people aged 60-70 years (% of total population)



Source: Eurostat, authors' calculations

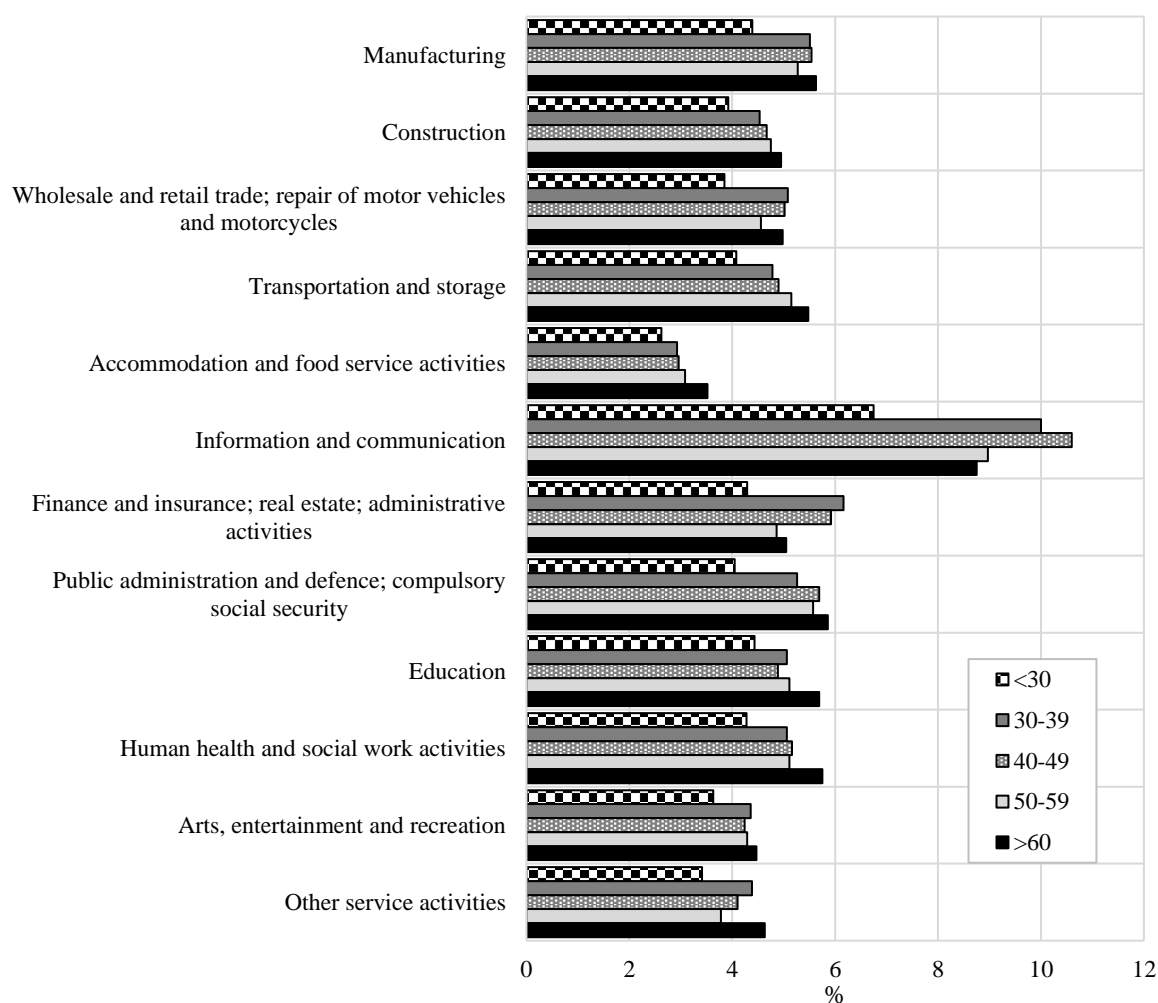
Closely related with labour force ageing is the question, if an older worker is more or less productive than younger one. The combination of factors (mentioned in previous chapter) typically leads to increase in labour productivity until workers are in their 40 years and a decline toward the end of their working life.

4 Hourly earnings by age

The productivity is usually defined as an output in relation to inputs to the production process. The problem of productivity is the dependency on the quality of used data. The optimal situation is when both labour and capital can be adjusted for quality such as labour and capital services (see Fischer and Sixta, 2009). In terms of labour productivity, it means output or gross value added per a worker. The wage rate and income and unit labour cost are often used as a proxy for the development of the gross valued added. For this reason, we chose average hourly earnings as proxy indicator for assessment of labour productivity.³

³ Labour productivity itself does not provide adequate information when we do not know the share of labour compensation in value added. The share of compensation of employees on gross value added in total economy at current prices was 46% in 2017.

Fig. 3: Average hourly earnings by age and economic activity in the Czech Republic (2014)



Source: Eurostat

Looking at Fig. 1, the hourly earnings increases with age. This applies for all Central European countries, not just for the Czech Republic. Workers over the age of 60 have the highest hourly earnings, more or less, in all industries. Only in Information and communication and Finance and insurance, real estate and administrative activities is hourly earnings of workers aged over 60 years lower than younger workers. In the Czech Republic, the highest difference between hourly earnings of old and young worker is in Public administration and defence⁴. The highest hourly earnings in Information and communication have workers aged 40-49 years. Workers aged over 60 years have hourly wage lower by 17.4%.

In Central European countries, there are differences in the earnings of young and old workers, see Tab. 1. In Information and communication industry, hourly wage of workers younger than 30 years in Germany is on the level of 55.2% average hourly wage in this industry.

⁴ This is determined by the salary tables in the state administration.

While hourly wage of workers younger than 30 years in Hungary is on the level of 82.2% average hourly wage in this industry. Significant difference is also in Education. While in Czech Republic the hourly wage of workers younger than 30 years is on the level of 88.1% average hourly wage, in Austria is only on the level of 62.5% average hourly wage. It can be said that in the Czech Republic and Slovakia, young workers are better paid, compared to other countries.

Tab. 1: Average hourly earnings of workers aged <30 by economic activity (index to average hourly wage in individual industry, 2014)

	Czech Republic	Germany	Poland	Slovakia	Hungary	Austria
Manufacturing	0.835	0.670	0.798	0.846	0.855	0.721
Construction	0.858	0.729	0.788	0.830	0.875	0.780
Wholesale and retail trade; repair of motor vehicles and motorcycles	0.819	0.691	0.757	0.835	0.879	0.712
Transportation and storage	0.841	0.748	0.778	0.876	0.849	0.762
Accommodation and food service activities	0.907	0.881	0.866	0.934	0.979	0.900
Information and communication	0.734	0.552	0.697	0.703	0.822	0.631
Finance and insurance; real estate; administrative activities	0.808	0.702	0.778	0.784	0.821	0.699
Public administration and defence; compulsory social security	0.758	0.630	0.638	0.813	0.771	-
Education	0.881	0.631	0.710	0.829	0.774	0.625
Human health and social work activities	0.848	0.729	0.761	0.856	0.861	0.824
Arts, entertainment and recreation	0.866	0.874	0.811	0.855	0.970	0.737
Other service activities	0.859	0.659	0.765	0.940	0.981	0.635

Source: Eurostat, authors' calculations

Note: Austria does not publish data about wages in industry of Public administration and defence, compulsory social security.

Workers aged over 60 years in all Central European countries have higher hourly wage than the average hourly wage in industries. In general, in the tertiary sector⁵ workers older than 60 years have the highest wages compared to the average (see Tab. 2). Significant difference is seen in Public administration and Defence. In the Czech Republic, hourly wage of workers aged over 60 years is on the level of 144.7% average hourly wage in this industry. In Germany and in Poland it is even 185.0% (resp. 190.9%) average hourly wage in this industry. In industry of Education. workers aged over 60 years in the Czech Republic have lower hourly wage than in Germany or Austria. Least wage increases with age is seen in industry, in all Central Europe.

⁵ Sector of services. It covers industries G to U of NACE Rev.2 according to classification of Eurostat. See: http://ec.europa.eu/agriculture/sites/agriculture/files/statistics/rural-development/2012/annex-a_en.pdf

Tab. 2: Average hourly earnings of workers aged 60+ by economic activity (index to average hourly wage in individual industry, 2014)

	Czech Republic	Germany	Poland	Slovakia	Hungary	Austria
Manufacturing	1.070	1.042	1.158	1.085	1.047	1.362
Construction	1.263	1.374	1.404	1.238	1.330	1.427
Wholesale and retail trade; repair of motor vehicles and motorcycles	1.294	1.385	1.563	1.256	1.406	1.828
Transportation and storage	1.343	1.165	1.589	1.298	1.258	1.201
Accommodation and food service activities	1.344	1.144	1.334	1.249	1.187	1.158
Information and communication	1.296	1.850	1.463	1.223	1.159	2.269
Finance and insurance; real estate; administrative activities	1.177	1.304	1.120	1.185	1.217	1.839
Public administration and defence; compulsory social security	1.447	1.859	1.909	1.384	1.527	-
Education	1.284	1.998	1.375	1.328	1.635	2.487
Human health and social work activities	1.343	1.407	1.622	1.432	1.568	1.579
Arts, entertainment and recreation	1.231	1.107	1.304	1.128	1.105	1.414
Other service activities	1.358	1.554	1.602	1.066	1.163	2.182

Source: Eurostat, authors' calculations

Note: Austria does not publish data about wages in industry of Public administration and defence, compulsory social security.

Based on analysis of hourly wages we can confirm opinions of number of studies dealing with productivity and age. Older workers have higher average levels of work experience with potentially positive effects on productivity (Disney, 1996). Especially in tertiary sector, accumulation of experience and knowledge over time is evidenced in higher hourly earnings⁶.

Conclusion

We dealt with hourly earnings of workers as proxy measure for their labour productivity. Such analyses are quite rare in the Czech Republic. We showed that workers over 60 years in some industries have relatively higher wages compared to average wages than in other industries. It concerns especially tertiary sector of the economy, not only in the Czech Republic. It can be expected that the ageing labour force will not cause problems in these sectors. Workers in industry of Information and Communication industry have currently the highest hourly wages between 40-49 years and then fall. In the future, however, it can be expected that even older workers will work with information technology from their youth and will be able to work in this industry and will have higher productivity, unlike today.

⁶ We realize that the data from year 2014 is not up to date, but we do not expect a significant relative change from this year to the present.

The total proportion of workers aged above 60 years has been increased not only in the Czech Republic. In 2017, it reached 8.3% of total productive population in the Czech Republic in, in Germany it is even 10.3%. Despite negative trends given by ageing in the population, we expect that population ageing will be partly compensated by the increase of the individual productivity. This will come along with increasing rate of economic activity (given also by the increase of the statutory retirement age), better health condition of the workers. We cannot omit technological progress, as well. The significant question is what the impact on individuals' productivity is and what the impact on the total economy is. According to Aiyar et al., 2016, projected ageing in Europe could reduce total factor productivity growth by an average of 0.2 percentage points per annum over the next twenty years. Yet we think that the research aimed at industries is very important since we cannot expect that ageing effects will proportionally affect all sectors of the economy.

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