

Integrating health, finance and technology chains: A systemic restructuring agenda for China's silver economy

Qianyue Su

ssquri@163.com

Hunan University of Chinese Medicine

Xinbin Xia

Hunan University of Chinese Medicine

Research Article

Keywords: population ageing, silver economy, long-term care, pension finance, age-friendly technology, China

Posted Date: September 21st, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10735066/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Additional Declarations: No competing interests reported.

Abstract

China has entered a moderately aged society, and developing the silver economy has been elevated to a national strategy. Yet the sector faces a systemic dilemma: enormous potential demand coexists with inefficient and fragmented supply, while coordination among the three key domains of health, finance and technology remains ineffective. This paper constructs a “three-chain integration” framework—comprising the health value chain, the financial support chain and the technological innovation chain—to diagnose the structural blockages of China’s silver economy. We show that the health value chain exhibits “breakpoints” caused by institutional fragmentation of the medical–care–rehabilitation system; the financial support chain exhibits “blockages” caused by the mismatch between capital attributes and the long-cycle nature of the industry; and the technological innovation chain exhibits “chokepoints” caused by commercialization failures and the digital divide. These blockages transmit across chains through payment, scenario and capital–R&D interfaces, locking the system into a low-level equilibrium. We accordingly propose a restructuring agenda that combines chain-specific repair with interface bridging—integrating medical, rehabilitative and custodial care; cultivating patient capital; and building a demand-oriented age-friendly technology ecosystem—supported by cross-departmental coordination, legal and standards reform, and workforce and data capacity. The framework offers an integrated account of how population ageing reshapes the policy logic of health and welfare systems and informs policies for sustainable ageing in rapidly ageing societies.

Introduction

Population ageing is reshaping the social ecology and economic structure of societies worldwide. China, home to the world’s largest older population and one of the fastest-ageing societies, illustrates the depth and breadth of this transformation. According to the National Bureau of Statistics of China (2024), by the end of 2023 the population aged 60 and above had reached 297 million, or 21.1% of the total population, placing the country firmly in the stage of moderate ageing. The medium-variant projection of *World Population Prospects 2022* suggests that by 2050 China’s population aged 60 and above will exceed 500 million, accounting for 38.81% of the total (United Nations, 2022). The silver economy is therefore set to become a pillar of the national economy.

Developing the silver economy has moved beyond the scope of industrial policy to become a core strategy bearing on long-term prosperity and social stability. The report of the 20th National Congress of the Communist Party of China called for “implementing a national strategy to actively respond to population ageing and developing elderly-care services and industries”; the 14th Five-Year Plan for the development of ageing services made systematic arrangements in health support, elderly-care service systems and the ageing industry; and the *Guiding Opinions on Developing the Silver Economy and Improving the Wellbeing of Older Persons*, issued by the State Council in 2024 as China’s first dedicated policy document on the silver economy, marked the beginning of its institutionalized advancement. The Institute on Ageing at Fudan University (2022) projects that, under a medium growth scenario for per

capita consumption, China's silver economy will reach 19.1 trillion yuan by 2035—about 9.6% of GDP—and climb further to 49.9 trillion yuan, or 12.5% of GDP, by 2050.

In stark contrast to these grand expectations, however, the industry faces a systemic predicament in which vast potential demand coexists with inefficient, fragmented supply, and market failure is deeply intertwined with institutional constraint. This predicament unfolds along three critical chains. First, the health value chain exhibits “breakpoints”: the separation of medical care from custodial and rehabilitative care fragments the service chain and constrains improvements in older persons' wellbeing (Chen et al., 2024). Second, the financial support chain exhibits “blockages”: the mismatch between a “slow economy” and “fast capital” produces a chronic shortage of long-term patient capital, while households' payment capacity is poorly converted into effective demand (Yang & Liu, 2025). Third, the technological innovation chain exhibits “chokepoints”: commercialization failures and a pronounced digital divide prevent age-friendly technologies from responding effectively to market demand (González et al., 2025). Crucially, these breakpoints, blockages and chokepoints are not isolated; they interweave and reinforce one another. Their essence is a systemic failure of coordination among the three core elements of health, finance and technology.

Existing research offers rich insights into this predicament but has largely proceeded from single vantage points—macro-level strategy (Du & Wang, 2025), industrial finance (Zhu & Zhou, 2025; Li, 2025), or specific service domains (Shen et al., 2025; Li & Gao, 2025). Integrative attempts have recently emerged, such as the “industry–finance–consumption” coordination framework (Yang & Liu, 2025) and measurements of the coupling coordination between pension finance and the silver economy (Ding et al., 2026), yet an analytical framework that treats health, finance and technology as a co-evolving system remains absent. The fragmentation of scholarship mirrors and, to some extent, aggravates the fragmentation of practice. This paper therefore constructs a three-chain integration framework—health value chain, financial support chain and technological innovation chain—to address three questions: What are the operating logics and blockages of the three core chains of the silver economy? How do blockages transmit across chains to produce systemic failure? What integrated restructuring paths and institutional arrangements can repair inter-chain connections and achieve co-evolution?

The marginal contributions of this paper are threefold. First, it proposes and systematically constructs a three-chain integration framework that combines value chain theory, innovation systems theory and an industrial-ecosystem perspective, moving beyond the compartmentalized perspective of existing research. Second, building on the diagnosis of intra-chain blockages, it reveals the mechanism of cross-chain transmission, deepening the explanation of systemic failure in the silver economy. Third, it proposes an integrated “problem–path–safeguard” restructuring agenda, offering policymakers an actionable guide and laying a conceptual foundation for future efforts to measure the degree of three-chain integration. The remainder of the paper proceeds as follows: the next section presents the analytical framework; the third section diagnoses the blockages of the three chains and their cross-chain transmission; the fourth section sets out the restructuring paths; the fifth section discusses policy safeguards; and the final section concludes.

An analytical framework: three-chain integration

In this paper, the silver economy is defined in line with the official definition in the State Council's 2024 *Guiding Opinions on Developing the Silver Economy and Improving the Wellbeing of Older Persons*: the totality of economic activities that provide products or services to older persons, together with activities that prepare for the ageing stage of life. Within this boundary, we identify three core chains. The **health value chain** denotes the value-creation process of medical, rehabilitation, nursing and elderly-care services organized around older persons' health needs, proceeding through the stages of demand identification, resource allocation, service delivery and value realization; it constitutes the value core of the silver economy. The **financial support chain** denotes the fund-transmission process through which risk pricing, maturity matching and incentive mechanisms convert household savings into long-term capital for age-friendly industries while sustaining older persons' payment capacity; it functions as the capital nexus of the silver economy. The **technological innovation chain** denotes the supply process of age-friendly technologies running from basic research and technology development to product commercialization and scenario application; it serves as the efficiency engine of the silver economy. A concept central to the effective functioning of the financial support chain is **patient capital**—capital that does not chase short-term returns, tolerates volatility and drawdowns, and values long-term and social returns, in sharp contrast to short-term speculative capital (Yu et al., 2026; McCarthy et al., 2016).

The three chains are interlocked through three types of interfaces. The **payment interface** connects the financial chain with the health chain: payment arrangements such as long-term care insurance, pensions and commercial health insurance determine whether effective demand for health services can form and whether the cash flows of health assets can support capital entry. The **scenario interface** connects the health chain with the technology chain: real-world medical and care scenarios provide demand definition and testing environments for technology development, while technological products feed back into service efficiency and quality. The **capital–R&D interface** connects the financial chain with the technology chain: the long horizons and high risks of research and development require patient capital, while the prospective returns of technological commercialization guide capital allocation. Value chain theory, national and regional innovation systems theory, and the theory of industrial ecosystems and complex adaptive systems jointly suggest that the predicament of the silver economy cannot be reduced to problems internal to any single chain; the coupling state among chains must be examined. Accordingly, the analysis below proceeds in two layers, diagnosis and restructuring: it first diagnoses the internal blockages of each chain and their cross-chain transmission, then proposes chain-specific repairs together with interface-bridging measures, and finally turns to policy safeguards, so that problem diagnosis and path design remain in strict correspondence.

Blockages in the operation of the three chains: breakpoints, blockages and chokepoints

Breakpoints in the health value chain

First, institutional fragmentation of the medical–care–rehabilitation system breaks the service chain. China's medical system is treatment-centered, whereas the elderly-care system is centered on daily-life

assistance; the two are supervised by different authorities, follow different service standards, and are financed through different payment systems, with no unified coordination mechanism. Large tertiary public hospitals concentrate high-quality medical resources, yet under the prevailing performance-appraisal regime for tertiary public hospitals they lack incentives to extend services into community and home-based care settings; care institutions, though willing, generally lack medical licenses and professional capacity, producing a deadlock in which “those with capacity have no incentive, and those with incentive have no capacity.” The direct consequence is that rehabilitation becomes the weakest breakpoint. Rehabilitation is the most effective evidence-based means of reducing post-stroke disability: according to World Health Organization data, among stroke survivors who receive active rehabilitation, about 90% regain the ability to walk and manage daily living and about 30% regain the ability to undertake light work, whereas among those without rehabilitation the corresponding recovery rates are only about 6% and 5%. The *Chinese Guidelines for Early Rehabilitation Treatment of Stroke* likewise confirm that organized stroke-unit care reduces mortality and disability by at least 20% (Chinese Society of Neurology, 2017). Yet after discharge, older patients rarely obtain continuous rehabilitation and nursing, and the “treatment–rehabilitation–care” chain breaks at precisely this point.

Second, a deep mismatch between supply and demand suppresses value realization. According to the National Health Commission, China’s old-age care follows a “90-7-3” pattern—roughly 90% of older persons age at home, about 7% rely on community services, and about 3% reside in institutions—while the professionalization of supply lags far behind: basic services such as meal and bathing assistance dominate, whereas professional services such as rehabilitation nursing and telemedicine remain underprovided. A survey released by the National Working Commission on Aging (2008) found that the overall satisfaction rate of demand for urban home-based care services was only 15.9%, and the rate for nursing services only 8.3%; although the survey dates back some years, subsequent studies have continued to corroborate this pattern of mismatch. An “inversion” also exists: high-end facilities suffer from low occupancy because of high prices, while affordable facilities face chronic bed shortages, worsening both allocative efficiency and the family caregiving burden.

Third, barriers to factor mobility weaken the chain’s resilience. Licensing restrictions make it difficult for medical staff to practice in care institutions, while care workers generally lack medical-skills training; the workforce chain is poorly articulated, constraining the accumulation of professional service capacity.

Blockages in the financial support chain

First, there is a structural mismatch between capital attributes and industrial demand. The silver economy is a typical “slow economy”: elderly-care projects require large upfront investment and often take more than a decade to break even, whereas commercial bank credit typically requires repayment of principal and interest within one to three years. Even insurance funds, on which high hopes are placed, are forced to shorten their investment horizons under the dual constraints of solvency regulation and short-term performance assessment (Yang & Liu, 2025; Gao & Huang, 2025). The United Kingdom’s 2022 pension crisis offers a warning: liability-driven investment strategies triggered collateral calls and a

liquidity crisis when interest rates rose sharply, showing that once long-term funds suffer maturity mismatches and weak risk control, they amplify rather than stabilize systemic volatility. The conflict between “short-term money” and the “long cycles” of the industry deprives age-friendly projects of stable financing.

Second, difficulties in converting household payment capacity suppress demand. China’s third-pillar individual pension scheme exhibits a “three lows” pattern—low contribution rates, low average contributions and low investment participation (Pu & Liu, 2025): according to the Ministry of Human Resources and Social Security, 72.79 million individual pension accounts had been opened by the end of November 2024, yet market survey data indicate that only about 22% of account holders actually contribute, with an average contribution of roughly 2,000 yuan, far below the annual cap of 12,000 yuan, and fewer than two-thirds of contributors actually invest their balances. Behind this lie dual constraints: the current tax-deferral incentive is weak for low- and middle-income groups, and household savings are crowded out by rigid expenditures such as housing and education, producing a pattern of “growing old before getting prepared.” Empirical evidence shows that pension finance can boost silver consumption by easing liquidity constraints, strengthening risk protection and improving payment convenience (Fu & Lu, 2026); conversely, blocked conversion of payment capacity directly suppresses the release of older persons’ consumption demand. Insufficient payment capacity in turn destabilizes cash flows on the supply side, creating a negative loop of “insufficient demand—shrinking supply—declining service accessibility.”

Third, inadequate inclusive finance constrains micro, small and medium-sized providers. Elderly-care providers are typically asset-light and labor-intensive, and cannot meet the collateral requirements of conventional credit. In 2022 the People’s Bank of China introduced a targeted relending facility for inclusive elderly care with an initial pilot quota of 40 billion yuan, later expanded in coverage, but the facility remains small relative to the industry’s financing needs; long approval chains and the absence of credit-rating systems for age-friendly projects further dilute its effectiveness (Huang, Zhao, et al., 2025).

Chokepoints in the technological innovation chain

First, the supply of core technologies is disconnected from market demand. Key fields such as rehabilitation aids, elderly-care robots and vital-sign sensors remain import-dependent. A report by the China National Committee on Aging (2019) shows that more than 60,000 elderly-oriented products are available worldwide—nearly 40,000 of them in Japan—whereas only about 2,000 have been independently developed in China, a stark gap in product variety; moreover, the development of rehabilitation aids is disconnected from clinical demand and commercialization rates remain chronically low (Huang & Hu, 2025). Research institutions prioritize technical breakthroughs, while users care more about ease of operation and age-friendly design, producing technologies that are “advanced but inaccessible, usable but not user-friendly.”

Second, the digital divide renders technological empowerment uneven. According to the 56th *Statistical Report on China’s Internet Development* released by the China Internet Network Information Center

(CNNIC, 2025), by June 2025 the number of internet users aged 60 and above had reached 161 million, corresponding to an internet adoption rate of 52.0% among older persons—meaning that nearly half of the elderly population remains offline, and a considerable share of older persons give up smart devices and online services because of operational difficulties. On the product side, insufficient user involvement is pervasive: deep menu hierarchies and the absence of voice interaction and other age-friendly designs turn the “digital dividend” into “digital exclusion” (González et al., 2025).

Third, standards and data barriers limit the depth of application. The standards system for age-friendly products and services remains incomplete and quality is uneven: although national standards for age-friendly products have been issued successively since 2023 and the Ministry of Industry and Information Technology has published catalogues of recommended elderly products, the overall standards system covering products, services, management and data still has large gaps. Meanwhile, data systems for health care, elderly care and civil affairs are mutually isolated; enterprises cannot obtain authentic user profiles and must substitute generic algorithms for personalized adaptation, sharply reducing the precision of technological empowerment.

Cross-chain transmission of blockages

The three types of blockages are not isolated but transmit and reinforce one another along the inter-chain interfaces. Breakpoints in the health value chain destabilize project cash flows and cloud scale-up prospects, directly raising risk pricing in the financial chain and deepening capital caution—breakpoints turn into blockages. The absence of financial support deprives technology development and commercialization of long-term capital, while technological demand in care scenarios cannot be effectively articulated—blockages extend into chokepoints. In turn, inadequate technology supply limits efficiency and quality gains in health services, weakens the industry’s value-creation capacity and further depresses expected returns—chokepoints feed back into deeper breakpoints. The three chains thus form a closed loop of “low-level equilibrium.” This transmission mechanism implies that piecemeal repair cannot work: restructuring the silver economy must be a systemic project in which the three chains move together. It should be noted that this transmission mechanism is a theoretical inference based on inter-chain interface institutions; its empirical strength awaits case-study testing in typical regions or industries, a point we return to in the conclusion.

Paths of systemic restructuring

Since the three blockages transmit across interfaces and reinforce one another in a low-level equilibrium, restructuring cannot remain confined to repairing any single chain; chain-specific repair and interface bridging must proceed together.

Reshaping the health value chain: toward an integrated, continuous medical–care–rehabilitation service system

In response to rehabilitation breakpoints caused by institutional fragmentation, the deep integration of medical care, elderly care and rehabilitation should be advanced. At the organizational level, diversified models such as “medicine within care,” “care within medicine” and contracted cooperation should continue to be encouraged, and the construction of medical–care consortiums and community-embedded service complexes should be promoted, so that older persons can move continuously among diagnosis, rehabilitation and care within their community radius. According to the National Health Commission, by the end of 2023 China had more than 7,800 integrated medical–care institutions holding medical licenses and having completed care-institution registration, with a total of 2 million beds and 87,000 cooperation agreements between medical institutions and care providers, and four relatively mature service models—contracted cooperation, institutional embedding and service extension among them—had taken shape. Qingdao, which established the country’s first long-term medical care insurance scheme in 2012, now covers about 8.6 million urban and rural participants, effectively easing the predicament in which “institutions cannot provide medical care, hospitals cannot provide custodial care, and families cannot afford to care.” These explorations offer transferable experience for building an integrated and continuous service system. At the mechanism level, two-way referral procedures, cost accounting and benefit-sharing arrangements should be established, with clear referral standards and responsibility-sharing rules to ensure the sustainability of cooperation. At the payment level, the pilot coverage of long-term care insurance should be steadily expanded, and standardized rehabilitation for high-incidence conditions such as stroke should be gradually brought within its scope, so that a sound payment interface pulls the service chain toward closure (Li & Gao, 2025).

Unblocking the financial support chain: a multi-level, targeted supply mechanism for patient capital

In response to the mismatch between a “slow economy” and “fast capital,” patient capital should be cultivated at the levels of instruments, institutions and mechanisms. At the instrument level, for asset-heavy projects, the inclusion of elderly-care facilities in the infrastructure real estate investment trust (REIT) pilot should be steadily advanced: in July 2024 the National Development and Reform Commission’s *Notice on Promoting the Normalized Issuance of Infrastructure REIT Projects* (Document No. 1014) included elderly-care facilities within the issuance scope of publicly offered REITs for the first time, and the January 2025 *Opinions on Deepening the Reform and Development of Elderly-Care Services* issued by the CPC Central Committee and the State Council further endorsed REIT issuance for elderly-care facilities at the top strategic level. Such instruments revitalize stock assets and provide exit channels for early-stage capital. For asset-light small and medium-sized enterprises, pledge financing based on future revenue rights and intellectual property, together with supply-chain finance, should be developed. At the institutional level, policy finance and government-guided funds should play a “probe” function, using fund-of-funds structures to leverage social capital into long-horizon tracks such as rehabilitation technology and smart care (Zhu & Shi, 2024; Yu et al., 2026). At the mechanism level, a closed loop of “old-age wealth reserve—industrial investment—risk control” should be constructed. As noted above, the lesson of the UK pension crisis is that maturity mismatches and weak risk control amplify systemic volatility; long-term funds invested in the silver economy should therefore be subject to independent investment-decision and stress-testing mechanisms, regulatory assessment arrangements

should be optimized, and the appraisal horizons of insurance funds and enterprise annuities should be moderately lengthened, institutionally safeguarding the “patient” attribute of capital (Gao & Huang, 2025).

Activating the technological innovation chain: a demand-oriented, open and collaborative age-friendly technology ecosystem

In response to the misalignment between technology supply and demand, the innovation chain should be rebuilt around demand. In terms of innovation organization, leading enterprises should be supported—through channels such as the National Key Research and Development Program—in jointly building industrial technology-innovation platforms for the silver economy with universities and research institutes, focusing on chokepoint components such as core parts of rehabilitation robots and establishing rapid pilot-testing and commercialization mechanisms. Because the large-scale application of age-friendly technologies ultimately depends on recognition and purchase by payers, health technology assessment (HTA) should be introduced at the evaluation stage, conducting cost-effectiveness analyses of new technologies such as geriatric drugs and intelligent rehabilitation equipment to provide a scientific basis for payment by medical insurance and commercial insurers, thereby connecting technological innovation with the payment interface of the health value chain. For data support, regional smart health-and-elderly-care data platforms should be built, promoting the integration of medical, social-security and civil-affairs data under security and privacy safeguards to support a precise model of “no service without assessment.” In product design, participatory design should be promoted, involving older persons deeply in demand research, prototype testing and interface optimization, so that co-creation mechanisms bridge the digital divide (González et al., 2025).

Bridging the three chains through interface institutions

Beyond chain-specific repairs, interface institutions are needed to link the three chains: payment arrangements such as long-term care insurance and inclusive elderly-care finance can connect the financial chain with the health chain, channeling capital into service scenarios along the payment interface; clinically grounded demand lists and pilot-test bases under medicine–engineering collaboration can connect the health chain with the technology chain, turning service pain points into research topics; and arrangements such as guidance funds and benefit-sharing in technology commercialization can connect the financial chain with the technology chain, allowing patient capital to accompany technologies from the laboratory to the market. Only when the interfaces are unobstructed can “breakpoint repair, blockage clearance and chokepoint opening” generate positive feedback, propelling the system from a low-level equilibrium toward co-evolution.

Policy safeguards: building the institutional foundation for three-chain integration

This section addresses not “how to repair” on the chains but “how to make repair land”: the interface institutions discussed above are mechanisms at the inter-chain level, and their functioning depends on the broader institutional environment. Three sets of safeguards are required.

Strengthening top-level design for cross-departmental coordination

Silver-economy policy spans civil affairs, health, medical insurance, industry and information technology, and financial authorities; fragmented governance by multiple departments easily produces policy fragmentation. An inter-ministerial coordination mechanism for silver-economy development should be operated on a permanent footing, with a clear mandate for cross-cutting domains such as medical–care integration, elderly-care finance and technology standards, together with regular evaluation and dynamic adjustment mechanisms. Japan’s experience of establishing a headquarters for an ageing society at the cabinet level to coordinate departmental policies offers a useful reference for such high-level, institutionalized coordination arrangements (Nelles et al., 2025).

Improving the legal, regulatory and standards system

Revision of the *Law of the People’s Republic of China on the Protection of the Rights and Interests of the Elderly* and its supporting regulations should be accelerated, bringing the rights-and-responsibilities structure of medical–care integration, rehabilitation services and smart elderly care into the legal framework. Germany’s enactment of a dedicated long-term care insurance law in 1994—codified as Book XI of the Social Code, defining service coverage and payment standards and becoming the fifth pillar of its social insurance system—offers a reference for China’s long-term care insurance legislation (Liu, 2021). Meanwhile, led by the standardization authorities, an age-friendly standards system covering products, services, management and data should be developed at pace, filling standard gaps in rehabilitation aids, smart devices and related fields.

Consolidating workforce and data as supporting factors

For the workforce, two-way mobility and mutual recognition of skills between medical staff and care workers should be established; training capacity in geriatric medicine, rehabilitation therapy and long-term care should be expanded; and age-friendly product design should be incorporated into industrial-design education. For data, the rules and boundaries governing the collection, sharing and use of health and elderly-care data should be clarified; data-integration platforms and demonstration scenarios should first be built in pilot regions, and replicable experience should then be generalized nationwide. These factor safeguards, together with the restructuring paths outlined above, constitute the institutional foundation on which three-chain integration can be implemented. The argument has thus completed a full chain of “problem diagnosis—path design—institutional safeguards.”

Conclusion

This paper has addressed a central question: how to understand and resolve the failure of coordination among the health, finance and technology domains in the development of China’s silver economy. The analysis shows that the “breakpoints” of the health value chain, the “blockages” of the financial support chain and the “chokepoints” of the technological innovation chain transmit across the payment, scenario and capital–R&D interfaces, trapping the silver economy in a low-level equilibrium. Systemic

restructuring must therefore proceed through chain-specific repair combined with interface bridging, underpinned by institutional safeguards in cross-departmental coordination, laws and standards, and factor endowments. By shifting the analytical focus from optimizing individual sectors to diagnosing and repairing inter-chain connections, the three-chain integration framework provides an integrative perspective for understanding the systemic predicament of the silver economy and a coherent “problem–path–safeguard” logic for policy design—one that speaks directly to population-ageing scholarship concerned with the sustainability of health and welfare systems and the determinants of healthy ageing.

The study has limitations. First, the three-chain integration framework remains at the level of normative analysis and mechanism interpretation; its explanatory power should be tested through case studies of typical regions or industries. Second, although researchers have begun to measure the coupling coordination between pension finance and the silver economy (Ding et al., 2026), the measurement of integration across the health, finance and technology chains remains a methodological gap; future research could construct an evaluation index system covering factor flows, interface institutions and value co-creation, developing the framework from an interpretive tool into an operational evaluative one. Third, this paper focuses on the three core chains of health, finance and technology, with limited attention to other domains of the silver economy such as age-friendly living environments and cultural consumption; the framework’s boundaries and conditions of applicability warrant further discussion. As the national strategy for actively responding to population ageing advances, the three-chain integration perspective is expected to provide continuing theoretical support and policy reference for the transition of the silver economy from scale expansion to high-quality development.

Declarations

Author Contribution

Su wrote the main manuscript text. Xia reviewed and revised the article and provided suggestions. All authors reviewed the manuscript.

References

1. Chen, G., Ran, X., Liu, F., et al. (2024). Reflections and suggestions on developing the silver economy in response to population ageing. *Strategic Study of CAE*, 26(6), 10–18. [In Chinese]
2. China Internet Network Information Center. (2025). *The 56th statistical report on China’s internet development*. CNNIC. [In Chinese]
3. China National Committee on Aging. (2019). *Research report on elderly consumption and willingness from the demand-side perspective*. [In Chinese]
4. Chinese Society of Neurology, Neurorehabilitation Group of the Chinese Society of Neurology, & Cerebrovascular Disease Group of the Chinese Society of Neurology. (2017). Chinese guidelines for

- early rehabilitation treatment of stroke. *Chinese Journal of Neurology*, 50(6), 405–412. [In Chinese]
5. Ding, G., Xu, J., Liu, L., et al. (2026). Evaluation of the coupling coordination level between pension finance and the silver economy and diagnosis of obstacle factors. *Statistics & Decision*, (15), 159–164. [In Chinese]
 6. Du, P., & Wang, F. (2025). Empowering the development of the silver economy with new quality productive forces. *Social Sciences of Beijing*, (1), 109–119. [In Chinese]
 7. Fu, D., & Lu, Q. (2026). How pension finance boosts silver consumption: An empirical analysis based on China Longitudinal Aging Social Survey data. *Financial Economics Research*, (3), 85–98. [In Chinese]
 8. Gao, R., & Huang, Y. (2025). Insurance funds boosting the development of the silver economy. *China Finance*, (1), 33–35. [In Chinese]
 9. González, L. P., Hidalgo, I. R., et al. (2025). Co-creating an inclusive and comprehensive European digital health literacy strategy. *International Journal of Integrated Care*.
 10. Huang, S., & Hu, Q. (2025). Path optimization for the high-quality development of the silver economy. *Journal of Xinjiang Normal University (Edition of Philosophy and Social Sciences)*, 46(2), 59–69. [In Chinese]
 11. Huang, Y., Zhao, D., Tian, Z., et al. (2025). Constraints, instrument application and implementation paths of financial support for the high-quality development of China's elderly-care industry. *Southwest Finance*, (4), 29–43. [In Chinese]
 12. Institute on Ageing, Fudan University. (2022). *China silver economy development research report*. [In Chinese]
 13. Li, X. (2025). The internal logic and path of pension finance supporting the high-quality development of the silver economy. *Jiangsu Social Sciences*, (2), 152–160. [In Chinese]
 14. Li, Y., & Gao, C. (2025). Policy evolution and optimization strategies for the coordinated development of elderly-care services and the elderly-care industry in China. *Academic Forum*, (2), 81–94. [In Chinese]
 15. Liu, T. (2021). The origin, operation, adjustment and reform of Germany's long-term care insurance system. *Journal of Anhui Normal University (Humanities and Social Sciences)*, 49(1), 74–86. [In Chinese]
 16. McCarthy, M. A., Sorsa, V. P., & van der Zwan, N. (2016). Investment preferences and patient capital: Financing, governance, and regulation in pension fund capitalism. *Socio-Economic Review*, 14(4), 751–769.
 17. National Bureau of Statistics of China. (2024). *Statistical communiqué of the People's Republic of China on the 2023 national economic and social development*. [In Chinese]
 18. National Working Commission on Aging of China. (2008). *Research on urban home-based elderly-care services in China*. [In Chinese]

19. Nelles, J., Tuckerman, L., Purna, N., et al. (2025). Policy responses to the healthy aging challenge: Confronting hybridity with social innovation. *Journal of Aging & Social Policy*.
20. Pu, X., & Liu, C. (2025). China's individual pension scheme: Practice, obstacles and optimization strategies. *Journal of Southwest Minzu University (Humanities and Social Sciences)*, (4), 118–127. [In Chinese]
21. Shen, S., Sun, J., & Liang, S. (2025). The comparative advantages, distinctive value and realization mechanisms of commercial insurance participation in integrated medical and elderly care. *Journal of Northwest University (Philosophy and Social Sciences Edition)*, 55(3), 99–107. [In Chinese]
22. United Nations, Department of Economic and Social Affairs, Population Division. (2022). *World population prospects 2022*. United Nations.
23. Yang, Y., & Liu, Z. (2025). Coordinated development of “industry–finance–consumption” in China's silver economy. *Journal of Hohai University (Philosophy and Social Sciences)*, 27(3), 47–59. [In Chinese]
24. Yu, J., Zhang, J., & Wu, T. (2026). The capital patience gap in the high-quality development of the silver economy: Formation logic, bridging mechanisms and institutional responses. *Journal of Harbin University of Commerce (Social Science Edition)*, (4), 33–41. [In Chinese]
25. Zhu, C., & Shi, X. (2024). Paths for commercial banks to support the high-quality development of the silver economy: A perspective based on the development of the elderly-care industry. *Southwest Finance*, (7), 77–88. [In Chinese]
26. Zhu, W., & Zhou, Y. (2025). China's elderly-care industry finance: Development status, international experience and paths forward. *Southwest Finance*, (1), 3–14. [In Chinese]