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EU FINANCIAL AND DEMOGRAPHIC SECURITY: INTERLINKING AGING POPULATION AND INSTITUTIONAL INVESTORS' ASSET MANAGEMENT TRENDS

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ФІНАНСОВА ТА ДЕМОГРАФІЧНА БЕЗПЕКА ЄС: ВЗАЄМОЗВ'ЯЗОК МІЖ СТАРІННЯМ НАСЕЛЕННЯ ТА ТЕНДЕНЦІЯМИ В УПРАВЛІННІ АКТИВАМИ ІНСТИТУЦІЙНИХ ІНВЕСТОРІВ

This article delves into the critical issues stemming from the aging population in the European Union (EU) and its profound implications for financial markets and demographic stability. With a growing segment of the population over 65, the EU faces challenges in pension systems, healthcare, labor markets, and the overall financial landscape. This demographic shift, characterized by increased longevity and declining birth rates, necessitates a strategic reassessment of asset

management by institutional investors, such as pension funds, insurance companies, and investment trusts.

The research employs a multi-faceted methodology, including threshold, comparative, and correlation analyses, to examine insurance penetration and the aging coefficient in EU member-states. This approach is geared towards understanding the interplay between financial security, as measured by insurance penetration rates, and demographic security, indicated by the proportion of the elderly population. The article reveals significant disparities in financial security across the EU, with some countries exhibiting high levels of insurance penetration, while others face critical challenges.

Demographic analysis, particularly through the lens of the aging coefficient, highlights the diverse challenges each EU country faces. Countries like Italy, with high aging coefficients, require urgent corrective actions, while others, like Austria and Belgium, demonstrate a more balanced age distribution, possibly due to factors like higher birth rates and effective immigration policies.

The study finds a negligible, statistically insignificant correlation between the aging coefficient and insurance penetration. This insight is pivotal for policymakers and financial regulators in developing strategies to address the impact of demographic changes on financial markets.

The prospects for future research could include determining the impact of demographic changes at the micro-level, conducting an international comparative analysis, highlighting potential technological and innovative solutions to the identified problems in demographic and financial security, and studying the role of sustainable development in asset management.

У статті розглянуто критичні питання, які пов'язані зі старінням населення та його наслідки для фінансових ринків і демографічної стабільності в Європейському Союзі (ЄС). Зі зростанням частки населення старшого 65 років ЄС стикається з проблемами в пенсійній системі, системі охорони здоров'я, на ринках праці та в загальному фінансовому ландшафті. Демографічні зміни, що характеризуються збільшенням тривалості життя і зниженням народжуваності, вимагають стратегічної переоцінки управління активами інституційних інвесторів, зокрема пенсійних фондів, страхових компаній та інвестиційних трастів.

У дослідженні використано пороговий, порівняльний та кореляційний методи аналізу для вивчення проникнення страхування та коефіцієнта старіння населення в країнах-членах ЄС. Цей підхід спрямований на розуміння

взаємозв'язку між фінансовою безпекою, яка вимірюється рівнем проникнення страхування, та демографічною безпекою, що відображається часткою населення похилого віку. У статті виявлено значні диспропорції у фінансовій безпеці в ЄС: деякі країни демонструють високі рівні проникнення страхування, тоді як інші стикаються з критичними проблемами.

За допомогою демографічного аналізу через призму коефіцієнта старіння населення висвітлено різноманітні виклики, з якими стикається кожна країна ЄС. З'ясовано, що окремі країни, наприклад, Італія, мають високий коефіцієнт старіння і потребують термінових корегувальних заходів, у той час як інші, такі як Австрія та Бельгія, демонструють більш збалансований віковий розподіл, імовірно, завдяки таким чинникам, як вища народжуваність та ефективна імміграційна політика.

Автори виявили незначну, статистично несуттєву кореляцію між коефіцієнтом старіння та рівнем проникнення страхування. Цей висновок є ключовим для політиків і фінансових регуляторів під час розроблення стратегій, спрямованих на подолання негативного впливу демографічних змін на фінансові ринки.

Визначено, що перспективними напрямами для майбутніх досліджень є визначення впливу демографічних змін на мікрорівні, проведення міжнародного компаративного аналізу, висвітлення потенційних технологічних та інноваційних розв'язань виявлених проблем у демографічній та фінансовій безпеці, а також вивчення ролі сталого розвитку в управлінні активами.

Keywords: *aging population, asset management, demographic security, European Union, financial security, institutional investors.*

Ключові слова: *старіння населення, управління активами, демографічна безпека, Європейський Союз, фінансова безпека, інституційні інвестори.*

General statement of the problem and its connection with important scientific or practical tasks. The aging population in the EU is not a new issue; it has been a growing concern for decades. With advancements in healthcare and living standards, the average life expectancy has significantly increased. This, combined with declining birth rates, leads to a demographic shift where a larger portion of the population is aged 65 and over, posing profound challenges for the EU, particularly in areas such as pension systems, healthcare, and labor markets. The financial

implications are immense, as aging populations typically entail increased public expenditure on health and social care, coupled with reduced tax revenues due to a shrinking workforce. Consequently, understanding how these demographic changes influence and are influenced by the asset management strategies of institutional investors becomes pivotal.

Institutional investors, such as pension funds, insurance companies, and investment trusts, play a crucial role in the financial markets. They hold large pools of capital and are significant players in determining the flow of investments across various sectors and regions. In the context of an aging population, these investors are increasingly tasked with the responsibility of ensuring the long-term security and growth of retirement and pension funds. This responsibility requires a delicate balance between risk and return, necessitating a strategic re-evaluation of investment portfolios in light of demographic trends.

The connection between the aging population and the asset management trends of institutional investors is multifaceted. On one hand, the aging population impacts the types of investments that are attractive or necessary. There is likely to be increased demand for healthcare, pharmaceuticals, and age-related services, potentially steering investments towards these sectors. On the other hand, the need for stable, long-term returns to support an aging population compels institutional investors to reconsider their investment strategies, possibly leading to a greater emphasis on sustainable and socially responsible investments, which have shown resilience and long-term viability.

This scenario presents both scientific and practical tasks. Scientifically, it requires an in-depth analysis of demographic data, financial market trends, and investment strategies, combining insights from sociology, economics, and finance. Practically, it calls for the development of robust policy frameworks and investment strategies that can adapt to and capitalize on these demographic changes. Policymakers and institutional investors need to work collaboratively to ensure that the financial systems are resilient, sustainable, and aligned with the changing demographic landscape.

Analysis of recent studies and publications. The intersection of demographic shifts, particularly the aging population, and financial security within the European

Union has attracted substantial attention in academia and policy-making. Scholars have extensively explored how demographic changes influence institutional investors' asset management strategies, considering factors like risk management, portfolio diversification, and the need for stable returns in changing markets.

For instance, Novak, Pravdyvets, Chornyi, Sumbaieva, Akimova, and Akimov point out the varied approaches of EU member-states in regulating financial markets and the challenges faced during crises. They advocate for reforms in financial regulation and stress the importance of a unified European currency for financial integration [1, p. e0835]. Their optimistic outlook on the EU overcoming crises and implementing effective reforms may overlook potential challenges and limitations.

Kočanová, Kováč, Serzhanov, and Buleca focus on the aging population in EU member countries, analyzing health, labor market conditions, and financial security for those aged 55 and over. They use cluster analysis and regression to categorize countries, revealing both similarities and disparities among them [2, p. 60]. The study suggests policy improvements but lacks specific, actionable recommendations for policymakers.

Yuan, Puah, and Yau investigate how aging influences household participation in risky financial assets. Their study shows that aging leads to decreased investment in these assets, with financial literacy helping to moderate this effect [3, p. 15021]. They suggest enhancing financial literacy and social security systems to mitigate the negative impacts of aging on investment behavior, but the study does not explore other potential moderating factors.

Li examines the increase in long-term care insurance participation in China due to aging and the two-child policy. The study reveals that more children can lead to reduced demand for insurance in rural areas, suggesting the need for socializing eldercare and government incentives to promote universal insurance coverage [4, pp. 124-125]. However, the paper does not fully consider other family dynamics affecting eldercare decisions.

Ilychok, Karkovska, Dziurakh, and Marмulyak discuss demographic security in Ukraine, noting a significant population decline and an aging population [5, p. 357]. They recommend systemic measures to improve living standards and birth

rates, but focus mainly on government-led initiatives, overlooking the role of other stakeholders.

Hrybinenko, Bulatova, and Zakharova analyze global demographic trends and their impact on economic security [6, p. 321]. They propose methodological tools for assessing demographic security but do not offer concrete policy solutions or consider individual country or regional circumstances.

Buha, Bychin, and Ozerna address the challenges and importance of regulations in the financial sector, emphasizing the role of technology and the threat of financial crimes [7, pp. 71-72]. They stress the need for effective state risk management but lack specific policy recommendations.

Yaremko, Voloshyn, Bilyk, Drapaliuk, and Say perform a bibliometric analysis on publications about financial security, identifying trends and key research areas [8, pp. 249-250]. They highlight the multidisciplinary nature of the topic but do not provide detailed guidance for different stakeholders.

Overall, abovementioned studies offer insights into the effects of aging populations on financial and demographic security but lack a focused examination of the interaction between aging trends and asset management in EU member-states.

Formulation of the objectives of the article (task statement). Employing threshold, comparative, and correlation analyses to scrutinize the existing condition and tendencies of insurance penetration within EU member states, in relation to the trends of an aging population, the article aims to contrast the observed levels of insurance penetration and the proportion of the elderly in the overall population (referred to as the aging coefficient) against predetermined threshold values that signify a nation's financial security. Furthermore, the article intends to offer valuable insights and suggestions to policymakers and financial regulators for optimizing the contribution of institutional investors to bolstering the EU financial and demographic security.

Summary of the main research material. The metrics used to evaluate the financial and demographic stability of a country include two key indicators. First, the insurance penetration rate, which is calculated as insurance premiums as a proportion of GDP, is used to gauge financial stability. Second, the proportion of the elderly population (aged 65 and over) in the total population, known as the aging coefficient,

is used to assess demographic stability in EU nations. Table 1 presents the value ranges for these indicators. For instance, a financial security level is deemed optimal when the insurance penetration rate reaches or exceeds 8% of GDP. Meanwhile, demographic security is considered optimal when the aging coefficient is between 18% and 20%, inclusive.

Table 1. The insurance penetration rate and the aging coefficient within EU financial and demographic security

Security levels	optimal	satisfactory	unsatisfactory	dangerous	critical
Insurance penetration, %	≥ 8	[6; 8)	[4; 6)	[2; 4)	[1; 2)
Aging coefficient, %	[18; 20]	[17; 18); (20; 21]	[15; 17); (21; 22]	[13; 15); (22; 23]	[11; 13); (23; 25]

Source: elaborated based on reference [9].

Table 2 exhibits the present insurance penetration rates, along with the progression of this measure and the typical levels of financial security for EU member-states spanning from 2020 to 2022.

Table 2. Insurance penetration rates and average levels of financial security in EU member-states from 2020 to 2022.

Country	*Financial security level*	Average	2022	2021	2020
Austria	*unsatisfactory*	**4.5**	4.3	4.5	4.7
Belgium	*satisfactory*	**6.1**	6.0	6.3	6.0
Bulgaria	*dangerous*	**2.3**	2.1	2.3	2.4
Croatia	*dangerous*	**2.7**	2.5	2.7	2.8
Czechia	*dangerous*	**2.9**	2.9	2.9	2.9
Denmark	*optimal*	**11.0**	10.3	11.3	11.3
Estonia	*dangerous*	**3.3**	3.2	3.2	3.4
Finland	*critical*	**1.8**	1.6	2.0	1.7
France	*optimal*	**10.3**	10.3	10.6	10.0
Germany	*satisfactory*	**6.6**	6.2	6.7	6.9
Greece	*dangerous*	**2.4**	2.2	2.5	2.5
Hungary	*dangerous*	**2.3**	2.1	2.4	2.5
Ireland	*optimal*	**10.3**	8.9	11.3	10.8
Italy	*satisfactory*	**7.5**	6.7	7.8	8.1
Latvia	*dangerous*	**2.6**	2.6	2.5	2.6
Lithuania	*critical*	**1.9**	1.8	1.9	1.9
Luxembourg	*optimal*	**33.7**	31.9	38.5	30.6
Netherlands	*optimal*	**9.0**	8.3	9.0	9.6
Poland	*dangerous*	**2.4**	2.2	2.5	2.6
Portugal	*unsatisfactory*	**5.0**	4.7	5.8	4.5
Slovak Republic	*dangerous*	**2.4**	2.4	2.3	2.6
Slovenia	*unsatisfactory*	**4.8**	4.6	4.8	5.0
Spain	*unsatisfactory*	**4.8**	4.6	4.9	5.0
Sweden	*optimal*	**10.7**	11.1	11.1	9.8
Average	*satisfactory*	**6.3**	6.0	6.7	6.3

Source: elaborated based on reference [10].

Table 2 reveals a complex landscape of financial security across EU member-states, with significant disparities between countries. The range of financial security levels is broad, varying from “dangerous” in several countries like Bulgaria, Croatia, Czechia, Estonia, Greece, Hungary, Latvia, Lithuania, Poland, Slovak Republic to “optimal” in Denmark, France, Ireland, Luxembourg, Netherlands, and Sweden. The “optimal” category includes nations with significantly higher scores (above 10) compared to the rest, indicating a strong disparity in financial security across the EU. Luxembourg stands out with an exceptionally high score of 33.7, which is more than three times the average score of 6.3.

In the “dangerous” category, most countries exhibit a consistent or slightly declining trend in their scores over the years. For instance, Bulgaria’s score went from 2.4 in 2020 to 2.1 in 2022, and Croatia’s score decreased similarly. These consistent low scores are indicative of major challenges in financial security and insurance penetration in these nations.

Finland and Lithuania, categorized as “critical”, have the lowest scores, with Finland showing a decline from 1.7 in 2020 to 1.6 in 2022. This indicates a severe lack of financial security and insurance coverage, which could have serious implications for the economic stability and welfare of their citizens.

Table 3 organizes EU member-states according to their demographic security level, as determined by the aging coefficient observed between 2020 and 2022.

Table 3 highlights the need for a multi-faceted approach to demographic analysis, considering various factors such as life expectancy, health standards, and fertility rates, alongside the aging coefficient. Each country faces unique challenges and would benefit from tailored policies addressing their specific demographic and health circumstances. From 2020 to 2022, a slight overall increase in the aging coefficient is observed across most countries, indicating a continuing trend of an aging population in the EU. This gradual increase suggests that the issue of demographic aging is persistent and requires ongoing attention.

Table 3. Classification of EU member-states by demographic security level (aging coefficient, population ages 65 and above, percent of total population) from 2020 to 2022

Country	*Demographic security level*	Average	2022	2021	2020
Austria	*optimal*	**19.5**	19.8	19.4	19.1
Belgium	*optimal*	**19.5**	19.7	19.4	19.2
Bulgaria	*dangerous*	**22.4**	22.4	22.4	22.3
Croatia	*unsatisfactory*	**22.0**	22.4	22.0	21.6
Czechia	*satisfactory*	**20.4**	20.6	20.5	20.2
Denmark	*satisfactory*	**20.3**	20.5	20.3	20.0
Estonia	*satisfactory*	**20.4**	20.6	20.4	20.2
Finland	*dangerous*	**22.9**	23.3	22.9	22.5
France	*unsatisfactory*	**21.3**	21.7	21.3	21.0
Germany	*dangerous*	**22.2**	22.4	22.2	22.0
Greece	*dangerous*	**22.5**	22.8	22.5	22.2
Hungary	*satisfactory*	**20.2**	20.0	20.4	20.1
Ireland	*dangerous*	**14.8**	15.1	14.8	14.5
Italy	*critical*	**23.7**	24.1	23.7	23.4
Latvia	*unsatisfactory*	**21.6**	21.9	21.6	21.4
Lithuania	*satisfactory*	**20.6**	20.8	20.6	20.4
Luxembourg	*dangerous*	**14.8**	15.0	14.7	14.6
Netherlands	*optimal*	**20.0**	20.3	20.0	19.6
Poland	*optimal*	**18.6**	18.6	18.8	18.4
Portugal	*dangerous*	**22.6**	22.9	22.6	22.3
Slovak Republic	*satisfactory*	**17.0**	17.0	17.2	16.8
Slovenia	*satisfactory*	**20.5**	21.0	20.5	20.1
Spain	*optimal*	**19.9**	20.3	19.9	19.7
Sweden	*satisfactory*	**20.1**	20.2	20.1	20.0
Average	***satisfactory***	**20.3**	**20.6**	**20.3**	**20.1**

Source: elaborated based on reference [12].

For Bulgaria, Finland, and Germany, classified as “dangerous” with aging coefficients above 22%, the demographic challenges are likely related to having a significant older population, similar to Italy. This older demographic can strain public resources and necessitates policy responses to mitigate potential economic and social impacts. Countries like Ireland and Luxembourg, despite having relatively low aging coefficients (14.8%), are categorized as “dangerous”. This unusual categorization could be attributed to low life expectancy, which means fewer individuals live to age 65 and beyond, resulting in a smaller percentage of the population in this age group.

In contrast, countries like Italy, labeled “critical” with the highest aging coefficient (23.7%), present the more commonly understood demographic challenge where a significant portion of the population is aged 65 and over. This situation typically results in increased demands on healthcare, pension systems, and a potential

shortage in the labor market due to a large retired population.

On the other end of the spectrum, countries like Austria (19.5%), Belgium (19.5%), Netherlands (20.0%), and Poland (18.6%) are classified as “optimal. These countries have managed to maintain a more balanced age distribution, which could be due to various factors like higher birth rates and effective immigration policies.

Table 4 contains the rankings of EU member states based on insurance penetration and aging coefficient. These rankings are utilized to assess the relationship between these two factors. A higher rank indicates a larger value of the corresponding indicator, with rank 1 representing the highest value and rank 24 representing the lowest value within the sample.

Table 4. Ranking of EU member-states by insurance penetration and aging coefficient

Country	Aging coefficient, rank	Insurance penetration, rank
Austria	19	13
Belgium	20	9
Bulgaria	5	22
Croatia	7	16
Czechia	12	15
Denmark	14	2
Estonia	13	14
Finland	2	24
France	9	5
Germany	6	8
Greece	4	20
Hungary	15	21
Ireland	23	4
Italy	1	7
Latvia	8	17
Lithuania	10	23
Luxembourg	24	1
Netherlands	17	6
Poland	21	18
Portugal	3	10
Slovak Republic	22	19
Slovenia	11	12
Spain	18	11
Sweden	16	3

Source: elaborated by the authors.

Table 5 presents the outcomes of Spearman’s correlation computations, revealing a negligible positive association, which is not statistically significant, between the aging coefficient and insurance penetration.

Table 5. Results of the Spearman's correlation calculations for insurance penetration and aging coefficient for EU member-states

Parameter	Value
Spearman's rank correlation coefficient (r_s)	-0.3304
r^2	0.1092
P-value	0.1169
Covariance	-16.5217
Sample size (n)	24
Statistic	0.3304

Source: elaborated by the authors.

The distribution of the correlation is asymmetrical when $r \neq 0$, thus the t distribution is employed over the Fisher transformation to construct the confidence interval. Since the p-value > α, the null hypothesis (H_0) cannot be rejected. A non-significant result doesn't validate H_0; it simply means that the null hypothesis cannot be refuted. The p-value is 0.1169 ($P(x \leq 0.3304) = 0.9416$), indicating a high chance of committing a type I error, which involves rejecting a correct H_0, at 11.69%. The correlation (0.3304) is within the 95% acceptance region [0, 0.406]. Consequently, the 95% confidence interval of the correlation is [-0.6685, 0.1208]. Normality was assessed using the Shapiro-Wilk Test ($\alpha = 0.05$). It is assumed that the distribution of residuals follows a normal distribution (p-value is 0.06553), or more precisely, we cannot reject the assumption of normality.

Conclusions and prospects for further research in this area. The study's findings highlight the varied landscape of financial security across the EU, with some countries exhibiting optimal levels of insurance penetration, while others fall into the dangerous or critical categories. The disparities in financial security levels across member states underscore the necessity for tailored policy responses and investment strategies that address specific national circumstances. The case of countries like Luxembourg, with exceptionally high insurance penetration rates, contrasts sharply with nations like Bulgaria and Croatia, revealing the breadth of the challenge at hand.

The demographic analysis, particularly the aging coefficient, sheds light on the diverse demographic challenges faced by EU member-states. Countries such as Italy face critical challenges with high aging coefficients, emphasizing the pressing need for effective policy responses. Conversely, nations like Austria and Belgium have maintained a more balanced age distribution, possibly due to factors like higher birth rates and immigration policies.

The research also unveiled a negligible, statistically insignificant correlation between the aging coefficient and insurance penetration. This finding suggests that while these two factors are related, the connection is not as straightforward as one might assume. This insight is crucial for policymakers and financial regulators as they devise strategies to manage the impacts of demographic changes on financial markets.

This research opens several avenues for further exploration and study. Firstly, to better understand the trends and dynamics of demographic shifts and financial security in the EU, longitudinal studies spanning more extensive periods would provide deeper insights. This could include analyses of how demographic changes and financial stability evolve over time and their impacts on economies and societies. Secondly, future research could focus on micro-level analysis, such as examining the impact of demographic shifts and financial security on individual households or specific demographic groups within countries. This approach would offer a more nuanced understanding of how these trends affect people's lives and livelihoods. Thirdly, a comparative analysis with other regions experiencing similar demographic changes, such as East Asia, could provide valuable insights into how different regions and cultures are addressing these challenges. Moreover, exploring the role of technology and innovation in addressing the challenges of an aging population and financial security. This might include studies on the impact of digitalization in the financial sector, the role of Fintech in enhancing financial inclusion, and the use of AI in managing demographic data and investment strategies. Finally, further investigation into how sustainability and social responsibility considerations in asset management can contribute to long-term demographic and financial stability. This includes analyzing the performance and impact of sustainable and socially responsible investments.

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