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Reflections on Developing the Silver Economy to Address Population Aging

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Abstract

Against the backdrop of the accelerated aging of the population and the upgrading of elderly consumption demand from subsistence-oriented to development-oriented, the silver economy has become a strategic fulcrum for alleviating the pressure of population aging and enhancing people's well-being. However, China's silver industry is currently facing core predicaments such as a structural lag in the supply of products and services, a weak system of scientific and technological innovation and financial support, and a severe shortage of professional service personnel. Based on an analysis of the causes of the above problems and drawing on international practical experience in smart elderly care, product and service supply, and elderly care finance, this paper puts forward four countermeasures: first, optimize the supply structure through policy guidance and standard construction to promote the accurate matching of products and services and balanced regional development; second, build a high-quality and compound team of elderly care service talents through vocational education, salary incentives and the integration of industry and education; third, accelerate the R&D and application of aging-adapted technologies, improve the multi-level elderly care financial system, and promote the in-depth integration of "technology + finance + elderly care" to stimulate the endogenous driving force of the market; fourth, improve the full-chain market governance system, advance the aging-adapted transformation of consumption scenarios and the construction of brand credit, and reshape consumer confidence among the elderly. The paper aims to provide a useful reference for addressing the challenges of population aging.

Keywords

Silver Economy; Population Aging; Smart Elderly Care; Countermeasures and Suggestions.

1. Introduction

Population aging is a basic national condition of China for a long period at present and in the future. With the expansion of the elderly population scale, the demands of the elderly group for health care, rehabilitation aids, spiritual culture and other aspects have shown the characteristics of being multi-level and diversified. Vigorously developing the silver economy is not only a strategic choice to expand domestic demand and foster new economic growth points, but also an inevitable requirement to actively respond to population aging, improve the quality of life of the elderly, and realize the goal of "ensuring the elderly are cared for and supported". Despite the broad prospects of the silver economy, China's related industry is still in the initial stage, and the contradiction of supply-demand mismatch has become increasingly prominent. In this context, how to break the bottlenecks in the development of the silver economy and build an industrial system adapted to an aging society has become an urgent issue to be addressed. This paper aims to deeply explore the importance and significance of

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developing the silver economy, so as to provide certain ideas and references for addressing the challenges of population aging.

2. The Problems Faced by the Development of China's Silver Economy

2.1. Imbalance between Supply and Demand, Lagging Supply of Products and Services

With the deepening of population aging in China, the demands of the elderly group for elderly care, medical care and other aspects are growing. However, the current supply situation of China's silver industry has the problems of imbalance and inadequacy, which has seriously hindered the improvement of the quality of life of the elderly. In terms of product supply, China's elderly products market is plagued by insufficient variety and a low level of aging adaptation. Many products remain at the middle and low ends of the industrial value chain with low innovation capacity and aging adaptation level, failing to accurately match the physical and psychological needs of the elderly[1]. For example, although smart wearable devices, aging-adapted household products, mobility aids and other products have achieved certain development, their functional design often ignores the operating habits of the elderly, resulting in a high threshold for use; the supply of high-end rehabilitation aids, chronic disease management equipment and other products is far from sufficient, making it difficult to meet the rigid demand for health care. In addition, an imperfect product standard system has led to disordered market production and uneven product quality, and some products are "not aging-adapted" or "shoddy", which undermines the consumption confidence of the elderly.

In terms of service supply, the shortcomings of the elderly care service system are more obvious. Problems such as insufficient coverage of community-based home care services, a shortage of professional nursing staff, and backward service facilities in rural areas are prevalent. Although community elderly care services have made progress in recent years, the supply of high-quality institutional elderly care beds is still tight, unable to meet the care needs of the disabled and cognitively impaired elderly. At the same time, the supply of development-oriented services such as cultural and entertainment activities, spiritual consolation, and tourism and leisure is lagging behind, which is difficult to adapt to the demands of the "new elderly group" for a high-quality life. Especially in rural and economically underdeveloped areas, the supply capacity of elderly care services is weak, and the family care burden is excessively heavy, which further restricts the release of the consumption potential of the elderly.

2.2. Weak Innovation-driven Momentum, Insufficient Scientific, Technological and Financial Support

In the field of the silver economy, scientific and technological innovation and product R&D are the key to improving the quality of life of the elderly. Internationally, there are more than 60,000 types of elderly products (including rehabilitation assistive devices), while only more than 2,000 types are independently developed in China. 80% of the products in the domestic market are imported, and domestic elderly products have a low technological content. In particular, there is insufficient R&D investment and slow development in high-tech products such as smart elderly care, rehabilitation aids and aging-adapted digital products. In terms of scientific and technological support, the main contradiction lies in the weak adaptive innovation of key technologies and system integration capability. Although cutting-edge technologies such as artificial intelligence and the Internet of Things have begun to penetrate the elderly care field, their in-depth integration with elderly care scenarios is still insufficient. Technological R&D is often disconnected from the real needs, operating habits and payment capacity of the elderly, resulting in many "intelligent" products being complicated to operate and of low practicability[2]. At the same time, there are inconsistent technical standards in the

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upstream and downstream of the industrial chain, and health data cannot be interchanged between different systems, forming "data silos", which seriously hinders the coherence and overall efficiency of home, community and institutional elderly care services. In addition, many elderly people have difficulties in accepting and using emerging scientific and technological products, with weak capabilities in information acquisition, processing and application. Taking e-commerce platforms as an example, although the daily active scale of elderly users is growing steadily, the payment rate is significantly lower than that of young people; survey data shows that more than 50% of the elderly take the initiative to give up online shopping due to difficulties encountered in the process. This "digital divide" not only limits the convenience and efficiency of silver economy services, but also affects the social participation and quality of life of the elderly.

2.3. Shortage of Human Resources, Lack of Professional Service Talents

The development of China's silver industry is also restricted by a shortage of professional talents. The supply of high-quality talents in fields such as elderly care nursing, medical rehabilitation, psychological counseling, aging-adapted product design and smart elderly care technology is far from meeting the demand. According to relevant statistics, up to now, the demand for elderly care givers in China exceeds 10 million, but the cumulative number of certified personnel is only more than 2 million, most of whom only have basic nursing skills and are unable to provide high-quality integrated medical and elderly care, rehabilitation training and spiritual consolation services. The main causes of the talent shortage are the low social recognition of the industry and uncompetitive salary and benefits, which lead to low occupational attractiveness and difficulty in retaining professional talents. At the same time, the vocational education and training system is imperfect, institutions of higher education have insufficient offerings of majors such as elderly care service management and geriatrics, the continuing education mechanism is lagging behind, and the cultivation of interdisciplinary and compound talents is seriously lacking. The shortage of such professional talents not only directly affects the professional level and innovation capacity of silver products and services, leading to uneven service quality of elderly care institutions and low satisfaction of the elderly, but also fundamentally restricts the large-scale, professional and high-quality development of the silver economy. It is urgent to solve this problem by improving occupational attractiveness, perfecting the talent training system and strengthening the integration of industry and education.

3. Reference to International Experience in Developing the Silver Economy to Address Population Aging

3.1. Practical Experience in Smart Elderly Care and Technological Application

In responding to population aging, developed countries attach great importance to the driving role of scientific and technological innovation in the elderly care industry. Relying on the "Society 5.0" strategy, Japan has widely applied the Internet of Things and artificial intelligence in the elderly care field, and reduced the R&D costs of enterprises through financial subsidies and tax incentives, realizing the intellectualization and popularization of elderly care equipment. Countries such as the United Kingdom and the United States focus on technological breakthroughs in specific scenarios: for example, the UK has prioritized the R&D of care robots to alleviate the labor shortage, while the US has leveraged its strong scientific and technological strength to promote the "plug-and-play" telemedicine system, breaking the spatial limitations of traditional medical and elderly care services. In addition, the UK and Singapore have implemented the "Digital Inclusion Program" to targetedly improve the digital literacy of the elderly, bridging the "digital divide" from both institutional and technical aspects. These

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practices show that scientific and technological means can not only improve service efficiency, but also serve as the core support for realizing the precision of elderly care services[5].

3.2. Supply of Silver Products and Services and Financial Support for Elderly Care

On the supply side, Nordic countries such as Sweden, with a home care rate of over 96%, have promoted the segmentation and high-end customization of the assistive device market. Enterprises such as Etac take into account both aesthetic and psychological needs while ensuring the basic functions of products, achieving a win-win situation for commercial value and user experience. Japan has built a trinity elderly care service network of "home - institution - community", and guaranteed the professional level of service personnel through the national qualification certification system for care workers. France has created a top-down model of senior universities by leveraging university resources, effectively filling the gap in elderly spiritual and cultural services. At the financial support level, the United States and Japan have injected vitality into the silver industry through financial innovation[6]. Japan has developed trust and annuity products deeply integrated with medical care; the US has maturely used tools such as long-term care insurance, reverse mortgages and target date funds, which not only reduce the financing costs of enterprises, but also alleviate the dilemma of the elderly "having demand but lacking payment capacity".

4. Countermeasures and Suggestions for Promoting China's Silver Economy to Address Population Aging

4.1. Optimize the Supply of Silver Products and Services and Promote Supply-Demand Balance

To effectively address the structural contradiction of insufficient supply of silver products and services and promote the accurate connection and dynamic balance of supply and demand, we should start with supply-side structural reform and take multi-dimensional measures to improve the quality and efficiency of supply.

4.1.1. Strengthen Policy Guidance and Incentive Mechanisms to Stimulate Enterprise Innovation Vitality

The government should further implement relevant policy documents such as the *Opinions on Developing the Silver Economy and Improving the Well-being of the Elderly* issued by the General Office of the State Council, and encourage enterprises to increase investment in the R&D and production of aging-adapted products through financial subsidies, tax incentives, special fund support and other means[4]. Enterprises and scientific research institutions should comply with the government's goal of developing the aging-adapted industry, increase R&D and manufacturing efforts in industries strongly supported by policies such as smart health elderly care, rehabilitation assistive devices, anti-aging, elderly care finance and residential elderly care, so as to meet the elderly's demand for improving the quality of life. Priority should be given to supporting the technological innovation and industrialization process in fields such as intelligent health monitoring equipment, rehabilitation assistive devices and aging-adapted smart home. At the same time, establish a key project database for the silver economy, give priority to including projects in the scope of national high-tech enterprise certification and R&D expense additional deduction, and reduce the innovation costs of enterprises. Through these incentive measures, guide more market players to enter the silver industry, enrich product categories, improve the diversity and high quality of supply, and thus better meet the transformation and upgrading of the elderly's demand from basic care to development-oriented demand such as health management and leisure and entertainment.

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4.1.2. Improve the Standard System and Quality Supervision to Enhance the Aging Adaptation Level of Products

Accelerate the construction of a full-chain system of national, industrial and group standards covering elderly products and services, focus on formulating key standards for smart wearable devices, home aging-adapted transformation, and elderly care service specifications, and clarify the requirements for functionality, safety and humanized design. Strengthen market supervision, crack down on fake and shoddy products and "non-aging-adapted" products, implement a product quality certification and traceability mechanism, and enhance consumer trust. At the same time, promote the standardized application of aging-adapted transformation, for example, popularize design specifications such as large fonts, voice control and one-click help in fields such as home appliances, furniture and building materials. Through standard guidance and quality control, ensure that the supplied products truly conform to the physical and psychological characteristics of the elderly, avoid formalistic innovation, and effectively improve the effectiveness and accuracy of supply.

4.1.3. Expand Diverse Supply Channels and Promote Balanced Regional Development

Support enterprises to innovate supply models, set up experience centers and special counters for elderly products in communities and shopping malls to facilitate the elderly to try products on the spot and give feedback; at the same time, develop "silver e-commerce" platforms, provide personalized recommendations and door-to-door services by analyzing the consumption preferences of the elderly with big data. Encourage the holding of exhibitions and sales of aging-adapted products on traditional festivals or special activities to promote a positive interaction between consumption experience and supply iteration. In terms of regional layout, increase inclined support to rural, central and western and economically underdeveloped areas, expand the coverage of home and community elderly care services, and fill the gaps in infrastructure and services. Ultimately realize the balance of supply and demand between urban and rural areas and among different regions, fully release the consumption potential of the elderly, and promote the high-quality development of the silver economy.

4.2. Strengthen the Construction of Talent Teams and Improve the Level of Professional Services

In view of the current severe shortage of professional talents in elderly care services, we must take multiple measures to accelerate the construction of talent teams to support the high-quality development of the silver economy and the active response to population aging. This can be promoted through improving occupational attractiveness, perfecting the talent training system and strengthening policy guarantees. Improve the salary and benefits and social status of practitioners such as elderly care givers, explore the establishment of a wage guidance price mechanism and a performance incentive system, and include them in the scope of vocational skill subsidies; at the same time, strengthen publicity and guidance, improve the social recognition of the industry, and attract more young people to join. Improve the vocational education and training system, support vocational colleges to expand the enrollment scale of majors such as elderly care service management, elderly nursing and rehabilitation therapy, encourage institutions of higher education to offer interdisciplinary majors such as geriatrics and smart elderly care, and promote continuing education and skill upgrading training for on-the-job personnel to realize a substantial increase in the rate of certified employment. Deepen the integration of industry and education and school-enterprise cooperation, establish training bases for elderly care service talents, introduce advanced domestic and foreign experience to cultivate compound talents, and at the same time attract high-level professional talents to the elderly care field through policies such as talent introduction subsidies and housing security. Through these comprehensive measures, gradually make up for the talent gap, improve the professional level of services, provide the elderly with higher-quality integrated medical and

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elderly care, spiritual consolation and personalized care services, and ultimately help the sustainable development of the silver economy and the improvement of the governance system for an aging society.

4.3. Develop Aging-adapted Technology and Elderly Care Finance to Stimulate New Market Vitality

At present, the silver industry is facing the dual constraints of insufficient scientific and technological support and inadequate financial support. To this end, we should focus on promoting the innovation of aging-adapted technology and the construction of the elderly care financial system, and drive the market vitality and industrial endogenous driving force with the joint efforts of technological empowerment and financial support, so as to realize the high-quality development of the silver economy.

4.3.1. Accelerate the R&D and Application of Aging-adapted Technology and Improve the Level of Smart Elderly Care

The government should increase investment in the R&D of artificial intelligence, the Internet of Things, big data, 5G and other technologies in the elderly care field, and encourage cooperation between enterprises, universities and scientific research institutions. At the same time, popularize relevant technologies in communities and elderly care institutions through pilot demonstrations, and reduce the usage costs of the elderly with the support of subsidy policies, gradually building a smart elderly care service system supported by technology, improving service efficiency and precision, and meeting the elderly's demand for a digital life.

4.3.2. Improve the Elderly Care Financial Support System and Broaden Industrial Financing Channels

Promote the development of a multi-level system of elderly care financial products, encourage financial institutions to innovate exclusive products such as elderly care savings, elderly care insurance, elderly care trusts and housing reverse mortgages, explore the establishment of a national overall planning mechanism for long-term care insurance, and expand the coverage of commercial endowment insurance[3]. Regulatory authorities can issue special guidelines to guide banks, insurance companies, funds and other institutions to set up special funds for the silver economy, strengthen credit support for small, medium and micro elderly care enterprises, and reduce their financing costs. At the same time, attract venture capital, private equity and other capitals to participate in silver technology projects, and support qualified enterprises to raise funds through listing on the stock market, bond issuance and other means. Through these measures, provide a diversified and stable source of funds for the silver industry and alleviate the financial pressure of enterprises in their development.

4.3.3. Promote the In-depth Integration of Technology and Finance to Stimulate the Vitality of Market Players

Establish and improve a coordination mechanism between science, technology and finance, and promote the docking and cooperation between silver technology enterprises and financial institutions. An industrial investment fund for the silver economy can be set up to focus on supporting projects with independent core technologies. Give play to the role of government-guided funds to drive the investment of social capital, and actively explore the integrated model of "technology + finance + elderly care", such as developing personalized elderly care service financial products based on big data, or promoting the financial leasing model of intelligent equipment. At the same time, strengthen policy coordination, improve the intellectual property protection and risk-sharing mechanism, and reduce the worries of innovation subjects. The organic combination of aging-adapted technology and elderly care finance can not only mobilize the enthusiasm of market investment and cultivate new business forms, but also help form a virtuous circle of industrial development, comprehensively enhance the endogenous

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driving force of the silver economy, and make it an important growth point for addressing population aging.

4.4. Improve the Market Governance System and Brand Echelon to Reshape Consumer Confidence Among the Elderly

The transformation of the silver economy from "potential demand" to "effective demand" depends not only on the abundance of product supply, but also on the integrity of the market environment and the credibility of brands. In view of the current reality that the silver market is a mixed bag and the consumption willingness of the elderly is restricted by the "trust deficit", it is necessary to make efforts from both market governance and brand building.

4.4.1. Build a Full-chain Regulatory Defense Line and Purify the Market Consumption Ecosystem

At present, irregularities such as false advertising, inductive consumption and illegal fund-raising targeting the elderly group have become the core obstacles to the release of silver consumption. The government should break departmental barriers, establish a cross-departmental comprehensive regulatory mechanism for the silver economy, and extend regulatory coverage from traditional offline stores to emerging fields such as live streaming and community marketing[7]. It is recommended to implement the "Credit for the Elderly" project, establish a credit rating evaluation system for elderly-related enterprises and a joint punishment mechanism for the blacklist, and increase the cost of breaking the law. At the same time, improve the legal aid system for the protection of the legitimate rights and interests of elderly consumers, reduce the threshold and cost for the elderly to safeguard their rights, and eliminate market irregularities through legal means, creating a safe, transparent and predictable consumption environment for the elderly.

4.4.2. Promote the Extension of the "Aging-adapted Environment" from Physical Space to Consumption Scenarios

Aging-adapted transformation should not be limited to the physical facilities of families and communities, but also cover the construction of the soft environment of commercial consumption scenarios. Encourage public places such as shopping malls, scenic spots and financial outlets to carry out aging-adapted service upgrading, such as retaining manual cash counters, setting up special service areas for the elderly, and optimizing signage systems. On the digital consumption side, in addition to the aging adaptation of application interfaces, more attention should be paid to the simplification of business processes to eliminate the "digital barriers" for the elderly in payment and after-sales links. By creating an age-friendly social consumption atmosphere, gradually reverse the traditional concept of the elderly of "attaching great importance to savings and neglecting consumption", and stimulate their endogenous driving force for pursuing a high-quality life.

5. Conclusion

In summary, developing the silver economy has become a pivotal strategic pillar for addressing the challenges of population aging, improving people's well-being, and fostering new growth drivers for the economy. The study finds that although China's silver industry is currently constrained by core dilemmas including unbalanced supply of products and services, insufficient innovation momentum, and a shortage of specialized talents, it is possible to explore industrial breakthrough pathways tailored to national conditions by drawing on advanced international experience in smart elderly care, targeted supply, and pension finance. Going forward, it is necessary to further strengthen policy guidance and standard development, promote the in-depth integration of "technology + finance + elderly care" to stimulate endogenous market dynamics, and consolidate the foundation of high-quality interdisciplinary

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talents by improving industry-education integration mechanisms. Meanwhile, a full-chain market governance system should be enhanced to accelerate the age-friendly transformation of consumption scenarios, effectively bridge the "digital divide", and drive the transformation and upgrading of silver consumption from subsistence-oriented to quality development-oriented. Through the coordinated efforts of the government, the market, and society, transforming "aging pressure" into "development momentum" holds profound strategic value for constructing a high-quality social security system for the elderly.

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