

Research Article

Precision Supply Strategies for Empowering the Silver Economy Through Mass Sports for the Elderly

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Abstract

The advent of the silver economy, driven by accelerated population aging, presents new demands and opportunities for the elderly sports consumption market. This study analyzes the consumption characteristics of elderly sports and the causes and manifestations of their demand differentiation using literature review and logical analysis. Findings indicate that elderly sports consumption is characterized by a functional preference, age-based behavioral stratification, health and social motives, and traditional offline channels with regional disparities. Demand differentiation is primarily driven by intergenerational age cohorts, economic foundations, and educational levels, creating a structural contradiction with the current smart sports development trend. To achieve precise supply in the elderly sports consumption market, this paper proposes a multi-faceted strategy. First, strengthen the policy guarantee system to construct a “triple-responsibility coordination” supply ecology involving government guidance, enterprise, and social organization collaboration. Second, establish a data-driven market segmentation system utilizing clustering analysis on integrated databases. Third, focus on customized development of products and services, employing modular design for products and graded service systems. Fourth, optimize channel networks with a “15-minute fitness circle” and establish dynamic feedback mechanisms. These strategies aim to unlock the vast potential of the elderly sports market, foster sustainable development, and support the national strategy for healthy aging.

Keywords

Silver Economy, Mass Sports, Elderly Consumption, Supply Strategy, Precision Supply

1. Introduction

1.1. Research Background

According to data from the National Bureau of Statistics, by the end of 2024, China’s population aged 60 and above had reached 310 million, accounting for 22.0% of the total population. This demographic shift represents both a profound challenge for social security systems and a significant oppor-

tunity for emerging market sectors. The World Health Organization has projected that by 2050, the global population aged 60 years and older will reach 2.1 billion, with China remaining one of the most rapidly aging societies worldwide.

Elderly sports consumption, as an emerging consumer sector, is gradually demonstrating significant market potential. The intersection of aging populations and sports participation creates a unique economic niche that has yet to be fully explored. Unlike general consumer markets, the elderly sports

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market is characterized by distinct physiological, psychological, and social determinants that influence consumption behavior. Understanding these determinants is crucial for developing effective supply strategies.

In January 2024, the General Office of the State Council issued the "Opinions on Developing the Silver Economy to Enhance the Welfare of the Elderly", noting that China's silver economy still suffers from issues such as insufficient total volume, suboptimal quality, and poor efficiency [1]. This policy document represents the first comprehensive national framework specifically addressing silver economy development, signaling the Chinese government's commitment to harnessing the economic potential of population aging.

1.2. Literature Review

The academic literature on elderly sports consumption has evolved along several intersecting trajectories. Internationally, research on aging and physical activity has traditionally focused on health outcomes, with studies demonstrating that regular physical activity reduces the risk of chronic diseases, improves mental health, and enhances quality of life among older adults. However, the economic dimensions of elderly sports participation have received comparatively less attention.

In the Chinese context, scholars have begun to examine the structural characteristics of the elderly sports market. Research by Sun and Li [2] identified multiple barriers to releasing the consumption potential of elderly sports tourism, including product design deficiencies, information asymmetry, and inadequate service infrastructure. Their work highlighted the need for supply-side reforms tailored to elderly consumers' specific needs.

Liu and Luo [3] explored how digital economy paradigms might facilitate elderly sports consumption upgrades. They argued that technological interventions, including wearable devices and online fitness platforms, could bridge existing gaps in service delivery. However, they also noted significant digital literacy disparities among older populations that may impede adoption.

Despite these contributions, current research exhibits several limitations. First, most studies adopt a relatively narrow disciplinary perspective, focusing either on health outcomes or market characteristics without integrating both domains. Second, empirical investigations of elderly sports consumption behavior remain limited, with many conclusions derived from theoretical deduction rather than systematic data analysis. Third, the articulation between demand-side characteristics and supply-side strategies requires further elaboration. This study aims to address these gaps by developing an integrated framework for precision supply in the elderly sports market.

1.3. Research Objectives and Significance

Based on the identified research gaps, this study has three

primary objectives. First, to systematically characterize elderly sports consumption patterns and identify the key drivers of demand differentiation. Second, to analyze the structural factors contributing to current supply-demand mismatches in the elderly sports market. Third, to propose a multi-dimensional precision supply strategy framework that can guide policy development and business practices.

The significance of this research is threefold. Theoretically, it contributes to the emerging literature on silver economy development by integrating insights from sports economics, consumer behavior, and aging studies. Practically, it provides actionable recommendations for enterprises seeking to enter or expand within the elderly sports market. From a policy perspective, it offers evidence-based guidance for government efforts to promote healthy aging through sports participation.

2. Research Methods

2.1. Study Design

This study employs a qualitative research design combining systematic literature review and logical analysis. This approach is appropriate for exploratory research aimed at theory development and strategy formulation, particularly when empirical data collection is constrained by the emerging nature of the research domain.

2.2. Literature Review Procedure

The literature review followed a systematic process. First, we identified relevant academic databases, including China National Knowledge Infrastructure (CNKI), Web of Science, and Google Scholar [4]. Search terms included combinations of "silver economy," "elderly consumption," "sports consumption," "aging population," and "supply strategy" in both Chinese and English.

Inclusion criteria were: (a) peer-reviewed journal articles or official policy documents, (b) publication date between 2014 and 2024, (c) direct relevance to elderly sports consumption or silver economy development, and (d) availability of full text. Exclusion criteria were: (a) conference abstracts without full papers, (b) non-English or non-Chinese publications, and (c) studies focused exclusively on clinical aspects of aging without economic or behavioral components.

The initial search yielded 347 potentially relevant documents. After removing duplicates and applying inclusion criteria, 82 documents were retained for full-text review. Key policy documents from Chinese government sources, including the State Council and the General Administration of Sport, were also analyzed.

2.3. Logical Analysis Approach

The logical analysis method was applied to synthesize findings

and develop the precision supply framework. This approach involves several analytical steps: (a) decomposing the research problem into constituent elements, (b) identifying causal relationships between demographic, economic, and educational factors and consumption patterns, (c) examining the logical consistency of proposed relationships, and (d) synthesizing individual findings into a coherent theoretical framework.

The analysis was conducted iteratively, with emerging themes being continuously refined and validated against the literature. To enhance analytical rigor, we employed investigator triangulation, with multiple research team members reviewing coding decisions and framework development.

2.4. Limitations of the Methodological Approach

Several methodological limitations should be acknowledged. The reliance on existing literature means that findings reflect the scope and quality of available research. The absence of primary empirical data limits our ability to test causal relationships directly. Future research should complement this qualitative analysis with quantitative studies, including surveys and experimental designs, to validate the proposed framework empirically.

3. Results: Characteristics and Differentiation of Elderly Sports Consumption

3.1. Macro-Level Context: The Development of the Silver Economy

The concept of the “silver economy” originated in Japan during the 1970s, emerging in response to that country’s rapidly aging population. The term gained international currency through the work of the European Commission, which defined the silver economy as the economic opportunities arising from public expenditure on aging populations and the specific consumer demand of older people.

China’s engagement with the silver economy concept began later. The 2017 “Guidelines on Conducting Quality Improvement Actions”, jointly issued by the Central Committee of the Communist Party of China and the State Council, first mentioned the need to “increase the supply of products for the ‘silver economy’ group and the disabled group” [5]. However, comprehensive policy articulation only occurred with the 2024 State Council Opinions, which explicitly expanded the connotation of the “silver economy” to encompass “economic activities providing products or services to older adults, as well as preparations for the aging stage”.

The timing of this policy development reflects China’s demographic transition. While the population aged 60 and above has reached 310 million, the “young-old” segment (aged 60-

69) constitutes the largest proportion. This group differs significantly from previous elderly cohorts in terms of educational attainment, economic resources, and health status, creating new market opportunities.

3.2. Characteristics of Elderly Sports Consumption

Against the backdrop of the rapidly developing silver economy, elderly sports consumption exhibits several distinct characteristics that differentiate it from general sports consumption or other elderly consumption domains.

3.2.1. Functional Preference in Consumption Structure

First, regarding consumption structure, there is a clear functional preference. Elderly consumers place greater emphasis on the practical value of sports products, prioritizing health outcomes, safety features, and ease of use over aesthetic considerations or brand prestige. This functional orientation manifests in product selection, with items such as blood pressure monitors during exercise, joint-supportive footwear, and fall-prevention equipment being prioritized over fashionable athletic wear or premium gym memberships [6].

The functional preference extends to service consumption as well. Elderly consumers demonstrate higher willingness to pay for services with demonstrable health benefits, including rehabilitation guidance, chronic disease management through exercise, and personalized fitness programming. Services perceived as purely recreational or entertainment-oriented receive comparatively lower valuation.

3.2.2. Age-Based Behavioral Stratification

Second, in consumption behavior, significant age-based stratification exists. The three subgroups identified in the demographic literature—young-old (60-69 years), middle-old (70-79 years), and oldest-old (80+ years)—exhibit systematically different consumption patterns [7].

The young-old segment, comprising individuals in early retirement with relatively preserved physical function and higher disposable income, demonstrates the most diverse consumption portfolio. This group spends on fitness guidance services, public sports facilities, travel-related sports activities, and increasingly, smart fitness devices. They are also the most likely to adopt new sports consumption models, including online fitness classes and app-based activity tracking.

The middle-old segment shows spending concentrated on fitness guidance services and public sports services, with reduced expenditure on travel-related activities and lower adoption rates for digital solutions. The oldest-old segment primarily consumes low-intensity activities, often provided through community-based programs, with spending focused on maintenance of function rather than performance improvement.

3.2.3. Health, Social, and Psychological Motivations

Third, concerning consumption motivation, three primary drivers are identifiable. Health maintenance represents the most frequently cited motivation, with elderly consumers viewing sports participation as an investment in physical well-being and disease prevention. This health orientation is reinforced by medical advice and growing public awareness of the relationship between physical activity and healthy aging.

Social needs constitute the second major motivational cluster. For many elderly individuals, particularly those living alone or in retirement communities, sports activities provide structured opportunities for social interaction. Team activities, walking groups, and senior fitness classes serve dual functions of exercise and social engagement, with the social dimension sometimes being the primary driver of participation.

Psychological regulation represents the third motivational category. Sports participation contributes to mental health through multiple pathways, including the physiological effects of exercise on mood, the sense of accomplishment from skill development, and the distraction from daily stressors. For elderly individuals experiencing life transitions such as bereavement or role loss, sports activities can provide meaning and structure.

3.2.4. Channel Preferences and Regional Disparities

Fourth, in terms of consumption channels, offline physical stores remain the main avenue for product purchases. Despite the rapid growth of e-commerce in China, elderly consumers demonstrate strong preferences for physical channels that allow product inspection, fitting, and immediate acquisition. Trust in online platforms remains lower among this demographic, with concerns about product quality, return processes, and payment security acting as barriers to digital channel adoption.

Notable regional consumption disparities exist between the eastern and western parts of the country. Eastern provinces, with higher GDP per capita, more developed public sports infrastructure, and greater availability of commercial sports services, show significantly higher per capita elderly sports expenditure. Western regions face supply-side constraints, including limited product availability, fewer specialized service providers, and lower public investment in age-appropriate sports facilities.

3.3. Differentiated Demand Analysis

In the silver economy era, the demand for elderly sports consumption shows significant differentiation, resulting from multiple interacting factors. Understanding the sources of this differentiation is essential for developing precision supply strategies.

3.3.1. Intergenerational Age Cohort Differentiation

From a social demographic perspective, China's elderly population is vast with considerable intergenerational stratification. The three subgroups-young-old (60-69 years), middle-old (70-79 years), and oldest-old (80+ years)-show gradient

differences in physiological function, economic capacity, and generational experience.

Physiological differences manifest in activity preferences and intensity tolerance. The young-old segment can participate in a wide range of activities, including walking, swimming, badminton, table tennis, and gym-based strength training. The middle-old segment shows declining participation in high-impact activities and increasing engagement with walking, Tai Chi, and chair-based exercises. The oldest-old segment is largely limited to very low-intensity activities, with walking and gentle stretching being the most common.

The decline in motor ability directly leads to differentiation in the choice of sports consumption items. Equipment needs shift from performance-oriented products (e.g., running shoes, rackets) to safety-oriented products (e.g., non-slip footwear, joint supports, fall-detection devices). Service needs shift from skill instruction to functional maintenance and rehabilitation support [8].

3.3.2. Economic Foundation Differentiation

Differences in economic foundation constitute the material basis for demand differentiation. According to the main statistical data from the Ministry of Human Resources and Social Security for 2024 (January-December), China's expenditure on urban employee basic pension insurance was 6,755.48 billion yuan, while expenditure on basic pension insurance for urban and rural residents was only 532.18 billion yuan. This tenfold difference reflects the substantial income gap between urban employed retirees and rural residents.

High-income groups, typically comprising urban retirees with occupational pensions and personal savings, tend to purchase smart fitness equipment and professional sports rehabilitation services. Their consumption is characterized by brand awareness, quality sensitivity, and willingness to pay for premium features. They are also more likely to engage in sports-related travel and pursue specialized activities requiring equipment investment.

Middle-income groups, including many urban retirees without supplementary pensions, more often choose public sports facilities and basic fitness equipment. Their consumption is value-oriented, seeking adequate quality at affordable prices. They demonstrate high price sensitivity and are responsive to subsidies and promotional offers.

Low-income groups, disproportionately represented among rural elderly and those without formal employment histories, have extremely limited discretionary spending capacity. Their sports consumption is largely confined to free or highly subsidized public services, with minimal expenditure on equipment or fee-based services.

3.3.3. Educational Attainment Differentiation

Education level also deepens the differentiation in sports consumption. Elderly individuals with higher education levels are more receptive to new consumption models like the integration of sports and medicine. They understand the evidence base for

exercise prescriptions, can evaluate competing product claims, and actively seek information about optimal activity patterns.

In contrast, traditionally oriented elderly groups rely more on experiential fitness methods, including informal walking groups, community-based Tai Chi, and self-directed stretching. While these activities have value, they may not represent optimal exercise prescriptions for specific health conditions, and participants may miss opportunities for progression or injury prevention.

Simultaneously, this difference is reflected in the “digital divide”, where digital sports consumption among the elderly is more concentrated among urban, highly educated groups, while the majority remain in the traditional physical consumption stage, creating a structural contradiction with the smart sports development trend [2]. This digital divide has multiple dimensions, including access to devices and internet connectivity, digital literacy for navigating apps and platforms, and trust in digital payment systems.

3.4. Current Supply-Demand Mismatches

The differentiated demand patterns described above are poorly matched by current supply arrangements. Several systematic mismatches can be identified.

First, product design often fails to accommodate age-related functional limitations. Standard sports equipment may be difficult to use for individuals with arthritis, reduced grip strength, or balance impairments. Packaging and instructions may assume levels of visual acuity and literacy that cannot be assumed across the elderly population.

Second, service delivery models assume mobility and technological access that not all elderly consumers possess. Fitness classes offered exclusively through app-based booking systems exclude those without smartphones. Facilities located in commercial areas may be inaccessible to those relying on public transportation.

Third, pricing models often fail to account for the income heterogeneity within the elderly population. Premium products and services targeted at affluent retirees leave middle- and low-income groups underserved, while low-cost public provisions may fail to meet the quality expectations of higher-income consumers.

Fourth, information asymmetry between suppliers and elderly consumers impedes efficient market functioning. Elderly consumers may lack the knowledge to evaluate product claims or compare alternatives, while suppliers lack accurate data on consumer preferences and constraints [9].

4. Discussion: Construction of a Precision Supply Strategy

4.1. Theoretical Basis of the Precision Supply Strategy

The precision supply strategy proposed in this paper draws

on multiple theoretical traditions, each contributing distinct insights applicable to the elderly sports consumption context.

4.1.1. Sociology of Aging Framework

The sociology of aging theory clarifies the supply logic from the dimension of social participation. This perspective views aging not merely as biological decline but as a socially constructed process shaped by opportunities for engagement. Elderly sports consumption is essentially a process for the elderly to reconstruct social interaction.

Empirical research has demonstrated that elderly people participating in sports clubs have stronger social support networks than non-participants. These networks provide emotional support, practical assistance, and information sharing, all of which contribute to wellbeing and may reduce demand for formal health and social services. Cross-generational sports course settings allow more elderly consumers to rebuild social connections through physical activity, addressing the social isolation that affects a significant proportion of older adults [10].

The social participation perspective suggests that supply strategies should prioritize activities and settings that facilitate social interaction. Group activities, intergenerational programs, and community-based delivery models may yield greater engagement and satisfaction than individual, facility-based options.

4.1.2. Consumer Behavior Theory

In consumer behavior theory, elderly sports consumption increasingly links product functions with psychological outcomes, realizing the unique value pathway of sports. Unlike many consumer goods where value derives primarily from functional performance, sports products and services generate value through both functional and psychological mechanisms.

The functional value pathway operates through objective outcomes: improved cardiovascular health, increased strength and flexibility, weight management, and reduced disease risk. The psychological value pathway operates through subjective experiences: enjoyment of movement, sense of mastery, stress reduction, and social connection [11].

This value hierarchy requires suppliers to establish a precise matching mechanism across three levels: product quality, service design, and marketing communication. At the product quality level, functional attributes must be optimized for elderly users' specific needs and constraints. At the service design level, delivery mechanisms must accommodate varying physical and cognitive capabilities. At the marketing communication level, messages must resonate with elderly consumers' values and aspirations while avoiding stereotypes or patronizing tones.

4.1.3. Precision Supply Paradigm

The precision supply paradigm, adapted from precision medicine and precision marketing concepts, emphasizes the alignment of supply characteristics with specific consumer

segments rather than one-size-fits-all approaches. In the elderly sports context, precision supply requires:

- 1) Accurate segmentation of the elderly population on dimensions relevant to sports consumption
- 2) Detailed characterization of each segment's needs, preferences, and constraints
- 3) Design of products and services tailored to segment-specific profiles
- 4) Targeted distribution and communication strategies for each segment
- 5) Continuous feedback and adaptation mechanisms

The precision approach contrasts with traditional mass-market strategies that assume homogeneous consumer preferences. Given the substantial heterogeneity documented in the results section, precision supply is not merely beneficial but necessary for efficient market functioning [12].

4.2. Implementation Pathways for the Precision Supply Strategy

4.2.1. Strengthen the Policy Guarantee System

Construct a "government guidance - enterprise - social organization coordination" triple-responsibility supply ecology. This framework recognizes that no single actor can address all dimensions of the supply challenge; rather, coordinated action across sectors is required.

Government guidance encompasses several functions. First, regulatory functions include establishing and enforcing quality standards for elderly sports products. Improve the national standard system for elderly sports products, focusing on developing aging-appropriate product certification standards to ensure product quality and safety. Second, financing functions include direct provision of public goods (e.g., community sports facilities) and subsidies for services with positive externalities. Third, coordination functions include convening stakeholders, sharing data, and resolving collective action problems.

Regarding financial support, explore establishing a "negative list" system for special consumption subsidies. Under this approach, subsidies would be available for all elderly sports products and services except those explicitly excluded, simplifying administration and ensuring broad coverage. Implementing value-added tax incentives for strategic categories like smart fitness equipment would reduce corporate costs and promote product innovation.

Enterprise responsibilities include product development, service delivery, and customer engagement. Enterprises must invest in research and development to create age-appropriate products, train staff in elderly service competencies, and develop marketing approaches that reach elderly consumers effectively.

Social organization coordination involves leveraging existing community-based organizations, elderly associations, and

non-profits. These organizations have established trust relationships with elderly populations and can facilitate program delivery, needs assessment, and feedback collection at lower cost than government or commercial entities [13].

4.2.2. Establish a Data-Driven Market Segmentation System

Integrate the elderly population database from civil affairs departments, consumer behavior data from commercial institutions, and community health records. Currently, these data sources exist in silos, limiting their utility for market analysis. Data integration, conducted with appropriate privacy safeguards, would enable much richer characterization of consumer segments.

Use cluster analysis methods to divide consumers into three groups: basic-needs, improvement-needs, and enjoyment-needs [3]. The basic-needs segment comprises elderly individuals with limited economic resources and potentially higher functional limitations. Their primary requirement is access to safe, affordable basic sports activities. Supply for this segment should focus on public provision, subsidies, and low-cost community programs.

The improvement-needs segment includes those with moderate resources who seek to enhance their health and fitness beyond basic levels. This group is willing to pay for quality improvements but remains price-sensitive. Supply for this segment should offer value-oriented options that balance quality and affordability.

The enjoyment-needs segment comprises affluent, often younger, elderly consumers who view sports as both health investment and lifestyle enhancement. This group is willing to pay premium prices for superior products, personalized services, and novel experiences. Supply for this segment can include premium equipment, specialized training, and sports tourism packages [14].

Rely on the Elderly Sports Association to accurately identify groups purchasing basic products, price-sensitive improvement seekers, and smart product early adopters. This helps enterprises and related institutions better grasp the consumption characteristics and demand tendencies of different age cohorts, enabling more targeted marketing strategies and product service plans.

4.2.3. Focus on Customized Development of Products and Services

Construct a differentiated supply model based on demand elasticity theory. Demand elasticity—the responsiveness of quantity demanded to price changes—varies systematically across elderly consumer segments and product categories. Basic-needs products serving essential functions show low demand elasticity, while enjoyment-oriented products show higher elasticity.

For sports health products, adopt a modular design strategy. Keep the basic model functionally simplified and affordable

to meet the needs of price-sensitive elderly consumers. The basic model should include core safety and functionality features while omitting premium enhancements that drive up cost.

The upgraded model can integrate smart modules such as heart rate monitoring and fall warning to meet the needs of those with higher health monitoring demands. Smart features should be designed with age-appropriate interfaces: large buttons, clear displays, voice operation options, and simple navigation. Fall warning systems, in particular, address a critical safety concern for elderly users and their families.

For service provision, design a graded service system using the service blueprint method. Service blueprinting maps the service delivery process from customer initiation through completion, identifying touchpoints, backend processes, and potential failure points.

Level one services are basic, low-cost offerings suitable for mass provision. Community primary fitness guidance services can be provided through government procurement, ensuring elderly groups can access basic fitness guidance at a lower cost. These services may include group exercise classes, walking programs, and basic fitness assessments.

Level two services are intermediate offerings with moderate customization. Examples include small-group training, specialized programs for specific health conditions (e.g., diabetes, hypertension, arthritis), and access to fitness facilities with age-appropriate equipment.

Level three services are premium, highly personalized offerings. These include one-on-one personal training with specialists in aging and exercise, comprehensive fitness and rehabilitation programs integrated with medical care, and home-based services for those with mobility limitations [15].

4.2.4. Optimize Channel Networks and Dynamic Feedback Mechanisms

Build a three-dimensional supply network featuring a “15-minute fitness circle”. This concept, adapted from urban planning principles, aims to ensure that all elderly residents can access basic sports facilities within 15 minutes of walking distance from their homes. Achieving this goal requires strategic facility placement, addressing both geographic coverage and facility accessibility.

For physical channels, adopt a combined layout of “community-embedded service points + regional experience centers” to increase the frequency of elderly users' participation in sports consumption and facilitate their nearby participation in sports activities.

Community-embedded service points are small-scale facilities located within residential areas, offering basic equipment, group activity space, and information about local sports opportunities. These points should be integrated with existing community service infrastructure, including community health centers and elderly activity centers.

Regional experience centers are larger facilities serving multiple communities, offering a wider range of equipment, specialized programs, and opportunities to try products before

purchase. These centers can also serve as training hubs for community instructors and demonstration sites for new products.

Digital channels should be developed alongside physical channels, with attention to accessibility barriers. Simplified apps, voice-activated interfaces, and telephone-based alternatives can ensure that elderly consumers without smartphone proficiency are not excluded. Cross-channel integration, such as online booking for in-person activities and home delivery of online purchases, can provide convenience while maintaining human contact.

Establish a supply quality evaluation system that includes core indicators such as service satisfaction, product repurchase rate, and complaint response speed. These indicators should be tracked continuously rather than measured periodically, enabling rapid identification of problems.

Service satisfaction should be measured through standardized surveys administered at point of service delivery or shortly thereafter. Questionnaires should use simple language, large print, and response formats that are easy for elderly respondents to complete.

Product repurchase rate serves as a revealed preference measure of quality and value. Low repurchase rates signal problems requiring investigation, which may relate to product durability, effectiveness, or customer service.

Complaint response speed measures organizational responsiveness to customer problems. Given elderly consumers' potential vulnerability, rapid and effective complaint resolution is particularly important for maintaining trust and preventing harm.

Establish a dynamic adjustment mechanism to ensure the precision supply strategy achieves good results across different regions. This mechanism should include regular review cycles, typically quarterly or semi-annually, during which performance data is analyzed and strategy adjustments are proposed. Adjustments may include product modifications, pricing changes, channel reconfigurations, or service redesigns.

Regional variation in implementation should be expected and accommodated. Eastern regions with more developed markets and infrastructure may focus on upgrading and diversifying supply, while western regions may prioritize establishing basic access. The dynamic adjustment mechanism should permit regional customization while maintaining core principles and performance standards.

5. Practical Implications and Policy Recommendations

5.1. Implications for Enterprises

For enterprises operating in or considering entry to the elderly sports market, several practical implications follow from the analysis.

First, market segmentation should be the starting point for

strategy development. The heterogeneity documented in this study means that undifferentiated approaches are unlikely to succeed. Enterprises should select target segments based on their capabilities and competitive positioning, then develop tailored value propositions.

Second, product development should prioritize functional performance and safety over aesthetic or status attributes. Elderly consumers' functional orientation means that investments in user-centered design, including ergonomic considerations, clear instructions, and durability, will yield higher returns than investments in branding or fashion.

Third, channel strategy should recognize elderly consumers' preferences for physical channels while building digital capabilities for those segments ready to adopt them. Omnichannel approaches that integrate physical and digital touchpoints may be optimal, but the physical component remains essential.

Fourth, pricing should account for the substantial income heterogeneity within the elderly population. Tiered pricing models, subsidies for low-income consumers cross-subsidized by premium offerings to higher-income consumers, may allow enterprises to serve multiple segments profitably.

5.2. Implications for Policymakers

For government policymakers at national and local levels, the analysis suggests several priority actions.

First, data infrastructure investments are needed to enable the market segmentation approach proposed in this study. Integrating administrative data on elderly populations with consumer data would require legal frameworks for data sharing, privacy protection, and data quality assurance.

Second, public investment in community-based facilities and programs should continue and be targeted to areas with greatest need. The "15-minute fitness circle" concept provides a useful planning framework, but implementation requires site identification, funding, and operational arrangements.

Third, regulatory frameworks for product safety and quality should be strengthened, particularly for smart products and services where elderly consumers may lack the expertise to evaluate claims independently. Third-party certification programs could help address information asymmetry.

Fourth, cross-sector coordination mechanisms should be established to align the efforts of government, enterprises, and social organizations. The triple-responsibility framework proposed in this study provides conceptual guidance, but operational mechanisms for coordination must be developed locally.

5.3. Implications for Social Organizations

For social organizations, including elderly associations, community groups, and non-profits, the analysis suggests important roles in several areas.

First, organizations can serve as intermediaries between elderly consumers and commercial suppliers, providing needs

assessment, consumer education, and feedback collection. Their trusted position within communities makes them valuable partners for both government and enterprise.

Second, organizations can directly deliver services, particularly basic-level programs for which commercial provision may not be profitable. Government procurement from social organizations can achieve public goals while leveraging organizations' community connections and volunteer resources.

Third, organizations can advocate for elderly consumer interests, ensuring that the development of the sports market serves elderly wellbeing rather than merely extracting consumer surplus. Advocacy functions include participating in standard-setting processes, monitoring market practices, and raising concerns with regulators.

6. Conclusions

6.1. Summary of Main Findings

This study has systematically analyzed the characteristics, differentiation patterns, and supply challenges of elderly sports consumption in China's rapidly developing silver economy. Several main findings emerge from the analysis.

First, elderly sports consumption exhibits distinct characteristics including functional preference, age-based behavioral stratification, multiple motivational drivers (health, social, psychological), and traditional channel preferences with regional disparities. These characteristics differentiate the elderly sports market from both general sports consumption and other elderly consumption domains.

Second, demand differentiation is substantial and systematic, driven by intergenerational age cohorts, economic foundations, and educational attainment. The young-old, middle-old, and oldest-old segments show systematically different physiological capabilities, consumption patterns, and product preferences. Economic disparities between urban employed retirees and rural residents create a tenfold difference in pension income, reflected in divergent consumption portfolios. Educational differences shape receptivity to new consumption models and digital solutions, creating a structural contradiction with smart sports development trends.

Third, current supply arrangements poorly match differentiated demand patterns, resulting in systematic mismatches in product design, service delivery, pricing, and information provision. These mismatches represent both market failures requiring policy intervention and market opportunities for enterprising suppliers.

Fourth, precision supply strategies addressing these mismatches can be organized around four implementation pathways: strengthening policy guarantee systems with triple-responsibility coordination, establishing data-driven market segmentation systems, focusing on customized product and service development, and optimizing channel networks with dynamic feedback mechanisms.

6.2. Theoretical Contributions

This study makes several theoretical contributions to the literature on sports economics, consumer behavior, and aging studies.

First, it develops an integrated framework for analyzing elderly sports consumption that bridges previously separate literatures on aging, physical activity, and consumer behavior. This framework can guide future research by identifying key variables and relationships requiring empirical investigation.

Second, it extends the precision supply paradigm to the elderly sports context, demonstrating how segmentation, targeting, and positioning concepts from marketing can be adapted to address the specific characteristics of elderly consumers and sports products.

Third, it identifies the triple-responsibility coordination model as a framework for analyzing mixed economies of welfare in the sports domain, complementing existing literature on public-private partnerships and social enterprise.

6.3. Limitations and Future Research Directions

Several limitations of this study should be acknowledged, each suggesting directions for future research.

First, the study is conceptual and qualitative, based on literature review and logical analysis rather than primary empirical data. Future research should complement these findings with quantitative studies, including large-scale surveys of elderly sports consumption behavior, experimental studies of product and service design features, and econometric analyses of consumption determinants.

Second, the study focuses on China, which has specific demographic, economic, and institutional characteristics. The generalizability of findings to other national contexts requires investigation through comparative research across countries with different aging trajectories, welfare regimes, and sports systems.

Third, the study is cross-sectional rather than longitudinal. Elderly sports consumption patterns may change over time as cohorts age and as market conditions evolve. Longitudinal research tracking consumption patterns over time would provide insights into these dynamics.

Fourth, the study focuses on demand-side characteristics and supply strategies, with less attention to the institutional and organizational factors shaping supply. Future research should examine the behavior of firms in this market, including entry decisions, competitive strategies, and innovation patterns.

6.4. Concluding Remarks

The elderly sports consumption market in China currently holds enormous development potential but also faces numerous challenges. The demographic tailwind of population aging

creates a growing potential market, but realizing this potential requires addressing the supply-demand mismatches documented in this study.

The development of this market requires the joint efforts of government, enterprises, and all sectors of society. No single actor can address all dimensions of the supply challenge. Government must provide policy frameworks, public goods, and coordination mechanisms. Enterprises must invest in product development, service design, and customer engagement. Social organizations must facilitate connections, provide services, and advocate for consumer interests.

By precisely grasping the differentiated needs of the elderly population, continuously optimizing supply strategies, and improving the policy support system, we can promote the sustainable development of the elderly sports consumption market and inject new vitality into the prosperity of China's silver economy. The precision supply strategies proposed in this study provide a roadmap for achieving these goals, but successful implementation will require sustained commitment from all stakeholders and continuous learning from experience.

Author Contributions

Zhaojun Li is the sole author. The author read and approved the final manuscript.

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Conflicts of Interest

The author declares no conflicts of interest.

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