

IMPACT OF DEMOGRAPHIC CHANGE ON SOCIETY: ACTIVE AGING, SILVER ECONOMY, AND STRATEGIC BUSINESS

Elena QUERCI

*University of Insubria
Via Monte Generoso 71, 21100 Varese, IT
elena.querchi@uninsubria.it*

Patrizia GAZZOLA

*University of Insubria
Via Monte Generoso 71, 21100 Varese, Italy
patrizia.gazzola@uninsubria.it*

doi: 10.25019/STR/2023.036

Abstract

The changes in the structure of the population worldwide, particularly in Europe and the United States, have determined the transition of the population with a demographic dividend characterized by the increase in the life span of the elderly population and the fertility capacities with the result of low birth rate and low mortality. The expected negative effects on the economic growth of the current demographic change can be mitigated by prolonging the participation of seniors in the workforce, managing migration correctly, improving financial flows, and using the IoT to increase productivity. In reality, there is a scenario with even positive implications since an aging population opens up a market that has not been fully explored and exploited. A longevity society is a multidimensional target for the Silver Economy. The spending power of the baby boomers is high. It is aimed at sectors such as training, health care, housing, information and communication technologies, travel and tourism, and cultural and leisure activities. In the 2021 Green Paper, the European Commission outlines the guidelines for active and healthy aging through the promotion of healthy lifestyles throughout life, positively impacting the labor market, employment rates, social protection systems, and, therefore, economic growth and productivity. The UN 2030 goals examine longevity and its impact on society by suggesting actions to promote healthy aging to address inequalities and ensure older people age safely in a place that suits them, are free from poverty, continuing to develop their skills by contributing to their community, maintaining autonomy and health.

Keywords

silver economy; longevity society; baby boomer; UN 2030 goals; healthy aging

Introduction

Demographic aging has been the subject of studies for several decades. Large organizations and individual countries have launched studies on demographic changes, such as the European Commission (EC, 2010, 2011, 2015a, 2015b, 2018, 2020, 2021a, 2021b), the European Parliament, C. d. E.U. (2012), and the World Health Organization (WHO, 2021), have drafted important reports and resolutions to identify the central nodes of change, understand the impact on society and the economy of ageing countries, and suggest strategies. Certainly, over the years, it has emerged that

the aging process of the population will have repercussions on the labor market, the social integration of the population's old age, and the sustainability of welfare and health systems (European Commission, 2011). On the other hand, a country's economy can have positive aspects if people live longer and healthier. Higher education, higher personal savings, and investments in quality of life characterize the baby boom. Committing to healthy longevity is important in trying to ensure that you not only live longer but also more productive lives.

While the longevity dividend has a downside for more people consuming resources and producing less, the economy has a positive side (Scott, 2021a). Senior consumers are an opportunity for businesses and innovators. The silver economy in the future will be driven by the tastes and needs of older families (Scott, 2021b).

The strategies to be adopted to achieve an objective of the future sustainability of increasingly elderly countries is not to focus on simple policies conditioned by age as a whole but to consider (EC, 2015) that the aging population can be divided into three groups, each with their patterns of needs: active, fragile and dependent. The Silver Economy thus encompasses a large part of the general consumer economy but with notable differences in spending priorities and patterns.

Research methodology and assumption

The article focuses on the literature review on the impact of demographic change on society, the need to encourage active aging with positive repercussions on the silver economy, and the opportunity for companies to encourage investments in the elderly population market with innovative strategic businesses. In particular, we focused on the interventions of the European Commission and the European Parliament.

In the debate, we try to highlight 1) the effects of the decrease in birth rate and mortality on the economies; 2) the strategies suggested by the EU and the United Nations to keep not only the elderly population in the world of work for several years but also, provide a concerted action plan to formulate policies that strengthen the skills of older people in all sectors and create a world fit for all current and future generations, including older people; 3) Longevity and entrepreneurship policies that must set the direction on how and where the silver economy should develop with respect to the provision of goods and services purchased by older adults with an indirect impact, reflecting every activity linked to the silver supply chain starting from direct suppliers and an induced impact corresponding to the total value of the increase in jobs generated by the economic activities of the silver market.

Discussion

According to EUROST 2020 estimates, by 2070, 30% of people in Europe will be over 65 years of age, and it is expected that from 2019 to 2070, the proportion of people aged 80 and above will more than double to 13%, Figure 1.

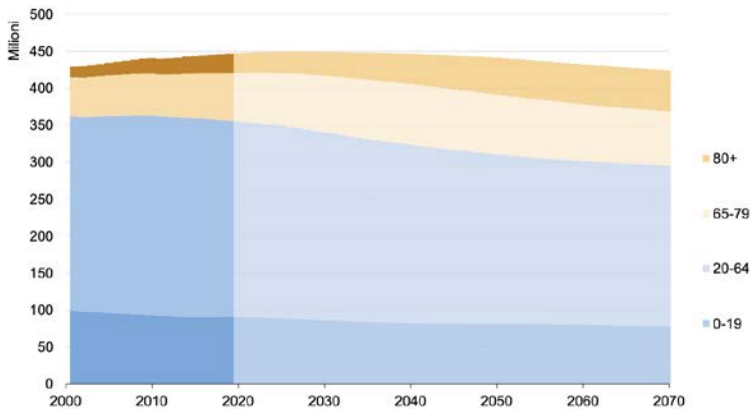


Figure 1. Population by age group, EU-27, 2001-2070
(Source: EUROSTAT 2020 in COM)

The COM 2020 report analyzes, among other things, the data on the number of minors needed to keep the population size constant in Europe in the absence of migrations, which must settle at 2.1, while in Europe in 2018, this figure stood at 1.55 children per woman and in 2021 it fell further to 1.53. The effect, therefore, of the drop in fertility is to decrease the number of younger age groups and to increase the relative weight of the older ones, also given by the lengthening of life expectancy, which accelerates this process of population aging. Individual nations must implement responsible policies in the face of marked variations in fertility characteristics, and they must be country-centered and not only compared with universal standards. This is because, in the face of unusually high mortality, you could have fertility results that could actually be lower than expected (Espenshade et al., 2003). Faced with the demographic transition, with a decreasing level of fertility, we will have a decrease in the percentage of young people and an increase in the percentage of adult workers and older adults. According to global demographic forecasts, the number of people aged 65 and over is expected to more than double, from 761 million in 2021 to 1.6 billion in 2050 (Wilmoth et al., 2023).

The aging of the population entails fundamental, collective, and individual consequences with an impact on the economic level as it can modify the economic growth potential of a country can force it to review the organization of production processes also in relation to the prospective change in the demand for goods and services and in the labor market which changes in terms of the quantity and structure of human capital available, (Quattrociochi et al. 2020). Among the strategies to be adopted to achieve a future sustainability goal of aging countries is to not focus on simple age-related policies and instead reflect on diversity and changes in the way people age to implement policies aimed at producing financial sustainability and are intergenerational equitable in that current young people will be future seniors (Scott, 2021a).

The way forward is promoting a culture of active aging is one way forward to meet the needs related to demographic trends, develop, support, and disseminate strategies,

policies, and practices of social innovation to support active aging, capable at the same time of strengthening solidarity between young and old (World Health Organization, 2021). The World Health Organization has promoted the term 'active aging' to mean optimizing opportunities for health, participation, and safety to improve the quality of life of older people. Pursuing active aging both individually and as a government policy strategy enables people to maintain their potential physical, social, and mental well-being throughout their life course and to participate in society according to their needs, desires, and capacities, providing them with adequate protection, safety, and care when assistance is required, (Kalache et al., 2003).

Active aging, in addition to facilitating the right of older people to remain in good health, with lower costs of social assistance and health care, also helps to stay longer in the world of work, reducing the burden of pension costs (Fries, 2012). Through the Active Ageing Index (AAI), national progress can be measured and monitored to ensure older populations' activity and quality of life in the European Union and other UNECE countries. The AAI can quantitatively measure the set of activities and opportunities in terms of social, work, training, civic engagement, and entertainment, in which older people can aspire to participate according to their needs, attitudes, and desires (Zaidi et al., 2017). This is why the index measures how well older people realize their full potential regarding life expectancy and good health, participation in the economy, social and cultural life, and independent living. As in Figure 2, we see that there are four areas in which AAI data is collected:

1. Contributions through paid activities: Employment as employees and as their own business.
2. Contributions through unpaid productive activities: participation in society, voluntary work, family help, etc.
3. Independent, healthy, and safe life, with autonomy for travel, sports, cultural activities, etc.
4. Active aging capabilities: capabilities and environments conducive to active aging, such as smart cities, transport, robotics, access to lifelong learning, etc.

The first three domains reveal themselves to actual experiences of active aging, while the fourth measures the capacity for active aging, determined by the individual, by his characteristics, and by how much the environmental factors facilitate it or not (Chirugu & Andrioni, 2021).

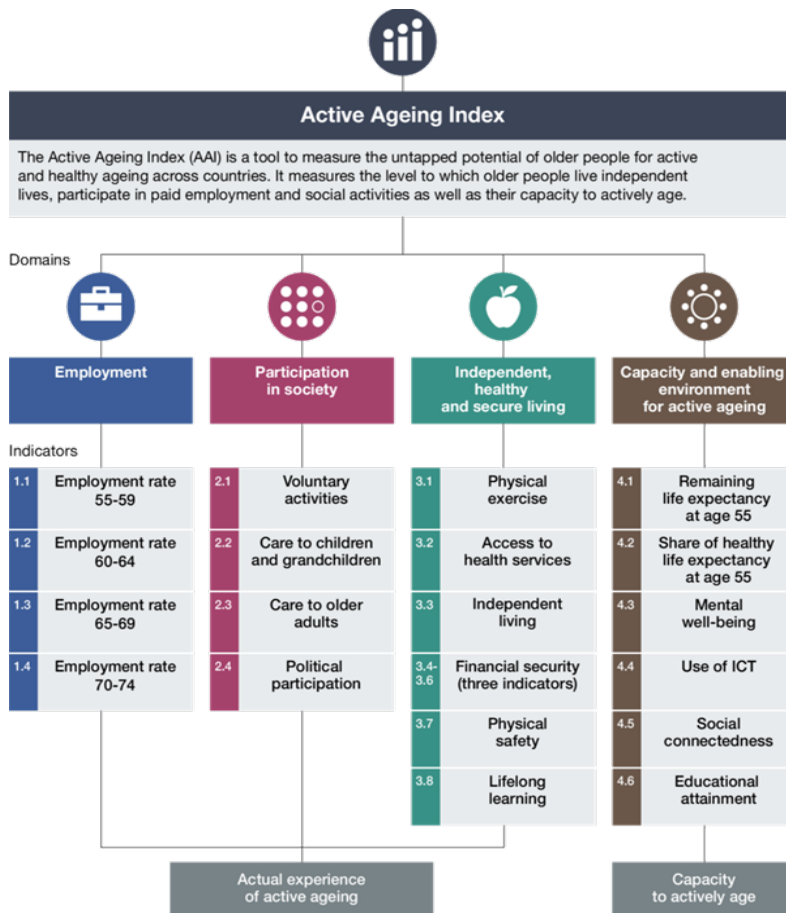


Figure 2. The domains and indicators of AAI
(Source: Active Ageing Index project)

The index is based on a vision of older people, which is not that of a passive old age characterized by health needs and social marginalization (Mirabile et al., 2009) but of the elderly as a resource and protagonist of social life (Walker & Maltby, 2012). In 2050, the over 60s will double, reaching 2 billion, 22% of the world's population (Wilmoth et al., 2023). Institutions worldwide recognize healthy and active ageing as a social right, which is fully part of creating a sustainable society for all ages.

The UN (United Nations Organization, 2019), with the document called Agenda 2030 for Sustainable Development, has set itself the objective of promoting a plan of concerted actions to formulate policies that strengthen the skills of older adults in all sectors in collaboration with Member States and international and national partners. These 9 out of 17 goals pursue creating a world fit for all current and future generations, including older people. Table 1. summarizes the goals to be achieved for older people and their rights.

Table 1.: Agenda 2030 UN: older people and their right
 (Source: UN, 2019. Sustainable development goals)

1. Zero Poverty	Incentivize actions on flexible pension policies and protection measures for informal workers, training and retraining paths for workers, support services and assistance to the family (caregiver), and guaranteed access to health services, including in the long term.
2. No fame	Particular attention to the nutrition of older people can prevent malnutrition, which increases their dependence on care and decreases their intrinsic capacity. Initiate actions to make food accessible to poor older adults living in isolated areas, providing them with vitamins, minerals, and proteins in food.
3. Health and Wellness	Being active helps older people stay healthy at all stages of life by facilitating social and economic participation in society and lowering healthcare costs. Foresee actions for long-term health care to guarantee disease prevention, care and rehabilitation of the elderly, and access to medicines and technologies in favor of functional capacity enhancement.
4. Quality Education	The aim is to create paths for lifelong learning through specific programs of basic literacy, health, and the acquisition of new skills (for example, technologies), breaking down the barriers that prevent older people from accessing education and staying updated extends too their working life.
5. Gender Equality	In 2021, women represent 56% of the global population over 65, and women also live longer than men on average. This objective aims to enhance the presence and role of women in the workplace, combat poverty, increase access to retirement with social pensions, and improve health conditions and family management, thus reducing the gender gap between men and women.
9. Industry, Innovation and Infrastructure	Innovation in production and infrastructure promotes healthy and active aging. It is necessary to promote technologies for telemedicine and health monitoring and the prevention of diseases of older people, to exploit the interoperability of data collected from research to create tailor-made solutions and products for older adults.
10. Reduction of Inequalities	Part of the discrimination experienced by older people is that the physical and social environment in which they live is not suited to their needs. (home, neighborhood, community, workplace). Inequalities lead to discrimination based on age, gender, ethnicity, and level of education.

<p>11. Sustainable Cities and Communities</p>	<p>By 2050, 908 million older people will live in urban areas. Cities suitable for all ages must be rethought in many respects: health, long-term care, transport, logistics, housing, employment, social protection, information, and communication. In this context, the actors that need to be involved are the government, service providers, civil society, older people and their organizations, families, and friends.</p>
<p>16. Peace, Justice, and Stronger Institutions</p>	<p>The image of aging needs to be corrected: awareness campaigns, dissemination of good practices, and promotion of inclusion policies for the elderly can prepare the ground for the necessary change of vision of the elderly seen as a resource and not only a problem.</p>

The European Commission (2021a), in the green paper on aging, acknowledges that the path to pursue is active and healthy aging through the promotion of healthy lifestyles throughout life, also in terms of models of consumption and nutrition and levels of physical and social activity. Active and healthy aging positively impacts the labor market, employment rates, and social protection systems, impacting economic growth and productivity (Ingenito, 2019). Today's political and economic discussion on the issue of the aging population focuses more on older adults as a fiscal burden rather than an economic opportunity, not considering that the aging population is a challenge for many economies (Tkalec, 2017).

Considering the aging of the population as a resource opens the way to a supply chain at the service of older people with essential repercussions on the labor market. The activities involved that have a transversal impact on the entire economy are the pharmaceutical sector, health services and residences for older adults, cultural and recreational services, travel and tourism, food and food and wine, the world of banking and insurance services, and the real estate market. According to the estimate from the report prepared by Oxford Economica and Technopolis Group (2018), a study prepared for the European Commission, in 2025, the silver economy will be worth 5.7 trillion euros, equal to almost a third of the GDP of the Union, and to employ 88 million people, equal to nearly 38% of the total (Figure 3).

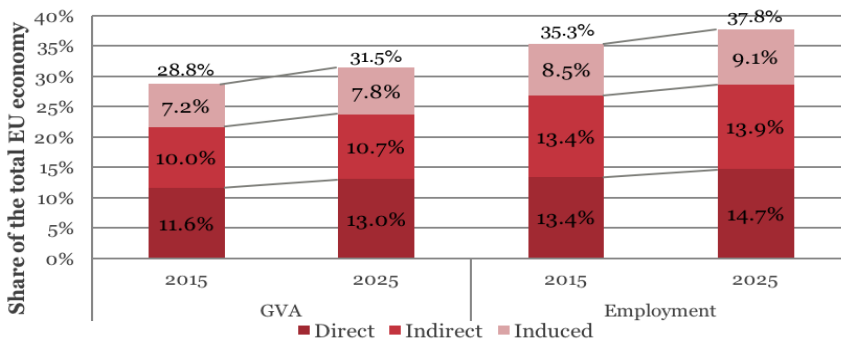


Figure 3. Economic Impact of the Silver Economy in the EU
(Source: European Commission)

The European Commission officially defines the meaning of the Silver Economy: *“The silver economy is the amount of economic opportunities deriving from public and consumer spending related to population ageing and the specific needs of the over-fifty population.”* It is a component of the real economy that is well-defined, identified, and constantly expanded. This can be attributed to the increase in longevity and the decrease in the birth rate (European Commission, 2015). For OECD (2014), the silver economy is *“an environment in which the over-60 interact and thrive in the workplace, engage in innovative enterprise, help drive the marketplace as consumers and lead healthy, active and productive lives”*.

The quality of life of older people also depends on the development of the silver economy, which seeks to look holistically at ageing and the opportunities it presents. Longevity and entrepreneurial policies need to set the direction for how and where the silver economy should develop: in the built environment, unemployment among the 50+, the 65+ still in work, lifelong learning and health care preventive to keep older adults healthy and active for a longer time, (Bojanić & Erceg, 2017). Controlling the costs of aging can be monitored and reduced through new technologies. The IoT (Internet of Things, IoT) is part of the fourth sector of the industrial revolution, connecting machines, devices, sensors, and people, making things smart in the digital world. The benefits of IoT technology to improve the quality of life of older people are innumerable. The activities of older people can be monitored and tracked by sensors. They can optionally generate automatic notifications to their family members and doctors via SMS, phone call, or voice message in case of unusual activity (e.g., detection of falls, changes in health status, abnormal behavior, etc.), or the sensors can find applications in home automation to allow older people to control the ventilation system, lighting, water, temperature, etc. Alerts can be sent when dangerous situations or anomalies arise in older adults' homes (gas emissions, ambient temperature, and air quality can be sent).

Meanwhile, with people with cognitive decline, the IoT helps through text or voice messages when it's time to take their medicines or appointments with doctors and other commitments. In terms of maintaining social relationships and social participation, solutions such as video chat, photo sharing, and care robots are being introduced (Thangavel et al., 2019). According to the European Commission's Silver Economy 2018 report, three areas of impact exist. A direct impact of the Silver Economy relates to activities directly related to the provision of goods and services purchased by older people; an indirect effect, which reflects every activity linked to the supply chain starting from direct suppliers; a third induced impact corresponding to the entire value of the increase in jobs generated by the economic activities described above.

Companies' marketing approach aimed only at creating the so-called "age brand" is reductive; focusing on reducing ageism and active aging is necessary; therefore, committing to age-friendly solutions in public spaces and homes is essential. As suggested by the European Commission (2007), a broader approach to the silver economy is needed, including formation, research, and development (R&D), a cross-sectoral mix of goods and services from existing sectors, and career opportunities in the silver industry.

An important project at the European level goes in this direction. It's called Next Age and is the first path in Europe aimed at startups that develop solutions dedicated to the Silver Economy. It was born in Italy in 2022; the second edition will be released in 2023. There are many subjects involved: it was born on the initiative of CDP Venture Capital together with AC75 and international venture capital SOSV, which manages start-up development programs in the initial phase, sees the presence of Banca Intesa Sanpaolo as leading partner as well as the National Institute for Elderly Hospitalization and Care (I.N.R.C.A.), the Marche Polytechnic University, the Marche Region and the UK National Innovation Center for Ageing which will be scientific partners for the initiative, CDP Next Age).

The endowment of start-up financing capital is 5.46 million, subscribed by the Accelerator Fund of CDP Venture Capital and AC75 Start-up Accelerator. Next Age aims to enhance the growth of startups promoting the Silver Economy. This sector transversally embraces innovative solutions for the emerging needs of the population over 50, from wellness to health, new housing and welfare models to recreational activities, mobility to tourism, and dedicated financial and insurance services. The start-up targets are highlighted in Figure 4.



Figure 4. Target startup
(Source: <https://nextage.io/>)

In addition to an initial investment for the start-ups selected by the program, the budget includes capital for subsequent post-acceleration follow-ons for start-ups with greater growth potential. The Silver Economy is a global market with specific impacts on individual national contexts, which is why The mission of the Next Age program is to develop an innovation hub in the Silver Economy through the active involvement of

start-ups, corporate companies, research centers, and national and international investors, to start operational collaborations between each of these actors.

Next Age is a program with a solid international character: in the first edition, over 60% of the applications came from over 40 countries from all over the world, and thanks to the program, three foreign start-ups from Barcelona were brought to Italy, Berlin, and Singapore. Next Age's mission is: *"We are looking for startups with innovative solutions and ready to seize the opportunities of the flourishing Silver Economy with us."*

Conclusion

The analysis conducted on the literature highlights a contingent problem: the aging of the population and the low birth rate. The European institutions are committed to outlining a policy on aging. The search for innovative strategies in the silver market has led to the birth of new start-ups that develop solutions dedicated to the Silver Economy for the emerging needs of the over-50 population, such as well-being, health, new housing and care models, recreational activities, mobility and tourism, dedicated financial and insurance services.

The demographic transition, characterized by a decrease in mortality and lower fertility" (Kohler et al., 2002), has led the world to wonder about economic and social future scenarios. As early as 2012, the International Monetary Fund warned nations of longevity risk, saying it would be one of the most significant challenges to pension systems over the next 50 years, with global annuities and pension-related exposure estimated at 15-25 trillion dollars in the United States (Global Financial Stability Report, 2018). The G20 proposed the topic of reflection on the aging of the population: *"Among the possible policy principles discussed are equal access to healthy and active life; adjustment of workplaces in line with the needs of senior workers; fighting against age discrimination; focusing on youth employment in the provision of elderly care services and development of new products; ensuring the sustainability of pension systems; taking actions against the digital divide; developing targeted policies in cooperation with social partners and relevant stakeholders; and sharing best practices"* (G20, 2015). The European Commission (2021a), in the Green Paper on Ageing - Promoting solidarity and responsibility between generations, indicates the way forward: Ageing actively and in good health. Active and healthy aging positively impacts the labor market, employment rates, and social protection systems, therefore affecting the growth and productivity of the economy (Ingenito, 2019).

Increasingly, more voices are asking governments to engage in strategies aimed at considering older people as a resource. It is not enough to lengthen the retirement age to reduce costs; but it is necessary to review the working methods of older people. Some solutions are using new technologies, exoskeletons to facilitate the performance of tiring jobs, and smart working. But active seniors also need goods that match their status in the various stages of aging. The silver economy is not only the production of "age brands" but a well-defined and identified component of the ever-expanding real economy. It is an opportunity, as we find in the definition given by the European Commission (2015): *"The silver economy is the set of economic opportunities deriving from public spending and consumption linked to the ageing of the population and the specific needs of the over 50 population"*. The aging population can be divided into three

groups, each with its own need patterns: active, fragile, and dependent. Thus, the silver economy comprises a large part of the general consumer economy but with considerable spending priorities and pattern differences (EC, 2015). The areas in which to seek the innovation of products and services suitable for older people are those aimed at satisfying the needs related to housing and mobility, active aging, nutrition, and recreational activities.

References

AAI. (2014). *Active Ageing Index 2014: analytical report*. Centre for Research on Ageing, University of Southampton, and UNECE (Geneva), European Commission.

AAI. (2019, October). *Active Ageing Index Analytical Report*. United Nations. Retrieved from <https://statswiki.unece.org/display/AAI/Active+Ageing+Index+Home>

Bojanić, I. B., & Erceg, A. (2017). Silver economy: Demographic change and economic opportunity. In *Interdisciplinary Management Research Conference XIII*. (pp. 1005-1020).

CDP Venture Capital. *Next AGE*. Retrieve from https://www.cdpventurecapital.it/cdp-venture-capital/it/dettaglio_acceleratore.page?contentId=ACL2333

Chirugu, G., & Andrioni, F. (2021). *Study on the European framework for the application of the active ageing index*. In MATEC Web of Conferences (Vol. 342, p. 10001). EDP Sciences

Department of Economic and Social Affairs of the United Nations. (2023). *World Social Report 2023: Leaving no one behind in an ageing world*.

Espenshade, T. J., Guzman, J. C., & Westoff, C. F. (2003). The surprising global variation in replacement fertility. *Population Research and Policy Review*, 22, 575-583.

European Commission. (2007). *Europe's Demographic Future: Facts and Figures on Challenges and Opportunities*. Office for Official Publications of the European Communities.

European Commission. (2010). *2012 to be European Year for Active Ageing. DG Employment Social Affairs and Inclusion website*. Retrieved from <http://ec.europa.eu/social/main.jsp?langId=en&catId=89&newsId=860>

European Commission. (2011). *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Youth Opportunities Initiative*. Brussels, Belgium: European Commission.

European Commission. (2011). *The 2012 Ageing Report: underlying assumptions and projection methodologies*. Joint Report prepared by the European Commission (DG ECFIN) and the Economic Policy Committee (AWG), European Economy 4/2011.

European Commission. (2012). *Libro Bianco. Un'agenda dedicata a pensioni adeguate, sicure e sostenibili [White Paper. An agenda dedicated to adequate, safe and sustainable pensions]*. COM (2012) 55 final.

European Commission. (2015a). *Growing the European Silver Economy (Background Paper)*. Retrieved from <http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/silvereco.pdf>

European Commission. (2015b). *Age-friendly Homes & Independent Living (EU Silver Economy Fiches)*. European Commission.

European Commission. (2018). *The Silver Economy. Executive Summary*. Technopolis Group and Oxford Economics. Retrieved from <https://op.europa.eu/en/publication-detail/-/publication/2dca9276-3ec5-11e8-b5fe-01aa75ed71a1/language-en/format-PDF/source-search>

European Commission. (2020). *Report on the Impact of Demographic Change*. Retrieved from https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1056

European Commission. (2021a). *Green Paper on Ageing – Fostering Solidarity and Responsibility Between Generations*. COM(2021) 50 Final. Retrieved from https://ec.europa.eu/info/sites/default/files/1_en_act_part1_v8_0.pdf

European Commission. (2021b). *Horizon Europe Work Programme 2021–2022 – Digital, Industry and Space*. Retrieved from https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-7-digital-industry-and-space_horizon-2021-2022_en.pdf

European Parliament. (2020). Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee, and the committee of the regions on the impact of demographic change, com/2020/241 final

European Parliament. C. d. U. e. (2012) sull'Anno europeo dell'invecchiamento attivo e della solidarietà tra le generazioni.). Decision n. 940/2011/UE del 14 settembre 2011. (GU L 246 del 23.9.2011). Retrieved from <https://eur-lex.europa.eu/legalcontent/IT/ALLuri=CELEX:32011D0940>

Fries, J. F. (2012). The theory and practice of active ageing. *Current Gerontology and Geriatrics Research*, 2012. <https://doi.org/10.1155/2012/420637>

Global Financial Stability Report. (2018, April 18). The quest for lasting stability [Internet]. Retrieved from <http://www.imf.org/external/pubs/cat/longres.aspx?sk=25343>

G20. (2015, November 15-16). Leaders Communiqué Antalya Summit. Retrieved from <http://g20.org.tr/g20-silver-economy-workshop-held-in-rome/index.html>

Ingenito, A. (2019). *Il futuro è longevo. Esperienze di invecchiamento attivo in Italia e in Europa [The future is long-lived. Active aging experiences in Italy and Europe]*. IRES ER.

Kalache, A., & Gatti, A. (2003). Active ageing: a policy framework. *Advances in Gerontology / Uspekhi gerontologii*, 11, 7-18..

Kohler, H. P., Billari, F. C., & Ortega, J. A. (2002). The emergence of lowest-low fertility in Europe during the 1990s. *Population and Development Review*, 28(4), 641-680.

Mirabile, L. M., De Sario, B., & Mastropietro, E. (2009). *L'anziano come risorsa [The older people as a resource]*. IRES Istituto ricerche economiche e sociali.

Next Age. The Silver Economy accelerator of CDP National accelerators network. Retrieved from <https://nextage.io/it/homepage-it/>

Quattrocioni, L., Tibaldi, M., & Caputi, M. (2020). *Invecchiamento attivo e condizioni di vita degli anziani in Italia [Active aging and living conditions of older people in Italy]*. Italian National Statistical Institute—ISTAT.

Scott, A. J. (2021a). The longevity society. *The Lancet Healthy Longevity*, 2(12), e820-e827.

Scott, A. J. (2021b). The longevity economy. *The Lancet Healthy Longevity*, 2(12), e828-e835.

Thangavel, G. (2019). Internet of things for improving older adults quality of life. Ageing in a changing society, 964 in Ageing in a changing society: – Interdisciplinary popular science contributions from the Newbreed Research School, Örebro University.

Tkalec, I. (2017). *The Interplay between Active Ageing and Silver Economy—a QCA Analysis*. Cahiers RESUME.

UN. (2019). Sustainable development goals. Retrieved from <http://www.undp.org/content/undp/en/home/sustainable-development-goals.html>

Walker, A., & Maltby, T. (2012). Active ageing: A strategic policy solution to demographic ageing in the European Union. *International Journal of Social Welfare*, 21, S117-S130.

Wilmoth, J. R., Bas, D., Mukherjee, S., & Hanif, N. (2023). *World Social Report 2023: Leaving No One Behind in an Ageing World*. UN.

World Health Organization. (2021). *UN decade of healthy ageing: Plan of action 2021–2030*. WHO.

Zaidi, A., Gasior, K., Zolyomi, E., Schmidt, A., Rodrigues, R., & Marin, B. (2017). Measuring active and healthy ageing in Europe. *Journal of European Social Policy*, 27(2), 138-157.