

# THE IMPACT OF EARLY RETIREMENT ON THE PERFORMANCE OF THE ECONOMY AND THE SUSTAINABILITY OF THE PENSION SYSTEM IN THE CONTEXT OF ESG FACTORS

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## Abstract

The study investigates how early retirement affects economic performance and the sustainability of the pension system, incorporating environmental, social, and governance (ESG) factors. Using data from the Social Insurance Agency of the Slovak Republic, the Statistical Office, and EUROSTAT, the study applies regression analysis to examine the relationship between early retirement expenditures, GDP, and public finance outcomes. The results reveal a complex but predominantly negative impact: while earlier labor market exits may free jobs and influence productivity, they simultaneously reduce the labor force, weaken economic growth, and increase fiscal pressure on the pension system. These effects have broader social and governance implications, including risks to long-term public finance sustainability and challenges for ESG-aligned policymaking. The findings underscore the need for balanced pension policies that consider demographic trends, economic efficiency, and ESG responsibilities. The study fills a research gap by linking early retirement to ESG dimensions and provides evidence-based insights for future pension reforms and policy development.

**Keywords:** *Early Retirement, Pension System Sustainability, Economic Performance, Esg Factors, Aging Population, Labor Market, Public Finance.*

**JEL Codes:** *H55, J26, J11, G38, Q56.*

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## Introduction

The Slovak Republic, like many other countries in the European Union (EU), faces challenges associated with an aging population and the sustainability of pension systems. These challenges are gaining importance in the context of the increasing average age of the population and the decreasing ratio between the active workforce and the retired population. One aspect that receives limited attention in the scientific sphere is the impact of early retirement pensions on the Environmental, Social, Governance (ESG) concept in relation to economic performance and the availability of labor resources for business needs. However, this issue is extremely important because it can have extensive impacts not only on the economy as a whole but also on social stability

and individual well-being, especially in relation to future generations.

Population aging poses unprecedented challenges for pension systems in many countries. The central problem of pension systems is the inability to adapt to long-term demographic trends, including declining birth rates, increasing life expectancy, and differences in life expectancy. Many features of traditional social security pension systems, such as contribution rates, defined benefits, and retirement age, were established in earlier stages of demographic transition and are now not aligned with the increasing retirement age and rapidly growing older population. Such defined systems raise social dimension issues within the ESG concept,

especially physical and mental workforce fatigue. In response to the growing fiscal costs associated with population aging, many governments have reformed their pension systems to be financially sustainable. Common measures include postponing the retirement age, extending the contribution period, reducing indexation, adjusting pension benefit formulas, and introducing certain longevity adjustment factors (Kudrna, et al., 2022). ESG factors play a significant role in analyzing the impact of early retirement on the economy and society. When evaluating pension policies, it is important to consider their relevance to the broader societal and environmental context.

In terms of environmental factors, early retirement can affect environmental sustainability. For example, when workers retire earlier, it can impact their consumption and use of resources, which can have ecological consequences. It can also affect the development of environmental policies and investments in environmental technologies. Social ESG factors are related to the impact of early retirement on social cohesion and justice. Issues such as income distribution among generations, access to pension systems, and social justice are crucial in assessing the impact of pension policies on society as a whole. Proper ESG factors relate to transparency, governance, and responsibility in the public and private sectors. When formulating pension policies, it is important to ensure transparent and fair governance to minimize corrupt practices and ensure the credible functioning of pension systems. Overall, ESG factors play a key role in assessing and formulating pension policies as they take into account not only economic but also environmental, social, and governance aspects that influence society and its sustainable development.

Currently, Slovakia is witnessing a growing trend of early retirement from the labor market, whether due to health issues, unemployment prevention, or favorable conditions in pension systems. This issue is current and requires attention. Early retirements can have conflicting consequences for the economic performance of businesses and consequently the entire country. In connection with this issue, it is increasingly important to consider ESG responsibility factors

as well. Investors, regulatory authorities, and the public are beginning to place greater emphasis on sustainability and corporate social responsibility. For this reason, it is necessary to consider ESG factors when assessing the impact of pension policies on economic performance and social stability. The study provides empirical evidence and understanding of the mechanisms influencing economic performance and the pension system in relation to early retirement age. The study provides findings that have the potential to provide relevant information for the formulation of policies and reforms of pension systems not only in Slovakia but also in other EU countries. The study presents important scientific findings that can contribute to a better understanding of the relationship between pension policies and ESG factors and can provide incentives for future research in the field of pension systems and public finance in connection with ESG.

### **Literature review**

The performance of the economy is significantly influenced by innovations in technology as well as the implementation of artificial intelligence in all areas of society. Current technological changes play a significant role in early retirement decisions, although they affect heterogeneous specific groups in the sample (in terms of gender, level of education, and employment status). This fact leads to a conflict between governments, which seek to postpone the retirement age, and labor markets, which seek to push out unfit workers earlier. When developing policies related to aging and retirement, it is necessary to consider the impact of new labor-saving technologies on the decisions of older workers [6]. Slovakia is known for its workforce mainly engaged in lower-skilled jobs, often associated with manual labor, which can be exhausting and frustrating for the workforce in later years. Demanding working conditions with low control over work tasks have a negative impact on employees' health, leading to early retirement from the labor market [10]. Additionally, Dingemans et al. [8] showed that older workers in lower occupational classes (e.g., manual workers), who tend to have demanding jobs with fewer resources, expressed more anger towards policies increasing the retirement age

compared to those in higher classes who tend to have better access to resources. For these reasons, skills and competency education for older workers is shown to be a necessary part of the social context, also in connection with ESG; lifelong learning will therefore intensify and need to be implemented in an innovative manner.

Opportunities for skills development should therefore facilitate acquiring new job-related skills that can keep workers in the labor market [15]. Pension reforms implemented in many states are minimally oriented towards education and the implications of extended life expectancy in the labor market, as education itself represents a cost. The key goal of reforms increasing the statutory retirement age or introducing actuarial reductions for early retirement is to prevent the increase in life expectancy from unduly prolonging the period of receiving pension benefits. However, a commonly cited argument against these reforms is that certain groups, who have worked hard throughout their careers, should be exempt from raising the normal retirement age (NRA) or the early retirement age (ERA) [9].

In connection with the ESG concept, it is necessary to examine various aspects that influence the decisions of the workforce to stay in the labor market. The actual behavioral effects of pension reforms usually manifest after several years. Current retirees are usually not significantly affected by these impacts, while future retirees must consider changing pension rules in their retirement planning. Knowledge about the intentions of affected cohorts to retire is therefore crucial for evaluating the effects of pension reform on behavior [19]. Equally important is the generational transition and the role of caring for grandchildren or elderly parents. Early retirement significantly does not predict old-age parenthood, although there is a relatively higher chance of becoming an older father if the person who retired is highly educated [3]. A notable phenomenon is the health status of the workforce and their subjective feeling of coping with labor market demands, which began to manifest especially during the pandemic. The retirement of older workers increased during the COVID-19 pandemic, and health concerns are considered a critical factor [14]. Motivation to work

significantly decreases with age, and the reward system may play a major role. If there is no significant drop in the standard of living after retirement, the workforce loses motivation and prefers leisure time and freedom. Differences in retirement age can lead to differences in wages and opportunities for career advancement. Vickerstaff et al. [31] state that as employees approach retirement age, their work motivation may decrease, and they may minimize their involvement in activities related to human capital investment, such as on-the-job training or actively seeking job changes. The author notes that older workers often internalize age norms and perceptions, which influence their decisions regarding extending their working lives or timing retirement.

Petery et al. [25] discuss how older employees face discrimination, which limits their access to training and career opportunities. The authors found that older workers often experience age bias, leading to their earlier retirement. European countries are increasing their statutory retirement age and promoting longer working lives [21, 22]. This has raised concerns about the extent to which extended working lives exacerbate social inequality in retirement transitions and adjustments [30]. In the work context, resources such as opportunities for skills development, job autonomy, and recognition can motivate workers and therefore encourage them to retire later. Policies promoting longer working lives may remain ineffective if employers are unable or unwilling to hire an aging workforce. Depending on what employers consider appropriate age norms for work and retirement, they may be more willing to hire and retain older workers [26, 13, 29].

### **Methodological approach**

The study focuses on identifying the main factors influencing economic performance in relation to early retirement and its impact on the sustainability of public finances and economic growth. We also address the connection with environmental, social, and governance (ESG) factors to better understand the overall context and implications for society, considering not only the short-term but also the long-term consequences of these measures. The aim of the study is to provide

empirical evidence that early retirement significantly impacts GDP and the pension system

The methodological approach in addressing the issue involved analyzing relevant studies published in scientific databases such as Web of Science and Scopus. Furthermore, we analyzed data obtained from the Social Insurance Agency of the Slovak Republic, the Statistical Office, and EUROSTAT. The study focuses on identifying the main factors influencing economic performance in relation to early retirement and their implications for the sustainability of public finances and economic growth with a connection to ESG factors.

Early retirements have a negative impact on the sustainability of public finances. This is due to their reduction of tax revenues and increase in pension expenditures. Therefore, measures taken must aim to compensate for these negative impacts, such as increasing taxes or reducing pensions. Based on available studies and

statistical data from Slovakia, two scientific hypotheses were established:

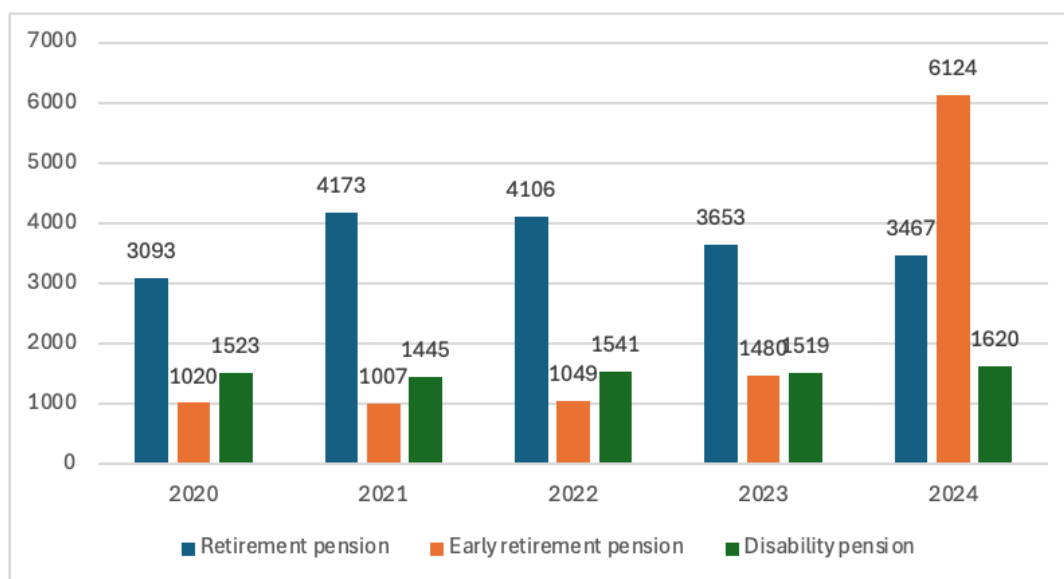
H1: Early retirement pensions have a negative impact on the economy of Slovakia.

H2: Early retirement pensions have a negative impact on the pension system in Slovakia.

To test the scientific hypotheses, regression analysis was used. Regression analysis is used to model the relationship between variables, aiming to quantify the strength and direction of this relationship. The output is the coefficient of determination (R<sup>2</sup>), which shows the degree of dependence. The subject of this analysis was to find the relationship between the dependent variable Y (GDP, pension system) and the independent variable X (expenditures on early retirement pensions).

## Results

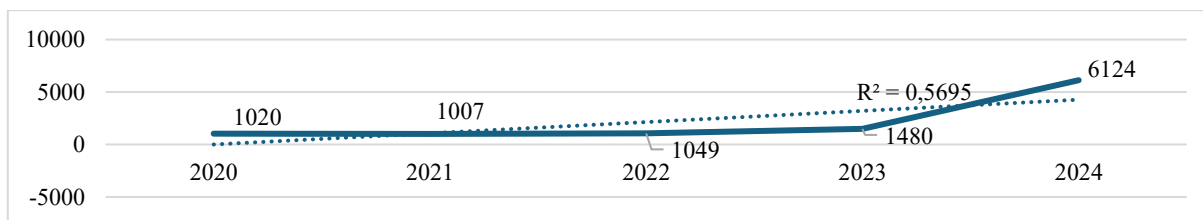
In Figure 1, we present the average monthly number of newly granted pensions for the years 2020 - 2024.



**Figure 1. Average monthly number of newly granted pensions in 2020-2024**

In the first three months of 2024, the number of newly granted early retirement pensions reached 12,248 (when converted, it was approximately 1,480 retirements for early retirement per month in 2023, approximately 1,048 retirements in 2022, and currently, in 2024,

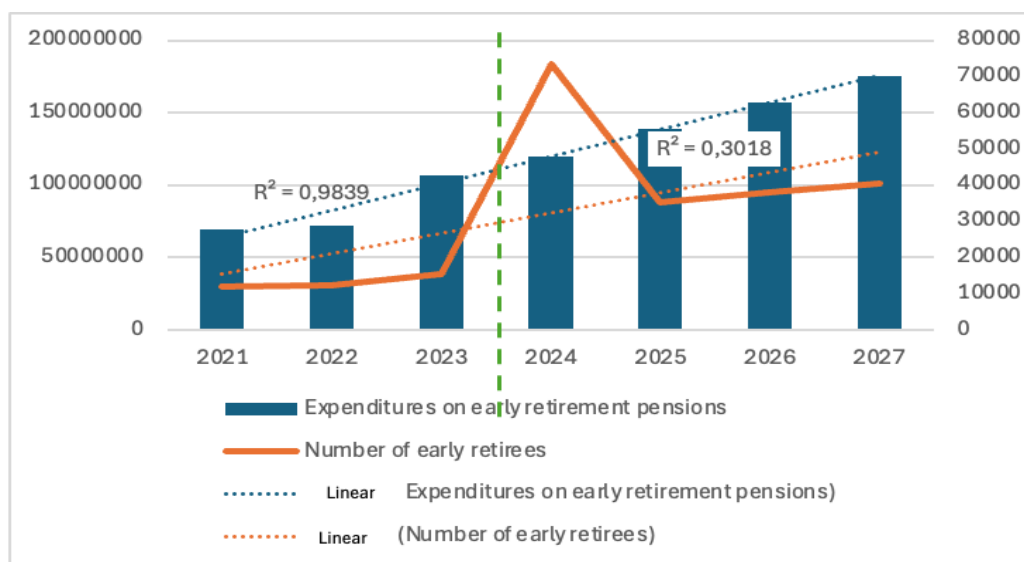
it is already 6,124 retirements per month). If we were to continue at this pace, by the end of 2024, 73,488 retirees would have entered early retirement, which would have a significant impact on the labor market situation, and this workforce would undoubtedly be missed.



**Figure 2. Monthly trend in the number of early retirement pensions**

Expenditures on early retirement pensions gradually increase from 2021 to 2027. The increase in expenditures is quite significant. This trend suggests an increased burden on the pension system in relation to early retirement pensions. While the number of early retirement pensions remains relatively stable until 2023, there is a

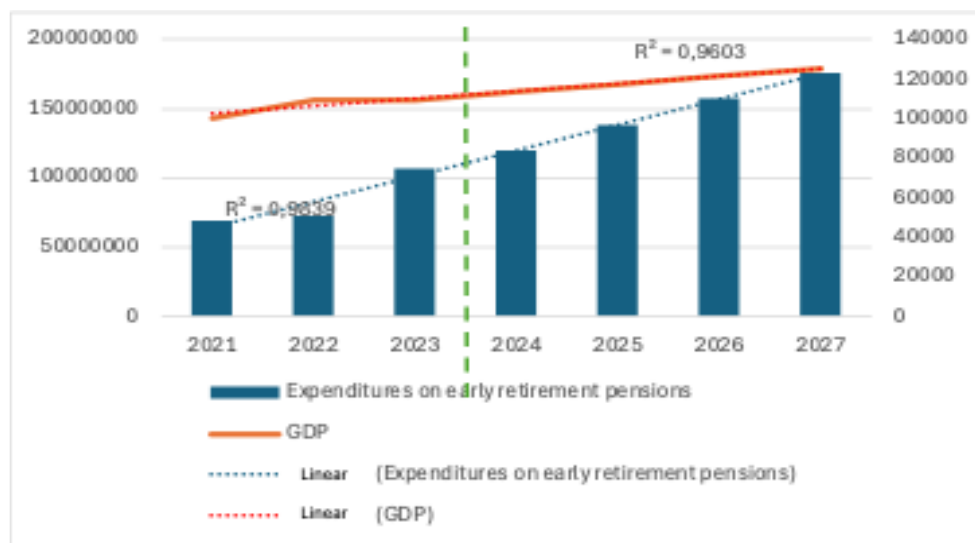
significant increase from 2024 onwards. This increase is dramatic, with the number of early retirement pensions rising from 15,426 in 2023 to 40,509 in 2024. This indicates possible changes in legislation or demographic factors leading to an increase in the number of people receiving early retirement pensions.



**Figure 3. Expenditure on early retirement pensions and number of early retirees**

The R2 value for the number of early retirement pensions (PSD) (0.3018) suggests that only 30% of the variability in the number of early retirement pensions can be explained by the forecast used. This indicates that there are other factors influencing the number of early retirement pensions that are not included in the forecast model. Conversely, the R2 value for expenditures on PSD (0.9839) is very high, indicating that the forecast model used explains the variability in expenditures on early retirement pensions well. This means that the model used has a strong

predictive ability for expenditures on early retirement pensions. Overall, from this data, it can be inferred that early retirement pensions represent a significant aspect of public expenditures and that there may be a significant increase in their number in the future, which will impact the pension system and public finances. It is important to further examine the factors influencing the number of early retirement pensions to better understand this trend and to take appropriate measures for the sustainability of the pension system.



**Figure 4. Model of the impact of early retirement pensions on GDP**

From the data, we can see that expenditures on early retirement pensions gradually increase each year from 2021 to 2027. On the other hand, GDP also grows, but not as sharply as expenditures on early retirement pensions. This suggests that expenditures on early retirement pensions are growing faster than the overall economy. The R2 values for GDP (0.9603) and

for expenditures on early retirement pensions (0.9839) are both high, indicating that the forecasts used have very good ability to explain variability in GDP and expenditures on early retirement pensions. This means that these forecasts appear to be accurate and adapt well to existing trends.

**Table 1. Impact of the growth of early retirement pensions on economic growth**

Regression Statistics	
Multiple R	0,948125537
R Square	0,898942035
Adjusted R Square	0,878730442
Standard Error	2925,962347
Observations	7

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	380775160	380775160,5	44,4765553	0,001144619
Residual	5	42806278,3	8561255,654		
Total	6	423581439			

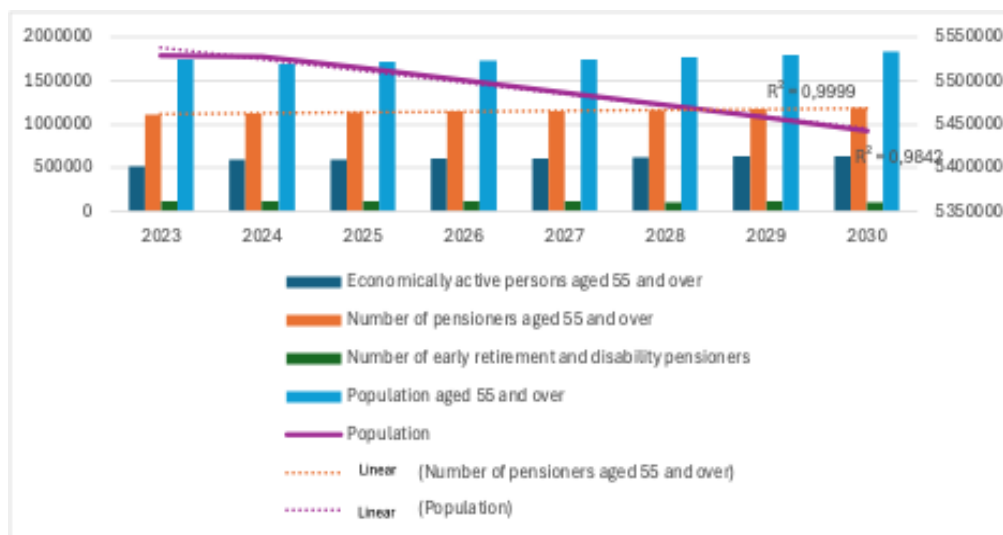
The value of multiple R, which is 0.948, indicates a strong positive correlation between GDP and expenditures on early retirement pensions. This means that these two variables are closely related. The R2 value, which is 0.899, signifies that approximately 90% of the variability in GDP can be explained by expenditures on early retirement pensions. This high R2 suggests that the model effectively explains the relationship between these two variables. The F-test value is 44.48 with a corresponding P-value of 0.00114,

indicating that the model is statistically significant. This means that at least one of the independent variables (in this case, expenditures on early retirement pensions) has a significant impact on the dependent variable (GDP). Overall, these results suggest that expenditures on early retirement pensions have a significant impact on gross domestic product and can be an important factor in predicting economic activity.

*H1 has been confirmed. Early retirement pensions have a negative impact on the economy of Slovakia.*

Based on data from the OECD and our population movement predictions up to 2030, an alarming trend emerges, clearly indicating the

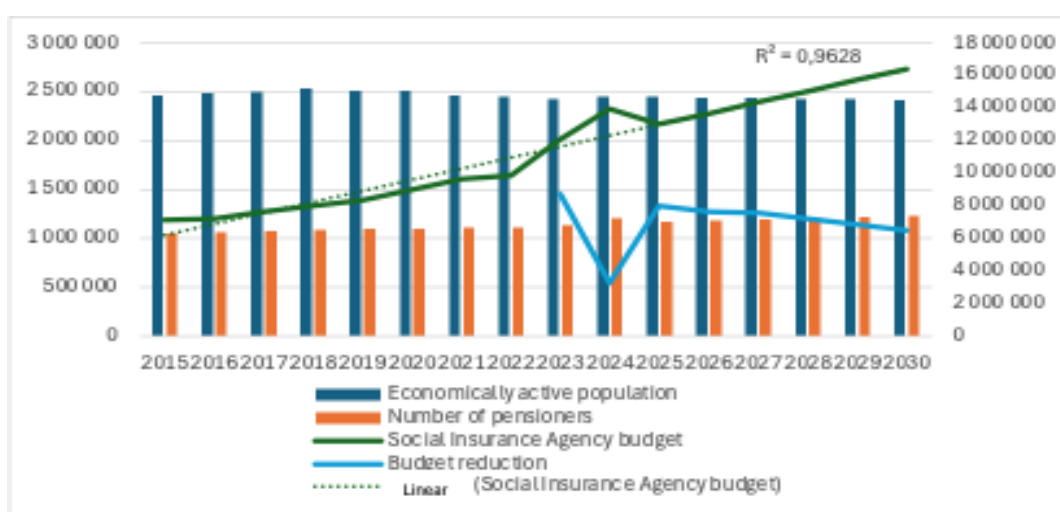
disparity between the population and the number of retirees. In the long term, this situation would be unsustainable, making it necessary to establish a different pension system or allow early retirees to continue working.



**Figure 5. Comparison of population and pensioner projections to 2030**

We attempted to illustrate a scenario in which early retirees could work for the minimum wage. We take into account the increasing minimum wage. Their contribution to the Social Insurance would be significant, as seen from the data on the graph. At the current state, the Social

Insurance budget would have to be increased to €16.39 million, but contributions from early retirees could reduce it by €9.9 million. The year 2024 presents an opportunity for active involvement of this population group, given the dynamic trend in early retirement pensions.



**Figure 6. Comparison of the evolution of the economically active population, Social Insurance Institution expenditures and payroll deductions of potential working pensioners**

The subject of our research question was to determine whether early retirement pensions have a negative impact on the pension system in Slovakia. It can be said that population aging exacerbates the sustainability issue of financing the pension system in Slovakia. In the future, due to the deteriorating old-age economic dependency ratio, achieving sustainability in financing the pension system will become increasingly challenging. The increasing need for financial resources for the pension fund will be covered from the State budget, where sufficient funds from general taxation will flow (such as income tax, corporate income tax, VAT, excise duties, etc.).

The number of economically active population is decreasing, but the number of retirees is gradually increasing. The budget of the Social Insurance has been increasing since 2015, probably mainly due to the increasing costs of caring for retirees. The value of  $R^2 = 0.9628$  indicates that 96.28% of the variability is explained by the presented predictive model. This is a significant finding in terms of importance for decision-making in the field of legislation involving early retirees in the labor market or planning social programs, as it indicates a close relationship between these variables. However, this issue has multiple dimensions and aspects. It is very interesting to examine it from the perspective of ESG, as this aspect can bring new solutions and new perspectives.

*H2 was confirmed. Early retirement pensions have a negative impact on the pension system in Slovakia.*

## **Discussion**

Extensive literary sources analyze the impact of various pension reforms on the labor market. ESG has become a significant initiative to promote the development of quality-listed companies and has gained increasing academic attention as a perspective on development that seeks to reconcile economic and social values [1, 5, 23]. However, most studies do not address the ESG dimension and utilize administrative data on social security as quasi-experimental variations induced by pension reforms to estimate the causal effects on the labor market. Administrative data has the advantage of providing precise

information on the work and earnings history of large samples or even the entire population. However, social security data mainly include individual information, making it impossible to examine the effects of pension reforms at the household level. Consequently, with individual data, it's not possible to analyze the heterogeneous effects of pension reforms based on household composition or behavioral reactions at the household level. The current review of relevant literature suggests that the examined issue in the context of defined scientific hypotheses has not yet been comprehensively explored. Based on this identified gap in existing knowledge, we can state that the presented study addresses an unexplored area and brings new insights in this field. It mainly concerns the behavior of companies towards their employees in terms of motivation for loyalty and education and environmental issues, which closely correspond to the ESG issue. The limitations for distributional and fiscal analyses from the perspective of the studied literature are even more pronounced. Distributional and fiscal analyses of pension reforms based on individual data are only partially informative since other household income sources, especially spousal income and household transfer income, cannot be taken into account. However, we can analyze the impacts on public finances from various perspectives [24]. This study examines the impacts of the political decision to allow early retirees to re-enter the labor market at their discretion. This decision, as it turns out, causes serious problems in the management of public finances. On the other hand, it is commendable and motivating for the workforce to participate in the labor market officially and contribute taxes and contributions. Otherwise, especially the younger workforce may be demotivated and seek to realize their capacity in the informal labor market or in other foreign markets where conditions are more favorable. The goal of employers should then be to motivate this workforce, which is eligible for early retirement, to engage in the work process, which could lead to increased performance not only for the organization but also in terms of public finances. The socio-economic impacts of pension reform have often been discussed without careful consideration of the institutional context, despite

the fact that institutional designs of public pensions vary significantly across countries [18]. In this context, we must emphasize that the least discussed area is the social impacts. On the one hand, the workforce is worn out and tired after 40 years of work, so it is logical that they seek a life outside the labor market. On the other hand, no one has studied how the burnout syndrome works in this age group and how many of them would like to re-enter the labor market after a certain break to live a full life and contribute to society. The social impacts of early exit from the labor market can have similar effects and phases as in the case of unemployment. Initially, individuals may feel relief, but later they may change their daily rhythm and may even become frustrated.

Population aging has forced policymakers in most developed countries to reform pension systems to maintain or restore financial sustainability. This usually involves cost-cutting measures such as later retirement age eligibility and lower replacement ratios. Such reforms entail tough compromises to provide adequate pensions. Social welfare and inequality have recently emerged as significant concerns of pension reforms, emphasizing that a lack of “social sustainability” can undermine financial sustainability [4]. We can conclude that all these measures lead to an extension of the retirement age and may be ineffective considering the health status of the population. Livingston et al. [17] emphasizes that individual well-being is influenced by various economic and social factors, such as income, mental and physical health, education, social relationships, employment, discrimination, government policies, and environmental conditions. Individual well-being includes both physical and mental health as part of a holistic approach to health promotion and disease prevention. The well-being of individuals affects the well-being and productivity of the entire society, making it an important public health issue at the macro level.

Vickerstaff [31] argues that social norms, default options, and reference dependence are important factors influencing retirement decisions. Internalized age norms and stereotypes common in the workplace can lead older employees to feel too old for training, career advancement, or job change. These perceptions

may motivate workers to retire at a specific age to enjoy their remaining years in good health or to stay employed to avoid health problems associated with inactive retirement.

In the literature, it is quite challenging to find a connection between the ESG concept and the issue we are studying, essentially representing a research gap. We believe that more extensive use of the ESG concept in considering the entire issue could lead to a more balanced and rational approach to setting pension system issues. For example, if companies were to start using alternative energy sources more, which would be more supported by the state, they would not be dependent on energy price fluctuations and could invest more in human resources. In a social context, this could mean providing more time for workforce regeneration (unlimited vacation, sabbaticals, psychological counseling, etc.) It would be fair for further involvement in the labor market to be highly motivating and to show younger generations that long-term participation in the labor market does not have to be frustrating but motivating. In this sense, we are actually setting conditions for younger generations. From their perspective, it is currently demotivating to work, so they are more likely to seek escape routes to avoid the labor market, which could be the subject of further studies. Thus, the goal of proper state management should be to motivate people to engage in desired behavior, in this case, involvement in the labor market. If it were motivating for people of retirement age to work, their activity in the labor market would be more visible, and the income to the state budget would be more noticeable. This motivation should be based on respect for experience, authority, similar to the Japanese culture. ESG factors play a key role in assessing and formulating pension policies, as they take into account not only economic but also environmental, social, and governance aspects that affect society and its sustainable development.

## Conclusions

This study provides empirical evidence that early retirement significantly and negatively affects both GDP and the sustainability of the pension system. A reduced labor force weakens productivity and economic growth, while longer

benefit receipt and fewer contributors create increasing fiscal pressure on pension funds. These findings align with OECD assessments that early retirement poses substantial risks for public finance and long-term pension sustainability [21, 22, 4] and with research emphasizing its negative long-term macroeconomic consequences [18].

The results highlight the importance of integrating environmental, social, and governance (ESG) considerations into pension and labor-market policies. ESG-aligned business practices - such as improved working conditions, support for mental and physical health, and opportunities for lifelong learning - can help extend working lives and mitigate the economic impact of early labor - market exit. Sustainable human - resource management and responsible corporate behavior [11] can therefore play an important complementary role in economic and pension-system resilience.

From a policy perspective, early retirement increases fiscal pressures by raising pension expenditures and shrinking the contributor base [2, 4]. Strengthening incentives to remain employed, improving job quality for older workers, and ensuring equitable and transparent governance frameworks are essential elements of a sustainable pension system. ESG factors offer a useful framework for designing such measures, as they encourage environmentally responsible practices, social fairness, and sound governance - each of which can support longer labor-market participation and overall societal well-being.

The study is limited to one EU country; however, it introduces a novel perspective by linking early-retirement dynamics with ESG factors. Future research should examine this relationship in a broader international context to validate the findings and refine policy recommendations.

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