Article

Research on Competitiveness of China's Social Commerce Enterprises Based on Macro- and Micro-Niche

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Abstract: Imbalance of development and resources allocation can emerge during the rapid expansion of social commerce enterprises, which significantly reduces their competitiveness and sustainability. In this paper, we put forward the concept of social commerce ecosystem and propose a model composed of macro-niche and micro-niche to empirically analyze the performance of different social commerce enterprises in China. The results show that: (1) The social sharing e-commerce sub-industry is a monopoly market while the social retail e-commerce sub-industry tends to be a perfectly competitive market; (2) Compared with using only macro-niche or micro-niche, our model shows a more comprehensive insight of enterprise competitiveness, which provides a better niche evaluation for other industries.

Keywords: social commerce; enterprise competitiveness; niche breadth; niche fitness; niche overlap; entropy weight method

1. Introduction

In the new round of digital transformation, the social characteristics of network information ecology and e-commerce ecological evolution drive the vigorous development of social commerce [1,2]. The social commerce industry is a branch of the e-commerce industry, a new type of e-commerce model that reflects the social value in network socialization. Specifically, it refers to the business activities based on social network service or tools including community, social network and other social media software [3]. In 2019, China's social commerce became the fastest-growing part of e-commerce, with an overall scale of more than 2 trillion yuan (an increase of 63.2%), accounting for more than 20% of online retail and 71% of penetration rate [4]. Besides, many giant enterprises have developed social commerce, such as Alibaba's new app "Taoxiaopu", Jingdong's new independent social commerce platform "Jingxi", TikTok's new social commerce function, and so on. Social commerce has become one of the frontier business models of the digital economy that drives future business and economic prosperity [5,6]. However, many enterprises have rushed for the exit since November 2019. Especially, more than 500 social commerce platforms in Guangzhou and Yiwu closed down in 2020 [7,8]. The main reasons are the fierce competition, fast iteration of the business model and overwhelming flow advantage of giant enterprises. Meanwhile, many social commerce enterprises have problems in the process of rapid expansion, such as unbalanced development and resource allocation [9]. These problems significantly affect the competitiveness and sustainable development of social commerce enterprises, which makes the whole industry a relatively unstable state. Therefore, in order to solve these development problems and improve survivability, it is imperative to evaluate the entire social commerce ecosystem.

The literature on social commerce mainly focuses on the following three aspects: The first is on the business model of social commerce, studying the innovative applications of the business process, co-design and value creation, which are different from traditional e-commerce [10–13]. The business model innovation combined with the practical application has spawned many successful cases, such as Pinduoduo, which focuses on low-quality and low-cost products and provides massive subsidies [14,15] and Mogu, which attaches importance to user content sharing on women's wear [16]. The second is research on consumer behavior in social commerce, involving intentions and behaviors of adopting, using, buying, sharing and trusting on the social e-commerce platform [17–22]. On this basis, it provides guidance and suggestions for social commerce marketing. Besides, due to the natural communication advantage of social commerce, research on information dissemination in social commerce has also attracted much attention [23–25]. It is found that there are few studies on the competition of social commerce enterprises, and most of them focus on the competition game strategy [26,27], while no research focuses on the entire social commerce ecosystem. In the future, network and ecosystem perspectives will be the new entry points for the research on the three aspects above, such as optimization of social commerce service process network from the perspective of process mining [28], customer value flow from the perspective of consumer network [29] and the distribution of interests from the perspective of stakeholder network [30,31].

By reviewing the literature on enterprise niche, we find that some scholars have studied the enterprise niche mostly by case analysis [32,33], or simulated the development of niche elements in the way of co-evolution [34–36], without involving numerical measurement. The measurement of enterprise niche mainly involves niche value and niche breadth, niche fitness and niche overlap, which are used to analyze the survivability of enterprises [37,38], the rationality of enterprise resource allocation [39], and the degree of market competition [40] respectively. Based on niche evaluation, many enterprise competition strategies have been put forward, such as the niche integration strategy of two cross-industries after the deep competition and cooperation [41], the co-evolution balance strategy based on capital allocation efficiency and financing niche [35], four optimization strategies for different evolution stages of niche separation, niche expansion, niche selection, and niche alliance [36]. Scholars' understanding of enterprise niche can be divided into macro and micro. The macro-niche represents the resource combination that the enterprise population relies on to survive in the competition with other groups [42], and thus can be used to judge the immediate environment for the survival and development of the enterprise. The micro-niche represents the resources and production capacity needed for the existence and development of the enterprise individual, so it can be used to analyze all the extension behaviors of the enterprise [43]. It is found that, at present, the relevant research on enterprise niche is generally from the perspective of only macro-niche or micro-niche, and the research content only involves one or two of niche value, niche breadth, niche fitness, and niche overlap. However, since there may be different insights from the perspectives of macro-niche and micro-niche, single niche evaluation can cause the one-side conclusion of the enterprise performance. Therefore, this paper instead considers both macro and micro perspectives and includes four parts of content: niche value, niche breadth, niche fitness and niche overlap, as shown in Table 1.

Table 1. Research perspective and content of enterprise niche measurement.

Representative Scholar	Research Perspective		Research Content				Application Area
	Macro-Niche	Micro-Niche	Niche Value	Niche Breadth	Niche Fitness	Niche Overlap	
Wang [35]		√		√			Energy vehicle
Zhang [37]		√	√				E-commerce
Zhao and Ling [38]		√	√				Wind turbine
Qian [40]	√			√		√	Port
Shi [44]		√	√				Home appliance
Zhu [45]		√		√	√		Logistics
Chen [46]		√		√			Tourism
Yang [47]	√		√	√		√	Technology innovation
Zhao and Xu [48]		√		√		√	International construction contracting
Peng [49]		√	√				Green technology
This paper	√	√	√	√	√	√	Social commerce

We believe that niche theory is very suitable for the evaluation of social commerce for the following reasons: Firstly, the digital service platform connects many stakeholders and thus is a complex ecosystem [50], and social commerce is a digital platform with service as the core to reflect social value. Secondly, there are sub-industries with significant differences in business models in the social commerce industry and these enterprise groups conform to the concept of population in ecology [51]. In addition, future research trends in the field of value co-creation mainly include the construction of business ecosystem framework and the enterprise niche [52]. As the core research field of value co-creation, social commerce is fully applicable to the prediction. Furthermore, some previous scholars have studied the enterprise niche of e-commerce platform [37]. Therefore, it is appropriate to construct the social commerce ecosystem and evaluate the enterprise niche. At the same time, we put forward the following two research questions:

1. How is the competitive performance of enterprise roles (macro-niche) and their leading enterprises (micro-niche) in the social commerce ecosystem?
2. What is the difference between macro-niche and micro-niche of social commerce enterprises? Could the combination of macro-niche and micro-niche evaluation be better than the single niche evaluation?

Through the combination of macro-niche and micro-niche, we expect to discover some interesting "contradictory phenomena", and try to explore the industry essence that has not been paid attention to.

The main contributions of this paper are that we put forward the concept of social commerce ecosystem, propose a model composed of macro-niche and micro-niche to comprehensively evaluate the social commerce ecosystem, and present the comparison between our model and the single niche evaluation. The results show that the social sharing e-commerce sub-industry is a monopoly market while the social retail e-commerce sub-industry tends to be a perfectly competitive market. Compared with using the single niche evaluation, our model shows a more comprehensive insight into enterprise competitiveness, which provides a better niche evaluation for other industries.

The rest of this paper is organized as follows: Section 2 provides the research framework of this paper and the construction of the macro and micro index system of social commerce. Section 3 describes data acquisition and processing of social commerce enterprises in China, as well as the niche evaluation methods used in this paper. The results and analysis are shown in Section 4. The conclusions and management implications are presented in Section 5.

2. Construction of Index System for Evaluating the Ecological Niche of Social Commerce

2.1. Research Framework

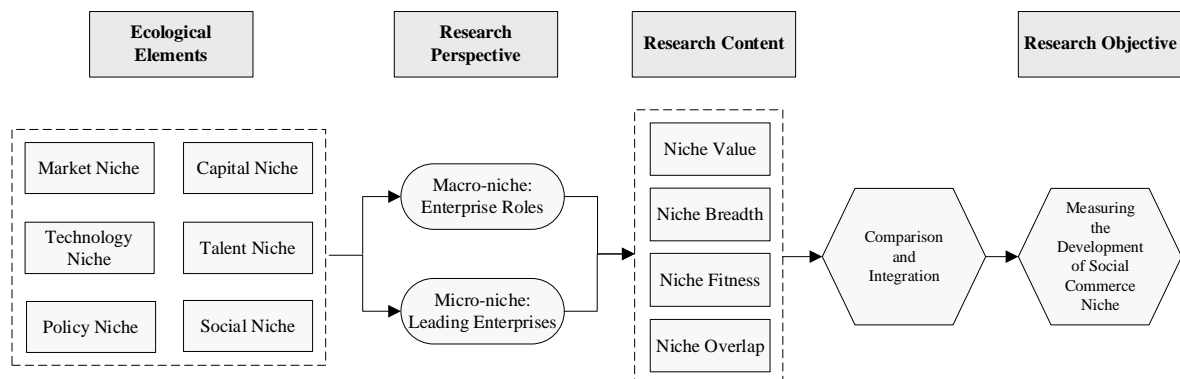The research framework of the study is shown in Figure 1.

Figure 1. Research framework.

We respectively take the enterprise roles and the leading enterprises as the research objects, and construct the macro-niche and micro-niche evaluation models to analyze the performance of different sub-industries and leading enterprises. Furthermore, the macro-niche and micro-niche are integrated to evaluate the development of social commerce ecosystem comprehensively.

2.2. Design of Macro-Niche Evaluation System

According to niche theory and ecosystem view, the social commerce ecosystem is defined as a dynamic balance system with service as the core, reflecting the value transferring of socialization. It contains all participants' interaction in the external environment, including social commerce enterprise groups, businesses, and consumers [3]. The social commerce enterprise groups consist of four main participants: social retail e-commerce (SRE), social sharing e-commerce (SSE), social content e-commerce (SCE), and social e-commerce service provider (SESP) [53]. These participants jointly promote the rapid development of the social commerce industry. According to previous research [38], we consider the macro-niche of social commerce enterprises composed of five niche elements: capital, talent, market, technology and policy, as shown in Figure 2.
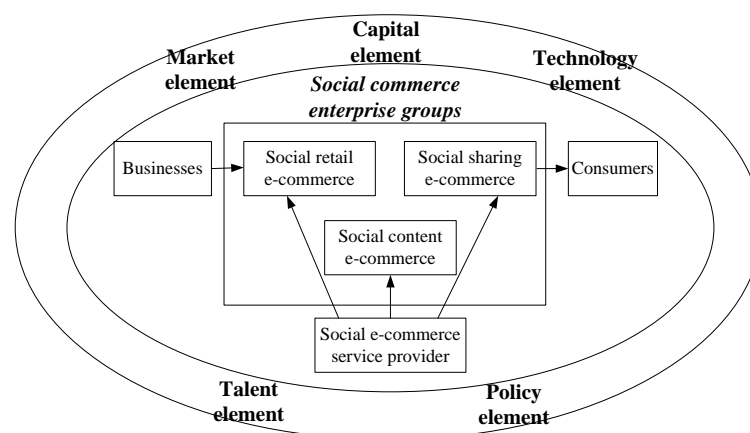

Figure 2. Social commerce ecosystem.

Based on the principles of scientific credibility, concise representation, feasibility and usability, and combined with the previous research [38,39], niche evaluation indexes from

five aspects are selected to investigate the niche performance of social commerce enterprises with different roles. The evaluation index of social commerce macro-niche is shown in Table 2.

Table 2. Evaluation index of social commerce macro-niche.

Primary Index	Secondary Index	Definition of Index
Market Niche	App score	Market niche represents the degree of social commerce enterprise's market acceptance. App score data is selected to highlight the evaluation of social commerce enterprises by consumers or businesses.
Capital Niche	Paid-in capital	Capital niche represents the utilization of capital resources of social commerce enterprises. Paid-in capital reflects the capital strength of the enterprise. Financing quota reflects the investment obtained by the enterprise according to their project strength and prospect.
	Financing quota	
Talent Niche	Number of employees	Talent niche represents the current situation of human resources in social commerce enterprises. Number of the employees is selected.
Technology Niche	Patent counts	Technology niche represents the technological development of social commerce enterprises. Patent counts, software copyright, copyright of works and website filing data are selected.
	Software copyright	
	Copyright of works	
	Website filing	
Policy Niche	Tax rate	Policy niche represents the strength of social commerce enterprises to obtain policy support. We select the enterprise income tax rate, which is a negative index. The lower the tax rate, the higher the government's support for enterprises.

2.3. Design of Micro-Niche Evaluation System

Based on the above evaluation index of social commerce's macro-niche, we consider the social attribute of social commerce users and add the social niche. Social niche represents the level of interaction between social commerce enterprises and users. Due to the high propagation brought by the social network, the social commerce's growth of user scale and transaction scale is more significant, compared with other industries. Therefore, this paper selects user scale, annual growth of users and annual increase in transaction scale to reflect the social niche status of social commerce enterprises. Furthermore, enhancing the richness of the secondary index, the micro-niche evaluation model of social commerce leading enterprises is constructed, as shown in Table 3.

Table 3. Evaluation index of social commerce micro-niche.

Primary Index	Secondary Index
Market Niche	Market cap
	Market share
	App score
Social Niche	User scale
	Annual growth of users
	Annual increase in transaction scale
Capital Niche	Total assets
	Current ratio
	Profit growth
	Return on equity
	Asset-liability ratio
Talent Niche	Number of Employees
Technology Niche	Research output-input ratio
	Patents and copyrights
Policy Niche	Tax rate

3. Materials and Methods

With the rapid development of social e-commerce in China, it has begun to take shape. There are well-developed leading enterprises in each sub-industry, which meet the data requirements of macro-niche and micro-niche. Therefore, this paper selects China's social commerce enterprises as examples, expecting to evaluate the entire social commerce ecosystem through our model.

3.1. Data Preparation

3.1.1. Data Acquisition of Social Commerce Enterprise Roles

In order to evaluate the current situation of social commerce ecosystem, this paper classifies social commerce enterprises by the project descriptions in Tianyancha database. This database is a business query platform under the National Development Fund of China for small and medium-sized enterprises. It contains more than 180 million social entities with more than 90 dimensions of real-time information. Specifically, 1026 social commerce enterprises are selected from this database, filtered by keywords of "social commerce", "social e-commerce" and "community e-commerce" (excluding cancellation and revocation). These enterprises are classified into corresponding roles by the structured content analysis method [54,55]:

Firstly, one coder put labels for each enterprise according to its brand description from Tianyancha database, such as social sharing e-commerce corresponds to the following description: group buying, shopping guide, rebate, or coupon, as shown in Table 4.

Table 4. An example of a matching process from enterprise introduction to the role.

Enterprise	Brief Introduction of Project Brand in Tianyancha Database	Coding Role
Pinduoduo	Pinduoduo is a social commerce platform, focusing on the marketing mode of C2B group buying. After the user selects the product, it will send a group invitation to its family or friends through social media. If the number of people meets the requirement, they all can buy the product at the group-buying price. It takes products as the center, guides users to purchase through content and social interaction, and makes the accurate recommendation based on machine algorithms.	Social Sharing E-commerce

Inspired by the labels and project descriptions from Tianyancha database, we attempt to describe the enterprise role in social commerce, as shown in Table 5.

Table 5. Enterprise roles and descriptions in the social commerce ecosystem.

Enterprise Roles and Descriptions	Representative
Social retail e-commerce (SRE) is the primary mode of social value transformation of social commerce, including Business-to-Customer (B2C) mode of traditional e-commerce platform or retailers rapidly transforming and forming scale advantage under their core retail ability, and Supplier-to-Business-to-Customer (S2B2C) mode taking membership e-commerce as a new idea.	B2C: Jingxi, Youyu S2B2C: Yunji, Beidian
Social sharing e-commerce (SSE) relies on the strong relationship to transform social value, mainly in the form of sharing group, supplemented by sharing rebate and obtaining coupons.	Pinduoduo, Taojiji, Peanut diary, Liwushuo
Social content e-commerce (SCE) stimulates consumers' emotional resonance and value recognition through content. Its core competitiveness is continuous, high-quality content output, and it can be divided into community-based SCE focusing on market segmentation and guiding-flow SCE focusing on omni-channel marketing.	Community-based: Xiaohongshu, Mogu, Youhuo Guiding-flow: TikTok, Kwai
Social e-commerce service providers (SESP) are committed to providing solutions for the software development, advertising marketing, WeChat business training, customer management and other needs of social commerce enterprises.	Youzan, Weimob, Yike

Then, based on these labels, a second evaluator matches each enterprise to its corresponding role. All authors confirm the final code of each enterprise and discuss the differences among them, which will help to eliminate individual bias.

Finally, we identify four types of general enterprise roles, social retail e-commerce (SRE), social sharing e-commerce (SSE), social content e-commerce (SCE) and social e-commerce service providers (SESP). Information of 1026 enterprises is shown in Table 6.

Table 6. Information of 1026 sample enterprises.

Enterprise Roles	Total No.	No. of High-Tech Enterprises	No. of Enterprises with Financing
Social Retail E-Commerce (SRE)	432	33	88
Social Sharing E-Commerce (SSE)	170	7	31
Social Content E-commerce (SCE)	164	16	45
Social E-Commerce Service Providers (SESP)	260	25	26

The paid-in capital and number of employees of 1026 social commerce enterprises are from the Chinese National Enterprise Credit Information Publicity System (NECIPS). Their patent counts, software copyright number, work copyright number and website filing information are from the Chinese National Intellectual Property Administration (NIPA). Their financing quota data come from the publicly disclosed news information. The tax rate is formulated according to the Income Tax Law of the People's Republic of China, with 15% tax rate for high-tech enterprises and 20% for small and micro enterprises. We also use web crawler to collect the corresponding App scores and comments of 1026 social commerce enterprises on the four platforms of Huawei App Market, Apple App Store, Xiaomi App Mall and Tencent App Store. In order to ensure the integrity of the data, the final App score of enterprises is obtained by the weighted average of the four platforms' data.

3.1.2. Data Acquisition of Social Commerce Leading Enterprises

We select five leading listed enterprises, namely Pinduoduo, Mogu, Yunji, Youzan and Weimob, which are representative enterprises of SSE, SCE, SRE and SESP, respectively. The data sources of App score, patents and copyrights, and tax rate are consistent with those of macro-niche evaluation indexes. The market cap comes from the stock market's real-time data on 16 July 2020, and the market cap of enterprises listed in Hong Kong's stock market and the American stock market are converted into RMB market cap. The market share is calculated by the proportion of the annual transaction scale of each enterprise. For example, the scale of China's social commerce market would exceed 200 billion yuan in 2019 [56]. Pinduoduo's 2019 annual report shows that its annual transaction scale is 1006.6 billion yuan, so its market share is 50.33%. The data of the user scale, the annual growth of users and the annual increase in transaction scale come from the news information disclosed by enterprises. The indexes of capital niche, the number of employees and the research output-input ratio can be calculated from the 2019 annual report of each enterprise. For example, the research output-input ratio is calculated by the proportion of R&D expenses to operating revenue.

3.2. Methods
3.2.1. Index Weight

According to the Catastrophe Progression Method, to evaluate the upper indexes, the lower indexes should be first sorted by their importance from large to small [37]. To avoid the subjective ranking, we use the Entropy Method to calculate weights for each index, representing their contribution to upper indexes. The specific calculation method is as follows:

- Step 1: To ensure the unity of index units, we first normalize the original data:

$$Y_{ij} = \frac{X_{ij}}{max_{k=1}^{n} X_{kj}} \tag{1}$$

where X_{ij} is the original value of the ith evaluation object under the jth index, Y_{ij} is the normalized value of the ith evaluation object under the jth index.

- Step 2: Calculate the index weight of the ith evaluation object under the jth index as:

$$Z_{ij} = \frac{Y_{ij}}{\sum_{k=1}^{m} Y_{kj}} \tag{2}$$

where the entropy value of jth index is calculated as:

$$e_j = -\frac{1}{ln(m)} \sum_{i=1}^{m} Z_{ij} ln(Z_{ij}) \tag{3}$$

- Step 3: Calculate the utility value $u_i = 1 - e_i$, the weight of jth index is:

$$w_j = \frac{u_j}{\sum_{k=1}^{n} u_k} \tag{4}$$

according to the principle of entropy additivity, the upper index's weight value in the multi-level structure evaluation index system can be expressed by the sum of the lower index weights.

3.2.2. Niche Value

The normalization formula of the standard catastrophe system model is expressed as where X_M is the niche value of upper index M, and X_{P_i} represents its corresponding lower niche value sorted by entropy weights. n is the number of lower indexes, which is an integer greater than 0.

$$X_M = \frac{X_{P_1}^{\frac{1}{2}} + X_{P_2}^{\frac{1}{3}} + \ldots + X_{P_n}^{\frac{1}{n+1}}}{n} \tag{5}$$

3.2.3. Niche Breadth

Social commerce's niche breadth refers to the sum of various resources used by the evaluation object of social commerce enterprises for survival and development. This can be used to measure its diversity of resource utilization, which reflects its potential ability to adapt to the environment and utilize resources. The wider the niche breadth of social commerce, the higher its characterization [47], representing the stronger competitiveness. We use the Shannon-Wiener Exponential Formula [57] proposed by Levin to measure social commerce's niche breadth as:

$$b_i = -\sum_{j=1}^{n} P_{ij} ln P_{ij} \tag{6}$$

where b_i represents the social commerce's niche breadth of evaluation object i, n is the number of evaluation indexes, and $P_{ij} = \frac{Y_{ij}}{\sum_{k}^{n} Y_{ik}}$ represents the proportion of jth resource used by evaluation object i in its total resources.

3.2.4. Niche Fitness

Social commerce's niche fitness refers to the similarity between the real niche of social commerce and the optimal niche. According to the above social commerce evaluation index system, we construct the measurement model of social commerce's niche fitness as:

$$F_i = \sum_{j=1}^{n} w_j \frac{min_k|Y_{ik} - h_k| + \alpha max_k|Y_{ik} - h_k|}{|Y_{ij} - h_j| + \alpha max_k|Y_{ik} - h_k|} \tag{7}$$

where F_i represents the niche fitness value of the ith evaluation object, and it fluctuates between the interval [0,1]. The larger the value, the more suitable the niche development of the evaluation object is. w_j is the weight of each ecological factor, Y_{ij} is the real niche of each evaluation object, h_j is the optimal niche of each evaluation object, and α is the model parameter.

- Measurement of the most suitable value h_j. With reference to Zhu's assumption, this paper proposes that the social commerce ecological factors follow the normal distribution approximately and the optimal value can be calculated by the sum of the mean and the standard deviation [45]. Set $\mu_j = \frac{1}{m} \sum_{i=1}^{m} Y_{ij}$, $\sigma_j = \sqrt{\frac{1}{m} \sum_{i=1}^{m} (Y_{ij} - \mu_j)^2}$, where μ_j is the mean, and σ_j is the standard deviation, $j = 1, 2, \ldots, n$. Then $h_j = \mu_j + \sigma_j$ is the optimal value of the ecological factor j.
- Measurement of model parameter α. We refer to Li's method of measuring parameter α [58]. Set $\varepsilon_{ij} = |Y_{ij} - h_j|$ ($i = 1, 2, \ldots, m; j = 1, 2, \ldots, n$), the maximum value, minimum value, and mean value of ε_{ij} are respectively $\varepsilon_{max} = max_{i=1}^{m} max_{j=1}^{n} \varepsilon_{ij}$, $\varepsilon_{min} = min_{i=1}^{m} min_{j=1}^{n} \varepsilon_{ij}$, $\bar{\varepsilon} = \frac{1}{m \times n} \sum_{i=1}^{m} \sum_{j=1}^{n} \varepsilon_{ij}$. If $\varepsilon_{ij} = \bar{\varepsilon}$ and $F_i = 0.5$, then $\alpha = \frac{\bar{\varepsilon} - 2\varepsilon_{min}}{\varepsilon_{max}}$.

3.2.5. Niche Overlap

The niche overlap model of social commerce is constructed to analyze the similarity of ecological resources that evaluation objects rely on. The higher the degree of niche overlap, the higher the degree of sharing the same ecological resources, the more intense the competition. In this paper, we use the Pianka Model [59] to measure social commerce's niche overlap and use the normalized data matrix $Y_{ij}(i = 1, 2, \ldots, m; j = 1, 2, \ldots, n)$ when calculating the niche breadth, then:

$$O_{ab} = \frac{\sum_{j=1}^{n} P_{aj} \times P_{bj}}{\sqrt{\sum_{j=1}^{n} P_{aj}^2 \sum_{j=1}^{n} P_{aj}^2}} \tag{8}$$

where O_{ab} is the niche overlap value of evaluation object a and evaluation object b, and the value range is [0,1]. P_{aj} represents the proportion of the jth resource used by evaluation object a in its total resource utilization, P_{bj} represents the proportion of the jth resource used by evaluation object b in its total resource utilization.

4. Results and Discussion

4.1. Results and Discussion of Macro Dimension Analysis

4.1.1. Niche Value

We sum the secondary index of enterprises in the same role in social commerce to obtain the original data, where each role represents a population. The weights of primary and secondary indexes evaluated by the Entropy Methods are shown in Table 7.

Table 7. Index weights of macro-niche evaluation system of social commerce.

Primary Index	Weight	Secondary Index	Weight
Market Niche	0.144954	App score	0.144954
Capital Niche	0.236316	Paid-in capital	0.138200
		Financing quota	0.098115
Talent Niche	0.160932	Number of employees	0.160932
Technology Niche	0.400257	Patent counts	0.072510
		Software copyright	0.106531
		Copyright of works	0.155111
		Website filing	0.066105
Policy Niche	0.057542	Tax rate	0.057542

According to the Catastrophe Progression Method, the four enterprise roles' niche values are calculated, as shown in Table 8.

Table 8. Niche value results of social commerce's macro-niche.

Primary Index	Secondary Index	Social Retail E-Commerce	Social Sharing E-Commerce	Social Content E-Commerce	Social E-Commerce Service Providers
Market Niche		0.0685	1	0.6169	0
	App score	0.0047	1	0.3806	0
Capital Niche		0.7834	0.6823	0	0.5203
	Paid-in capital	1	0.1329	0	0.1222
	Financing quota	0.1821	1	0	0.3298
Talent Niche		1	0.2143	0	0.3761
	Number of employees	1	0.0459	0	0.1414
Technology Niche		1	0.5364	0.3115	0.4723
	Patent counts	1	0.7392	0.2967	0
	Software copyright	1	0	0.1312	0.3375
	Copyright of works	1	0.1529	0	0.0533
	Website filing	1	0.3879	0	0.8249
Policy Niche		0.7903	0	1	0.9874
	Tax rate	0.6245	0	1	0.9750
Total Niche		0.8937	0.6586	0.4932	0.6545

It is found that social retail e-commerce (SRE) occupies the first place in the comparison of the four enterprise roles. Three of the five primary niche indexes occupy the first place, but the market niche performance is poor. In the secondary niche index comparison, its financing quota is lower than that of social sharing e-commerce (SSE) and social e-commerce service providers (SESP). Meanwhile, its App score is lower than that of social sharing e-commerce (SSE) and social content e-commerce (SCE). It can be seen that SRE, as the primary form of social commerce—"socialization of retail e-commerce", has a low entry threshold and the largest number of enterprises. In the early stage of the development of the social commerce industry, it has occupied a dominant position in all aspects. However, the development of the social commerce industry has entered a new stage. The investment funds are inclined to the SSE, a relatively new social commerce model. The industry has begun to realize the importance of SESP's innovation and development. Simultaneously, the consumer agglomeration phenomenon of SRE is significant, and consumers have a low evaluation of the uneven application.

In the comparison of the primary niche index of SSE, the market niche ranks first. Its capital niche and technology niche also have good performance, second only to SRE, while the policy niche performs poorly and ranks the last. When comparing the secondary niche index, the niche performance of financing quota and App score is the best. Except for the poor performance of software copyright and tax rate, the other indexes perform well on the whole, which is consistent with the second ranking in the total niche comparison. SSE led by "Pinduoduo" has developed rapidly in recent years. Although it cannot compete with SRE in the number of enterprises, its leading effect is significant, which drives the rapid development of the SSE sub-industry.

Although SCE is not dominant in total niche comparison, its policy niche and market niche perform well, especially the niche of the tax rate, which is the best among all roles, showing the greatest policy support. The values of the capital niche and talent niche are the lowest, and there is a large space for improvement.

SESP ranks second or third in comparing the five primary indexes except for market niche, which is consistent with its total niche performance. The secondary index does not perform well in terms of App score and patent counts, ranking the last. The reason is that SESP, as a supporting role in the social commerce industry, mainly focuses on enterprise services, and its technical basis is mostly from the e-commerce and communication industry. The development space of patent innovation combined with the characteristics of social commerce is vast.

4.1.2. Niche Breadth

We calculate the proportion of the *j*th resource used by each enterprise role in its total resource utilization P_j. The niche breadth of four enterprise roles in social commerce can be calculated by substituting it into the Formula (6), as shown in Table 9.

Table 9. Niche breadth, niche fitness and niche overlap of social commerce's macro-niche.

Enterprise Role	Niche Breadth	Niche Fitness	Niche Overlap			
			Social Retail E-Commerce	Social Sharing E-Commerce	Social Content E-Commerce	Social E-Commerce Service Providers
Social retail e-commerce	2.0110 (1)	0.6247 (3)	1			
Social sharing e-commerce	1.6132 (2)	0.5846 (4)	0.3923	1		
Social content e-commerce	1.1424 (4)	0.6421 (2)	0.3720	0.3241	1	
Social e-commerce service providers	1.6006 (3)	0.6788 (1)	0.6163	0.2990	0.6629	1

Niche breadth values of the four enterprise roles in social commerce are more significant than 1, indicating that each role has a good performance in resource utilization. The niche breadth value of SRE is greater than 2, ranking the first, while SSE and SESP are ranked second and third with a slight gap. SCE is at the bottom of the list. The ranking and numerical differences of niche breadth of the above social commerce enterprise roles are consistent with their niche values.

4.1.3. Niche Fitness

The normalized evaluation index data Y_{ij} is substituted into Formula (7) to calculate model parameter α and optimum value h_j. Combined with the index weight w_j which is calculated previously, the social commerce's niche fitness is measured, as shown in Table 9. The four enterprise roles are sorted. In this paper, we refer to Zhu [45] to set five levels of fitness: when $0 \le F_i \le 0.4$, unfitness; when $0.4 < F_i \le 0.5$, low fitness; when $0.5 < F_i \le 0.6$, fitness; when $0.6 < F_i \le 0.8$, moderate fitness; when $0.8 < F_i \le 1$, high fitness.

This paper finds that social commerce's macro-niche fitness is relatively high, and there are no unfitness and low fitness. Except for the niche fitness of SSE, the other three enterprise roles' niche fitness is moderate. The lower fitness of SSE may be due to the unbalanced resource allocation caused by the rapid development of the shopping

e-commerce platform led by Pinduoduo in a short period. In general, social commerce's macro-niche meets the needs of social commerce development. Its resource allocation is relatively reasonable, but there is still room for progress.

4.1.4. Niche Overlap

The proportion P_j of the jth resource used by each enterprise role in its total resource utilization is substituted into Formula (8) to calculate the niche overlap, as shown in Table 9. It is found that the changing range of the four enterprise roles' niche overlap in social commerce is [0.2990, 0.6629], and the proportion of low, medium and high competition is 1:3:2. In general, there is moderate competition in the niche overlap of enterprise roles. That is, the similarity degree of enterprise roles in resource utilization is moderate, and the degree of competition is moderate. The reason is that there is a big difference in the business model among four enterprise roles. The reason for the high niche overlap between SESP and SCE providers is that some service providers undertake the function of guiding to the platform. To a certain extent, they have some business overlapping with the guiding-flow SCE. The niche overlap of SRE and SESP is moderate, which is since most of the two enterprise roles are transformed from traditional retail platforms or e-commerce service providers and their essential resources are similar.

4.1.5. Macro-Niche Analysis

Based on the niche breadth and niche fitness of each enterprise role, we find that social retail e-commerce (SRE) and social sharing e-commerce (SSE) have strong survivability and weak resource allocation ability, while social e-commerce service providers (SESP) and social content e-commerce (SCE) have weak survivability and strong resource allocation ability. We refer to this as the inversion phenomenon of survivability and resource allocation ability in the social commerce industry.

4.2. Results and Discussion of Micro Dimension Analysis

4.2.1. Niche Value

In this paper, the Entropy method is used to calculate the weight of each evaluation index of micro-niche, as shown in Table 10.

Table 10. Index weights of micro-niche evaluation system of social commerce.

Primary Index	Weight	Secondary Index	Weight
Market Niche	0.242699	Market cap	0.135695
		Market share	0.077075
		App score	0.029929
Social Niche	0.223642	User scale	0.140592
		Annual growth of users	0.056137
		Annual increase in the transaction scale	0.026912
Capital Niche	0.341664	Total assets	0.119928
		Current ratio	0.034001
		Profit growth	0.075737
		Return on equity	0.064130
		Asset-liability ratio	0.047868
Talent Niche	0.043728	Number of Employees	0.043728
Technology Niche	0.097559	Research output-input ratio	0.051631
		Patents and copyrights	0.045928
Policy Niche	0.050708	Tax rate	0.050708

According to the Catastrophe Progression Method above, the niche values of evaluation indexes of the five leading enterprises are calculated, as shown in Table 11.

Table 11. Niche value results of social commerce's micro-niche.

Primary Index	Secondary Index	Pinduoduo	Mogu	Yunji	Youzan	Weimob
Market Niche		0.6667	0.3333	0.3876	0.5074	0.6201
	Market cap	1	0	0.0021	0.0261	0.0252
	Market share	1	0	0.0172	0.0469	0.7910
	App score	0	1	0.5455	1	0.3636
Social Niche		0.9293	0.0635	0.6339	0.5848	0.3351
	User scale	1	0.0363	0.0069	0.0003	0
	Annual growth of users	0.4893	0	1	0.4812	0.0029
	Annual increase in the transaction scale	1	0	0.4487	0.8289	0.5542
Capital Niche		0.5485	0.8	0.4531	0.3229	0.6186
	Total assets	1	0	0.0085	0.1066	0.0085
	Current ratio	0.3294	1	0.3235	0	0.8176
	Profit growth	0.0118	1	0.1969	0	0.2144
	Return on equity	0.2188	1	0	0.1830	0.0797
	Asset-liability ratio	0	1	0.2585	0.1025	0.6028
Talent Niche		1	0	0.2882	0.6779	0.7842
	Number of Employees	1	0	0.0830	0.4595	0.6150
Technology Niche		0.7491	0.8505	0.1070	0.6820	0.4077
	Research output-input ratio	0.3490	0.4915	0.0458	1	0
	Patents and copyrights	0.7470	1	0	0.0482	0.5422
Policy Niche		1	1	0	0	1
	Tax rate	1	1	0	0	1
Total Niche		0.9233	0.6763	0.6285	0.6854	0.8670

Among them, Pinduoduo occupies the first place in the total niche comparison of five social commerce enterprises, which is far higher than the other four. In the comparison of the primary indexes, the market niche, social niche, talent niche and policy niche of Pinduoduo rank first, while the capital niche and technical niche are not dominant. Its capital niche lags behind Mogu and Weimob, and its technical niche is lower than that of Mogu. From the view of secondary evaluation indexes, the App score and asset-liability ratio rank the last, and the profit growth ranks the fourth. The reason is that the low-quality and low-price product gathering in Pinduoduo platform inevitably leads to the problem of word-of-mouth differentiation, which makes its App score low. Its product gathering characteristic limits the space of Pinduoduo's profit growth.

Compared with the five social commerce enterprises, Mogu ranks fourth in the total niche. Among all its primary niches, the market niche, social niche and talent niche rank the last. In contrast, the policy niche, capital niche and technology niche rank first. From all indexes of Mogu, we find that its niche value is either the largest or the smallest. It shows the polarization problem and the uneven development of Mogu in the social commerce ecosystem. In the future, without damaging the dominant niches, efforts should be made to make up for the inferior niche, such as absorbing outstanding talents and strengthening the social interaction with users.

The total niche of Yunji ranks the last, and its social niche ranks the second while its other primary indexes are basically the last but one. The annual growth of users is the largest, while the other secondary indexes are almost the second last.

Youzan's performance of policy niche and capital niche is deficient in the primary index comparison, ranking the last. It is worth mentioning that Youzan has the most extensive research output-input ratio. It can be seen that despite the lack of funds in Youzan, it attaches great importance to R&D.

Weimob ranks first or second in most primary indexes, which is consistent with its total niche performance of the second ranking. However, the performance of the social niche is poor, ranking the fourth, and the secondary index of user scale is even the last. Besides, among the secondary indexes, the research output-input ratio is the lowest. It can be seen that Weimob has advantages in most resources, but it still needs to strengthen user interaction and increase R&D investment.

4.2.2. Niche Breadth

According to the above niche breadth model of social commerce, the niche breadth of five leading enterprises is calculated, as shown in Table 12.

Table 12. Niche breadth, niche fitness and niche overlap of social commerce's micro-niche.

Leading Enterprises	Niche Breadth	Niche Fitness	Niche Overlap				
			Pinduoduo	Mogu	Yunji	Youzan	Weimob
Pinduoduo	2.3976 (1)	0.5055 (4)	1				
Mogu	2.0810 (3)	0.4496 (5)	0.3288	1			
Yunji	1.8368 (5)	0.7186 (1)	0.3169	0.3818	1		
Youzan	1.9298 (4)	0.5773 (2)	0.4194	0.3797	0.6452	1	
Weimob	2.2000 (2)	0.5598 (3)	0.6641	0.6881	0.3813	0.3574	1

From Table 12, the niche breadth of the five leading enterprises of social commerce is about 2, which indicates that they all have nice performance in resource utilization. Specifically, the niche breadth of Pinduoduo is 2.3976, ranking first. It is followed by Weimob, 2.2 and Mogu, 2.081; Youzan and Yunji are lower than the first three, which are 1.9298 and 1.8368 respectively. The ranking and numerical differences of niche breadth of the above five leading enterprises in social commerce are consistent with their total niche values.

4.2.3. Niche Fitness

The niche fitness of five listed leading enterprises is measured according to Formula (7) and are ranked, as shown in Table 12. Under the five levels of fitness, the niche fitness of Yunji is the highest, reaching moderate fitness; the niche fitness of Mogu is the lowest, which is low fitness; the niche fitness of the other three leading enterprises all belong to fitness. Combined with the above analysis of the niche breadth of leading enterprises, we find that the niche breadth of Yunji is the lowest, while its niche fitness is the highest, which indicates its "small and fit" business model. The niche fitness of Mogu belongs to low fitness, which is related to the severe polarization of various resources, and the low fitness of Mogu is consistent with its low niche breadth.

4.2.4. Niche Overlap

According to the above niche overlap model of social commerce, we can calculate the niche overlap of five listed leading enterprises, as shown in Table 12. The changing range of five leading enterprises' niche overlap is [0.3169, 0.6881], and the proportion of low, medium and high competition is 0:7:3. In general, the competition among these five leading enterprises is moderate. The reason is that the five leading enterprises of social commerce belong to four different enterprise roles. Moreover, there is no evident homogenization among different enterprise roles' business model. The reason for the low niche overlap of Youzan and Weimob, which both belong to SESP, is that Weimob mainly relies on WeChat system to provide omni-channel mini programs as e-commerce solutions for businesses. Therefore, Weimob mainly adopts the agent mode for promotion. However, Youzan mainly adopts the free trial and the local promotion mode to attract businesses. These are apparent differences between the two business models.

4.2.5. Micro-Niche Analysis

Based on the niche breadth and fitness of leading enterprises, we can summarize their survivability and resource allocation abilities as follows: Among them, Yunji (SRE) has the weak survivability and the strong resource allocation ability. Pinduoduo (SSE), on the contrary, has strong survivability and the weaker resource allocation ability. The resources relied on by Mogu (SCE) are seriously polarized. Youzan and Weimob (SESP) adopt differentiation strategies, carving up market share "peacefully".

4.3. Macro and Micro Combination Analysis

This paper makes a comparative study on the macro-niche according to the enterprise roles and the micro-niche represented by leading enterprises. The micro-niche of SESP is computed by averaging the niche values of Youzan and Weimob. The integrated results are shown in Table 13.

Table 13. Combination of the macro-niche and micro-niche of social commerce.

Enterprise Roles	Corresponding Leading Enterprises	Total Macro-Niche Value	Total Micro-Niche Value	Macro-Niche Breadth	Micro-Niche Breadth	Macro-Niche Fitness	Micro-Niche Fitness
Social Retail E-Commerce	Yunji	0.8937 (1)	0.6285 (4)	2.0110 (1)	1.8368 (4)	0.6247 (3)	0.7186 (1)
Social Sharing E-Commerce	Pinduoduo	0.6586 (2)	0.9233 (1)	1.6132 (2)	2.3976 (1)	0.5846 (4)	0.5055 (3)
Social Content E-commerce	Mogu	0.4932 (4)	0.6763 (3)	1.1424 (4)	2.0810 (2)	0.6421 (2)	0.4496 (4)
Social E-Commerce Service Provider	Youzan$Weimob	0.6545 (3)	0.7762 (2)	1.6006 (3)	2.0649 (3)	0.6788 (1)	0.56855 (2)

We can consider the macro-niche value of the sub-industry as its average level to a certain extent and hence show both macro-niche and micro-niche in the same graph as Figure 3.
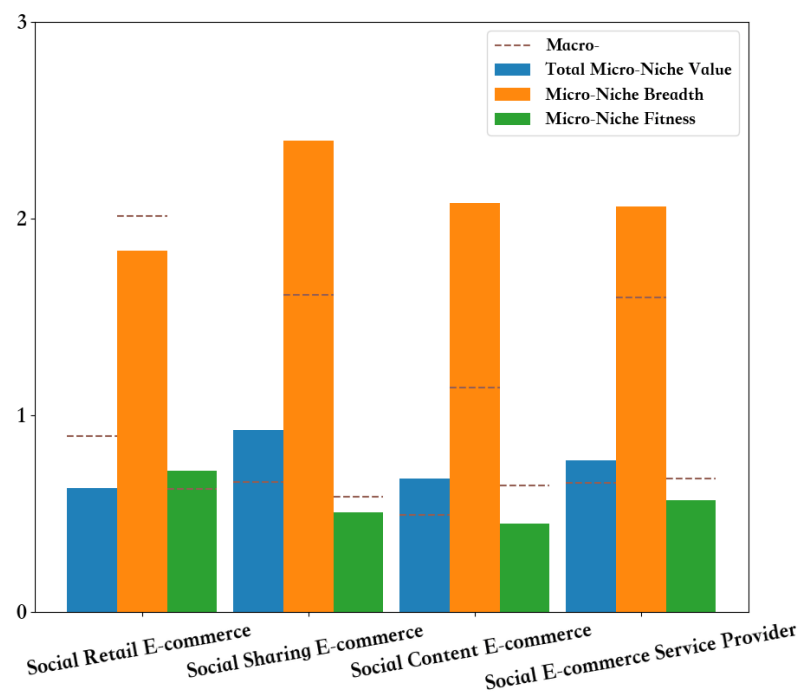

Figure 3. Visualized comparison between the macro-niche and micro-niche of social commerce.

In Figure 3, the bars with different colors represent the micro-niche index values of corresponding sub-industries, and the dotted lines represent the corresponding macro-niche values. From Table 13 and Figure 3, the niche breadth of SRE is the first, but its niche fitness is low. Surprisingly, Yunji (SRE) ranks the last in niche breadth and ranks first in niche fitness. It is related to the large number of SRE enterprises, indicating fierce competition. Yunji's rationality of resource allocation is high, but it does not occupy an oligopoly position in the SRE sub-industry. Therefore, we believe that the SRE sub-industry tends to be a perfectly competitive market. Besides, the niche breadth of Pinduoduo (SSE) ranks first, and its competitiveness is far higher than the average industry level and other leading enterprises. However, the niche breadth of SSE still ranks second. It can explain, to a certain extent, that Pinduoduo is dominant in the SSE sub-industry, and the development level of other SSE enterprises is trivial. Therefore, we suggest that SSE sub-industry is a monopoly market. Moreover, the niche fitnesses of Mogu, Youzan and Weimob are lower than those of their average industry levels, so their rationalities of resource allocation need to be strengthened.

The niche overlap of social commerce's macro-niche is similar to that of micro-niche, which can be seen in that their niche overlap ranges are similar, [0.2990, 0.6629] and [0.3169, 0.6881] respectively. The competitions between most of the evaluation objects are moderate, no matter from macro-niche or micro-niche evaluation.

In this paper, macro-niche and micro-niche with niche value, breadth and fitness are integrated as the comprehensive competitiveness evaluation of each sub-industry in social commerce, as shown in Figure 4.
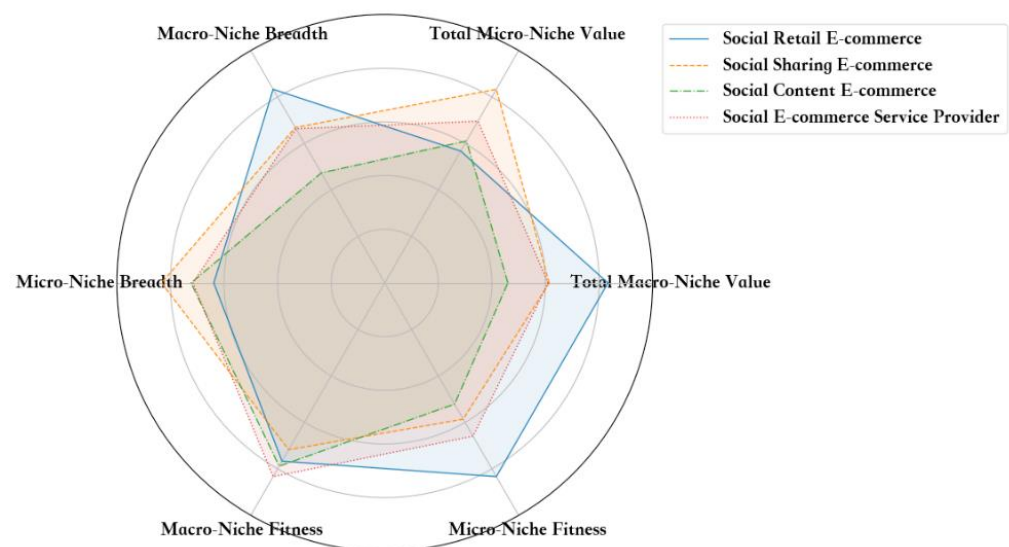

Figure 4. Comprehensive niche performance of social commerce.

From Figure 4, it is found that the order of the hexagon area is SRE, SSE, SEEP and SCE from large to small. Among them, the last three are mutually included in turn, while SRE and the other three have significant differences in the performance of each dimension. On the whole, we suggest that the competitiveness of SRE and SSE is in the leading position, while the competitiveness of SESP is stronger than that of SCE.

Due to the significant individual differences among the leading enterprises, it is not representative to only use micro-niche to evaluate the competitiveness of the social commerce industry. Therefore, we only compare the results of our model and the single macro-niche evaluation. The radar chart of macro-niche evaluation is shown in Figure 5.
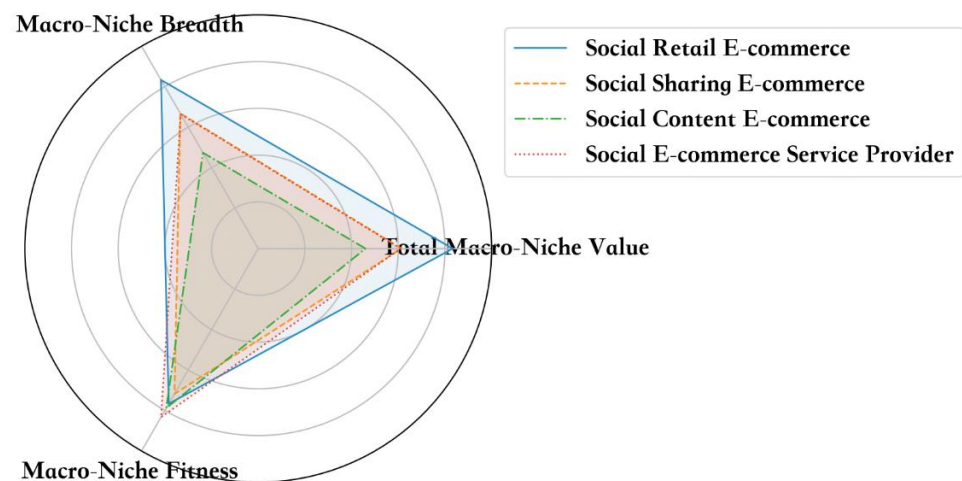
Figure 5. Macro-niche performance of social commerce.

From Figure 5, we can suggest that SRE is in the leading position, SESP in the second place is slightly superior to SSE, and SCE has the worst performance among them. However, our model further considers the significant influence of leading enterprises. As a result, SSE surpasses SESP in the second place due to the excellent performance of Pinduoduo (SSE). Therefore, we believe that our model can correct the one-sided evaluation from the single niche perspective and provide more information about the competitiveness of the social commerce industry.

5. Conclusions

In this paper, we put forward the concept of social commerce ecosystem and propose a model composed of macro-niche and micro-niche to empirically analyze the performance of different social commerce enterprises in China. Conclusions can be drawn as follows:

(1) The evaluation of social commerce macro-niche shows that the survivability of social retail e-commerce (SRE) and social sharing e-commerce (SSE) is leading, while the resource allocation rationality of social e-commerce service providers (SESP) and social content e-commerce (SCE) is better, which shows an inversion phenomenon.

(2) The evaluation of social commerce micro-niche shows that the Pinduoduo (SSE) has superior survivability, Yunji (SRE) and Mogu (SCE) have balanced and polarized resource allocation respectively, and Youzan and Weimob (SESP) adopt differentiation strategies.

(3) The combination of macro-niche and micro-niche shows that SSE is a monopoly market, while SRE tends to be a perfectly competitive market. This integrated method shows more comprehensive results, which is better than the single niche evaluation method.

Based on these conclusions, aiming at the individual problems of leading enterprises and the common problems of each enterprise role in social commerce, this paper provides the following suggestions:

(1) A single supervision mode is not conducive to the sustainable development of the social commerce industry. Targeted and effective industrial policies should be adopted for different characteristics of social commerce sub-industries. For example, the SSE sub-industry belongs to a monopoly market, and hence, incentive policies should be introduced to vigorously support the development of small and medium-sized enterprises and encourage benign competition of the industry. On the other hand, SRE tends to be a perfectly competitive market and subdivision supervision policies should be adopted to prevent the risk of vicious competition.

(2) In the rapid development of social commerce enterprises, the imbalance of resource allocation is severe. When the enterprise develops to a certain stage, the development

focus should be shifted from "speed" to "balance". For example, the polarized resource allocation of Mogu (SCE) seriously restricts its development sustainability. Therefore, in the future, its attention should be paid to absorbing industry talents and enhancing the interaction between products and users.

(3) Social commerce enterprises should pay special attention to the development of differentiation strategy, so as to reduce the overlap between the enterprise roles and even between the leading enterprises in the same role. For example, Youzan and Weimob, both in the SESP sub-industry, adopt different business models and profit models. Therefore, when seizing the market share, they could avoid the fierce conflict, which is beneficial to the sustainable development of the whole sub-industry.

Although this study has some innovation among studies of the same type, it still has some limitations. For example, due to the short development time of social commerce, research can only be carried out from the static perspective, without considering the change of indexes over time. The second limitation is the lack of data of small and medium-sized enterprises in social commerce, which makes it hard to cover a large number of macro-niche evaluation indexes, especially indexes of social attributes. Besides, this study is based on the China region, which is representative of the development of social commerce, but it can still cause a lack of model universality. The future research will further consider the evolution law of social commerce niche from a dynamic perspective and extend the model to other countries or regions.

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References

1. Pagani, M.; Pardo, C. The impact of digital technology on relationships in a business network. *Ind. Mark. Manag.* **2017**, *67*, 185–192. [CrossRef]
2. Phang, D.C.W.; Wang, K.L.; Wang, Q.H.; Kauffman, R.J.; Naldi, M. How to derive causal insights for digital commerce in China? A research commentary on computational social science methods. *Electron. Commer. Res. Appl.* **2019**, *35*, 100837. [CrossRef]
3. Wu, Y.; Chen, X. A new cognitive framework for understanding social commerce: A service ecosystem perspective. *J. Serv. Sci. Manag.* **2020**, *13*, 459–469. [CrossRef]
4. Ebrun. Social e-Commerce Development Report. 2020. Available online: https://www.ebrun.com/20200907/401052.shtml (accessed on 20 December 2020).
5. Busalim, A.H.; Hussin, A.R.C. Understanding social commerce: A systematic literature review and directions for further research. *Int. J. Inf. Manag.* **2016**, *36*, 1075–1088. [CrossRef]
6. Han, H.; Xu, H.Y.; Chen, H.Q. Social commerce: A systematic review and data synthesis. *Electron. Commer. Res. Appl.* **2018**, *30*, 38–52. [CrossRef]
7. Southern Metropolis Daily. Behind the Community Group Buying War, Continuous Mergers and Acquisitions, Bankruptcy and Reorganization. Available online: http://news.southcn.com/nfdsb/content/2020-12/15/content_191843842.htm (accessed on 20 December 2020).
8. Sohu News. More Than 500 Companies Have Closed Down in Half a Year, Is the Social Commerce Going to Die? Available online: https://m.sohu.com/a/417906755_121339 (accessed on 20 December 2020).

9. Lam, H.K.S.; Yeung, A.C.L.; Lo, C.K.Y.; Cheng, T.C.E. Should firms invest in social commerce? An integrative perspective. *Inf. Manag.* **2019**, *56*, 103164. [CrossRef]
10. Hajli, M. A research framework for social commerce adoption. *Inf. Manag. Comput. Secur.* **2013**, *21*, 144–154. [CrossRef]
11. Zwass, V. Co-creation: Toward a taxonomy and an integrated research perspective. *Int. J. Electron. Commer.* **2010**, *15*, 11–48. [CrossRef]
12. Baghdadi, Y. A framework for social commerce design. *Inf. Syst.* **2016**, *60*, 95–113. [CrossRef]
13. Yu, Y.C.; Pelaez, A.; Lang, K.R. Designing and evaluating business process models: An experimental approach. *Inf. Syst. E Bus. Manag.* **2016**, *14*, 767–789. [CrossRef]
14. McDonald, T.; Dan, L. Pulling the sheep's wool: The labour of online thrift in a Chinese factory. *J. Consum. Cult.* **2020**, *9*. [CrossRef]
15. Chen, H.H.; Zang, S.W.; Chen, J.; He, W.T.; Chieh, H.C. Looking for meaningful disruptive innovation: Counterattack from Pinduoduo. *Asian J. Technol. Innov.* **2020**, *9*. [CrossRef]
16. Wang, H.; Chen, Y. Analysis of social e-commerce business model based on value network. *J. Commer. Econ.* **2020**, *3*, 103–106.
17. Hajli, N. Social commerce constructs and consumer's intention to buy. *Int. J. Inf. Manag.* **2015**, *35*, 183–191. [CrossRef]
18. Zhang, H.; Lu, Y.; Gupta, S.; Zhao, L. What motivates customers to participate in social commerce? The impact of technological environments and virtual customer experiences. *Inf. Manag.* **2014**, *51*, 1017–1030. [CrossRef]
19. Sashi, C.M. Customer engagement, buyer-seller relationships, and social media. *Manag. Decis.* **2012**, *50*, 253–272. [CrossRef]
20. Shin, D.H. User experience in social commerce: In friends we trust. *Behav. Inf. Technol.* **2013**, *32*, 52–67. [CrossRef]
21. Aladwani, A.M. A quality-facilitated socialization model of social commerce decisions. *Int. J. Inf. Manag.* **2018**, *40*, 1–7. [CrossRef]
22. Bugshan, H.; Attar, R.W. Social commerce information sharing and their impact on consumers. *Technol. Forecast. Soc. Chang.* **2020**, *153*, 119875. [CrossRef]
23. Kim, J.; Lee, H. VADA: Wi-Fi direct based voluntary advertisement dissemination algorithm for social commerce service. In Proceedings of the IEEE Vehicular Technology Conference, Glasgow, UK, 11–14 May 2015; IEEE Computer Society Press: Washington, DC, USA, 2015; pp. 1–6.
24. Sang, C.Y.; Liao, S.G. Modeling and simulation of information dissemination model considering user's awareness behavior in mobile social networks. *Phys. A Statal Mech. Appl.* **2019**, *537*, 122639. [CrossRef]
25. Zhao, N.; Li, H. How can social commerce be boosted? The impact of consumer behaviors on the information dissemination mechanism in a social commerce network. *Electron. Commer. Res.* **2020**, *20*, 833–856. [CrossRef]
26. Zhang, Y. Study on Decision Model of Enterprises in Emerging E-Business Marketing Modes. Ph.D. Thesis, Nanchang University, Nanchang, China, 21 May 2019.
27. Zhang, W.; Ma, W. Research on the competition strategy of social commerce bilateral market. *J. Commer. Econ.* **2016**, *4*, 50–52.
28. Esmaeili, L.; Golpayegani, A.H. A novel method for discovering process based on the network analysis approach in the context of social commerce systems. *J. Theor. Appl. Electron. Commer. Res.* **2021**, *16*, 34–62. [CrossRef]
29. Grange, C.; Benbasat, I.; Burton-Jones, A. A network-based conceptualization of social commerce and social commerce value. *Comput. Hum. Behav.* **2020**, *108*, 105855. [CrossRef]
30. Reypens, C.; Lievens, A.; Blazevic, V. Leveraging value in multi-stakeholder innovation networks: A process framework for value co-creation and capture. *Ind. Mark. Manag.* **2016**, *56*, 40–50. [CrossRef]
31. Wang, H.; Chen, J.H.; Yao, S.J.; Zhang, Y.Q. The value co-creation analysis framework of service ecosystem stakeholders based on the actor network theory. *Soft Sci.* **2020**, *11*. Available online: http://kns.cnki.net/kcms/detail/51.1268.G3.20201215.1731.004.html (accessed on 3 January 2021).
32. Zhang, D.N.; Shi, Y.S.; Li, W.W. China's sharing economy of mobility industry: From perspective of industrial ecosystem. *Sustainability* **2019**, *11*, 7130. [CrossRef]
33. Jiang, S.M.; Hu, Y.M.; Wang, Z.Y. Core firm based view on the mechanism of constructing an enterprise innovation ecosystem: A case study of Haier group. *Sustainability* **2019**, *11*, 3108. [CrossRef]
34. Li, W.J.; Liu, W.; Xu, X.; Gao, Z.J. The port service ecosystem research based on the Lotka-Volterra model. *Pol. Marit. Res.* **2017**, *24*, 86–94. [CrossRef]
35. Wang, Q.; Geng, C.X.; Hai-Tao, E. Dynamic coevolution of capital allocation efficiency of new energy vehicle enterprises from financing niche perspective. *Math. Probl. Eng.* **2019**, *2019*, 1412950. [CrossRef]
36. Meng, F.L.; Tian, Z.R.; Chang, B.Q.; Yu, H.X.; Zhang, S. Research on the niche evolution game of ecological community innovation of corporate venture capital based on logistic extended complexity model. *Complexity* **2020**, *2020*, 6327218. [CrossRef]
37. Zhang, Y.J.; Gao, L.M. Research on the niche evaluation of platform enterprises based on value delivery: Taking the e-commerce industry as an example. *Manag. Rev.* **2019**, *31*, 116–123.
38. Zhao, Z.Y.; Ling, W.J.; Zillante, G. An evaluation of Chinese wind turbine manufacturers using the enterprise niche theory. *Renew. Sustain. Energy Rev.* **2012**, *16*, 725–734. [CrossRef]
39. Bian, W.J.; Liu, W.G. Research on measurement methods for ecological niche of regional hi-tech entrepreneurial population. *Sci. Sci. Manag. S. T.* **2014**, *35*, 148–157.
40. Qian, L.X.; Cao, Z.L. Research on port industry development of Guangdong province based on niche theory. *Sci. Technol. Manag. Res.* **2018**, *38*, 205–209.

41. Wang, L.; Wang, Y.; Chen, J. Assessment of the ecological niche of photovoltaic agriculture in China. *Sustainability* **2019**, *11*, 2268. [CrossRef]
42. Hannan, M.; Freeman, J. Structural inertia and organizational change. *Am. Sociol. Rev.* **1984**, *49*, 149–164. [CrossRef]
43. Baum, J.A.C.; Singh, J.V. Organizational niches and the dynamics of organizational founding. *Organ. Sci.* **1994**, *5*, 11–26. [CrossRef]
44. Shi, B.; Tian, H.N. Research on the path selection of green process innovation of home appliances manufacturing based on niche ecostate-ecorole theory. *Manag. Rev.* **2018**, *30*, 83–93.
45. Zhu, F.Y.; Jia, Q.X.; Tan, B.H. Niche suitability measurement model of logistics industry and its dynamic coupling evolution. *Sci. Technol. Manag. Res.* **2019**, *39*, 217–224.
46. Chen, J.; Lin, S. Research on the niche breadth measurement model for tourism enterprises. *Agro Food Ind. Hi Tech* **2017**, *28*, 721–724.
47. Yang, X.Z.; Luo, W.; Tang, Z. Evaluation and evolution of science, technology and innovation competitiveness in the Yangtze river economic belt based on ecological niche. *Soft Sci.* **2019**, *33*, 8–14.
48. Zhao, Z.Y.; Xu, K.; Zuo, J.; Tang, C. Developing the international construction contracting market: Enterprise niche approach. *J. Manag. Eng.* **2016**, *33*, 04016027. [CrossRef]
49. Peng, B.H.; Zheng, C.Y.; Wei, G.; Elahi, E. The cultivation mechanism of green technology innovation in manufacturing industry: From the perspective of ecological niche. *J. Clean. Prod.* **2020**, *252*, 119711. [CrossRef]
50. UNCTAD. Digital Economy Report 2019-Value Creation and Capture: Implications for Developing Countries. Available online: https://unctad.org/webflyer/digital-economy-report-2019 (accessed on 20 December 2020).
51. Harrison, L.G. Complexity—Life at the edge of chaos. *Science* **1993**, *259*, 387–388. [CrossRef]
52. Jiang, S.R.; Qiao, H.; Zhang, S.; Liu, Y.; Hu, Y.; Xu, Y.M. The frontiers of value co-creation research: Ecosystem and business model innovation. *Manag. Rev.* **2020**, *32*, 3–17.
53. Ebrun. White Paper on Social Commerce in China. 2019. Available online: http://www.199it.com/archives/950433.html (accessed on 20 December 2020).
54. Miles, M.B.; Huberman, A.M. *Qualitative Data Analysis: An Expanded Sourcebook*; Sage: Newbury Park, CA, USA, 1994; pp. 105–138.
55. Mayring, P. Qualitative inhaltsanalyse. In *Handbuch Qualitative Forschung in der Psychologie*; VS Verlag für Sozialwissenschaften: Wiesbaden, Germany, 2010; pp. 601–613.
56. Internet Society of China. Report on the Development of China's Social E-Commerce Industry in 2019. Available online: https://www.isc.org.cn/hyjl/zghlwdh/listinfo-36858.html (accessed on 24 November 2020).
57. Levins, R. *Evolution in Changing Environments: Some Theoretical Explorations*; Princeton University Press: Princeton, NJ, USA, 1968; pp. 297–298.
58. Li, Z.Z.; Li, W.L.; Ma, Z.H.; Yang, Y.H. Model of niche-fitness of crop species and its application to the growth and yield of spring wheat. *J. Lanzhou Univ. Nat. Sci.* **2010**, *46*, 45–50.
59. Pianka, E.R. Niche overlap and diffuse competition. *Proc. Natl. Acad. Sci. USA* **1974**, *71*, 2141–2145. [CrossRef]