

Old-age Dependency Ratio in the Czech Republic: Challenges for Businesses in the Context of an Ageing Population

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Abstract: This article focuses on the analysis of demographic indicators in the Czech Republic, with an emphasis on South Bohemia. The main objective is to evaluate changes in the old-age dependency ratio (ODR) and young-age dependency ratio (YDR) in different regions and to identify critical factories that affect it. The results show that areas with high ODR, such as Jindřichův Hradec, Písek, and Hradec Králové, face significant challenges, especially in connection with labour shortages, which can negatively affect the sustainability of local businesses. On the other hand, regions such as Prague East, with low ODR and high YDR, have a younger demographic structure, which supports their economic growth and attractiveness to young families. The article also concludes by outlining how these demographic differences may affect the ability of companies to adapt to changing market conditions and maintain competitiveness.

Keywords: Old-age Dependency Ratio, Czech Republic, Population Ageing, Regional Enterprises

JEL Classification: M21, J11

1 Introduction

Jonsson et al. (2023) consider age management as an umbrella term that emphasises the active role of organisations in adapting work to the capabilities of older workers. Vrabcová & Urbancová (2022) view age management as the management of an organisation where the age of their employees is considered. In the same breath, they add that a sustainable human resource management system enables an organisation to utilise the full potential of its employees of all ages. Silva & Helal (2022) see age management as the best way to strategically cope and deal with the changes that result from the ageing population and the related changes in the labour market. Therefore, the main objective of age management is to enable more employees over 50 to participate in the workforce. Procházková et al. (2022) add that this concept encompasses global trends. According to Flynn & Schröder (2021), these include global population contraction, while Cameron (2023) adds population growth, urbanisation and international migration. Procházková et al. (2022) also talk about changes in human resource management that have transformed the workforce into a sustainable workforce. This is most often done by creating and maintaining flexible working conditions. Age management interventions are usually implemented through specific actions, such as preventing workplace accidents, retaining older workers' experience in the organisation, or reducing absenteeism due to worker illness.

A significant term in age management is the concept of workability. According to Lahti et al. (2024), workability is understood as the balance of health with work demands. Understanding this concept is essential for policymakers and preparing for future challenges with enough time to make the right and necessary decisions. Ehmann et al. (2021) view work capability as the potential of individual employees to perform job tasks given their health, working conditions and mental resources. According to the authors, good workability is related to the high quality of work, high productivity, and enjoyment of staying on the job. Efforts to maintain workability throughout a worker's working life are thus seen as the key to a good life in retirement. Perceived work ability (PWA) is also an important point. According to McGonagle et al. (2022), this characterises the relationship between how workers perceive their ability to continue working in their current jobs. PWA can have the strength of a leading indicator at points of worker absence or retirement.

Another essential concept is the Work Ability Index (WAI). According to Ronchese et al. (2023), this can be considered a tool that measures the workability of employees. Workability can be influenced by individual factors such as work-life balance, lifestyle or work environment. Mateo Rodríguez et al. (2021) consider the work ability index the

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most used method in measuring workability. He adds that it comprises a combination of self-assessed work ability, diagnoses and absenteeism. Ezzatvar et al. (2021) add that this index relies on different spheres of the employee's life, such as the organisation of the structure of their work or the work environment where the employee is located. They also argue that it is pretty highly age-dependent, and Rieker et al. (2023) are inclined to suggest that a lower level of the Work Capability Index may be related to a longer duration of incapacity for work, early retirement or even an increased risk of premature death of the employee.

The related notion of the old-age dependency ratio also appears in this context. According to Skirbekk et al. (2022), the old-age dependency ratio measures the ratio of people aged 65 and over to people of working age, i.e., those aged between 20 and 64. Romp & Beetsma (2023) argue that people over 15 can already be included in the working-age population. „Flying Responsibly" (2024) favours the old-age dependency ratio methodology to compare people aged 65 and over with the working population between 20 and 64.

The old-age dependency ratio, as reported by Kämpfen et al. (2020), is also known by the acronym OADR. They also talk about the fact that these are fundamental demographic indicators of the potential challenges and opportunities associated with old age in a given population. Soukupova et al. (2024) add that this indicator is essential in measuring population ageing.

Šetek (2021) argues that the old-age dependency ratio may double by 2100. Emerson et al. (2024) say a high old-age dependency ratio may drag future growth. According to the authors, education could help, as they argue a positive relationship between education and development. If the old-age dependency ratio is high in a population, there is low investment in education and, therefore, in human capital, which the authors argue is critical to growth. This is confirmed by Jedwab et al. (2021), who also say that a high old-age dependency ratio can lead to slower economic growth.

The impact of ageing on companies themselves then presents several realities. Ranasinghe et al. (2023) discuss that ageing is associated with declining physical abilities and a decrease in cognitive function and adaptability, affecting an individual's ability to perform at work. Therefore, they recommend that employers put in place appropriate measures to ensure better employee health and safety. Blomé et al. (2020) argue that there may be a slight decline in the productivity of older workers. The authors further describe older employees as being more loyal to the company and having a negative attitude towards new technologies. According to the authors, ageing can also be beneficial in terms of higher managerial skills or adherence to work ethic. Kollmann et al. (2020) add that older employees experience fewer negative emotions and also experience limited time. From a management perspective, motivation changes for these older employees or goal setting should be more short-term.

2 Methods

This study aims to analyse demographic indicators in the Czech Republic, focusing on population ageing in individual regions and districts. Specifically, the study uses old-age dependency ratio (ODR) and young-age dependency ratio (YDR) indicators to identify areas with the highest and lowest values of these indicators. At the same time, we try to understand and analyse the factors contributing to the differences in demographic structure between these regions. To achieve this goal, we set two main research questions. The first question is which regions in the Czech Republic have the highest and lowest ODR and YDR values. The second question is, what are the main factors influencing the differences in demographic structure between regions with high and low values of these indicators?

The data for this analysis were obtained from the EUROSTAT (2024) and Czech Statistical Office (CZSO) (2024) databases. We focused on data from 2023 to ensure that the results of our study are as relevant as possible to current demographic trends. First, a descriptive statistical analysis was carried out based on the representation in individual regions of the ratio of persons over 65 and under 14 years of age and the number of persons between these years. For the article, we have leaned towards the Romp and Beetsma methodology (2023) due to the increasingly common involvement in the work process of people between 15-20 years of age in the Czech Republic.

Subsequently, we calculated the necessary ratio indicators for ODRs and YDRs, which best reflect the ratio of dependent age groups to the working-age population. Based on the results obtained, an analysis of selected regions was carried out in terms of economic, social and geographical factors better to understand the causes of differences in demographic structure.

The results of our analysis are presented using graphs and tables that visualise the ODR and YDR values for each region. These visualisations allow us to compare demographic trends between regions better. We focused on visualising

the differences between areas with extreme values, which helped us identify the key factors influencing demographic structure.

It is essential to mention that the availability and accuracy of data from public databases limits our study. Furthermore, we focus only on demographic indicators, so we do not include all possible factors influencing population ageing.

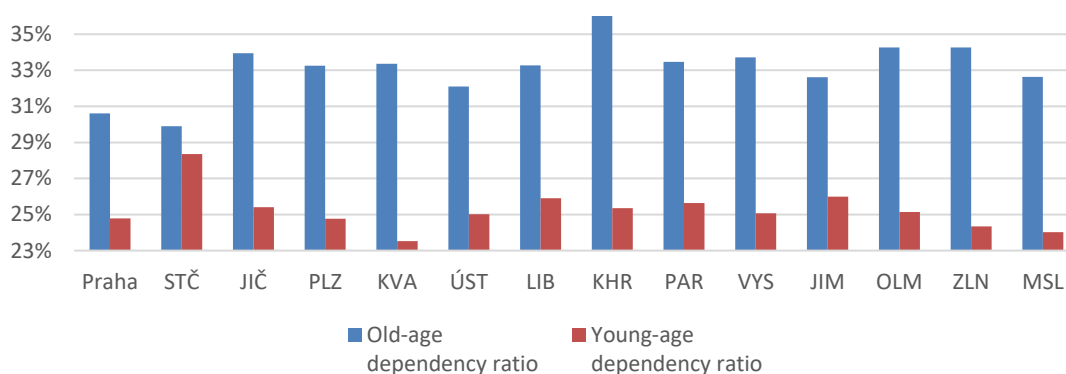
3 Research results

The Results chapter is devoted to an overview of demographic trends in the Czech Republic, with a particular focus on the region of South Bohemia. An analysis of the old-age dependency ratio (ODR) and young-age dependency ratio (YDR) reveals significant differences between areas, which can have important implications for socio-economic stability and the sustainability of enterprises in these areas. Special attention is paid to South Bohemia, where some regions, such as Písek or Jindřichův Hradec, face a significant ageing population, which affects the availability of labour and poses a challenge for local businesses. This chapter focuses on identifying the regions with the highest and lowest values and analysing the factors contributing to these demographic disparities.

The Czech Republic (Czechia) is somewhat more balanced, with an old-age dependency ratio of around 32%, which is lower than the EU average. The young-age dependency ratio in the Czech Republic is around 25%, which is relatively high compared to other countries such as Germany 20%, Austria 20%, and Poland 23%. This suggests that the Czech Republic, like many different European countries, is facing challenges related to population ageing. Still, the situation is not as critical as in other parts of Europe. Demographic trends in the Czech Republic reveal various challenges and opportunities across regions, as seen in Figure 2. Analyzing the old-age dependency ratio (ODR) and young-age dependency ratio (YDR) provides valuable insight into population ageing and its impact on regional development.

In Prague, ODR is 31% and YDR 25%, indicating a relatively balanced proportion of the older and younger population. With its attractiveness to young workers and families, the capital maintains a stable demographic structure. However, a slight predominance of older residents poses a potential health and social services challenge. Similarly, the Central Bohemian Region has an ODR of 30% and a YDR of 28%, indicating a younger population, probably due to affordable housing near Prague. The Hradec Králové Region, with the highest ODR in the country (36%), is an example of a region with a significantly ageing population. This demographic development may result from the migration of the younger population to dynamically developing areas, which leaves the older generations in the region without sufficient support from the younger population. The South Bohemian (ODR 34%, YDR 25%) and Plzeň (ODR 33%, YDR 25%) show similar trends, suggesting a lack of stimulation to attract and retain younger residents. The same applies to regions such as the Liberec Region (ODR 33%, YDR 26%) and the South Moravian Region (ODR 33%, YDR 26%), which also show a higher proportion of older and younger populations, which, however, from the national average, may indicate a specific stability and balance between generations. These regions have a particular capacity to retain young people, which is crucial for their future development.

Figure 1 Young-age dependency and Old-age dependency ratio in Czech Republic regions

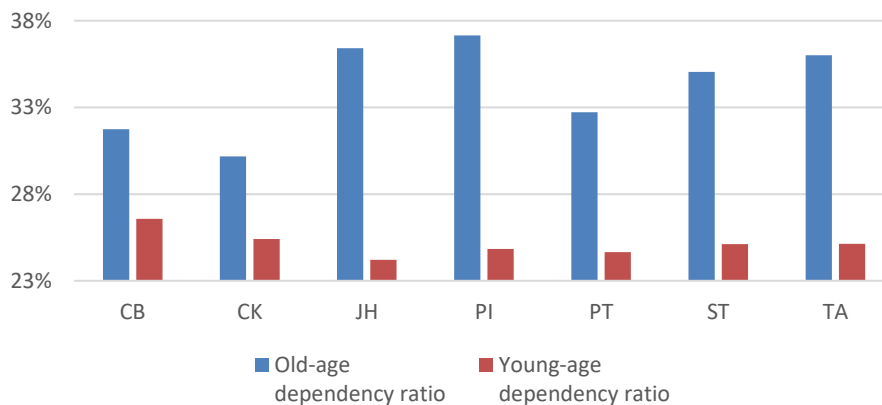


Source: Own processing

Figure 2 focuses specifically on this region to meet the needs of the Inproforum conference held in South Bohemia. České Budějovice (CB) has an ODR of 32% and a YDR of 27%, indicating a relatively balanced proportion of the older and younger population. The region has a slightly higher proportion of younger residents than other areas, which can be an advantage for the city regarding long-term population sustainability. This effect is undoubtedly due to the status of a

regional and university city. On the other hand, Český Krumlov (CK), with an ODR of 30% and a YDR of 25%, has a lower proportion of the older population and an average share of younger people. Known for its historic centre and UNESCO-listed castle, this region attracts many tourists, which affects the local economy. However, the high dependence on tourism means that many job opportunities are seasonal, which can limit the stability of the labour market and the availability of affordable housing for young families. Jindřichův Hradec (JH), with an ODR of 36% and a YDR of 24%, has a higher proportion of older residents, which indicates an ageing population. Unlike Český Krumlov, however, its economy is more diversified, including industry, trade and services. This provides more stable job opportunities, which can be attractive to younger residents. Lower real estate prices compared to tourist-attractive locations such as Český Krumlov make Jindřichův Hradec more accessible to young families.

Figure 2 Young-age dependency and Old-age dependency ratio in the South Bohemian region



Source: own processing

Another region is Písek (PI), where the ODR reaches 37% and the YDR 25%. This region has the highest proportion of elderly inhabitants, which indicates a significant ageing population. The high proportion of older people may reflect a lack of opportunities for young people moving from the region in search of better opportunities.

When comparing Český Krumlov and Jindřichův Hradec, it is clear that while the former is an attractive tourist destination with higher housing prices and seasonal job opportunities, the latter offers more stable economic conditions and more affordable housing. This combination of factors contributes to the differences in demographic structure between these regions, with Jindřichův Hradec having a more significant potential to attract and retain a younger population.

Strakonice, Prachatic and Tábor face similar demographic challenges. The high proportion of the elderly population in all three regions indicates that these areas may face challenges linked to population ageing, which may hurt their long-term sustainability and economic development. These regions are likely to need to develop strategies to improve economic and social conditions to attract and retain younger generations, thereby mitigating the effects of population ageing and supporting their development for the future.

Overall, regions such as Český Krumlov and Písek face challenges associated with population ageing. At the same time, Jindřichův Hradec shows more excellent demographic stability, which could support long-term development and attract young families looking for favourable living conditions. This data is crucial for understanding demographic trends and can serve as a basis for planning social and economic strategies in individual regions.

4 Conclusions

Based on the analysed demographic trends in the Czech Republic, especially concerning the old-age dependency ratio (ODR) and young-age dependency ratio (YDR), it is clear that population ageing poses a significant challenge for social systems and businesses across different regions. As the data show, areas with a high proportion of older populations, such as Písek or Jindřichův Hradec, are facing significant demographic changes that can lead to an acute shortage of labour.

Businesses in these areas have to contend with several key challenges. The first is the shrinking base of the young workforce, which complicates recruitment and threatens the long-term sustainability of businesses. Young people often migrate to larger cities such as Prague or Brno in search of better job opportunities, which leads to an outflow of talent

from regions with higher ODRs. This trend leaves an older population in these regions that can no longer perform more demanding work tasks, which can directly affect local companies' productivity and competitiveness.

Another problem is the lack of investment in education and training in regions with a high proportion of older populations. Businesses may have limited access to modern skills and technology because the younger generation, which brings innovation and new approaches, is either not present in the region or only in limited numbers. This leads to stagnation and the limited ability of companies to adapt to new market conditions. This can be seen, for example, in the number of secondary schools in the Jindřichův Hradec district, where there are only 13, including three grammar schools. In contrast, 31 secondary schools and 9 grammar schools are in the České Budějovice district. The České Budějovice district has the highest YDR values, while the JH district has the lowest (*Rejstřík škol*, 2024).

In addition, in areas with high ODR, such as Jindřichův Hradec or Písek, retaining existing employees cannot be easy. A higher proportion of the older population also means higher retirement rates, which further reduces workforce availability. This forces businesses to rethink their HR management strategies, including finding ways to extend older employees' working lives or introduce flexible working arrangements that could attract back younger workers, for example, through teleworking or the provision of part-time work. In 2020, 10.9% of employees aged 15-24 and 4.6% of employees aged 25-49 worked part-time. In 2022, these numbers increase to 15.4% (15-24 years) and 6.1% (25-49 years) (*Part-Time Employment | CEDEFOP*, 2020). The part-time trend is really clear and companies should encourage it even more. Another way to support the attractiveness not only of the company but also of the region is undoubtedly company benefits aimed at supporting young families. These benefits can include childcare allowances, company nurseries, family insurance or time off for family matters.

On the other hand, regions with relatively low ODR and higher YDR, such as Prague East, can provide a specific pattern for different areas. These regions attract young families thanks to affordable housing, quality infrastructure and good access to job opportunities, leading to more sustainable demographic developments. Firms in these regions can benefit from a larger workforce while benefiting from a higher share of the working-age population, contributing to higher productivity and innovation.

Overall, demographic trends, as described in this article, directly impact businesses, especially in terms of labour availability. Businesses in regions with high ODR will have to face significant challenges and adapt their strategies to maintain competitiveness. This context highlights the need for targeted interventions and policies to support regions with ageing populations, essential to ensure long-term economic stability and growth.

Among the limitations of the paper is that the study is based on data from public databases such as EUROSTAT and the Czech Statistical Office, which may not capture all demographic nuances or recent trends. The accuracy and availability of data may affect the conclusions of the study. At the same time, the analysis focuses primarily on demographic indicators (ODR and YDR) while not including other factors such as economic policies, cultural influences or migration patterns that can significantly affect regional demographics and the sustainability of businesses. While the paper mentions that population ageing poses a challenge for businesses, there is a lack of detailed economic analysis of the impacts on productivity, innovation and investment in individual regions. The article focuses only on the current state of demographic trends. Still, it does not provide long-term forecasts that could better reveal future developments and allow for planning strategies to mitigate the negative impacts of population ageing. All these aspects offer opportunities for future research and the extension of scientific knowledge.

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