

## THE IMPACT OF THE SILVER ECONOMY ON NATIONAL ECONOMIC PERFORMANCE IN THE CONTEXT OF THE LABOR MARKET

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### Abstract

Population ageing has become one of the key demographic challenges affecting economic performance and labour markets across Europe. The growing share of older individuals has led to the emergence of the silver economy as a concept emphasising the economic potential of the population aged 50 and above. This paper examines the development and economic determinants of purchasing power in Slovakia and analyses the impact of the silver economy on the country's gross domestic product. The empirical analysis is based on secondary statistical data for the period 2015–2023 and applies ordinary least squares regression models to assess the relationship between GDP and the employment rates of older age cohorts (50–54, 55–59, 60–64 and 65+ years). The results confirm a statistically significant positive relationship between senior employment and economic performance in all analysed age groups. The strongest and most stable effects are observed among individuals aged 50–59, while a substantial positive impact is also identified for the 65+ cohort, indicating the high economic value of working retirees. The findings highlight the heterogeneous nature of the silver economy and underline the importance of age-specific and regionally differentiated labour market and social policies. Supporting senior employment and purchasing power can represent an effective tool for mitigating the negative economic consequences of population ageing and for promoting sustainable economic growth in Slovakia.

**Keywords:** *Silver Economy, Population Ageing, Purchasing Power, Senior Employment, Labour Market, Gross Domestic Product; Slovakia.*

**JEL Code:** *J14, J21, J26, E24.*

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### Introduction

Intergenerational exchange influences a wide range of processes not only in the social but also in the economic sphere. Given the increasing life expectancy, advances in medicine, and the introduction of new technologies, the clash between generations has never been as pronounced as it is today. Europe's population is ageing, and as older citizens increasingly shape the economy, it is expected that the expansion of this age group will lead to growing demand across many sectors (Govorova, 2021). Senior employment can help mitigate labour shortages, increase tax and social contribution revenues, and stimulate domestic consumption as well as the

overall life satisfaction of older people (Kwak & Lee, 2024). This complex situation has led to the emergence of the so-called "silver economy" (SE), which generally represents the part of the economy associated with demographic changes caused by population ageing, where the role and importance of older adults increase as a result of changes in their needs and expectations that influence their economic, political, and social aspects (Alvarez-Diez et al., 2023). The silver economy focuses on harnessing the purchasing potential of the population aged 50 and over by meeting their consumption needs (including housing, health, tourism, cultural, information,

and communication needs), and it is expected that the importance and profitability of the SE will grow annually in various areas such as finance, employment, and the use of digital tools (Niemczyk et al., 2024). Consumers in the silver economy are often perceived as individuals with higher purchasing power and a large amount of leisure time, making them a significant market segment. However, this image cannot be viewed uniformly, as seniors represent a diverse and socially differentiated group in which differences in living standards are also manifested regionally. These disparities are the result of social transformations such as increasing financial security, higher levels of education, and changing lifestyles, which condition differences in consumer behaviour across the older population. A cluster analysis identified, for Eastern European countries including Slovakia, a segment characterised by underdeveloped SE infrastructure, low pension expenditures, high poverty rates, and minimal use of new technologies; these regional differences confirm that the development of the silver economy will be region-specific rather than uniform, highlighting the need for targeted regional strategies (Roszko-Wojtowicz et al., 2024). For a comprehensive assessment of the level of active ageing, the Active Ageing Index (AAI) was introduced, the analysis of which at the regional level (R\_AAI) is important for monitoring the strengths and weaknesses of active ageing within territorial units. An evaluation of Slovak regions (NUTS3) revealed that the Bratislava Region achieves the highest level of active ageing, while the Košice Region records the lowest level (Kaščáková et al., 2025). Economic factors play a significant role, particularly in post-transformational countries, where the position of the older population in the labour market deteriorated following the system change. Despite the growing willingness of seniors to re-enter the labour market, substantial barriers that limit their employment persist. Working during retirement therefore often does not represent a choice but rather a necessity resulting from relatively low pensions (Knapinska, 2023). Working pensioners frequently provide financial support to younger generations who face difficulties entering the labour market and building economic stability.

The aim of this paper is to examine the development and economic determinants of purchasing power in Slovakia and to specify the impact of the purchasing power of the silver economy segment on the formation of the gross domestic product of the Slovak Republic.

### **Literature review**

Demographic ageing is becoming one of the key phenomena influencing both the social and economic development of society. This trend changes the population structure, affects the labour market, and has an increasing impact on the consumer behaviour of the older generation. Declining fertility rates, increasing life expectancy, and the growing share of the older population place pressure on social, healthcare, and economic systems, including pension systems and public finances (Domonkos et al., 2024; Kafková, 2022). At the same time, in Europe there is a growing need to monitor the quality of active ageing and to identify inequalities between individuals and countries. Research shows that factors such as employment, health status, and education significantly influence seniors' ability to remain active and economically independent (Kocanová et al., 2023; Olivera, 2022). Authors (Firat et al., 2025) also point out that retirees' decisions to continue working depend primarily on their health and financial situation, with healthy retirees in countries with higher healthcare expenditures being even more likely to remain engaged in work during retirement. In Slovakia, demographic trends are reflected, among other aspects, in delayed fertility and an increasing intensity of births after the age of 35, which affects overall reproduction and population structure (Sprocha & Fitalová, 2022). Low fertility and population ageing also have a significant impact on pension systems, which need to be adapted to new economic and social conditions. Optimisation of the points-based child allowance system can support fertility and improve the sustainability of the system (Jasurková & Melichercik, 2024). In addition to reproductive trends, the behaviour of the older generation as consumers and participants in the labour market is also changing. Seniors increasingly use modern retail formats and large shopping centres, where traditional shopping

patterns are changing and convenience, accessibility, and a wide product assortment are preferred (Trembosová et al., 2022). At the same time, the phenomenon of the Wealth Decumulation Puzzle emerges, referring to the tendency of retirees not to draw down their savings, which is influenced by bequest motives, generous pensions, and homeownership (Horioka & Ventura, 2024). Demographic ageing also has significant macroeconomic and intergenerational impacts. Increased dependence of the public sector and imbalances between labour income and consumption require combined measures involving higher labour productivity and more efficient consumption management in order to mitigate the negative economic consequences of population ageing (Domonkos et al., 2024).

Current research emphasises that the transformation towards a silver economy society is not only a local but a global phenomenon with profound economic consequences. Liao (2025) notes that in countries such as China, accelerated ageing leads to a dramatic decline in the labour force, with the most significant decrease expected after 2030 in the 25–44 age group, which represents the most active segment of the labour market. This demographic shift creates pressure to change the structure of consumption and increases demands on social security systems. However, the paradigm is changing in the European perspective regarding the economic potential and re-evaluation of ageing. Veleva (2025) proposes perceiving ageing not as a one-sided social burden, but as a strategic economic asset. Authors (Grishina et al., 2023) emphasise that the silver economy, focused on the well-being of the older population, has become an important sector influencing aggregate demand and economic growth. They state that within the European Union, this sector represents the third largest economy in the world (after China and the United States), which underlines its substantial contribution to GDP formation in the European context. At the same time, they point to a high degree of regional differentiation, which requires specific economic policy measures – ranging from supporting senior demand to strengthening social security in less developed regions. Gupta and Dwivedi (2025) highlight the silver economy as a strategic opportunity for economic growth in

the context of population ageing. Their findings emphasise the importance of social and digital inclusion, technological adoption, and targeted policies in supporting the economic participation of seniors. In their view, the older population is an active economic actor rather than a passive recipient of social transfers. At the level of consumer behaviour, authors (Podgórnjak-Krzykacz & Przywojska, 2025) identify a high degree of sustainable and rational purchasing behaviour among consumers aged 55+. Their empirical results suggest that silver consumers use their purchasing power effectively, with their decision-making influenced by personal and social norms as well as environmental awareness. The macroeconomic dimension of the silver economy is elaborated by Zaborovskaya and Kranina (2025), who emphasise the need for inclusive policies supporting older populations' access to education, employment, and economic opportunities. Their conclusions point to the importance of regionally differentiated strategies reflecting the specific needs of older cohorts. A complementary perspective is offered by Juracka and Vovk (2025), who identify significant socio-demographic differences in consumer behaviour in the digital and sharing economy in Slovakia. Their findings indirectly point to the risk of digital exclusion of older generations, which represents a challenge for the development of an inclusive silver economy.

The literature thus confirms that the silver economy is a complex phenomenon linking demographic trends, purchasing power, and consumer behaviour, providing a relevant theoretical basis for the analysis of intergenerational differences in purchasing power in Slovakia.

### **Methodology**

Demographic ageing and changes in the consumer behaviour of the older population represent a significant factor influencing a country's economic development. The silver economy, as a new economic concept, reflects the growing importance of seniors not only as consumers but also as active participants in the labour market. Their purchasing power, employment, and financial behaviour have the potential to affect macroeconomic indicators,

including gross domestic product. In view of these facts, it is important to examine how intergenerational differences in purchasing power are reflected in the overall economic performance of the country. The aim of this paper is to examine the development and economic determinants of purchasing power in Slovakia and to specify the impact of the purchasing power of the silver economy segment on the formation of the gross domestic product of the Slovak Republic.

In the present study, the following research questions were formulated:

1. How are intergenerational differences in purchasing power reflected in the economic performance of Slovakia, particularly in relation to GDP?

2. To what extent can the development of the silver economy contribute to sustainable economic growth under conditions of demographic ageing?

Based on the research questions, the following hypotheses were formulated:

**H1:** The involvement of the silver economy has a statistically significant impact on the development of gross domestic product in Slovakia.

**H2:** A higher employment rate of seniors is positively correlated with the growth of gross domestic product in Slovakia.

The selected research approach allows for a comprehensive examination of the economic relationships of differences in purchasing power in Slovakia. The formulated research questions and hypotheses create a framework for the analytical part of the study, the aim of which is to contribute to a better understanding of the role of the older population in the economy and to support the formulation of effective policies and national strategies in the field of the silver economy. The empirical analysis is based on secondary statistical data available in databases – slovakstatistic. The dependent variable of the models is the gross domestic product of the Slovak Republic at current prices. The explanatory variables selected were the employment rates of seniors in four age groups: 50–54 years, 55–59 years, 60–64 years, and 65 years and over.

These age cohorts represent individual phases of the silver economy – from late working age to the post-working phase. The significance level at which a statistically significant correlation between the respective age cohort and the

examined variable was identified was set at  $\alpha = 0.05$ . The analysis was carried out using annual time series data for the period 2015–2023. The selected time span reflects the availability of consistent data for all variables and simultaneously captures a period of significant demographic and economic changes in Slovakia. To estimate the relationships between senior employment rates and GDP development, the ordinary least squares (OLS) method was applied. A separate linear regression model was estimated for each age group, which made it possible to identify differences in the strength and direction of the impact of individual silver economy cohorts on the country's macroeconomic performance. Econometric data processing was conducted using the statistical software Gretl. Given the nature of the time series data, attention was paid to verifying the basic assumptions of the classical linear regression model.

The validity of the estimated models was verified through standard diagnostic tests. The normality of residuals was tested using the chi-square test. The assumption of homoskedasticity was verified using the White test and the Breusch–Pagan test. Autocorrelation of residuals was assessed based on the value of the Durbin–Watson statistic. Despite the identification of positive autocorrelation of residuals in some models, this phenomenon was accepted, as it is a common issue in the analysis of short time series of macroeconomic indicators and does not have a substantial impact on the direction or statistical significance of the estimated coefficients. Overall, the results of the diagnostic tests confirmed the fulfilment of the basic assumptions of regression analysis and allowed for the interpretation of the estimated parameters.

## **Findings**

The findings present the results of an empirical analysis focused on assessing the impact of the purchasing power of selected age groups of the population on the formation of the gross domestic product of the Slovak Republic. Through regression models, the relationship between the silver economy segment and the country's macroeconomic performance is quantified. The results also make it possible to identify which age cohorts play the most significant role in terms of economic contribution.

**Table 1. Regression results for the 50–54 age group**

50-54 years	Coefficient	Std. Error	t-Statistic	p-Value
Constant (const)	-49450,3	18692,1	-2,646	0,0332
Employment rate of seniors	810,144	225,869	3,587	0,0089

Source: own elaboration

The results of the regression analysis indicate a statistically significant relationship between the employment rate of individuals aged 50–54 and the development of gross domestic product. The estimated coefficient for this variable reaches a value of 810.144 and is statistically significant at the significance level  $\alpha$

= 0.05 (p-value = 0.0089), confirming the existence of a positive impact on GDP. This means that an increase in the employment rate of this age group by one percentage point is, on average, associated with an increase in GDP of approximately EUR 810, *ceteris paribus*.

**Table 2. Regression Analysis Results (Ages 50–54)**

Statistic	Value
Mean dependent variable	17566.55
S.D. dependent variable	2539.695
Sum squared residuals	18182859
S.E. of regression	1611.692
R-squared	0.647622
Adjusted R-squared	0.597282
F-statistic	12.86503
Prob(F-statistic)	0.008895
Log-likelihood	-78.10489
Akaike information criterion (AIC)	160.2098
Schwarz criterion (BIC)	160.6042
Hannan–Quinn criterion	159.3586
Durbin–Watson statistic	0.713810
Rho	0.693351

Source: own elaboration

The coefficient of determination reaches a value of  $R^2 = 0.647622$ , which means that the regression model explains approximately 64.76% of the variability in gross domestic product. This result indicates a relatively good explanatory power of the model and suggests that the selected explanatory variable accounts for a significant share of GDP development. The value of Adjusted  $R^2 = 0.597282$  simultaneously indicates that the model retains adequate stability even after

accounting for the number of estimated parameters. The overall statistical significance of the model was verified using the F-test. The value of  $F = 12.86503$  with a p-value of 0.008895 indicates that the model as a whole is statistically significant at the significance level  $\alpha = 0.05$ . Based on the obtained results, it can therefore be stated that the explanatory variable significantly contributes to explaining the variability of GDP. The value of the Durbin–Watson statistic is 0.713810, which indicates the presence of

positive autocorrelation of residuals. However, this phenomenon is relatively common in the analysis of time series of macroeconomic indicators and was therefore not considered a major obstacle to the interpretation of the model. The remaining information criteria (AIC, BIC, Hannan–Quinn) reach standard values, which are

mainly useful for comparing multiple model specifications.

Within the diagnostics of the regression model, attention was devoted to verifying the fulfilment of the basic assumptions of the classical linear regression model.

**Table 3. Diagnostic Tests of the Regression Model (Ages 50–54)**

Test	Test statistic	df	p-Value	Conclusion
White's test	5.39017	2	0.0675365	No heteroskedasticity
Breusch–Pagan test	1.92988	1	0.164772	No heteroskedasticity
Normality test ( $\chi^2$ )	1.59022	2	0.451533	Residuals are normally distributed

Source: own elaboration

The normality of residuals was tested using the chi-square test. The obtained value of the test statistic  $\chi^2 = 1.59022$  with a p-value of 0.451533 does not allow the rejection of the null hypothesis of normal distribution of residuals at the significance level  $\alpha = 0.05$ . This result indicates that the distribution of the random component of the model is consistent with the assumptions of linear regression, thereby supporting the applicability of standard inferential procedures. The assumption of constant variance of residuals was verified using the White test and the Breusch–Pagan test for heteroskedasticity. In the case of the White test, an LM statistic value of 5.39017 with a p-value of 0.0675365 was obtained, while the Breusch–Pagan test yielded an LM value of 1.92988 with a p-value of 0.164772. Since in both cases the p-values exceed the significance level of 0.05, the null hypothesis of

homoskedasticity cannot be rejected. It can therefore be concluded that the variance of residuals is statistically consistent with the assumption of constancy and the model does not exhibit signs of heteroskedasticity.

After analysing the 50–54 age group, attention is further focused on the subsequent segment of the silver economy, namely the population aged 55–59. This age cohort smoothly follows the previous group and represents a period of gradual transition towards the end of the economically active age, which may influence its position in the labour market as well as its consumer behaviour. Examining this category therefore makes it possible to assess whether the intensity of the impact of the silver economy on the formation of gross domestic product changes with increasing age and whether older age groups play a different role in the economic performance of the Slovak Republic.

**Table 4. Regression results for the 55–59 age group**

55-59 years	Coefficient	Std. Error	t-Statistic	p-Value
Constant (const)	-23974,5	7810,33	-3,070	0,0181
Employment rate of seniors	543,653	102,079	5,326	0,0011

Source: own elaboration

The regression analysis for the 55–59 age group confirmed a statistically significant positive effect of the senior employment rate on GDP. The estimated coefficient reaches a value of 543.653 and is statistically significant at the significance level  $\alpha = 0.05$  (p-value = 0.0011), which allows the rejection of the null hypothesis of no effect.

The value of the t-statistic ( $t = 5.326$ ) indicates a strong and statistically reliable relationship between the variables. This means that an increase in the employment rate of individuals aged 55–59 by one percentage point leads, on average, to an increase in GDP of approximately EUR 543, *ceteris paribus*.

**Table 5. Regression Analysis Results (Ages**

Statistic	Value
Mean dependent variable	17566.55
S.D. dependent variable	2539.695
Sum squared residuals	10213753
S.E. of regression	1207.935
R-squared	0.802061
Adjusted R-squared	0.773784
F-statistic	28.36377
Prob(F-statistic)	0.001092
Log-likelihood	-75.50954
Akaike information criterion (AIC)	155.0191
Schwarz criterion (BIC)	155.4135
Hannan–Quinn criterion	154.1679
Durbin–Watson statistic	0.968445
Rho	0.457761

Source: own elaboration

The coefficient of determination reaches a value of  $R^2 = 0.802061$ , which means that the regression model explains approximately 80.21% of the variability in gross domestic product. This result indicates a high explanatory power of the model and suggests that the employment rate of individuals aged 55–59 has a significant share in GDP development. The value of Adjusted  $R^2 = 0.773784$  simultaneously confirms the stability of the model even after correcting for the number of included parameters. The overall statistical significance of the model was verified using the

F-test. The value of  $F = 28.36377$  with a p-value of 0.001092 indicates that the model as a whole is statistically significant at the significance level  $\alpha = 0.05$ , and thus the explanatory variable significantly contributes to explaining the variability of GDP. The value of the Durbin–Watson statistic (0.968445) indicates positive autocorrelation of residuals; however, the model was also retained in its original specification in this case, as this is a common phenomenon in time series and does not represent a substantial limitation to the interpretation of the results.

**Table 6. Diagnostic Tests of the Regression Model (Ages 55–59)**

Test	Test statistic	df	p-value	Conclusion
White’s test	2.75507	2	0.2522	No heteroskedasticity
Breusch–Pagan test	0.89626	1	0.343787	No heteroskedasticity
Normality test ( $\chi^2$ )	0.656694	2	0.720113	Residuals are normally distributed

Source: own elaboration

Testing of the residual component confirmed that the model meets the basic statistical assumptions. The normality test based on the chi-square statistic ( $\chi^2 = 0.656694$ ;  $p = 0.720113$ ) did not reveal deviations from normal distribution, which means that the distribution of the random component is consistent with the

theoretical assumptions of linear regression. The stability of the variance of residuals was assessed using the White test (2.75507;  $p = 0.2522$ ) and the Breusch–Pagan test (0.89626;  $p = 0.343787$ ). The results of both tests do not indicate the presence of heteroskedasticity; therefore, the variance of the

random component can be considered statistically constant across the entire range of observations.

After evaluating the results for the 55–59 age group, the analysis further shifts to the population aged 60–64, which represents a specific part of the silver economy. This group consists of individuals at the threshold of exiting economic activity, where some are still fully economically active, while others may already be receiving early or regular old-age pensions depending on individual circumstances and

applicable legislation. From an economic perspective, this age cohort is particularly interesting because it combines elements of productive age with the growing importance of pension income and increased consumption orientation towards health and social services. Examining its impact on GDP thus makes it possible to capture the transition between economic activity and the retirement period, which is essential for the dynamics of the silver economy.

**Table 7. Regression results for the 60–64 age group**

60-64 years	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>p-Value</b>
Constant (const)	7870,00	997,694	7,888	0,00009970
Employment rate of seniors	264,131	26,4342	9,992	0,00002150

Source: own elaboration

The results indicate a statistically significant relationship between the senior employment rate and the development of gross domestic product. The estimated coefficient for the senior employment rate variable reaches a value of 264.131 and is statistically significant at the significance level  $\alpha = 0.05$  (p-value = 2.15E-05). Based on this result, it can be stated that the

independent variable has a statistically significant impact on GDP. Specifically, an increase in the senior employment rate by one percentage point leads, on average, to an increase in GDP of approximately EUR 264, ceteris paribus. The high value of the t-statistic for the senior employment rate variable ( $t = 9.992$ ) further indicates the strength of the identified relationship and the low probability that the observed effect is the result of random fluctuations in the data.

**Table 8. Regression Analysis Results (Ages 60–64)**

<b>Statistic</b>	<b>Value</b>
Mean dependent variable	17566.55
S.D. dependent variable	2539.695
Sum squared residuals	3,380,758
S.E. of regression	694.9571
R-squared	0.934482
Adjusted R-squared	0.925122
F-statistic	99.84082
Prob(F-statistic)	0.000022
Log-likelihood	-70.53418
Akaike information criterion (AIC)	145.0684
Schwarz criterion (BIC)	145.4628
Hannan–Quinn criterion	144.2171
Durbin–Watson statistic	1.096455
Rho	0.216686

Source: own elaboration

The coefficient of determination reaches a value of  $R^2 = 0.934482$ , which means that the regression model explains approximately 93.45% of the variability in GDP. This result indicates a high explanatory power of the model and suggests that the selected explanatory variable has a significant share in GDP development. The high value of Adjusted  $R^2 = 0.925122$  simultaneously

confirms that the model is not overestimated and retains its stability even after correction for the number of variables. The overall statistical significance of the model was also verified using the F-test, where the value ( $F = 99.84$ ) with a p-value of 0.000022 indicates that the model as a whole is statistically significant at the significance level  $\alpha = 0.05$ .

**Table 9. Diagnostic Tests of the Regression Model (Ages 60–64)**

Test	Test statistic	df	p-Value	Conclusion
White's test	4.72115	2	0.0943658	No heteroskedasticity
Breusch-Pagan test	0.286509	1	0.592466	No heteroskedasticity
Normality test ( $\chi^2$ )	2.21222	2	0.330844	Residuals are normally distributed

Source: own elaboration

The assumptions of the regression model were verified using three diagnostic tests. The White test did not indicate the presence of heteroskedasticity, as its p-value exceeded the conventional significance level. The Breusch-Pagan test produced the same result and likewise did not indicate a statistically significant change in the variance of residuals. The residual normality test confirmed that their distribution is consistent with normality, which supports the applicability of standard inferential procedures. The model therefore meets the basic statistical assumptions required for the interpretation of the estimated parameters.

In the final phase of the analysis, the age group of 65 years and over was also included in

the model, representing the core of the silver economy. This population is already to a much greater extent outside the labour market, and its income situation is largely formed by pension benefits and other transfers rather than labour income. From an economic perspective, however, this group remains significant, primarily through the consumption of goods and services, especially in the areas of healthcare, housing, and personal services. The inclusion of this cohort in the analysis therefore makes it possible to assess more comprehensively the extent to which the economic activity and purchasing power of the post-productive population are reflected in the formation of gross domestic product.

**Table 10. Regression results for the 65+ years age group**

65 + years	Coefficient	Std. Error	t-Statistic	p-Value
Constant (const)	8390,64	1801,30	4,658	0,0023
Employment rate of seniors	2268,77	433,771	5,230	0,0012

Source: own elaboration

The regression analysis for the age group of 65 years and over confirmed a statistically significant relationship between the senior employment rate and GDP development. The estimated coefficient for the senior employment

rate variable reaches a value of 2,268.77 and is statistically significant at the significance level  $\alpha = 0.05$  (p-value = 0.0012), as well as at the more stringent level  $\alpha = 0.01$ , indicating very strong evidence of the existence of an effect.

**Table 11. Regression Analysis Results (Ages 65+)**

Statistic	Value
Mean dependent variable	17566.55
S.D. dependent variable	2539.695
Sum squared residuals	10513391
S.E. of regression	1225.526
R-squared	0.796254
Adjusted R-squared	0.767147
F-statistic	27.35647
Prob(F-statistic)	0.001212
Log-likelihood	-75.63966
Akaike information criterion (AIC)	155.2793
Schwarz criterion (BIC)	155.6738
Hannan–Quinn criterion	154.4281
Durbin–Watson statistic	0.661490
Rho	0.716336

Source: own elaboration

The model achieved a coefficient of determination of  $R^2 = 0.796$ , which means that it explains approximately 80% of the variability of the dependent variable. The overall statistical significance of the model was confirmed using the F-statistic ( $F = 27.36$ ;  $p = 0.0012$ ), indicating that the model as a whole is statistically significant.

The value of the Durbin–Watson statistic is 0.66, which suggests the presence of positive autocorrelation of residuals; however, since a similar result also appeared in the previous models, this degree of autocorrelation is accepted within the analysis.

**Table 12. Diagnostic Tests of the Regression Model (Ages 65+)**

Test	Test statistic	df	p-Value	Conclusion
White's test	5.09152	2	0.0784134	No heteroskedasticity
Breusch–Pagan test	1,27190	1	0.25941	No heteroskedasticity
Normality test ( $\chi^2$ )	0.15992	2	0.92306	Residuals are normally distributed

Source: own elaboration

The tests confirm the fulfilment of the basic assumptions of the classical linear regression model. Neither the White test nor the Breusch–Pagan test indicated the presence of heteroskedasticity, as their p-values exceed the established significance level. The residual normality test based on the chi-square statistic also confirmed that the residuals are normally distributed.

Across all analysed age cohorts of the silver economy (50–54, 55–59, 60–64 and 65+ years), a statistically significant relationship between the senior employment rate and the gross domestic product of the Slovak Republic was demonstrated. In the case of hypothesis H1, which assumes a statistically significant impact of the involvement of the silver economy on the development of gross domestic product, the null

hypothesis of no effect was not rejected, and therefore hypothesis H1 is accepted. Similarly, in the case of hypothesis H2, which assumes a positive relationship between the senior employment rate and the growth of gross domestic product, the null hypothesis was not rejected. The estimated regression coefficients had a positive sign in all analysed models and were statistically significant at the level  $\alpha = 0.05$ ; therefore, hypothesis H2 is accepted. The findings thus confirm that the silver economy represents a significant component of the country's economic development.

### Discussion

The discussion builds on the empirical findings of the study and interprets them in the context of the stated objective and research questions. Attention is focused on the identified statistically significant relationships between the employment rates of individual age cohorts of the silver economy and the development of the gross domestic product of the Slovak Republic, as well as on differences in the economic contribution of individual senior age groups. By answering the first research question, “How are intergenerational differences in purchasing power reflected in the economic performance of Slovakia, particularly in relation to GDP?”, it was confirmed that a statistically significant positive relationship exists between the senior employment rate and GDP in all analysed age groups. However, the results point to differences in the intensity of this effect. The strongest and most stable effect was identified in the 50–54 and 55–59 age groups, which are in the late productive age and combine high labour activity with relatively strong purchasing power. These cohorts represent a key segment of the silver economy in terms of supporting economic growth. In the case of the 60–64 age group, a positive impact on GDP was also confirmed, but with lower intensity. This result can be interpreted as a consequence of the transitional period between economic activity and retirement, which is characterised by changes in income structure and labour market participation. Nevertheless, this group retains significant economic potential, highlighting the importance of policies supporting a gradual and flexible transition into retirement. An interesting finding is

the strong positive impact of employment among the population aged 65 and over on GDP. Although this is a numerically smaller group, the high value of the regression coefficient suggests that the economic activity of working pensioners is associated with above-average economic contribution. This effect can be explained primarily by the high level of human capital, experience, and specialised skills of seniors who remain economically active even in the post-productive age.

The second research question, “To what extent can the development of the silver economy contribute to sustainable economic growth under conditions of demographic ageing?”, was addressed through a comparison of regression models across individual age cohorts. The results confirmed the heterogeneous nature of the silver economy, as individual age groups differ not only in their level of labour market participation but also in the intensity of their economic contribution. These differences suggest that universal policies targeting seniors may not be effective and that a differentiated approach is required. The findings of the study are consistent with the existing literature, which highlights the growing importance of the older population as an active economic actor and the potential of the silver economy to mitigate the negative consequences of demographic ageing. The contribution of this study lies in the detailed differentiation of age cohorts and in demonstrating that the same economic mechanism—senior employment—has different significance across age groups. The results further indicate the need for targeted support of senior employment in Slovakia. While maintaining employability and eliminating age discrimination are priorities in the 50–59 age groups, in the 60+ groups it is important to support flexible forms of work and to create conditions for voluntary retention in the labour market. The discussion thus confirms that the silver economy represents an important instrument of sustainable economic growth under conditions of demographic ageing.

### Conclusion

The results confirm that the economic activity of the older population represents a significant, yet still insufficiently utilised, source

of economic growth in Slovakia. The empirical analysis demonstrated a statistically significant positive relationship between the senior employment rate and the development of gross domestic product across all analysed age cohorts. These findings have important practical implications, particularly in the context of the Slovak labour market, the pension system, and ongoing demographic ageing. In the conditions of the Slovak Republic, the economic activity of seniors is closely linked to the functioning of the pension system and the level of old-age pensions. A relatively low pension replacement rate compared to the average wage leads a substantial proportion of seniors to remain in the labour market not for reasons of self-fulfilment, but out of economic necessity. In practice, this phenomenon is reflected in a growing number of working pensioners, particularly in the services sector, healthcare, education, public administration, and occupations experiencing labour shortages. The results of the analysis suggest that this group of seniors has a disproportionately high economic contribution, which is also confirmed by the strong regression effect observed for the 65+ age cohort. From the perspective of the Slovak labour market, the 50–54 and 55–59 age groups appear particularly important, as they exhibit the most stable and significant impact on GDP. These groups often face an increasing risk of age discrimination in the workplace, limited access to retraining opportunities, and lower willingness on the part of employers to invest in their further education. However, the empirical findings of this study indicate that the premature exclusion of these workers from the labour market represents not only a social but also an economic problem. Maintaining their labour market participation has the potential to directly support economic growth while simultaneously reducing pressure on public finances. The age group of 60–64 years represents a transitional phase between productive and retirement age in Slovak practice. During this period, institutional settings such as the possibility of early retirement, the combination of work and pension receipt, and the tax and contribution burden on working seniors play a significant role. The results suggest that supporting continued labour market participation even at this age can bring positive macroeconomic effects. In practice,

this implies the need to develop flexible forms of work, part-time employment, and health-adjusted working conditions that reflect the specific needs of this group. Particular attention should be paid to the population aged 65 years and over, which in Slovakia is traditionally perceived primarily as a recipient of social transfers. Working seniors in this age group have a pronounced positive impact on GDP. In practice, these are often individuals with high levels of human capital, long-term experience, and specific skills that are difficult to replace by younger workers. Their economic activity also supports domestic consumption, thereby indirectly contributing to demand stability in the economy.

From the perspective of the Slovak Republic, the results of the study point to the need for the systematic integration of the principles of the silver economy into national strategies. Supporting senior employment should not be perceived as a temporary solution to labour shortages, but as a long-term instrument of sustainable economic growth. Measures focused on lifelong learning, digital inclusion, the elimination of age discrimination, and adjustments to pension incentives can significantly increase the economic potential of the older population. In the Slovak context, it is also essential to take into account regional differences in seniors' living standards, the availability of employment opportunities, and the quality of healthcare. The silver economy does not develop uniformly in practice, and its economic contribution is conditioned by local structural characteristics. Targeted regional policies can therefore play an important role in maximising the positive effects of population ageing.

In conclusion, the examination of intergenerational differences in purchasing power and the economic activity of seniors provides important insights for practice in Slovakia. The silver economy does not represent an economic burden, but rather a strategic source of growth whose potential is currently only partially utilised. Under conditions of an ageing population, Slovakia's ability to effectively integrate seniors into economic life will be one of the key determinants of its future economic stability and competitiveness.

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