

TERTIARY SECTOR IN RELATION WITH POPULATION AGEING

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Abstract

Population ageing is discussed especially in connection with the increasing financial burden of the pension system and health care system. This issue has also recently been addressed in relation to the consequences on the labour market. Current demographic development in developed countries challenge the sustainability of economic growth, because declining share of the young labour force will have to support rising share of elderly non-working people. Moreover, some economists prove that population ageing has negative impacts on growth and labour productivity. This paper deals with the situation on the labour market in connection with population ageing. It focuses mainly on the segment of services, i.e. on the tertiary sector of the Czech economy as this sector is becoming more important in terms of created value added in economy. The paper aims to show development of age structure of employment in tertiary sector. It also focuses on economic indicators in tertiary sector as labour productivity and wage differences by age, as well.

Key words: ageing, average wage, labour force, labour productivity, tertiary sector

JEL Code: J14, J31, J82

Introduction

Population ageing is not happening in isolation, it influences many areas of human life and economy. Simultaneously, there are other major societal changes that are influencing growth patterns and development of labour market as the rising role of the tertiary sector developed economies. The employment and value added share of the tertiary sector has grown consistently with the economic growth for many decades. Therefore, it is important to consider the interaction between population ageing and the increasing role of the service sector. One is the analysis of service sector expansion and employment growth and the subsequent productivity impacts (e.g. Gregory et al., 2007). Ilmakunnas and Ilmakunnas (2010) point out that population ageing would have a negative effect on economic growth, if, older workers were less productive than their younger counterparts. Many large service branches are labour-intensive and they are not characterized by high frequency of technological innovations, for

instance. Thus, when employment in the low-productivity tertiary sector is expanding more rapidly than in the secondary and primary sector, there is a risk of aggregate productivity growth to slow down. At the same time, unit costs of service increase if tertiary sector wages follow wage setting in manufacturing. The phenomenon has been labelled as Baumol's disease after Baumol (1967).

This paper brings the view on the tertiary sector in connection with labour force ageing. We focus on the indicators of economic results of the Czech Republic in condition of changing structure of employment. We were inspired by the research done abroad. In comparison with existing research, we bring innovative approach to the use of macroeconomic data and its combination with data from business statistics. The official data on these economic indicators by age are not available in the Czech Republic and no panel data¹ is available, therefore we combine data from business statistics (BS) and national accounts (NA). As a result, we can combine data about value added, wages and salaries, average wage with number of employees and their age. We divided employees to five age groups (less than 30, 30–39, 40–49, 50–59, 60 and over), focusing on the differences between young employees (less than 30 years) and employees older than 60 years. We focus on the period 2005–2015.

1 The importance of the tertiary sector

Tertiary sector of economy² is going through strong development through the world in the past few decades. This issue is accompanied by the reduction of the labour force employed in agriculture and in industry. Especially in the case of industrialised countries, it leads to the significant growth of the services percentage in the formation of the GDP (Prakash et al., 2013). Moreover, the role of services in economy is important when they exceed the sphere of the tertiary sector. Services are found in farming, and manufacture also becomes more and more dependent on services. Consequently, the services firms are more and more strongly integrated also in networks with other economic activities (Tănase, 2012).

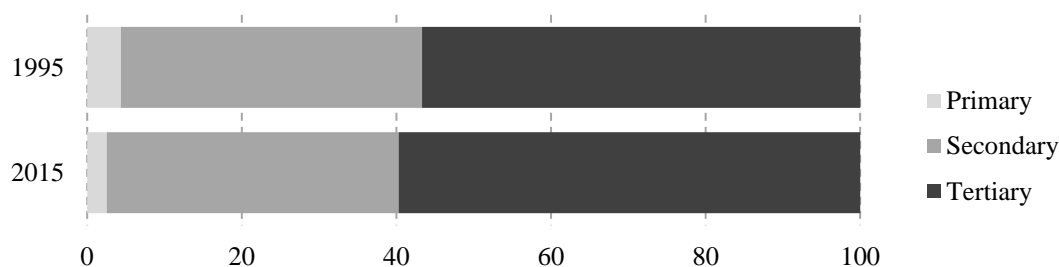
The structure of Czech economy has been changing, as well. Tertiary sector is slowly becoming more significant in terms of created value added. Gross value added in this sector represented 56.7% of total gross value added in 1995. In 2015, it was 59.7% (see Figure 1). The structure of value added in tertiary sector has also been changing. Some industries strengthened

¹ Some studies estimate the relationship of economic indicators and labour force demographics using panel data (e.g. Tang, MacLeod, 2006).

² It covers industries G to U of NACE Rev.2 (see Annex) according to classification of Eurostat. Industry A is considered as primary sector and industries B to F are included in secondary sector. See: http://ec.europa.eu/agriculture/sites/agriculture/files/statistics/rural-development/2012/annex-a_en.pdf

between 1995 and 2015, e.g. information and communication (J) created 5.2% gross value added in tertiary sector in 1995, in 2015 it was 8.5%. On the contrary, the share of gross value added of transportation and storage (H) on gross value added of total tertiary sector was 12.3% in 1995 and 9.4% in 2015.

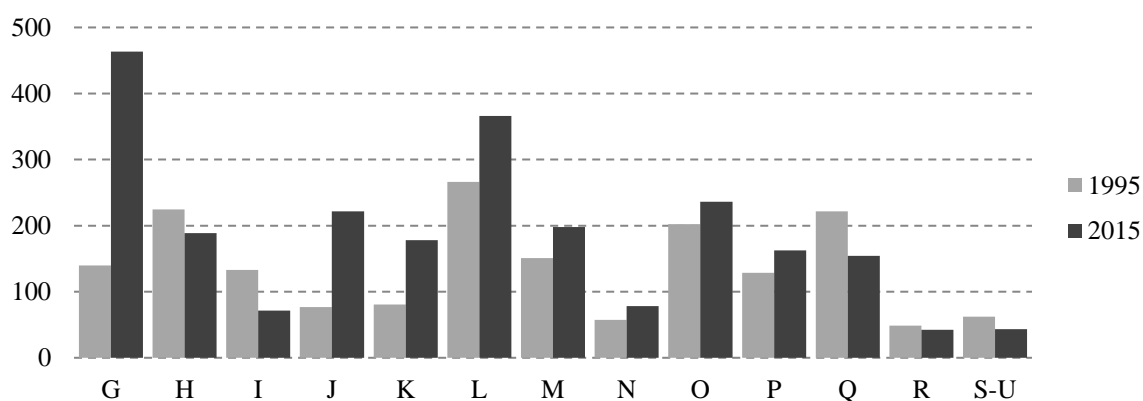
Fig. 1 Structure of gross value added by economic sectors (% , current prices)



Source: CZSO, authors' calculations

In 2015, the highest value added was in wholesale and retail trade (G), see Figure 2. Gross value added in this industry was 463.4 billion CZK in 2015 compared to 139.7 billion CZK in 1995. Information and communication created 76.7 billion CZK in 1995 and 221.5 billion CZK in 2015. On the contrary, gross value added has decreased since 1995 in human health and social services (Q), transportation and storage (H) or in accommodation and food services (I).

Fig. 2 Gross value added in industries of tertiary sector (CZK billion, constant prices of 2015)



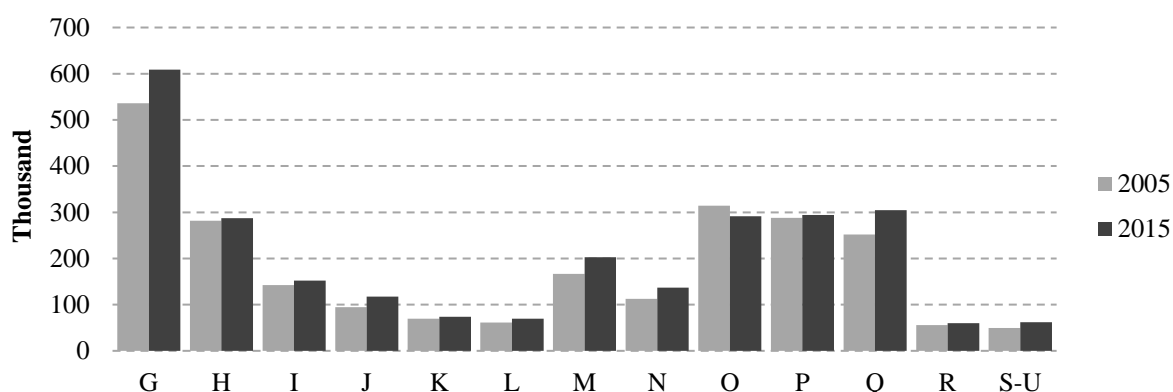
Source: CZSO, authors' calculations

2 Structure of employment in tertiary sector

Population ageing brings both increasing number of older workers and decreasing size of total labour force due to lower birth rate. The trend of reducing labour force can be observed in some specific occupation (Pernica, 2010 or Šídlo, 2011), but not in the tertiary sector as a

total. As Figure 3 shows, the number of employees in tertiary sector has not been decreasing. In the last ten years, the number of employees increased in all industries except for public administration and defence (O). The most increase of employees was in information and communication (J, by 23.9%) and health and social work (Q, by 20.6%) between 2005 and 2015. Increase of employment in industry Q is necessary in the conditions of population ageing, because increasing amount of old and infirm people require persons to take care of (Šimková, Langhamrová, 2017).

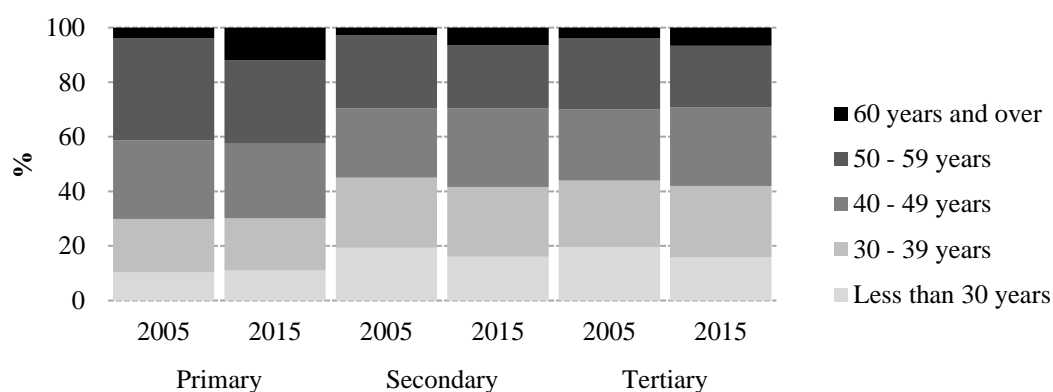
Fig. 3 Number of employees in tertiary sector by industries



Source: CZSO, authors' calculations

In comparison to primary and secondary sector, population ageing in tertiary sector occurs at the slowest pace (measured by increasing proportion of employees older than 60 years), see Figure 4.

Fig. 4 Age structure of employees by economic sectors (%)



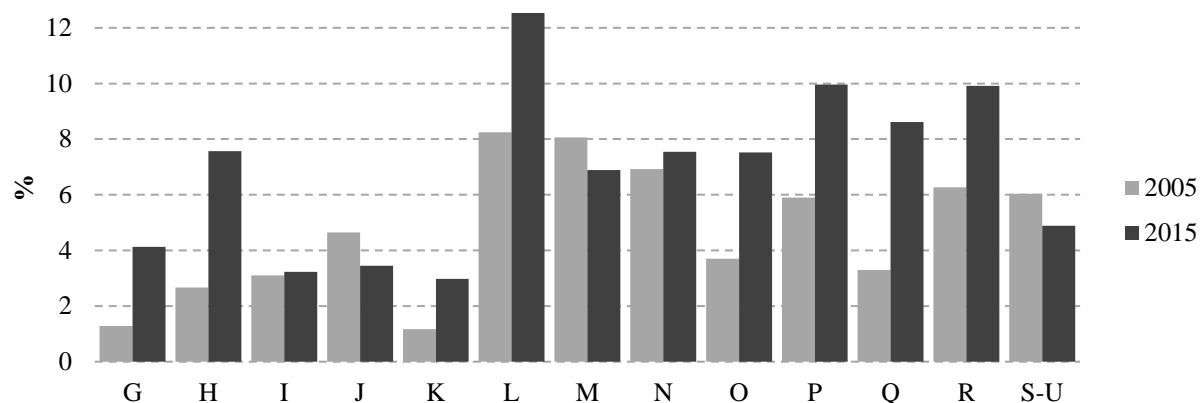
Source: CZSO, authors' calculations

In tertiary sector, the proportion of employees older than 60 years increased from 3.9% in 2005 to 6.7% in 2015. Similar growth is in secondary sector, where the proportion of employees older than 60 years increased by 3.6 p.p. to 6.4% in 2015. The most increase of the

proportion of employees older than 60 years was in primary sector (from 4.0% in 2005 to 12.4% in 2015). On the other hand, tertiary sector has the highest decrease of the proportion of employees younger than 30 years (from 19.6% in 2005 to 15.8% in 2015).

However, it is also necessary to focus on the particular industries when assessing the rate of labour force ageing. The proportion of employees older than 60 years most increased in health and social work (Q), education (P) and transportation and storage (H) between 2005 and 2015 (see Figure 5). In industry of health and social work (Q), the proportion of employees older than 60 years increased by 5.3% between 2005 and 2015. Even though, the total number of employees in this industry has increased, it remains the fastest ageing industry.

Fig. 5 The share of employees older than 60 years in industries of tertiary sector (%)



Source: CZSO, authors' calculations

Many studies focused on labour force ageing concern about a shortage of qualified personnel in the forthcoming years and thus impact on the output of organizations (Stam, 2009). Arguments range from lower productivity of older workers, lower ability to adopt modern technologies, lower potential for economic innovation to professional and occupational mobility (e.g. Tang and MacLeod, 2006). Skirbekk (2004) places around 50 the age at which productivity starts to decline, Avolio and Waldman (1994) even set at around 30 years the age at which cognitive and physical abilities start to decline.

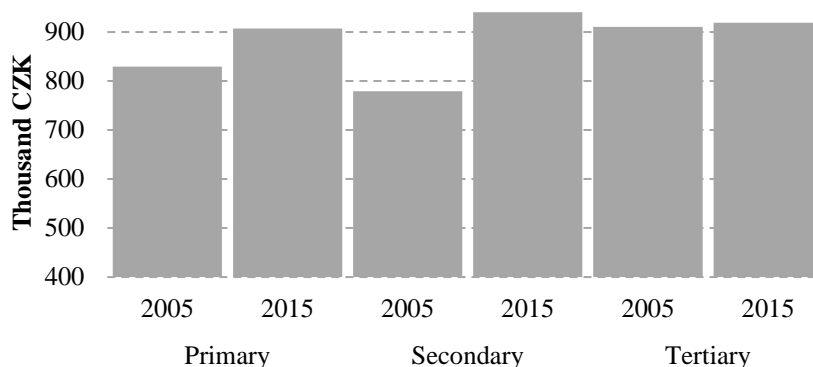
3 Economic indicators by age of employees

Ageing of labour force will lead to the changes of labour productivity and subsequently economic performance. There are some analyses about the relationship of labour force ageing and productivity at national level (e.g. Freyer, 2007), industry level (e.g. Mahlberg et al., 2012) or at occupation level. We focused on the issue of the value added generated by different age

group of employees in tertiary sector. The comparison of gross value added and number of workers is provided in real terms. Gross value added is expressed at constant prices of 2015.

Generally, labour productivity (=gross value added in prices of 2015 per worker) has increased between 2005 and 2015. The most significant increase has been seen in labour productivity in secondary sector (see Figure 6), from 779 thousand CZK in 2005 to 940 thousand CZK in 2015. Labour productivity in primary sector has been also increased since 2005, however labour productivity in tertiary sector was stable between 2005 and 2015.

Fig. 6 Labour productivity by economic sector (thousand CZK, prices of 2015)



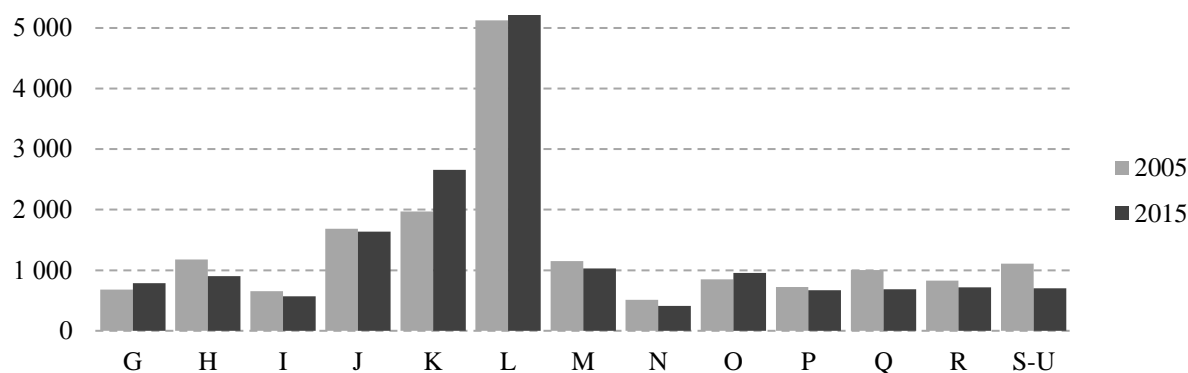
Source: CZSO, authors' calculations

Generally, total gross value added at prices of 2015 created in tertiary sector by employees younger than 29 years was by 21.1% lower in 2015 compared to 2005. On the contrary, gross value added created in tertiary sector by employees older than 60 years was by 78.9% higher in 2015 in comparison to 2005. Total labour productivity of employees less than 30 years in tertiary sector was by 10.4% lower in 2015 compared to 2005, just as labour productivity of employees older than 60 years in tertiary sector, it was by 5.5% lower in 2015 compared to 2005. On the contrary, labour productivity of employees in age group 40–49 years in tertiary sector increased by 6.1% between 2005 and 2015. Changes in labour productivity are different by age and industry level (see Figure 7). Increase in labour productivity of employees older than 60 years is seen in wholesale and retail trade (G), real estate activities (L)³ and in public administration and defence (O) between 2005 and 2015. Most significant increase of labour productivity of employees older than 60 years was in financial and insurance activities (by 34.8% between 2005 and 2015). Even though, for other industries of tertiary sector is characteristic decline in labour productivity of employees older than 60 years, the

³ Level of labour productivity in real estate activities (L) is significant higher than in other industries. It is caused by methodological concept of national accounts, because this industry includes dwelling services of owners-occupied dwellings in this industry (Sixta, Vltavská, 2016).

decrease was small (by 17.5% on average). Significant decrease of labour productivity of employees older than 60 years was in health and social services (Q), where the increase in the number of employees over 60 is also evident (see Figure 5).

Fig. 7 Labour productivity of employees older than 60 years in industries of tertiary sector (thousand CZK, prices of 2015)



Source: CZSO, authors' calculations

The second used economic indicator is the amount wages paid to the workers of all age groups. Wages should better correspond to the amount of work provided by workers since they should include the mixture of individuals' work quality, knowledge and skills. Wages are deflated to the price level of 2015 by consumer price index.

Table 2 shows the average monthly wages by age groups of employees between 2005 and 2015. The differences between age and economic sectors is evident. The higher age of employees, the greater difference among wages between the primary and tertiary sector.

Tab. 1 Average monthly wage between 2005 and 2015 by age groups and economic sectors (CZK, prices of 2015)

	Less than 30 years	30–39 years	40–49 years	50–59 years	60 years and over
Primary	18 493	20 500	20 472	19 837	19 814
Secondary	20 770	25 542	25 607	24 127	26 886
Tertiary	21 215	27 788	26 841	25 380	27 608

Source: CZSO, authors' calculations

The difference in average wage between employees younger than 30 years and over 60 years in primary sector is 1,321 CZK, while the difference in tertiary sector is 6,393 CZK.

The distribution of gross value added by economic sectors and industries illustrates that the impacts of labour force ageing on industries are rather different. High labour productivity including higher level of average wages of older workers positively stimulates some industries.

Even if there is inability to split effects of development, modernisation or progress, in industries of tertiary sector, increasing number of older workers does not decrease outcome and labour productivity.

Conclusion

The aim of the paper was to describe some consequences of ageing. We studied if labour force ageing has negative effects on economic output of the tertiary sector. We used combined data from business statistics and national accounts adjusted to fit national accounts' methodology that was necessary for our study.

We found out that the changes in the Czech economy are not straightforward. Significant differences can be observed in wages by age in tertiary sector. Despite all effects and differences in wages, we observed stable gross value added created by older workers. Moreover, older workers have higher productivity measured by the gross value added per worker at constant prices. On the level of industries of tertiary sector, increasing number of older workers does not significantly lead to the decrease of economic performance.

Our results proved the necessity for careful and specific approach to different economic sectors and industries that should be reflected in government strategies. This contains mainly policies for education, health, social services as a stack of labour force for some industries of tertiary sector.

Acknowledgement

This paper is prepared under the support of the Czech Science Foundation No. GA ČR 15-13283S under the title Projection of the Czech Republic Population According to Educational Level and Marital Status and with the support of Institutional Support for Long Period and Conceptual Development of Research and Science at Faculty of Informatics and Statistics, University of Economics, Prague.

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Annex: European Classification of Economic Activities (NACE)

- A Agriculture, Forestry and Fishing
- B Mining and Quarrying
- C Manufacturing
- D Electricity, Gas, Steam and Air Conditioning Supply
- E Water Supply; Sewerage, Waste Management and Remediation Activities
- F Construction
- G Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles
- H Transportation and Storage

The 11th International Days of Statistics and Economics, Prague, September 14-16, 2017

I	Accommodation and Food Service Activities
J	Information and Communication
K	Financial and Insurance Activities
L	Real Estate Activities
M	Professional, Scientific and Technical Activities
N	Administrative and Support Service Activities
O	Public Administration and Defence; Compulsory Social Security
P	Education
Q	Human Health and Social Work Activities
R	Arts, Entertainment and Recreation
S	Other Service Activities
T	Activities of Households as Employers; Producing Activities of Households for Own Use
U	Activities of Extraterritorial Organisations and Bodies

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