Differences in seniors' standard of living and their impact on the development of the silver economy across Europe

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Abstract. Meeting the diverse needs of seniors, a rapidly growing group across the EU, poses a challenge for the silver economy. The heterogenity of this social group stems from both social transformations—such as increased education and financial security—and spatial variations in seniors' living standards. This article explores how these factors influence the development trajectories of the silver economy. It highlights that the evolution of the silver economy will be region-specific rather than uniform, driven by significant differences in seniors' living conditions across Europe. Through cluster analysis, various market segments are identified, leading to tailored recommendations for silver economy strategies. These recommendations address the distinct needs of Scandinavian, Western, and Eastern European seniors, emphasizing the necessity of region-specific approaches to foster effective development in the silver economy.

Contents:

1.　Introduction

The aging of societies, a critical global demographic shift, has significant implications for national economies, healthcare, consumer markets, and social policies. This trend, driven by healthcare advancements and improved living conditions, is resulting in a growing senior population leading longer, healthier, and more independent lives (Golimowska, 2008; Nyce & Schieber, 2011; Polakowski, 2012; Harper, 2014; Maier, 2015; Acemoglu & Restrepo, 2017). The World Health Organisation categorizes seniors into 65-74 years (early old age), 75-89 years (mature old age), and over 90 years (longevity), highlighting the diversity within this group and the need to understand their varied needs and preferences (WHO, 2020). Future seniors are expected to be better educated, have higher disposable incomes, and possess greater digital literacy, resulting in increased diversity within this demographic (Sudbury & Simcock, 2009; Bałandynowicz-Panfil, 2012; Sudbury et al., 2012; Chand & Tung, 2014; Gerstorf et al., 2015; Grześkowiak et al., 2021). This demographic evolution presents both challenges and opportunities for global economies, affecting labor markets, pension systems, consumer behavior, and service delivery (Yoon et al., 2009; Kuppelwieser & Klaus, 2021b; Kotschy & Bloom, 2022; Yen et al., 2022; Knapińska, 2023; Sharma et al., 2023).

The rise in digital literacy among seniors creates new opportunities for technology-driven solutions and services, with studies showing increased internet use among older adults (Hunsaker & Hargittai, 2018; Lipp & Peine, 2022; Roszko-Wójtowicz et al., 2024). This trend is crucial for businesses and policymakers as it changes how seniors access information, make purchasing decisions, and engage with services (Moschis, 2012). The silver economy, which caters to the older demographic, is emerging as a rapidly growing sector with significant potential (Klimczuk, 2015; GUS, 2018). Understanding the evolving needs and behaviors of the senior population is essential for policymakers, businesses, and society at large, as this demographic shift continues to gain importance.

There is a paucity of research in the literature concerning the development trajectories of the silver economy in relation to subjective assessments of quality of life, specifically those that consider the domains identified as important by the elderly themselves. This article explores how these societal changes impact the development of the silver economy. We propose two hypotheses:

H1: There are regional differences in the quality of life of seniors in Europe.

H2: Spatial differences in living conditions may lead to varying consumer needs and influence the silver economy's development.

These hypotheses focus on the silver economy and its varied consumer segments, aiming to link seniors' socio-economic characteristics to their consumer behavior, which can be segmented using analytical methods like cluster analysis. The article is structured into five sections: introduction, research materials and methods, results, conclusions, and discussion.

The introduction outlines the research aims and questions, while the methodology section details the research scope and methods. The results section describes the identified consumer segments, and the final section compares findings with existing literature, discussing implications and future research directions.

2. Literature review

The Silver Economy

The silver economy is closely tied to the issue of aging societies. The European Commission's "Demographic Future of Europe" report recommends developing the silver economy, which combines good supply conditions (such as high education levels and R&D) with the growing purchasing power of older consumers, offering new opportunities for economic growth (European Commission, 2006). Rather than being a single sector, the silver economy comprises products and services from various existing sectors (Zsarnoczky, 2016), focusing on adapting production and service activities to the needs of an aging population.

More specifically, the silver economy involves goods and services designed to meet the specific needs of older adults, especially those that arise or change significantly due to biological aging, changes in personal situations, or professional activities. This includes senior-specific products and services, such as discounts aimed at older adults (Bakalarczyk, 2021; Główny Urząd Statystyczny, 2018). Klimczuk (2015) defines it as encompassing all goods and services for older people, including extending their professional lives and encouraging volunteering and civic activities. The core of the silver economy involves products and services accessible to seniors, incorporating gerontechnology and social innovations, as well as

adapting existing offerings to better suit older adults' needs (Szukalski, 2012).

Supply Perspective

Firms recognize the silver economy's potential. As early as 2010, Ferguson and Brohaugh noted that the growing number of older consumers offers significant market potential. However, many companies still approach this market with a primarily social and caregiving perspective, missing the business opportunities it presents (Conway Lenihan & McGuirk, 2022). The silver economy includes more than just healthcare and care services; it also encompasses smart living, adapted housing, technology-based supported living, education, culture, ICT, media, robotic services, mobility, recreation, travel, fitness, wellness, fashion, and financial services (Enste et al., 2008; Moody & Sasser, 2012; Zsarnoczky, 201; McGuirk et al., 2021). These sectors provide extensive opportunities for business development and activity.

For firms and institutions to effectively engage with this market, they need to understand how aging changes the roles, attitudes, and values of older people. This understanding is crucial for tailoring products and marketing strategies to meet the specific needs of this consumer segment and to encourage active aging (Guido et al., 2022).

The Senior Consumer

Societal changes are reflected in broad consumption patterns, with seniors becoming an increasingly influential group shaping consumer trends (Dabija et al., 2022). Given their diversity, senior consumer behavior cannot be analyzed as a homogeneous category (Berg & Liljedal, 2022). Since the 1980s, researchers have highlighted the risks of grouping consumers solely by age, which can obscure significant differences within the group (Barak & Schiffman, 1981). For instance, Abdel-Ghany and Sharpe (1997) demonstrated varying spending patterns among different age cohorts. The literature emphasizes that the senior market particularly requires segmentation, as differences in lifestyle, needs, and habits intensify with age (Doets & Kremer, 2016; Alén et al., 2017; Olejniczak, 2021; Trembošová et al., 2022). These differences arise from aging, life circumstances, and life-changing events, influencing seniors' consumer behavior and mental state (Moschis, 2022).

After-sales service is crucial, as it can determine whether seniors make repeat purchases or reject a firm's offer (Babin et al., 2021). Seniors often base their choices on experience and may prefer habitual purchasing over seeking new information (Kieżel, 2010). This behavior can be influenced by digital exclusion, which limits access to information (Adamczyk & Betlej, 2021; Abouzahra & Ghasemaghaei, 2022; Schirmer et al., 2022). Cognitive function deterioration with age can also affect decision-making, making ease of purchase a priority over novelty (Drolet et al., 2011). Factors such as lifestyle, education, financial situation, and social contact significantly shape consumer attitudes, making the senior market complex and unpredictable.

Seniors today are a diverse group, with some adhering to traditional stereotypes of dependency and limited social contact, while others are technologically savvy, educated, and financially secure (Lian & Yen, 2014; Lesaková, 2016; Kim, 2017; Olejniczak, 2019; Svatosova, 2020). The younger segment of seniors is more engaged with new technologies and participates actively in online communities, influencing consumer behavior in ways previously associated with younger demographics (Sudbury Riley et al., 2012). Seniors do not abandon their interests and skills upon aging, and sectors should adapt their offerings to meet these evolving needs, especially in promoting active aging and leveraging new promotional strategies (Guido et al., 2022).

During the Covid-19 pandemic, the number of seniors using the internet for shopping and social communication increased, highlighting their adaptability (Gao et al., 2022; Roszko-Wojtowicz et al., 2024). Active engagement in various aspects of life, such as work, volunteering, and cultural activities, enhances seniors' consumer awareness and demands. The importance of adapting business strategies to meet these consumers' needs cannot be overstated. Selected features of regional silver economy models were described by Klimczuk (2016).

3. Research results

3.1. Data and methods

The literature identifies various factors influencing consumer behaviors and decisions, which are often categorized in different ways (Stefko et al., 2022). Key factors include psycho-social aspects such as personality, life stage, lifestyle, and generational characteristics (Adamek & Solarz, 2023; Jagoda et al., 2023; Roszko-Wójtowicz et al., 2023). Among

these, financial considerations play a critical role in the decision-making process (McEachern et al., 2010).

Pilot Study

In 2020, just before the Covid-19 pandemic, we conducted a survey among seniors in three voivodeships in Poland: Lower Silesia (dolnośląskie, PL51), Opole (opolskie, PL52), and Silesia (śląskie, PL22) (Fig.1). The survey was repeated from January to March 2024 with the same questionnaire, involving 55 respondents, compared to 57 in 2020. The participants, all aged 65 or over, were selected using the snowball technique, where current participants recommend future respondents, a method chosen to reduce research costs and ease participants' concerns, thus improving response rates.

The pilot study explored aspects of seniors' lives such as health, finances, social relations, and their immediate environment. Based on the responses, we found that these areas significantly influence seniors' purchasing decisions. This information was used to identify differences between seniors in various European Union countries, suggesting a diverse demand structure and different directions for the development of the silver economy. More information about this pilot study can be found in the publication by Grześkowiak et al. (2021).

Domains and Indicators

The health domain and its indicators can directly and indirectly influence purchase decisions. Seniors who are healthy, physically active, expect many years of good health, and are satisfied with their access to medical examinations are likely to make more confident purchases, anticipating long-term use. Their activity can drive changes in purchasing trends, such as clothing, equipment, training, sports sessions, and travel. An active lifestyle also impacts social contacts, further influencing consumer attitudes.

Finances are a key factor in purchase decisions, especially for seniors (McEachern et al., 2010). A favorable financial situation makes purchasing easier for seniors, who are generally reluctant to use credit and loans due to concerns over repayment and the higher cost of credit for older individuals.

Social contacts and relationships can increase demand for restaurant, tourist, and training services. Effective use of the Internet or electronic banking

Fig. 1. Regions of Poland included in the pilot study (in white)
Source: own study

can boost seniors' participation in online purchases and courses. Access to information enables them to actively seek and compare offers, altering their consumer attitudes.

The influence of surroundings on seniors' consumer attitudes is less obvious but significant. The level of democracy in a country can lead to prosocial attitudes among seniors, increasing engagement in volunteering (Grześkowiak et al., 2021), awareness of discrimination, and openness to social contacts. This shapes consumers who base their preferences on peer group patterns, creating trends in fashion, sports, and tourism.

The general economic situation and welfare provision (spending on pensions and benefits) provide stability and safety, indirectly affecting consumer attitudes and spending. Many seniors are increasingly aware of sustainable development, which influences their consumer choices (Eastman et al., 2020; Kim et al., 2013). Considering the consumer footprint within surroundings highlights the environment in which seniors function and the extent of sustainable development in their countries.

These domains helped select suitable indicators, assembling factors to segment seniors from European Union countries. The indicators used to depict the situation of seniors in individual EU countries are: Health

1. Healthy years of life at age 65 female – X_1
2. Healthy years of life at age 65 male – X_2
3. Health rated as good or very good – X_3
4. Self-reported unmet needs for medical examination – X_4
5. Projected life expectancy for 2030 female – X_5
6. Projected life expectancy for 2030 male – X_6

Finances:
1. Excessive burden of housing costs – X_7
2. Inability to make ends meet – X_8
3. Median net income among 60+ – X_9
4. Inability to face unexpected financial expenses – X_{10}

Relations:
1. Overall satisfaction of relationships 65+ – X_{11}
2. Internet use: never – X_{12}
3. Internet use (65-74) – X_{13}
4. Participation in tourism for personal purposes (65+) – X_{14}
5. Participation in training sessions – X_{15}

Surroundings:
1. Expenditure on pensions – X_{16}
2. Employment rate of older workers – X_{17}
3. Consumer footprint – X_{18}
4. Poverty rate among 65+ – X_{19}
5. Projected old-dependency ratio – X_{20}
6. Democracy index – X_{21}

The variables X_1, X_2, X_3, X_5, X_6, X_9, X_{11}, X_{13}, X_{14}, X_{15} and X_{21} are stimulants (defining the benefit criterion for the silver economy), while the rest are considered costs. All data was sourced from Eurostat for the year 2023. In cases of missing data, trend extrapolation was used.

3.2. Cluster analysis

Cluster analysis was employed to identify groups of countries with similar situations for seniors, which are relevant to the silver economy. The analysis began with 23 indicators across four domains, which had a sufficiently high coefficient of variation (minimum value set at 10%). To ensure comparability, the data were standardized using the following formula:

$$z_{ij} = \frac{(x_{ij} - \bar{x}_j)}{s_j}$$

where:

z_{ij} – the normalised value of the j-th variable in the i-th object;

x_{ij} – the observed value of the j-th variable in the i-th object;

$\bar{x}_j$ – the average value of the j-th variable;

S_j – the standard deviation of the j-th variable.

Cluster analysis is a multi-dimensional technique used to identify similarities between objects, allowing for the grouping of countries into clusters based on multiple features (Anderberg, 1973; Frątczak, 2009; Roszko-Wójtowicz & Grzelak, 2021). In this study, the k-means clustering method was used, which involves assigning each object to the nearest cluster center, recalculating cluster centers as arithmetic averages, and reassigning objects to the nearest centers if necessary. This process continues iteratively until no objects need reassignment (Sokołowski, 2010).

The initial analysis revealed no outliers among the seniors from EU countries, allowing for the k-means method to divide them into four groups. Analysis of variance and p-values indicated that certain factors, such as housing costs overburden (X_7), overall satisfaction of relationships (X_{11}), participation in tourism (X_{14}), consumer footprint (X_{18}), and projected old-dependency ratio (X_{20}), had the least significant impact on differentiating the groups (Tab. 1).

Excluding these factors from the analysis led to changes in the grouping results, prompting the decision to divide the set into three clusters (Fig. 2).

The stability of the clusters was verified through different selection variants of cluster centers, including:
*   Maximization of cluster distances for initial observation selection.
*   Fixed interval selection after prior sorting of distances.
*   Selection of the first N observations.

In all scenarios, the grouping results remained consistent, underscoring the robustness of our cluster analysis approach.

Table 1. P- values for 21 variables

Variable	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	X_{16}	X_{17}	X_{18}	X_{19}	X_{20}	X_{21}
Signif.p	0,0	0,00	0,00	0,01	0,00	0,00	0,13	0,02	0,05	0,00	0,58	0,00	0,00	0,11	0,00	0,00	0,03	0,63	0,00	0,10	0,00

Source: Own author's draft basing on data from Eurostat
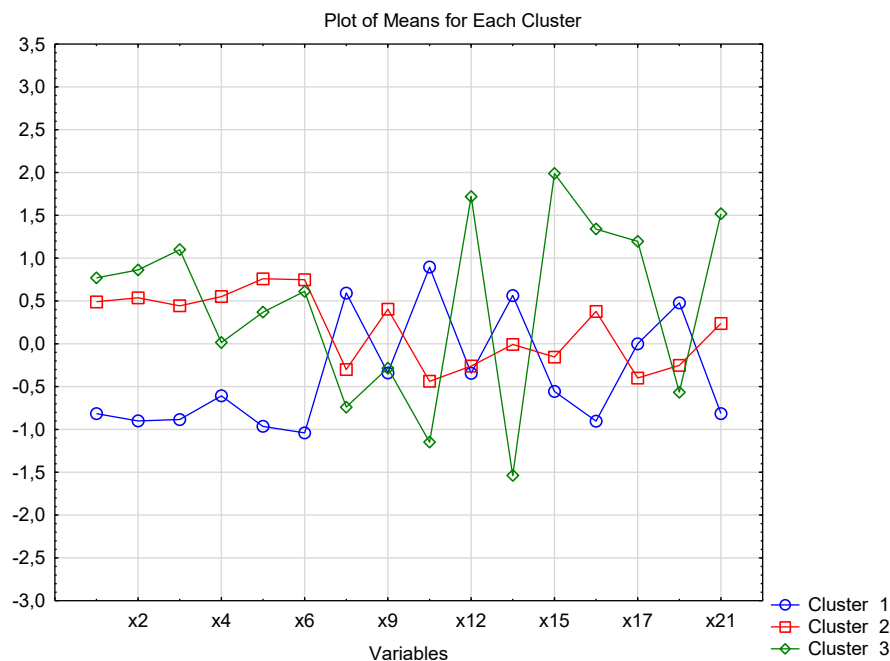
Fig. 2. Average standardised values of selected indicators in each of the identified clusters
Explanation: variables $X_1, X_2, X_3, X_5, X_6, X_9, X_{11}, X_{13}, X_{14}, X_{15}$ and X_{21} are stimulants (defining the benefit criterion for the silver economy), while the rest are considered costs
Source: authors' own elaboration on the basis of Eurostat data and Statistica 1.3 software

3.3. Results

The analysis conducted clearly indicates regional variations in Europe regarding the quality of life of the elderly, which allows for the positive verification of the first research hypothesis. The confirmation of the second hypothesis was facilitated by the identification of consumer profiles among seniors in different segments. The study highlights the existence of diverse needs, which will imply various directions for the development of the silver economy.

Europe remains divided into Scandinavian, Western, and Eastern regions, emphasizing the ongoing need for initiatives to equalize living standards across the continent, especially for older adults who have limited mobility. This segmentation indicates that each region presents unique challenges and opportunities for the silver economy. The analysis identified three groups of EU countries, each with similar conditions for seniors, as shown in Figure 3.

Based on domains established in our pilot study, we believe these results will help identify distinct segments within the silver economy. These domains cover key factors influencing senior consumer behavior. Regional differences in seniors' quality of life, as shown in our analysis, shape the characteristics

of each segment. We begin by describing the segment where seniors' attitudes and socio-economic opportunities for developing the silver economy are most favorable.

Segment I (Cluster 3) – Table 2.

This segment includes Denmark, the Netherlands, Finland, and Sweden, which invest heavily in pensions and rank among the most democratic nations in the European Union. Segment I encompasses the most active seniors, who expect the longest healthy life years. Surprisingly, their self-assessment of health is lower than seniors in the second cluster, possibly due to higher expectations from access to efficient healthcare systems, as indicated by a low percentage of seniors reporting unmet medical needs.

Seniors in this segment have a favorable financial situation despite facing high accommodation costs. They rarely report financial difficulties or problems covering unexpected expenses, with the median net income for those over 60 being the highest. This financial stability makes them particularly receptive to silver economy solutions. They also demonstrate excellent internet and e-banking skills, significantly exceeding other segments, and are eager to enhance their skills through training.

This segment excels in the "surroundings" domain, characterized by high democracy levels
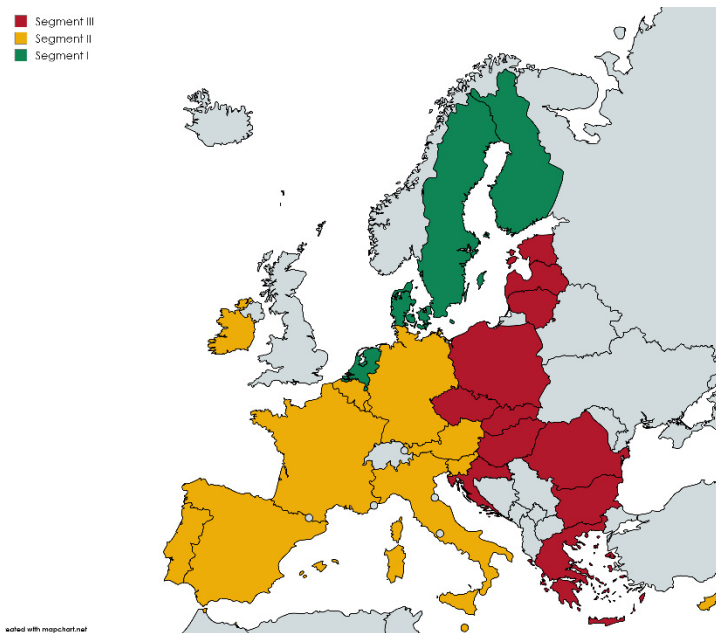
Fig. 3. Segmentation of seniors in EU countries
Source: own study

and substantial pension and benefit expenditures. These countries also have the lowest percentage of impoverished seniors and higher employment rates for older individuals compared to other segments.

Given their proactive approach to health and wellness, there is significant potential for businesses in the silver economy to develop personalized healthcare solutions. These could include telemedicine, advanced health monitoring devices, and wellness programs tailored to this segment's specific needs. Companies can also develop apps and platforms for easy access to medical consultations, health tracking, and fitness regimes. Personalized nutrition and diet planning services would also appeal to this health-conscious group.

Financial institutions can offer specialized products and services for seniors in this segment, such as investment products for retirement savings, comprehensive insurance, and financial advisory services. These can be provided through user-friendly digital platforms, aligning with their tech-savviness.

The interest in skill improvement among these seniors presents opportunities for educational institutions and online learning platforms. Courses on foreign languages, digital literacy, and hobbies could be highly successful. Universities can offer senior-specific programs that enable lifelong learning and skill development, enhancing their quality of life and societal engagement.

Table 2. Short description of segment I

HEALTH	FINANCES
• the longest years in health at the age of 65+ for both genders • best self-assessment of health • medium level of self-reported unmet needs for medical examination • medium value of projected life expectancy	• the lowest percentage of seniors with inability to make end meets • medium level of median relative income of elderly people persons aged 60 and over compared to persons aged less than 60 • the lowest level of percentage of seniors reporting problems with covering unexpected expenses
RELATIONS	SOURROUNDINGS
• seniors most familiar with new technologies • seniors most often taking part in various types of workshops and trainings	• the highest expenditures on pensions • the highest level of employment rate of older workers • the lowest poverty rate between people 65+_ • the highest level of democracy index

Source: Own author's draft basing on results of cluster analysis

The tourism industry can cater to this market with travel packages focused on wellness, culture, adventure, and education, emphasizing safety, comfort, and accessibility. Additionally, this segment's interest in sports and recreational activities offers a market for fitness equipment, senior-friendly gym memberships, and organized sports events, including virtual options.

Retailers, especially in fashion and sportswear, can attract these tech-savvy seniors with personalized online shopping experiences, including user-friendly websites and virtual try-ons using augmented reality (AR).

Financial institutions can offer specialized products and services for seniors in this segment, such as investment products for retirement savings, comprehensive insurance, and financial advisory services. These can be provided through user-friendly digital platforms, aligning with their tech-savviness.

Segment II (Cluster 2) – Tab.3

Seniors in this segment live in Belgium, Germany, Ireland, Spain, France, Italy, Cyprus, Luxembourg, Malta, Austria, Portugal, and Slovenia. They report few difficulties accessing medical care and have high life expectancy, suggesting strong healthcare systems and health awareness. Silver economy initiatives can focus on enhancing their well-being through preventive health services, regular screenings, fitness programs, and mental health support. Businesses can also develop products like wearable health trackers and telehealth services for home health monitoring.

Despite an average financial situation, seniors in this segment face challenges managing finances and covering unexpected expenses. Financial institutions can provide specialized services, including financial planning, budget management tools, emergency savings accounts, and affordable insurance. Fintech

solutions that simplify online banking can improve their financial security and independence.

Although these seniors are active online and open to training, their engagement is less than those in Segment I. Educational institutions and online learning platforms can offer courses to boost digital literacy, financial management skills, and other areas of interest.

With the lowest employment rate among older individuals, seniors in this segment have significant free time for leisure activities. Travel companies can create packages tailored to their interests, including cultural tours, wellness retreats, and educational vacations, with flexible options to accommodate varying physical abilities. Promoting local tourism and cultural events can encourage exploration and community engagement.

Given their online activity, there is potential for digital and online services targeted at this segment. E-commerce platforms can offer products like ergonomic furnishings, health and wellness items, and adaptive technology. Creating online communities and social platforms can help seniors connect, share experiences, and participate in virtual activities, reducing isolation.

The moderate expenditure on pensions and benefits, along with relatively low poverty levels, indicates a stable yet modest financial situation. Real estate developers can consider affordable housing options tailored to seniors, featuring senior-friendly designs, accessibility, and community-based environments. Affordable assisted living and independent living communities can provide necessary support services while fostering social interaction.

Encouraging social engagement and volunteerism can offer seniors a sense of purpose and community

Table 3. Short description of segment II

HEALTH	FINANCES
• medium value of years in health at the age of 65+ for both genders • medium self-assessment of health • the lowest level of self-reported unmet needs for medical examination • the highest value of projected life expectancy	• medium level of percentage of seniors with inability to make end meets • the highest relative incom of elderly people • medium percentage of seniors reporting problems with covering unexpected expenses
RELATIONS	SOURROUNDINGS
• the number of seniors declaring their use of the Internet at a level similar to segment III, however, the number of seniors who have never used the Internet is much smaller than in segment III • participation in training much less frequently than in segment I, at the level similar to segment III	• medium expenditures on pensions • the lowest level of employment rate of older workers • low level of poverty rate between people 65+, close to segment I • medium level of democracy index

Source: Own author's draft basing on results of cluster analysis

involvement. Organizations can develop programs that align volunteer opportunities with seniors' skills and interests, such as mentoring, community service, and local governance. Providing platforms and support for these activities can enhance social connections and overall well-being.

Segment III (Cluster 1) – Tab. 4.

This segment comprises seniors from Bulgaria, Estonia, Greece, Croatia, Latvia, Lithuania, Hungary, Poland, Romania, and Slovakia. It is marked by underdeveloped silver economy infrastructure, low pension expenditures, and high poverty rates among those aged 65 and over. These countries also exhibit low democracy indicators. Seniors here have low employment rates, although slightly higher than in Segment II.

Health outcomes in this segment are concerning, with seniors expressing low expectations for longevity and poor self-assessment of health. Many struggle to access medical care. Financially, this group is among the most disadvantaged in the EU, often struggling with high accommodation costs and an inability to cover unexpected expenses. They have the lowest median income among all segments, and the use of new technologies like e-banking and the Internet is minimal.

There is significant potential for the silver economy in areas like healthcare and rehabilitation. Given the poor health status and limited access to medical services, there is a critical need for affordable, accessible healthcare and rehabilitation services. Public-private partnerships could help fund these services, ensuring they are available to seniors regardless of financial status. Mobile healthcare units, telemedicine, and community health programs could be particularly beneficial for those with limited mobility or living in remote areas.

Introducing gerontechnology—such as health monitoring devices, emergency response systems, and assistive technologies—could improve quality of life. Given the financial constraints in this segment, these technologies should be affordable or subsidized by governments or NGOs. Digital literacy training programs can also help seniors adopt these technologies, increasing their self-reliance and safety.

Although financial constraints and poor health perceptions may discourage engagement in individual initiatives, targeted activation programs can still have a positive impact. Community centers offering free or low-cost activities, such as exercise classes, social clubs, and skill-building workshops, can encourage seniors to be more active, improving physical and mental health and fostering social connections.

Promoting physical activity is essential, as it requires minimal financial resources. Public spaces like parks and community centers can be equipped with senior-friendly exercise equipment and offer free fitness classes. Local governments and NGOs can organize community walks, yoga sessions, and other group activities to encourage active and healthy lifestyles.

To increase market engagement among seniors, businesses can offer discounts and special promotions tailored to their financial situations. Value-for-money products and services that meet the specific needs of seniors, such as affordable meal delivery, discounted cultural event entry, and budget-friendly travel packages, can help make these services more accessible and appealing.

Table 4. Short description of segment III

HEALTH	FINANCES
• the lowest value of years in health at the age of 65+ for both genders • self-assessment of health on the lowest level • the highest percentage of seniors who report unmet needs for medical services • the lowest life expectancy for 2030 year for both genders	• the highest level of percentage of seniors with inability to make end meets • the lowest relative income of elderly people but comparable with the segment 1 • the highest percentage of seniors reporting problems with covering unexpected expenses
RELATIONS	SOURROUNDINGS
• the number of seniors declaring their use of the Internet at a level similar to segment 2, • the highest number of seniors who have never used the Internet • the lowest participation in trainings	• the lowest expenditures on pensions • medium level of employment rate of older workers • the highest poverty rate between people 65+, • the lowest level of democracy index

Source: Own author's draft basing on results of cluster analysis

4. Discussion

The study of senior consumers in the silver economy has significantly progressed since the early 1970s, with research exploring their purchasing behavior, cognitive abilities, and reactions to marketing (Catterall & Maclaran, 2001; Kieżel, 2010; Bae et al., 2021; Berg & Liljedal, 2022; Kuppelwieser & Klaus, 2021a). Our use of advanced data segmentation techniques provides a deeper understanding of this market, highlighting its complexity and diversity, and extending prior research findings. Notably, regional differences play a crucial role in shaping these segments, providing a rich context for understanding the diversity within the senior consumer market.

A comprehensive understanding of the global silver economy requires examining different geographic and cultural contexts. Research from various regions reveals how socio-economic factors shape older consumers' behaviors. For example, studies by Steptoe and Zaninotto (2020) in the UK show that financial security impacts seniors' well-being and consumption patterns. Similar findings by Zalewska (2014) in Poland and Oduro et al. (2023) in Ghana emphasize the crucial role of economic conditions in shaping the attitudes and well-being of the elderly. These studies indicate a common trend: financial stability is vital for seniors' quality of life and consumer behavior, though it manifests differently across cultures and economies. The regional differences highlighted in these studies provide a backdrop against which the segments' distinct characteristics are understood and appreciated.

Research by Sudbury and Simcock (2009) in the UK highlights the diversity within the senior market, advocating for nuanced marketing strategies. Taloş et al. (2021) in Romania and Šostar and Ristanović (2023) in Croatia further detail this diversity, noting the influence of lifestyle changes and technological advancements on seniors' consumption habits. These insights underscore the need for a segmented approach in marketing and policymaking to cater to the varied needs and preferences within the senior population.

Our findings align with observations from previous studies, such as those by Steptoe and Zaninotto (2020), Zalewska (2014), and Oduro et al. (2023), which highlight the impact of financial conditions on seniors' well-being and consumer attitudes. They also corroborate the work of Sudbury and Simcock (2009), Taloş et al. (2021), and Maurel (2023), who stress the variability in consumer behavior among seniors. This variability, influenced by regional socio-economic conditions, calls for a segmented marketing and policy approach, recognizing the diverse needs and preferences within this demographic.

Moreover, our segmentation emphasizes the heterogeneity within the senior market, particularly regarding tourism preferences (Alén et al., 2017; Eusébio et al., 2017; Taloş et al., 2021; Aggarwal et al., 2023) and digital mobility (Bokolo, 2023; Tirado-Mouretta et al., 2023). The distinct segments we identified reveal differences in preferences, capacity, and willingness to engage with various products and services (Przybysz & Stanimir, 2023; Zhang, 2023), underlining how regional factors contribute to these variations.

While previous studies have acknowledged this heterogeneity, our research provides a more detailed segmentation, showing how socio-economic factors intersect with other variables like cognitive abilities and marketing responses to create distinct consumer profiles. Regional differences, in particular, are a backdrop for the creativity and differentiation seen in segment behaviors and preferences. Our study extends the discourse by offering a framework for understanding specific segments within the senior market, highlighting the need for targeted strategies that address the unique characteristics of each segment. For example, some segments may prioritize financial security and healthcare access, while others might focus on leisure and technology adoption. Recognizing these distinctions, shaped by regional contexts, is crucial for developing products, services, and policies that meet the specific needs and preferences of each segment.

5. Conclusions

This article addresses a research gap by identifying segments within the silver economy, based on domains that seniors themselves find important. Our segmentation delineates three groups of countries, each pointing to potential directions for the growth of the silver economy. The heterogeneity of this social group, influenced by generational changes and regional diversity, highlights the dynamic potential of the silver market. This dynamism necessitates the periodic reevaluation of domains significant to seniors, as changes in these domains can affect segmentation outcomes and the composition of individual segments. While the impact of certain domains, such as finances on seniors' well-being and attitudes, is well-documented (Oduro et al., 2023; Steptoe & Zaninotto, 2020; Zalewska, 2014), other

domains warrant further investigation, particularly in light of regional diversity.

The emphasis by European institutions on activating seniors across various life spheres has led to numerous programs that could reshape the domains significant to seniors, and by extension, their consumer attitudes. Such initiatives may alter the growth trajectories of the silver economy, emphasizing the need for strategies that consider regional diversity.

Implications for marketers, policymakers and Society

For marketers, our detailed segmentation offers a roadmap for developing targeted strategies that cater to the specific needs and preferences of each senior segment. This approach not only enhances the effectiveness of marketing campaigns but also fosters product adoption and customer loyalty, with a strong consideration of regional diversity.

Policymakers can use these insights to craft policies that address disparities within the senior population. By designing initiatives to improve healthcare access, reduce poverty among seniors, and encourage active aging, policymakers can affect the domains significant to seniors. Such tailored policies can also consider the unique characteristics of each segment.

The broader societal implications of our findings highlight the importance of understanding the diverse needs and preferences of seniors to sustain economic growth and ensure social cohesion. Businesses that effectively serve the senior market can drive innovation and economic development. Moreover, societies that adapt to the needs of their aging populations can improve the quality of life for all citizens, with a particular focus on regional differences.

Research into various aspects of seniors' lives should be conducted systematically across Europe to anticipate changes, enabling sectors of the silver economy to respond with adaptability. Our findings, emphasizing the influence of regional diversity, underscore the need to tailor offerings in individual markets to maximize seniors' access to diverse products and minimize their exclusion from the consumer base. Additionally, country-specific analyses should explore demographic differences among seniors at the NUTS3 national regions level. Our analysis serves as a foundation for international policy regarding the implementation of the silver economy. However, ensuring equal access to solutions that best meet seniors' expectations remains crucial, as each country strives for economic development. Despite efforts within the EU to ensure equal access to the free market, disparities between countries highlight the need for targeted approaches that address the unique needs of senior consumers, with particular attention to regional diversity.

References

Abdel-Ghany, M. & Sharpe, D.L. (1997). Consumption patterns among the young-old and old-old. *Journal of Consumer Affairs*, 31(1): 90–112. DOI: https://doi.org/10.1111/j.1745-6606.1997.tb00828.x.

Abouzahra, M. & Ghasemaghaei, M. (2022). Effective use of information technologies by seniors: the case of wearable device use. *European Journal of Information Systems*, (31): 241–255. DOI: https://doi.org/10.1080/0960085X.2021.1876534.

Acemoglu, D. & Restrepo, P. (2017.) Secular Stagnation? The Effect of Aging on Economic Growth in the Age of Automation. NBER Working Paper No. 23077. Available at: http://economics.mit.edu/fi les/12536.

Adamczyk, M. & Betlej, A. (2021). Social determinants of digital exclusion in an ageing society. The case of Poland. *Entrepreneurship and Sustainability*, (8): 122–135. DOI: https://doi.org/10.9770/jesi.2021.8.3(7).

Adamek, J. & Solarz, M. (2023). Adoption factors in digital lending services offered by FinTech lenders. *Oeconomia Copernicana*, 14(1): 169–212. DOI: https://doi.org/10.24136/oc.2023.005.

Aggarwal, A., Hajra, V., & Kukreja, V. (2023). Senior tourism: travel motivators and perceived constraints and risks for the elderly. *Tourism Review*, 79(4): 855-876. DOI: https://doi.org/10.1108/TR-09-2022-0443.

Alén, E., Losada, N. & De Carlos, P. (2017). Understanding tourist behaviour of senior citizens: lifecycle theory, continuity theory and a generational approach. *Ageing & Society*, 37(7): 1338–1361. DOI: https://doi.org/10.1017/S0144686X16000325.

Anderberg, M.R. (1973). *Cluster Analysis for Applications*. Publishers, New York.

Babin, J.B., Zhuang, W. & Borges, A. (2021). Managing service recovery experience: Effects of the forgiveness for older consumers. *Journal of Retailing and Consumer Services*, (58): 102222. DOI: https://doi.org/10.1016/j.jretconser.2020.102222.

Bae, H., Jo, S.H. & Lee, E. (2021). Why do older consumers avoid innovative products and services? *Journal of services marketing*, 35(1): 41-53. DOI: https://doi.org/10.1108/JSM-10-2019-0408.

Bakalarczyk, R. (2021). Activity of The Family Carers of The Elderly During SARS-COV-2 Pandemic. *Polityka Społeczna*, 571(10): 28-36. DOI: https://doi.org/10.5604/01.3001.0015.5574.

Bałandynowicz-Panfil, K. (2012). The Role of Older People as Consumers – the Comparative Analysis of Old and New Member States of European Union. *Comparative Economic Research*, 15(1): 83–101. DOI: https://doi.org/10.2478/v10103-012-0005-y.

Barak, B. & Schiffman, L.G. (1981). Cognitive Age: a Nonchronological Age Variable. *ACR North American Advances*, 8(1): 602–606.

Berg, H. & Liljedal, K.T. (2022). Elderly consumers in marketing research: A systematic literature review and directions for future research. I*nternational Journal of Consumer Studies*, 46(5): 1640-1664. DOI: https://doi.org/10.1111/ijcs.12830.

Bokolo, A.J. (2023). Inclusive and safe mobility needs of senior citizens: implications for age-friendly cities and communities. *Urban Science*, 7(4): 103. DOI: https://doi.org/10.3390/urbansci7040103.

Catterall, M. & Maclaran, P. (2001). Body talk: Questioning the assumptions in cognitive age. *Psychology & Marketing*, 18(10): 1117–1133. DOI: https://doi.org/10.1002/mar.1046.

Chand, M. & Tung, R.L. (2014). The Aging of the World's Population and Its Effects on Global Business. *Academy of Management Perspectives*, 28(4): 409–429. Available at: http://www.jstor.org/stable/43822378.

Conway Lenihan, A. & McGuirk, H. (2022). Small enterprises and the silver economy. *Small Enterprise Research*, 29(1): 1–5. DOI: https://doi.org/10.1080/13215906.2022.2048205.

Cylus, J. & Al Tayara, L. (2021). Health, an ageing labour force, and the economy: Does health moderate the relationship between population age-structure and economic growth? *Social Science & Medicine*, 287: 114353. DOI: https://doi.org/10.1016/j.socscimed.2021.

Dabija, D.C., Câmpian, V., Pop, A.-R. & Băbuţ, R. (2022). Generating loyalty towards fast fashion stores: a cross-generational approach based on store attributes and socio-environmental responsibility. *Oeconomia Copernicana*, 13(3): 891–934. DOI: https://doi.org/10.24136/oc.2022.026.

Doets, E.L. & Kremer, S. (2016). The silver sensory experience – A review of senior consumers' food perception, liking and intake. *Food Quality and Preference*, 48: 316–332. DOI: https://doi.org/10.1016/j.foodqual.2015.08.010.

Drolet, A., Lau-Gesk, L., Williams, P. & Jeong, H.G. (2011). Socioemotional selectivity theory: Implications for consumer research. In A. Drolet, N. Schwartz, & C. Yoon (Eds.), *The aging consumer*. Routledge. DOI: https://doi.org/10.4324/9780203852941.

Eastman, J.K., Modi, P. & Gordon-Wilson, S. (2020). The impact of future time perspective and personality on the sustainable behaviours of seniors. *Journal of Consumer Policy*, 43: 275-294. DOI: https://doi.org/10.1007/s10603-019-09440-1.

Enste, P., Naegele, G. & Leve, V. (2008). The discovery and development of the silver market in Germany. In F. Kohlbacher & C. Herstatt (Eds.), *The Silver Market Phenomenon. Business Opportunities in an Era of Demographic Change*. Springer.

European Commission (2006). The demographic future of Europe – From challenge to opportunity. Document 52006DC0571.

Eusébio, C., Carneiro, M.J., Kastenholz, E., Figueiredo, E. & da Silva, D.S. (2017). Who is consuming the countryside? An activity-based segmentation analysis of the domestic rural tourism market in Portugal. *Journal of Hospitality and Tourism Management*, 31: 197–210. DOI: https://doi.org/10.1016/j.jhtm.2016.12.006.

Ferguson, R. & Brohaugh, B. (2010). The aging of Aquarius. *Journal of Consumer Marketing*, 27(1): 76–81. DOI: https://doi.org/10.1108/07363761011012976.

Frątczak, E. (Ed.) (2009). Wielowymiarowa analiza statystyczna. Teoria-przykłady zastosowań z systemem SAS (Multivariate statistical analysis. Theory – examples of applications with the SAS system). Szkoła Główna Handlowa.

Gao, L., Huang, N., Pan, Y. & Lin, J. (2022). Analysis on the Online Consumption Behavior of Chinese Seniors. *American International Journal of Business Management*, 5(7): 51–57.

Gerstorf, D., Hülür, G., Drewelies, J., Eibich, P., Duezel, S., Demuth, I., Ghisletta, P., Steinhagen-Thiessen, E., Wagner, G.G. & Lindenberg., U. (2015.) Secular Changes in Late-life Cognition and Well-being: Towards a Long Bright Future with a Short Brisk Ending? Available at: http://www.diw.de/documents/publikationen/73/diw_01.c.498497.de/diw_sp0738.pdf (Accessed: 17 December 2023).

Golimowska, S. (2008). Społeczno-ekonomiczne konsekwencje starzenia się ludności (Socio-economic consequences of an aging population – in Polish). In: Konsekwencje ekonomiczne i społeczne starzenia się społeczeństwa (Economic and social consequences of an aging society – in Polish). Komitet Prognoz Polska 2000 Plus przy Preydium PAN.

Główny Urząd Statystyczny. (2018). Gospodarka senioralna w Polsce – Stan i metody pomiaru. Raport metodologiczny końcowy (Silver Economy in Poland – State and Measurement Methods. Final Methodological Report). Centrum Badań i Edukacji Statystycznej GUS, Prace Studialne. Available at: https://stat.gov.pl/statystyki-eksperymentalne/jakosc-zycia/gospodarka-senioralna-w-polsce-stan-i-metody-pomiaru,2,1.html (Accessed: 05 October 2023).

Grześkowiak, A., Przybysz, K., Peternek, P. & Stanimir, A. (2021). Pokolenie 65+ Perspektywa Społeczno-Ekonomiczna (Generation 65+ Socio-Economic Perspective – in Polish). Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu.

Guido, G., Ugolini, M.M. & Sestino, A. (2022). Active ageing of elderly consumers: insights and opportunities for future business strategies. *S.N. Business & Economics,* 2(1): 8. DOI: https://doi.org/10.1007/s43546-021-00180-4.

Harper, S. (2014). Economic and social implications of aging societies. *Science,* 346: 587-591. DOI: https://doi.org/10.1126/science.1254405.

Hunsaker, A. & Hargittai, E. (2018). A review of Internet use among older adults. *New Media & Society*, 20(10): 3937-3954. DOI: https://doi.org/10.1177/1461444818787348.

Jagoda, A., Kolakowski, T., Marcinkowski, J., Cheba, K. & Hajdas, M. (2023). E-customer preferences on sustainable last mile deliveries in the e-commerce market: A cross-generational perspective. Equilibrium. *Quarterly Journal of Economics and Economic Policy*, 18(3): 853–882. DOI: https://doi.org/10.24136/eq.2023.027.

Kieżel, E. (Ed.) (2010). Konsument i jego zachowania na rynku europejskim (Consumer and his behavior on the European market – in Polish). PWE.

Kim, J.J. (2017). The Effects of Elderly (Senior) Buying Factors and Satisfaction on Retailer's Online Shopping. *Journal of Distribution Science*, 15(7): 43–52. DOI: https://doi.org/10.15722/jds.15.7.201707.43.

Kim, M.J., Lee, C.K., Gon Kim, W. & Kim, J.M. (2013). Relationships between lifestyle of health and sustainability and healthy food choices for seniors. *International Journal of Contemporary Hospitality Management*, 25(4): 558–576. DOI: https://doi.org/10.1108/09596111311322925.

Klimczuk, A. (2015). *Economic Foundations for Creative Ageing Policy, Volume I: Context and Considerations*. Palgrave Macmillan.

Klimczuk, A. (2016). Comparative Analysis of National and Regional Models of the Silver Economy in the European Union. *International Journal of Aging and Later Life*, 10(2): 31–59. Available at: https://ssrn.com/abstract=2828138.

Knapińska, M. (2023). Is the silver generation still on the labour market or already inactive? The situation of the elderly on the Polish labour market. *Ruch Prawniczy, Ekonomiczny i Socjologiczny*, 85(4): 199–219. DOI: https://doi.org/10.14746/rpeis.2023.85.4.10.

Kotschy, R. & Bloom D.E. (2022). A comparative perspective on long-term care systems.

International Social Security Review, 75: 47–69. DOI: https://doi.org/10.1111/issr.12307.

Kuppelwieser, V.G. & Klaus, P. (2021a). Measuring customer experience quality: The EXQ scale revisited. *Journal of Business Research*, 126: 624–633. DOI: https://doi.10.1016/j.jbusres.2020.01.042.

Kuppelwieser, V.G. & Klaus, P. (2021b). Revisiting the age construct: Implications for service research. *Journal of Service Research*, 24(3): 372–389. DOI: https://doi.org/10.1177/1094670520975138.

Lesaková, D. (2016). Seniors and Their Food Shopping Behavior: An Empirical Analysis. *Procedia – Social and Behavioral Sciences*, 220: 243–250. DOI: https://doi.org/10.1016/j.sbspro.2016.05.496.

Lian, J.W. & Yen, D.C. (2014). Online shopping drivers and barriers for older adults: Age and gender differences. *Computers in Human Behavior,* 37: 133–143. DOI: https://doi.org/10.1016/j.chb.2014.04.028.

Lipp, B. & Peine, A. (2024). Ageing as a driver of progressive politics? What the European Silver Economy teaches us about the co-constitution of ageing and innovation. *Ageing & Society*, 44(7): 1481-1493. DOI: https://doi.org/10.1017/S0144686X22000903.

Maestas, N., Mullen, K.J. & Powell, D. (2023). The Effect of Population Aging on Economic Growth, the Labor Force, and Productivity. *American Economic Journal: Macroeconomics*, 15(2): 306-332. DOI: https://doi.org/10.1257/mac.20190196.

Maier, M. (2015). Skutki społeczno-ekonomiczne starzenia się społeczeństwa. Wybrane aspekty (Socio-economic effects of an aging society. Selected aspects – in Polish). *Europa Regionum*, 25: 241–253. DOI: https://doi.org/10.18276/er.2015.25-14.

Małys, Ł. (2023). The approach to supply chain cooperation in the implementation of sustainable development initiatives and company's economic performance. Equilibrium. *Quarterly Journal of Economics and Economic Policy*, 18(1): 255–286. DOI: https://doi.org/10.24136/eq.2023.008.

Maurel, A. (2023). Population Aging and Preferences for Government Investments and Public Debt. DOI: http://dx.doi.org/10.2139/ssrn.4321243.

McEachern, M.G., Warnaby, G., Carrigan, M., & Szmigin, I. (2010). Thinking locally, acting locally? Conscious consumers and farmers' markets. *Journal of Marketing Management*, 26(5-6): 395–412. DOI: https://doi.org/10.1080/02672570903512494.

McGuirk, H., Conway Lenihan, A. & Lenihan, N. (2021). Awareness and potential of the silver economy for enterprises: A European regional level study. *Small Enterprise Research*, 29(1): 1–14. DOI: https://doi.org/10.1080/13215906.2021.1919915.

Moody, H.R. & Sasser, J.R. (2012). *Aging Concepts and Controversies*. Sage Publication, Inc.

Moschis, G.P. (2012). Consumer Behavior in Later Life: Current Knowledge, Issues, and New Directions for Research. *Psychology & Marketing*, 29: 57–75. DOI: https://doi.org/10.1002/mar.20504.

Moschis, G.P. (2022). Overview of older consumer behavior. Marketing to the aging population: Strategies and tools for companies in various industries. Cham: Springer International Publishing.

Nyce, S.A. & Schieber, S.J. (2011). *The Economic Implications of Aging Societies. The Cost of Living Happily Ever After*. Wydawnictwo Naukowe PWN.

Oduro, J.K., Okyere, J. & Nyador, J.K.M.T. (2023). Risky health behaviours and chronic conditions among aged persons: analysis of SAGE selected countries. *BMC Geriatrics*, 23(1): 145. DOI: https://doi.org/10.1186/s12877-023-03836-y.

Olejniczak, T. (2019). *Konsumenci seniorzy wobec innowacji produktowych* (Senior consumers towards product innovations – in Polish). Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu.

Olejniczak, T. (2021). Innovativeness of Senior Consumers' Attitudes – An Attempt to Conduct Segmentation. *Folia Oeconomica Stetinensia*, 21(1): 76–91. DOI: https://doi.org/10.2478/foli-2021-0006.

Polakowski, M. (2012). Społeczne i ekonomiczne konsekwencje starzenia się społeczeństw a

główne kierunki reform systemów emerytalnych w Europie (Social and economic consequences of aging societies and the main directions of pension system reforms in Europe – in Polish). *Studia BAS*, 2(30): 169–200.

Przybysz, K. & Stanimir, A. (2023). How Active Are European Seniors – Their Personal Ways to Active Ageing? Is Seniors' Activity in Line with the Expectations of the Active Ageing Strategy? *Sustainability*, 15(13): 10404. DOI: https://doi.org/10.3390/su151310404.

Przybysz, K., Stanimir, A. & Wasiak, M. (2021). Subjective Assessment of Seniors on the Phenomenon of Discrimination: Analysis Against the Background of the Europe 2020 Strategy Implementation. *European Research Studies Journal*, 24: 810–835. DOI: https://doi.org/10.35808/ersj/2075.

Roszko-Wójtowicz, E., Deep Sharma, G., Dańska-Borsiak, B. & Grzelak, M.M. (2024). Innovation-Driven E-Commerce Growth in the EU: An Empirical Study of the Propensity for Online Purchases and Sustainable Consumption. *Sustainability*, 16: 1563. DOI: https://doi.org/10.3390/su16041563.

Roszko-Wójtowicz, E., Boczkowska, K. & Niziołek, K. (2023). Social and demographic factors in shaping the perception of work as a source of health and safety risks: a study on adult Europeans. *Economics and Environment*, 87(4): 712, 1–36. DOI: https://doi.org/10.34659/eis.2023.87.4.712.

Roszko-Wójtowicz, E. & Grzelak, M.M. (2021). Multi-dimensional analysis of regional investment attractiveness in Poland. Equilibrium. *Quarterly Journal of Economics and Economic Policy*, 16(1): 103–138. DOI: https:// doi.org/10.24136/eq.2021.004.

Schirmer, W., Geerts, N., Vercruyssen, A. & Glorieux, I. (2022). Digital Skills Training for Older People: The Importance of the 'Lifeworld'. *SSRN Electronic Journal*: 1–28. DOI: http://dx.doi.org/10.2139/ssrn.4003089.

Sharma, G.D., Stanimir, A., Przybysz, K. & Roszko-Wójtowicz, E. (2023). How do European seniors perceive and implement the postulates of sustainable tourism? Equilibrium. *Quarterly*

Journal of Economics and Economic Policy, 18(4): 1217–1249. DOI: https://doi.org/10.24136/eq.2023.038.

Sokołowski, A. (2010). Analiza skupień metodą k-średnich (K-means cluster analysis – in Polish). In: *Statsoft Polska. Słownik Statystyczny*. Available at: https://www.statsoft.pl (Available at: 05 October 2023).

Stefko, R., Bacik, R., Fedorko, R. & Olearova, M. (2022). Gender-generation characteristic in relation to the customer behavior and purchasing process in terms of mobile marketing. *Oeconomia Copernicana*, 13(1): 181–223. DOI: https://doi.org/10.24136/oc.2022.006.

Šostar, M. & Ristanović, V. (2023). Assessment of Influencing Factors on Consumer Behavior Using the AHP Model. *Sustainability*, 15: 10341. DOI: https://doi.org/10.3390/su151310341.

Steptoe, A. & Zaninotto, P. (2020). Lower socioeconomic status and the acceleration of aging: An outcome-wide analysis. *Proceedings of the National Academy of Science*, 117(26): 14911–14917. DOI: https://doi.org/10.1073/pnas.1915741117.

Sudbury R.L., Kohlbacher, F. & Hofmeister, A. (2012). A cross-cultural analysis of pro-environmental consumer behaviour among seniors. *Journal of Marketing Management*, 28(3-4): 290–312. DOI: https://doi.org/10.1080/0267257X.2012.658841.

Sudbury, L. & Simcock, P. (2009). A multivariate segmentation model of senior consumers. *Journal of Consumer Marketing*, 26(4): 251–262. DOI: https://doi.org/10.1108/07363760910965855.

Svatosova, V. (2020). The Importance of Online Shopping Behavior in the Strategic Management of E-Commerce Competitiveness. *Journal of Competitiveness*, 12(4): 143–160. DOI: https://doi.org/10.7441/joc.2020.04.09.

Szukalski, P. (2012). Trzy kolory: srebrny. Co to takiego silver economy? (Three colors: silver. What is the silver economy? – in Polish). *Polityka społeczna*, 458(5/6): 6-10.

Taloş, A.M., Lequeux-Dinca, A.I., Preda, M., Surugiu, C., Mareci, A. & Vijulie, I. (2021). Silver Tourism and Recreational Activities as

Possible Factors to Support Active Ageing and the Resilience of the Tourism Sector. *Journal of Settlements & Spatial Planning*, 8: 29–48. DOI: https://doi.org/10.24193/JSSPSI.2021.8.04.

Taylor, J. (2010). Public service motivation, civic attitudes and actions of public, non-profit and private sector employees. *Public administration*, 88(4): 1083-1098.

Tirado-Morueta, R., Rodríguez-Martín, A., Álvarez-Arregui, E., Ortíz-Sobrino, M.Á. & Aguaded-Gómez, J.I. (2023). The digital inclusion of older people in Spain: technological support services for seniors as predictor. *Ageing & Society*, 43(6): 1409–1435. DOI: https://doi.org/10.1017/S0144686X21001173.

Trembošová, M., Kramoliš J., Dubcová, A., Nagyová, Ľ. & Forgáč, P. (2022). Shopping Behavior of the Silver Generation in Slovakia: A Case Study Nitra. *E&M Economics and Management*, 25(3): 142–157. DOI: https://doi.org/10.15240/tul/001/2022-3-009.

Yen, D., Cohen, G., Wei, L. & Asaad, Y. (2022). Towards a framework of healthy aging practices, Journal of Business Research, 142: 176-187. DOI: https://doi.org/10.1016/j.jbusres.2021.12.026.

Yoon, C., Cole, C.A. & Lee, M.P. (2009). Consumer decision making and aging: Current knowledge and future directions. *Journal of Consumer Psychology*, 19(1): 2–16. DOI: https://doi.org/10.1016/j.jcps.2008.12.002.

Zalewska, A. (2014). The third age in Poland. Pleasure and a new form of sociality. In S. Grotowska & I. Taranowicz (Eds.), *Understanding Ageing in Contemporary Poland: Social and Cultural Perspectives*. Instytut Socjologii Uniwersytetu Wrocławskiego.

Zhang, Y. (2023). Circular Economy Model for Elderly Tourism Operation Based on Multi-source Heterogeneous Data Integration. *Applied Artificial Intelligence*, 37(1): 2205228. DOI: https://doi.org/10.1080/08839514.2023.2205228.

Zsarnoczky, M. (2016). Innovation challenges of the silver economy. VADYBA *Journal of Management*, 28(1): 105-109.