



## Research article

# A study of the influence of the stability of the population's income and expenditure on the development of restaurant chains

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## ABSTRACT

This study examines the connection between the income of Chinese residents and the expansion of restaurant chains from 2005 to 2021. It employs multiple methodologies, such as an evaluation index system, the entropy value method, and the coupled coordination degree model. There are sixteen indicators divided into two groups: residents' income and expenditures, and restaurant chain expansion. The analysis reveals the following trends: instability from 2005 to 2009 as a result of the global financial crisis; regional disparities from 2010 to 2014; and coordinated development from 2015 to 2021 as a result of government policies that stimulate domestic demand. This research contributes to strategic planning and decision-making in the hotel, catering, and tourism industries by assessing the effect of Chinese residents' stable income and expenditures on restaurant chains.

## 1. Introduction

The tourism industry in China has always been significantly influenced by catering chains, and the economic status of these enterprises is directly correlated with the industry's growth and decline. Additionally, the stability and consumption levels of the population have become critical factors that influence these enterprises [1]. Residents' consumption levels and stability are among the most critical variables that influence these enterprises [1]. Therefore, it is imperative to have a comprehensive comprehension of the relationship between the development of restaurant chains and the incomes and expenditures of residents in order to ensure the continued growth of the tourism and catering sectors. Two. The catering industry's growth is not solely determined by the income and expenditure patterns of its residents; it is also intricately linked to the general advancement of urban areas. With the rapidity of China's urbanisation, the hospitality industry is presented with new opportunities and challenges as urban planning and transportation systems are enhanced. Good urban planning can optimise the spatial distribution of F&B establishments, while a well-developed transport system enhances the accessibility of F&B venues, which in turn influences consumers' decisions. Recognising the existence of these factors is beneficial in comprehending the intricate environment in which the F&B industry is evolving, despite the fact that they are not the primary focus of this study. In addition, since 2023, a plethora of small communities have inspired consumers to investigate their distinctive culinary flavours. According to the chart (Fig. 1): The F&B industry is continuing to realise its potential, fueled by

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tourism demand, as evidenced by the fact that accommodation bookings for Mid-Autumn and National Day in Chinese cities such as Yanji, Taizhou, Shantou, Liuzhou, and Yibin have increased by over 400 % compared to 2019. Additionally, data from Meituan and Dianping indicates that F&B dine-in orders have increased by 110 % year-on-year during the “11th” holiday. According to the data from Meituan and Duan Dian, the number of catering dine-in orders increased by 110 % from the first day of the “11th” holiday in 2022.

One of the objectives of this investigation is to investigate the correlation between the stability of Chinese residents’ income and expenditures and the growth of chain restaurant enterprises. We have implemented a diverse array of research methodologies to conduct a comprehensive examination of this matter, such as the development of an evaluation index system, the entropy value method, and the coupled coordination degree model. We endeavoured to disclose the potential correlation between the income and expenditure circumstances of residents and the development of chain restaurant enterprises by analysing the data from 2005 to 2021. The investigation of the interaction between these economic activities and the urban transport system is a critical objective of this study. From an urban transport and regional economic activity perspective, this paper will investigate the indirect impact of the transport system on the restaurant industry’s prosperity by improving the accessibility of regional economic activities. In addition, the investigation will examine the extent to which transport accessibility facilitates the diversification of catering services and the attraction of a broader customer base, thereby disclosing the influence of urban transport development on the consumption habits of residents. What is the impact of changes in residents’ incomes and expenditures on the economic conditions of restaurant chains? This is the primary inquiry of the investigation. In an effort to resolve this inquiry, we have developed an evaluation index system that encompasses two critical components: the income and expenditure circumstances of residents and the development status of restaurant chains. This investigation’s primary objective is to examine the influence of residents’ income and expenditure stability on the growth of restaurant chains. However, it acknowledges that urban development and transportation systems may also contribute significantly to this relationship. These factors, while not the primary focus of this study, offer a framework for future, more comprehensive research on the multifaceted factors that influence the catering industry’s growth.

We have studied critical indicators, including the disposable income and consumption expenditure of urban and rural residents, as well as the disposable income index and the consumption expenditure index of the national population, in order to assess the income and expenditure situation of the population. All of these indicators are essential for assessing the economic stability of the residents, as they are indicative of their consumption behaviour and economic situation. In terms of the advancement of chain catering enterprises, our attention is directed towards the gathering of data regarding the total number of shops and locations, the number of employees, the



Fig. 1. Catering sector scenario description chart.

business area, the number of restaurants, the turnover, the total merchandise purchases, and the unified delivery merchandise purchases. These indicators are essential for assessing the catering industry’s healthy development, as they reflect the scope, employment, economic output, and supply chain status of catering enterprises.

The research results’ evolving trends, such as the unstable trend of the coupling nature between residents’ income and expenditure and the development of restaurant chain enterprises from 2005 to 2009, are the primary focus of our attention. This relationship further demonstrated an imbalance from 2010 to 2014. In contrast, the relationship between the two exhibited a trend of coordinated development between 2015 and 2021, i.e., prior to the epidemic and at the onset of the epidemic. These alterations can be attributed to the macroeconomic environment. The economic instability that resulted from the global financial crisis of 2005–2009 had a direct impact on the income and expenditure situation of residents, thereby negatively affecting the catering industry [2]. In this period, the economic situation of hospitality enterprises was unstable due to the pressure on residents’ spending power [3]. And from 2010 to 2014, despite the relatively consistent economic growth of China, the disparities among various regions resulted in an imbalance in residents’ expenditures, which also impacted the performance of restaurant chains [4]. However, the government has implemented a series of policy measures to stimulate domestic demand from 2015 to 2021. These measures include tax and fee reductions and catering



Fig. 2. Comparison of Chinese and European and American studies.

- (2) The most recent perspectives of pertinent academicians (Table 1)
  - a. The most recent perspectives of Chinese scholars:

**Table 1**  
Literature review table.

Serial number	Academia	Discuss a paper or thesis (old)	Core ideas relevant to this study	Periodicals	Be quoted
1	Yi Xingjian and Zhou Li	Whether Digital Inclusive Financial Development Significantly Affects Consumption - Micro Evidence from Chinese Households	Data from the Digital Inclusion study supports the importance of residents' incomes on food and beverage consumption, a factor that not only has an impact on an individual's food and beverage choices, but also has a profound effect on the development of the consumer sector as a whole and on the state of the economy.	Financial Research	1650
2	Cheng Mingwang and Zhang Jiaping	Internet Penetration and Urban-Rural Income Gap: Theory and Empirical Evidence	The popularity of the Internet and the income level of the population are among the important factors in catering consumption. By reducing the income gap between urban and rural areas, balanced growth in catering consumption can be further promoted.	China's rural economy	402
3	Zou Crescent and Wang Wang	Research on the Impact of Digital Inclusive Finance on Residents' Consumption - An Empirical Analysis Based on Spatial Econometric Modelling	Higher-income residents typically have greater spending power on food and beverage, and the development of digital financial inclusion can enhance the convenience and promotion of food and beverage consumption.	Research in Financial Economics	282
4	Zhang Xun etc.	Digital economy, financial inclusion and inclusive growth	Higher-income residents typically support higher levels of food and beverage spending, and the development of digital financial inclusion can increase the income levels of the population as a whole, contributing to a thriving food and beverage industry.	economic research	2520
5	Jiang Xiao Juan and Meng Lijun	Internal Circulation-based, External Circulation Enabling and Higher Level of Dual Circulation - International Experience and Chinese Practice	The new development pattern and the concept of the double cycle, with the inner cycle representing the development of the domestic market. The income level of the population is directly related to the realisation of the inner cycle.	Managing the World	662
6	Marcello M. Mariani and Samuel Fosso Wamba	Exploring how consumer goods companies innovate in the digital age: The role of big data analytics companies	Digital technology and big data analytics have become powerful tools for market research and product innovation. These tools can help the F&B industry better understand the needs and preferences of consumers so that they can better meet their expectations.	Journal of Business Research	134
7	Mario Lezoche et al.	Agri-food 4.0: A survey of the supply chains and technologies for the future agriculture	Digital technology and data analytics not only help to understand consumer needs, but also help F&B companies with market research and supply chain optimisation.	Computers in Industry	466
8	Jennifer Clapp	The problem with growing corporate concentration and power in the global food system	The impact of corporate concentration on the global seed and agrochemical industries was highlighted, which raised concerns about other areas of the food system, including the catering industry.	Nature Food	136
9	Sang M. Lee, Silvana Trimi	Convergence innovation in the digital age and in the COVID-19 pandemic crisis	The digital age and the current COVID-19 pandemic crisis, both of which have had a huge impact on the market environment of the restaurant industry. In such an environment, it becomes crucial to understand the impact of the population's income on restaurant consumption.	Journal of Business Research	333
10	Sabine O'Hara and Etienne C. Toussaint	Food access in crisis: food security and COVID-19	The reference to community-centred strategies highlights the need to consider community empowerment when addressing food inequality. Relevant research may have examined the impact of these strategies on different groups of residents.	Ecological Economics	236

support policies, which have contributed to the expansion of the catering industry and the increase in the disposable income of residents [5].

The topic's complexity and wide-ranging implications must be acknowledged when investigating the relationship between the stability of income and expenditure of Chinese residents and the development of restaurant chains [6]. Although this study's results offer valuable insights for the tourism industry, government policymakers, and hotel and restaurant companies, it is important to acknowledge that they are merely the beginning and that there is still much more to be explored in depth in the future. First and foremost, the model must be continuously evaluated and the data updated to monitor the long-term effects of changes in residents'

income and expenditure on restaurant chains, given the changing economic and social environment in China [7]. This will enable more precise predictions and responses to prospective economic hazards. Second, the catering industry may be significantly affected by additional factors, including the evolution of consumption patterns, increasing urbanisation, technological innovation, and environmental sustainability [8]. The integration of these factors into the scope of the study will facilitate a more thorough comprehension of the relationship between the development of catering enterprises and the consumption of residents. In addition, it is imperative to conduct a comprehensive examination of the role of government policies, with a particular emphasis on the effects of policy modifications on the catering industry over various time periods [9]. Therefore, it is imperative to conduct analyses of policies, as they significantly influence the business environment and the consumption habits of residents. In conclusion, this investigation offers significant insights into the influence of residential income and expenditure stability on restaurant chains; however, it is only one aspect of a multifaceted subject. To gain a comprehensive understanding of the challenges and opportunities that China's restaurant industry is currently confronting, future research will necessitate interdisciplinary collaboration and a broader spectrum of data. Our objective is to offer the tourism industry, hotel and restaurant companies, and the economy as a whole additional strategic guidance and beneficial references as a result of ongoing, comprehensive research.

## 2. Literature review

### 2.1. Overview of typical views

(1) Comparison of the present state of research in the United States, Europe, and China (Fig. 2).

a. Present research status in China today:

The development of restaurant chains in China has a long history and a rich tradition of research in the area of “the stability of residents’ income and expenditure.” Research in this field has undergone a series of phases, each of which has affected China’s social and economic development to varying degrees.

The catering industry’s development and urban planning have been the subject of significant research in recent years. There are academicians who have investigated the influence of economic activity and urban layout on the distribution of catering firms, thereby offering novel perspectives on the catering industry’s function in the urban economy.

- In the 1970s and 1980s, the initial Phase: Macroeconomic research was the primary focus at the outset of China’s reform and opening up, with a particular emphasis on the national balance of payments. Eleven. The initial stage of development occurred during the 1970s and 1980s. Institutions such as the Chinese Academy of Social Sciences (CASS) started to concentrate on the development of national policies and programmes to stimulate national economic growth during this period [10]. Dozen. The primary focus of the research was on the national balance of payments and policies, with a diminished emphasis on the income and expenditure situations of individual residents.
- Reform and opening-up phase (1980s–1990s): Due to the intensification of reform and opening-up, research in China has progressively shifted to concentrate on revenue and expenditure at the resident level. Thirteen. The implementation of a statistical system for the income and expenditures of residents occurred during this period. China initiated the establishment of a statistical system for residents’ income and expenditure data during this period, with the National Bureau of Statistics and other organisations serving as collaborators [11]. fourteen. In this endeavour, the National Bureau of Statistics and other organisations were engaged [11]. Simultaneously, the research emphasis was progressively transferred from the national level to the income and expenditure of individual residents and households, allowing for the examination of residents’ saving behaviour, consumption patterns, and living standards [12].fifteen.

It is (early 21st century to present) Research has been further fortified by the rapid expansion of China’s economy, with the active involvement of a variety of universities, research institutes, and think tanks. The scope of research has been broadened to encompass the quality of life of the population, the social security system, and the development of the catering industry, as well as the innovation of research methodologies, such as statistical analyses, social surveys, and the construction of models. I am sixteen. The research conducted in China has yielded a group of influential scholars and experts who have offered valuable guidance on social development and policy formulation.

The analysis conducted in China also concentrated on the influence of residents’ income and expenditure on the catering industry, with a particular emphasis on restaurant chains [13]. In this field, research is conducted to enhance comprehension of the competitive dynamics of the catering industry, the consumption patterns of residents in China, and the catering market.

Concurrently, the emphasis on the development of the transit system has increased in response to the accelerating pace of urbanisation. Numerous investigations have initiated to investigate the correlation between urban planning, transportation systems, and the distribution of catering, offering novel perspectives on the location and growth of catering enterprises. The interaction between economic activities and urban infrastructure has been the subject of investigation by certain academicians regarding the impact of urban accessibility on the development of the catering industry.

Furthermore, research conducted in China has concentrated on the influence of residents’ income and expenditure on the catering industry, with a particular emphasis on restaurant chains. Research conducted in this field enhances comprehension of the catering market in China, the consumption patterns of residents, and the competitive dynamics of the catering industry.

b. Presently, the State of Research in the United States and Europe:

In Europe and the United States, research on the stability of the population's income and expenditure, as well as the development of the hospitality industry, has a lengthy history and a variety of perspectives. Number eighteen. Research in this discipline varies across countries and regions; however, it can be broadly categorised into multiple stages. In the past few years, there has been a growing emphasis in European and American research on the correlation between urban planning and catering development. For example, certain investigations have investigated the impact of sustainable urban development plans (such as SUMP in Europe) on the organisation and advancement of the hospitality sector.

In the initial stages: The primary concentration of early studies in Europe and the United States was on macroeconomics and balance of payments at the national level, which was similar to how early studies were conducted in China. nineteen. Some studies concentrated on the population's response to national policies, international trade, and the global economic climate, which were somewhat indicative of the international economic environment of the era [14].

Phase of social science research: As social science advances, research advances to the individual and family level [15]. In Europe, major universities and research institutes, including the Institute of Housing and Urban Studies and the Department of Sociology at Uppsala University, initiated research on household income and expenditure and the lifestyles of the population [16]. twenty-two The quality of life and social participation of the population are the primary focus of these studies, which also address topics such as social policy, consumer behaviour, and social inequality.

- Early Stages of Research: Currently, the research field has expanded to encompass a wider range of dimensions, despite the fact that Europe and the United States continue to concentrate on the income and expenditure of individuals and households [17]. The digital economy, entrepreneurship, and the expansion of the hospitality industry have emerged as research hotspots, as interdisciplinary research approaches have become increasingly common [18]. This area of research is actively pursued by economists, sociologists, market analysts, and policymakers, and it not only has ramifications for social policymaking but also offers valuable insights into business strategies and market competition [19]. 25.

Additionally, the United States and Europe have obtained remarkable outcomes in their investigations of the correlation between economic activities and transportation systems. For instance, Hesse and Rodrigue (2004) investigated the influence of logistics and goods distribution on urban economic activities by analysing the geography of these processes. The studies in question demonstrate that the efficacy of the transport system has a substantial impact on economic activity, notably on the development of the restaurant industry, in contrast to Boyer and Hult's (2005) analysis of the impact of e-commerce on logistics and urban transport. The enhancement of the transportation system not only enhances the efficiency of logistics but also increases the flow of customers to catering establishments, thereby contributing to their economic development.

The stability of residents' income and expenditure, as well as the development of catering enterprises, are the subject of research in both China and Europe, as well as the United States [20]. These countries have a complex history and a variety of perspectives. Urban Mobility Planning (SUMP) has been implemented in Europe in recent years to generate novel concepts for sustainable urban development. Although these plans primarily concentrate on transportation systems, their comprehensive planning concepts are also beneficial for comprehending the restaurant industry's function in urban development. Additionally, subsequent to the COVID-19 pandemic, certain investigations have initiated an examination of the influence of urban logistics and e-commerce on the catering sector, thereby offering novel research opportunities.

These investigations not only represent the economic, cultural, and social attributes of various regions, but they also offer valuable experiences and insights for the advancement of global economic and social systems. A comprehensive comprehension of the present state of these studies is beneficial for comprehending the international context and trends in this significant field, as well as for obtaining valuable references and lessons for future research. While existing research offers valuable insights into the relationship between the hospitality industry's development and the income and expenditure of residents, there are still some deficiencies. For starters, the majority of the studies concentrate on the effects of individual factors on the catering industry and do not provide a comprehensive analysis of the intricate relationship between the catering industry, urban development, and the income and expenditure of residents. Secondly, the majority of the existing research exclusively concentrates on specific regions or periods, with a dearth of long-term, nationwide dynamic analyses. Finally, there are fewer studies that examine the evolution of this relationship during various phases of economic development.

One of the objectives of this investigation is to address these research deficiencies. To conduct a thorough analysis of the dynamic relationship between the development of restaurant chains and the income and expenditure of residents, we will employ the coupled coordination degree model to analyse long-term data from 2005 to 2021. Simultaneously, we will evaluate the potential influence of external factors, including urban development and transport systems, in order to offer a more thorough analytical perspective. This investigation additionally considers the evolving characteristics of this relationship as it progresses through various phases of economic development. This study will offer a more complete and profound comprehension of the relationship between the development of the restaurant chain industry in China and the income and expenditure of residents by leveraging innovations in these areas.

Diverse perspectives and insightful research on the topic of "Stability of Income and Expenditure of the Population on the Development of Food Consumption Enterprises" have been provided by an exceptional group of academicians in China. Details of the identities and research organisations of the following Chinese scholars are provided, along with their cutting-edge perspectives:

Scholars Yi Xingjian and Zhou Li (School of Finance, Guangdong University of Foreign Studies): Professor Yi Xingjian examines the influence of digital financial inclusion on the correlation between the consumption of food and apparel and the income and

expenditure of residents in his research. He emphasises that the consumption patterns of residents are influenced by their income levels. This means that high-income residents are more inclined to experiment with novel consumption experiences, whereas low-income residents may prioritise affordable and fundamental consumption requirements [21].

- Cheng Mingwang and Zhang Jiaping, scholars from the School of Economics and Management at Tongji University: Urban residents may have simpler access to a variety of upscale catering options, while rural residents may have more limited access, as Cheng Mingwang emphasised, due to the income disparity between urban and rural residents. By reducing the urban-rural income disparity and providing rural residents with a greater variety of Internet-based catering options, the spread of the Internet and the acceleration of the rural informatisation process could promote the diversification and expansion of catering consumption [22].
  - Scholars Zou Xinyue and Wang Wang (School of Finance, Guangdong University of Finance and Economics): The significance of inhabitants' income in terms of catering consumption is elucidated by Professor Zou Xinyue's research. The convenience and promotion of catering consumption can be improved by the development of digital inclusive finance, while high-income inhabitants typically have a greater spending power in catering. This combination of factors has a significant impact on the catering industry's prosperity and underscores the critical role of residents' income in catering consumption [23].
  - Zhang Xun et al. (Department of Financial Statistics, School of Statistics, Beijing Normal University): Professor Zhang Xun's research is centred on the potential for the advancement of digital finance to elevate the income of residents. By offering convenient payment methods, consumption, and insurance, digital financial inclusion can facilitate the process of accessing and paying for catering services for residents. This could potentially encourage individuals to derive greater pleasure from their culinary experiences, which could have a beneficial effect on the restaurant industry [24].
  - Scholars Jiang Xiaojuan and Meng Lijun (School of Public Administration, Tsinghua University): Their research demonstrates that the impact of catering consumption is significantly influenced by the income level of residents. The catering industry's prosperity and the advancement of internal and external circulation are bolstered by high-income residents. In order to foster the sustainable growth of the catering industry, it is imperative that the government and society prioritise equity in order to guarantee that individuals of all income levels have access to a wide range of high-quality catering services [25].
- b. Contemporary viewpoints from academicians in the United States and Europe:

In addition, there are academicians who have made significant contributions to the study of "the stability of the population's income and expenditure on the development of chain restaurant enterprises" in the United States and Europe. A representative list of European and American scholars and their cutting-edge perspectives, including their names and research organisations, is provided below: Marcello M. Mariani, Samuel Fosso Wamba (Henley Business School, University of Reading, UK): The significance of the socioeconomic level of the population in influencing restaurant consumption is evident in their research. Digital technology and big data analytics tools can assist the catering industry in gaining a more comprehensive understanding of the requirements of various levels of residents and in providing a more engaging culinary experience, as high-income residents are the foundation of a prospering catering industry. The F&B industry and the government should collaborate to guarantee that individuals of all socioeconomic levels have access to a wide range of high-quality dining services [26].

- Mario Lezoche and colleagues (CNRS, University of Lorraine, France): Their research unequivocally demonstrates that hospitality companies can more effectively satisfy consumer demand and optimise supply chains and costs by utilising digital technologies and data analytics. Equal access to high-quality food and beverage services should be prioritised in government and social policies to guarantee that individuals of varying socioeconomic backgrounds have the opportunity to consume them. [27].
- Jennifer Clapp (University of Waterloo, School of Environment, Resources and Sustainability): Her research underscores the influence of corporate concentration on the food system, which is also relevant to the restaurant industry. Residents' income levels significantly influence their food and beverage consumption habits and choices, and corporate concentration may impact the food and beverage market's functionality, technological innovation, and policymaking. Consequently, the significance of residents' incomes on food and beverage consumption is exacerbated. Consequently, it is imperative that policymakers and the F&B industry consider the income diversity of residents in order to guarantee that the F&B options are equitable and diverse enough to accommodate the requirements of a variety of residents [28].
- Silvana Trimi and Sang M. Lee, scholars from the University of Nebraska-Lincoln's School of Business. Their research underscores the critical role of the income level of the population in determining restaurant consumption in the digital era and within the context of the crisis. The catering industry's utilisation of technology and innovation is also underscored by the concept of convergent innovation. Catering companies must continue to innovate in order to adapt to the market's incessant changes, while also comprehending and adapting to the consumption patterns of the population. This underscores the importance of inhabitants' income in the development of the industry and the consumption of catering [29].
- Sabine O'Hara and Etienne C. Toussaint (School of Agricultural, Urban Sustainability, and Environmental Sciences, University of the District of Columbia, USA): The significance of residents' income levels in relation to food access and restaurant consumption is underscored by their research. The research may have illuminated the obstacles encountered by inhabitants of varying income levels when confronted with food inequality, as well as the potential involvement of community centre strategies in resolving these issues. This underscores the necessity of social advocacy and policy to guarantee that a greater number of inhabitants have access to sustainable and equitable sustenance [30].

The aforementioned literature collectively addresses the research field of "the stability of residents' income and expenditure on the

development of chain restaurant enterprises,” with the objective of acquiring a more profound comprehension of the most recent research trends and perspectives of scholars from China, Europe, and the United States in this area. Together, these perspectives can be analysed to gain a more comprehensive understanding of the global nature and diversity of this intricate subject. In their research, Chinese scholars have underscored the influence of government policies, innovation, reserves, and the income level of the population on food and beverage firms. Their research concentrates on the unique socio-economic context of China and offers valuable insights for the development of business strategies and policy. In contrast, the digital age, social inequality, environmental protection, and innovation have a significant impact on food and beverage firms, according to the perspectives of European and American scholars. Their research encompasses multicultural and international contexts, offering international perspectives on the global catering industry’s evolution.

The relationship between the stability of residents’ income and expenditure and the development of catering enterprises can be further explored in future research by continuing to draw on the expertise of these scholars. This encompasses a more comprehensive examination of emerging technologies and trends, as well as quantitative and qualitative studies. At the same time, it is imperative that we take into account globalisation and cross-cultural factors in order to more effectively adapt to the evolving market environment [31]. The discipline of “the stability of residents’ income and expenditure on the development of restaurant chains” is a subject in which scholars in the United States, Europe, and China have a wealth of experience and insights. Their contributions serve as a sound foundation for our comprehensive comprehension of this significant subject, as well as valuable references and inspirations for researchers, business operators, and policymakers. This interdisciplinary research area will persist in offering valuable assistance for the sustainable advancement of the global hospitality industry and the enhancement of the quality of life of the populace.



Fig. 3. Analysis of the results of the literature search.



## 2.2. Overview of the literature search

Prior to conducting the research on “the stability of residents’ income and expenditure on the development of chain restaurant enterprises,” we conducted a comprehensive literature search to gain a comprehensive understanding of the current state and academic context of the relevant field. We conducted searches in the China Knowledge Network (CNKI), China Wanfang Data, PubMed, and WOS Core Collection databases using two keywords: “residents’ income” and “chain restaurant.” Based on Fig. 3, it is evident.

### (1) Keyword search for “population income”

Initially, we identified 46,057 results on the China Knowledge Network (CNKI) and 104,921 related documents on the China Wanfang Data when we searched for “residents’ income.” These documents primarily address a diverse range of subjects, such as “income disparity,” “urban-rural income disparity,” and “empirical studies and analyses.” “Empirical studies and analyses,” “urban-rural income disparity,” and “income gap” comprise a broad spectrum of disciplines. A broad spectrum of disciplines is encompassed, such as “trade economy,” “macroeconomic management,” and “economic system reform.” These literatures offer substantial background information for the analysis of the stability of residents’ incomes and expenditures, as they provide comprehensive data and research findings regarding the status and disparity of residents’ incomes. The fact that the income level and distribution of residents in China have always been a significant subject of research is reflected in this. Specifically, China has undergone significant social and economic transformations since the reform and opening up, resulting in a rapid increase in the income of its residents, but also a widening disparity between urban and rural residents [32]. The Chinese Academy of Social Sciences, Renmin University of China, and other universities and research institutes were the most prominent during this period, but there were numerous research institutions and scholars who arose. Their research has focused on the macroeconomic policies, social development, and income distribution of China, offering substantial support for comprehending the country’s unique socio-economic context.

Also, we conducted searches on an international scale. We were able to retrieve 12,275 pertinent documents from the PubMed database, and 24,207 results from the WOS core collection data. “Business economics,” “social problems,” and “behavioural sciences” comprise the primary research areas of these international literatures. They offer valuable information for cross-cultural research by concentrating on the correlation between income and social issues, business economics, and other fields. As the social and economic conditions of each country differ, so do the research priorities in international studies. In the United States, research is primarily focused on the investigation of income disparity and social inequality, which are closely associated with the country’s market economic system and social structure [33]. For example, in the United States, research has concentrated on income disparities and social inequality, which are closely associated with the country’s market economy and social structure [33]. The institutional differences between various countries, as well as the relationship between social welfare policies and people’s incomes, are the primary focus of research in European countries [34]. Forty. The international literature has contributed to our comprehension of the correlation between income and social welfare policies in various countries. Our comprehension of the income situation of residents in various countries has been enhanced by these international literatures, which have also offered valuable references for research in the context of globalisation.

### (2) Conduct a keyword search for “restaurant chain”

Secondly, we obtained 551 relevant documents from China Knowledge Network (CNKI) and 4892 results from China Wanfang Data by employing the keyword “chain restaurant.” These documents encompass “cost control,” “optimisation research,” and “marketing strategy.” “Service economy,” “trade economy,” and “enterprise economy” comprise the curriculum. Detailed research information is available in the literature to analyse the business strategies and market competition of chain restaurant enterprises. This is indicative of the rapid growth of the chain restaurant industry in China in recent years, which has become a significant component of the service industry. In order to investigate the industry’s market competition strategies, management modes, and innovative development orientations, numerous research teams from domestic universities and business research organisations have conducted comprehensive studies. In addition, organisations such as the China Chain Restaurant Association have actively promoted industry research and data compilation. Forty-one In addition, the Chinese Chain Restaurant Association has actively promoted industry research and data compilation [35]. This body of literature offers comprehensive data and information to substantiate our comprehension of the Chinese chain restaurant market.

In parallel, we conducted searches in the international domain. 409 articles related to restaurant chains were obtained from the PubMed database, while 1942 articles were obtained from the WOS Core Collection. “Psychology,” “business economics,” and “behavioural science” comprise the primary research areas of these international papers. Valuable data and insights for international comparative studies are provided by their concentration on global trends and consumer behaviour in the restaurant chain industry. In addition, this international literature also addresses a variety of challenges and issues. First and foremost, the restaurant chain industry has developed in a variety of ways across various countries and regions. Literature from certain developed countries may emphasise competitive strategies and market share allocation within the industry, whereas literature from certain emerging market countries may emphasise the integration of restaurant chains with local culture and the examination of consumer habits [36]. A more comprehensive theoretical framework must be developed by thoroughly considering this diversity in research.

In total, these exhaustive literature searches have provided us with a comprehensive comprehension of the most recent research on the stability of residents’ income and expenditure, the development of restaurant chains, and the viewpoints of scholars and organisations in related fields. We are provided with a strong theoretical framework and empirical data to support our research in this

literature. A combination of domestic and international research findings will be employed to gain a more comprehensive understanding of the various facets of this significant subject matter as we investigate the relationship between restaurant chains and residents' income and expenditure.

### 2.3. Summary of previous studies and innovations in this study

Although there has been a significant amount of research on the influence of residents' income and expenditure on the development of restaurant chains in previous studies, there are still some knowledge gaps and limitations. Initially, we will provide a concise summary of the primary concepts and discoveries of prior research, followed by a focus on the novel aspects of this investigation.

#### a. Overview of prior research:

The following areas have been the focus of previous research.

- (1) Research on the correlation between residents' income, expenditure, and consumption behaviour: These studies have investigated the impact of inhabitants' income levels on their consumption decisions and behaviours in various income and expenditure scenarios. Nevertheless, the majority of the research has concentrated on general consumption products and services, with relatively few studies conducted on catering chains. The frequency and quantity of money that consumers spend on dining at restaurant chains are correlated with their disposable income [37]. These studies offer a preliminary comprehension; however, they do not investigate the influence of income and expenditure stability on the growth of restaurant chains, nor do they account for fluctuations in the macroeconomic environment.
- (2) Market analysis of the catering industry: While certain studies have concentrated on market trends, competitive patterns, and market share distribution in the catering industry, they have not examined the mechanism of the influence of residents' income and expenditure on catering enterprises. These studies typically concentrate on factors that are intrinsic to the catering industry, such as product innovation and marketing, and pay less attention to external factors, such as the economic conditions of residents [38]. Consequently, there is a dearth of comprehensive understanding regarding the relationships between the income and expenditure of residents and restaurant chains.
- (3) Policy impact studies: Certain studies have concentrated on the ways in which government policies affect the hospitality industry and the income and expenditure of residents, including tax and social welfare policies. Nevertheless, the relationship between the stability of residents' income and expenditure and policies has not been thoroughly examined in these studies. The income and expenditure of residents are directly correlated with macroeconomic conditions, which frequently influence the formulation and adjustment of policies [39].
- (4) Research on geographical disparities: certain studies have concentrated on the influence of disparities in the income and expenditure of residents on the hospitality industry in various regions or between urban and rural areas [40]. These studies underscore the significance of geographical factors; however, they fail to account for the effects of globalisation and time-series changes. In contrast, the majority of these studies concentrate on geographical distinctions within China and do not provide a comparative international perspective.

#### b. This study's innovations:

The following are the innovative aspects of this study.

- (1) A thorough examination of the population's income and expenditure stability: In order to evaluate the population's income and expenditure stability, we have not only addressed the level of income, but also paid particular attention to its expenditure. This facilitates a more thorough comprehension of the economic circumstances of the residents. In order to identify the fundamental mechanism, we have implemented an exhaustive investigation into the correlation between restaurant chains and the income and expenditure of inhabitants.
- (2) Implementation of the coupled coordination degree model: In order to more precisely represent the intricate relationship between the development of chain restaurant enterprises and the income and expenditure of residents, we implement the coupled coordination degree model, a relatively recent research methodology in the relevant field. This model can assist us in determining the intensity and direction of this relationship, as well as their trends over time.
- (3) Analysis of the macroeconomic environment: we have examined the relationship between the population's income and expenditure and the development of catering enterprises over various time periods from the perspective of the macroeconomic environment. This elucidates the distinct character of the coupling that emerged during the study period and connects it to the macroeconomic context. Through a more thorough examination of the macroeconomic data, we can gain a more comprehensive understanding of the influence of the macroeconomic environment on the income and expenditure of residents, as well as the operations of catering chain enterprises.
- (4) International comparative study: In order to investigate the evolution of China's restaurant chain industry from a global perspective, we integrate insights from the international literature into our research. This serves to contextualise the Chinese situation within an international framework and offers a more comprehensive guide for decision-making. We examine the international literature to identify insights and teachings regarding the hospitality industry in various countries.

The innovation of this study is that it considers the stability of residents' income and expenditure, the macroeconomic environment, international comparisons, and practical policy recommendations. Its objective is to offer a more comprehensive understanding of the relationship between catering chains and residents' economic conditions. Simultaneously, we underscore the interdisciplinary and long-term nature of the investigation in order to offer applicable insights and references for academic research and practical policymaking in related fields.

### 3. Research methodology and data sources

#### 3.1. Construction of the indicator system

Hotel and hospitality enterprises, particularly chain restaurants, have emerged as a significant component of the tourism and service sectors in China as a result of the country's ongoing economic expansion and urbanisation. Nevertheless, the economic status of these enterprises is inextricably linked to the stability and consumption of the local population. Consequently, the objective of this investigation is to investigate the extent to which the development of chain catering enterprises is influenced by the income and expenditure of residents. The development of chain catering enterprises and the income and expenditure situation of residents are the two aspects from which 16 evaluation indicators are selected, in order to construct a coordinated analysis and evaluation index system, taking into account the availability, representativeness, and operability of the data. This paper utilises the research findings of previous researchers to identify eight evaluation indexes from the subsystem of residents' income and expenditure. These indexes are derived from three first-level indexes: China's residents' income and consumption index, China's per capita GDP, and the subsystem of urban and rural residents' income and expenditure. The data of urban and rural residents' income and expenditure includes per capita disposable income (P), per capita disposable income (N), per capita consumption expenditure (E), per capita consumption expenditure (E), and per capita consumption expenditure (E). Consumption Expenditure (E), Per Capita Consumption Expenditure of Rural Residents (R), and China's Residents' Income and Consumption Indexes include the National Disposable Income Per Capita Index (D) and the National Per Capita Consumption Expenditure Index (U). China's Per Capita Gross Domestic Product (GDP) includes the Per Capita Gross National Income (I) and the Per Capita Gross Domestic Product (G). The data on merchandise distribution of chain restaurant enterprises includes the total amount of merchandise purchased (W) and the unified distribution of merchandise purchased (Q). Additionally, the number of employees (M), catering business surface at the end of the year (F), the number of seats (A), turnover (V), and the data on the number of seats (A) are all included. Tables 2 and 3 display comprehensive data regarding pertinent indicators.

The following four considerations are the primary factors for selecting these data indicators.

- (1) Representativeness and comprehensiveness: the selected indicators are representative and comprehensive in their coverage of the development of chain restaurant enterprises and the circumstances of residents' income and expenditure. These indicators are capable of providing a comprehensive representation of economic activities at various levels, such as the income situation

**Table 2**  
Evaluation index system for the development of China's chain catering enterprises.

System level	Tier 1 indicator level	Secondary indicator level	Unit (of measure)
Income and expenditure of the population	Income and expenditure of urban and rural residents	Disposable income per urban resident (P)	the Yuan or Mongol dynasty (1279–1368)
		Disposable income per rural resident (N)	the Yuan or Mongol dynasty (1279–1368)
		Consumption expenditure per urban resident (E)	the Yuan or Mongol dynasty (1279–1368)
		Consumption expenditure per rural resident (R)	the Yuan or Mongol dynasty (1279–1368)
	China's Income and Consumption Index	National disposable income per capita index (D)	/
		National index of per capita consumption expenditure (U)	/
Development of Catering Chain Enterprises	Gross domestic product per capita in China	GNI per capita (I)	the Yuan or Mongol dynasty (1279–1368)
		Gross domestic product (G) per capita	the Yuan or Mongol dynasty (1279–1368)
	Catering Chain Enterprises' Total Stores and Stores	Number of total restaurant chains (T)	classifier for individual things or people, general, catch-all classifier
		Number of outlets of restaurant chains (L)	classifier for individual things or people, general, catch-all classifier
	Catering Chain Business Turnover	Number of employees at the end of the year (M)	ten thousand people
		Catering business surface at year-end (F)	ten thousand square metres
		Number of meals (A)	ten thousand
	Distribution of goods by restaurant chains	Turnover (V)	billions
		Total purchases of goods (W)	billions
		Purchases of uniformly distributed goods (Q)	billions

**Table 3**  
Basic indicator data.

vintages	P	N	E	R	D	U	I	G
2005	10382.3	3370.2	8067.7	2748.8	803.4	718.4	14267	14368
2006	11619.7	3731	8850.7	3072.3	896.2	792	16707	16738
2007	13602.5	4327	10195.7	3535.5	1015.4	884.1	20541	20494
2008	15549.4	4998.8	11489	4054	1112.2	955.9	24250	24100
2009	16900.5	5435.1	12557.7	4464.2	1234.8	1068.4	26136	26180
2010	18779.1	6272.4	13820.7	4944.8	1363.3	1158	30676	30808
2011	21426.9	7393.9	15554	5892	1503.3	1267.5	35939	36277
2012	24126.7	8389.3	17106.6	6667.1	1662.5	1376.3	39679	39771
2013	26467	9429.6	18487.5	7485.1	1797.1	1471.2	43143	43497
2014	28843.9	10488.9	19968.1	8382.6	1940.5	1581	46971	46912
2015	31194.8	11421.7	21392.4	9222.6	2084.4	1690.6	49684	49922
2016	33616.2	12363.4	23078.9	10129.8	2216.1	1804.9	53516	53783
2017	36396.2	13432.4	24445	10954.5	2378.4	1902.3	59514	59592
2018	39250.8	14617	26112.3	12124.3	2532.1	2019.7	65246	65534
2019	42358.8	16020.7	28063.4	13327.7	2679.7	2131.6	69881	70078
2020	43833.8	17131.5	27007.4	13713.4	2737.3	2046.3	71253	71828
2021	47411.9	18930.9	30307.2	15915.6	2959.7	2303.8	80237	80976
vintages	T	E	M	F	A	V	W	Q
2005	300	9748	50.1	478.1	245.8	454.4	171.5	109.1
2006	349	11360	55.7	588.2	274.8	563.8	201.2	127.5
2007	358	12743	62.6	629.2	280	640	274.9	168.8
2008	453	12561	66.1	651.9	253.1	806.9	271.6	192.5
2009	426	13739	65.2	691.6	248.9	879.3	362	239.8
2010	415	15333	70.6	742.6	263.8	955.4	455.8	298.8
2011	428	16285	83.3	821.4	277.1	1120.4	518.9	343.1
2012	456	18153	80.6	869.2	286.5	1283.3	561.4	388.5
2013	454	20554	80.3	937.1	319.5	1319.6	571.2	400.7
2014	465	22494	78	1020	338.6	1391	583.4	413.9
2015	455	23721	71.4	970.9	333.6	1526.6	577	462.5
2016	459	25634	75.6	1036.9	341.1	1635.2	612.4	494.1
2017	463	27478	78	1075.4	337.9	1735.5	613.3	489.5
2018	482	31001	89.3	1075	332.6	1950	674	504.1
2019	495	34356	93.5	1151.5	346.6	2234.5	774.3	563.6
2020	504	37217	97.2	1216.2	381.2	2019.3	655.9	464.9
2021	553	43250	106	1339.2	398.5	2525.2	834.6	588.9

and living consumption level of residents, as well as the scope and economic performance of restaurant chains. Consequently, they assist in encapsulating the intricate interplay between these two dimensions.

- (2) Data availability and operability: The indicators were chosen with data availability and operability in mind. Typically, these selected indicators are official statistics that are routinely released by government departments or research organisations, making them easily accessible and valid. Furthermore, they are typically comparable across regions and time periods, which simplifies analyses across these boundaries.
- (3) Drawing on the findings of prior research: this investigation builds upon the findings of prior research, which offer valuable methodology and experience regarding the income and expenditure circumstances of residents and the growth of chain restaurant enterprises. By selecting indicators that are in accordance with prior research, it is possible to compare and refer to it in order to gain a more comprehensive understanding of the research problem.
- (4) Macro and micro perspectives: the selected indicators comprehensively evaluate the relationship between the stability of residents' income and expenditure and the development of chain restaurant enterprises from both macro and micro perspectives. From a macroeconomic standpoint, the impact of the overall economic environment on enterprise development can be better understood by concentrating on indicators such as the gross domestic product and per capita income index [41]. Additionally, indicators such as attrition, the number of employees, and the number of stores can provide insight into the internal operating conditions of the enterprise from a micro perspective. The study is rendered more exhaustive and in-depth by the amalgamation of these two levels of indicators.

The fundamental data for this paper is sourced from the China Statistical Yearbook 2005–2022 and the China Statistical Bulletin of the relevant years.

### 3.2. Entropy value method

#### 3.2.1. Standardised treatment of indicators' scales

In order to eliminate the magnitude and physical significance of each indicator, the article uses the square and normalisation method to process the raw data without a dimension. Equation (1) is shown below:

$$SSN.C_i = \frac{x}{\sqrt{\sum_{i=1}^n x_i^2}}$$

in the formula, the sum-of-squares normalisation, the purpose is to let the “sum-of-squares value” as a reference standard, all the data are divided by the sum-of-squares value, the data obtained is equivalent to the percentage of the sum-of-squares; the formula uses the “sum-of-squares value” of all the data as a unit, all the data are removed by the “sum-of-squares value”. The formula takes the “sum of squares” of all the data as the unit, and all the data are removed by the “sum of squares”.

3.2.2. Entropy weighting method to determine objective weights

- ① Calculate the entropy value of the indicator  $e_i$  “formula (2)”:

$$e_i = -k \sum_{j=1}^n f_{ij} \ln f_{ij}$$

where.  $k = \frac{1}{\ln n}$ , the  $f_{ij} = \frac{u_{ij}}{\sum_{j=1}^n u_{ij}}$ , and when  $f_{ij} = 0$  when  $f_{ij} \ln f_{ij} = 0$ .

- ② Calculate the weight of the indicator  $w_i$  “formula (3)”:

$$w_i = \frac{1 - e_i}{m - \sum_{i=1}^n e_i}$$

3.3. Modelling of coupled system coordination

The degree of interaction between two elements is characterised by the physical concept of coupling [42]. The degree of coupling indicates the extent to which the system of "residents' income and expenditure and the development of chain restaurant enterprises" interact, but it is not a precise indicator of the synergistic effect that the two systems enjoy when developed collectively. In light of this, the article proposes the following formula (4) for a coupling coordination model that is more scientific in nature:

$$D = \sqrt{C \times T}$$

where  $= \left[ \frac{c_1 c_2 c_3}{(c_1 + c_2 + c_3)^3} \right]^{1/3}$ , is the coordination index;  $c_1, c_2, c_3$  are the posting progress of the 3 subsystems, respectively;  $T = \alpha c_1 + \beta c_2 + \gamma c_3$ , is the comprehensive evaluation index;  $\alpha, \beta, \gamma$  are the weights of the subsystems determined by entropy weighting method, respectively. the larger the value of D, the better the degree of coordination and coupling.

Based on the classification criteria established in Zhao et al.'s [43] study on the rank of coordination, coupled coordination is divided into ten subcategories in this article (Table 4).

Note: The Coupled Coordination Degree Model and the Entropy Method are two quantitative analysis methods that are frequently employed in the examination of complex systems in the social, economic, and environmental sectors. The following section provides a comprehensive explanation of the applications of these tools and how to enhance the robustness of research results.

Strategies for enhancing robustness.

- ① Comprehensive multi-indicator evaluation: to prevent the one-sidedness of a single indicator, a variety of indicators are chosen for comprehensive evaluation.
- ② Dynamic analysis: Perform a time series analysis to observe the system's coupled and coordinated developmental changes across various time periods.

**Table 4**  
Criteria for classifying the coupling coordination level.

Interval of D-values for coupling coordination	Level of coordination	Degree of coupling coordination
(0.0–0.1)	1	extreme disorder
[0.1–0.2)	2	severe disorder
[0.2–0.3)	3	moderate disorder
[0.3–0.4)	4	mild disorder
[0.4–0.5)	5	on the verge of becoming dysfunctional
[0.5–0.6)	6	sue for coordination
[0.6–0.7)	7	Primary coordination
[0.7–0.8)	8	Intermediate level coordination
[0.8–0.9)	9	good coordination
[0.9–1.0)	10	Quality coordination

- ③ Sensitivity analysis: evaluate the model's resilience to the input data by examining the effects of indicator weights and data modifications on the results.

The robustness of the research results can be enhanced by combining the entropy value method and the coupled coordination degree model. To be more precise, the entropy method can be employed to ascertain the weights of the indicators, which are subsequently applied to the calculation of the coupled coordination degree model to produce more dependable and objective evaluation results.

#### 4. Comprehensive analysis

##### 4.1. Results of data normalisation

From the table below (Table 5 & Fig. 4), it can be seen that there are no anomalies in the current data set after the dimensionless treatment by the square and normalisation method; therefore, the next stage of analysis will be conducted directly on the data.

##### 4.2. Entropy method data weighting results

Using the entropy method to calculate the weights of a total of 16 items such as P, it can be seen from the following table and figure (Table 6): for the 16 indicators SSN\_P, SSN\_N, SSN\_E, SSN\_R, SSN\_D, SSN\_U, SSN\_I, SSN\_G, SSN\_T, SSN\_L, SSN\_M, SSN\_F, SSN\_A, SSN\_V, SSN\_W, SSN\_Q total 16 items and their weight values are 7.91 %, 10.28 %, 6.09 %, 10.61 %, 5.95 %, 4.78 %, 9.01 %, 9.06 %, 0.79 %, 7.73 %, 1.48 %, 2.99 %, 0.91 %, 8.24 %, 6.39 %, and 7.77 %. There are some differences in the weights between the items, with the SSN\_R item having the highest weight of 10.61 per cent and the SSN\_T item having the lowest weight of 0.79 per cent. [Tip]

- 1) Before the entropy method is usually carried out, it is often necessary to forward or reverse the data, which can be done using the Generate Variables function.
- 2) Principal Component Analysis, Factor Analysis both calculate weights.

##### 4.3. Analysis of the degree of coupling coordination

###### 4.3.1. Trajectory analysis of the correlation between residents' income and expenditure and catering chains and the evolution of coordination indexes

The exhaustive analysis seeks to shed light on the relationship between residents' income and expenditures and the growth of restaurant chains from 2005 to 2021, as well as the trajectory of this relationship's evolution in terms of its degree of coordination. In order to better comprehend this relationship, we first tracked the evolution of the T-value of the coordination index from 2005 to 2009, then from 2010 to 2014, and finally from 2015 to 2021. This is illustrated in Table 7:

The development of the T-value of the coordination index exhibits a distinguishing characteristic. During the period from 2005 to 2009, the T-value of the coordination index increased from 0.085 to 0.143, and the nature of the coupling between residents' income and expenditures and the growth of catering chains was unstable. This time frame coincided with the onset of the global financial crisis, which caused economic instability and a blow to residents' income and spending, thereby affecting the catering industry. The unstable coordination reflects the negative effect of economic environment fluctuations on enterprises in the catering chain.

In the period between 2010 and 2014, the Harmonisation Index T-value increased to 0.239, but the relationship is shown to be unbalanced during this time. China's economic development is relatively stable, but regional disparities exist, which may have

**Table 5**  
Basic indicators after data standardization.

Name (of a thing)	Sample size	Minimum value	Maximum values	Average	Standard deviation	Median
SSN_P	17	0.085	0.390	0.223	0.098	0.217
SSN_N	17	0.074	0.418	0.218	0.109	0.208
SSN_E	17	0.099	0.370	0.227	0.087	0.226
SSN_R	17	0.074	0.430	0.217	0.111	0.202
SSN_D	17	0.101	0.370	0.228	0.087	0.225
SSN_U	17	0.112	0.358	0.230	0.078	0.229
SSN_I	17	0.072	0.403	0.221	0.103	0.217
SSN_G	17	0.072	0.405	0.221	0.103	0.218
SSN_T	17	0.163	0.301	0.240	0.033	0.247
SSN_L	17	0.098	0.435	0.222	0.100	0.207
SSN_M	17	0.156	0.330	0.238	0.046	0.243
SSN_F	17	0.125	0.349	0.235	0.063	0.244
SSN_A	17	0.191	0.309	0.240	0.036	0.248
SSN_V	17	0.075	0.414	0.222	0.100	0.217
SSN_W	17	0.076	0.371	0.228	0.087	0.254
SSN_Q	17	0.067	0.360	0.225	0.094	0.245

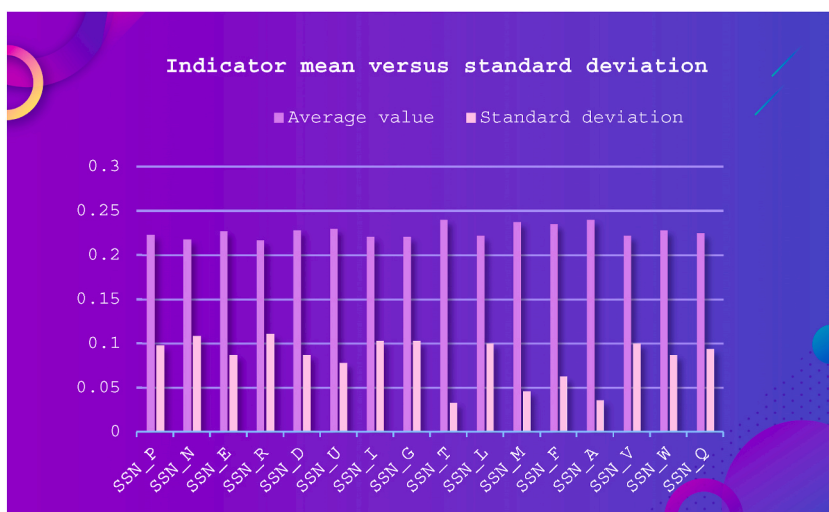


Fig. 4. Indicator Mean vs. Standard Deviation.

Table 6

Summary of the results of the entropy method for calculating weights.

Term (in a mathematical formula)	The information entropy value e	Information utility value d	Weighting factor w
SSN_P	0.9671	0.0329	7.91 per cent
SSN_N	0.9573	0.0427	10.28 per cent
SSN_E	0.9747	0.0253	6.09 per cent
SSN_R	0.9559	0.0441	10.61 per cent
SSN_D	0.9753	0.0247	5.95 per cent
SSN_U	0.9801	0.0199	4.78 per cent
SSN_I	0.9626	0.0374	9.01 per cent
SSN_G	0.9623	0.0377	9.06 per cent
SSN_T	0.9967	0.0033	0.79 per cent
SSN_L	0.9679	0.0321	7.73 per cent
SSN_M	0.9939	0.0061	1.48 per cent
SSN_F	0.9876	0.0124	2.99 per cent
SSN_A	0.9962	0.0038	0.91 per cent
SSN_V	0.9658	0.0342	8.24 per cent
SSN_W	0.9734	0.0266	6.39 per cent
SSN_Q	0.9677	0.0323	7.77 per cent

contributed to residents' disparate spending patterns. Regional differences have negatively impacted the market performance of restaurant chains, as reflected by the unbalanced coordination.

Notably, from 2015 to 2021, i.e., before the epidemic and at its onset, the T-value of the coordination index has increased to 0.394, indicating a trend of coordinated development in the relationship between the two variables. During this time period, the government adopted a series of policies to stimulate domestic demand, which contributed to the growth of disposable income and the hospitality industry. The coordinated development trend reflects the positive impact of policy support on the catering industry, as well as the fact that the stability of residents' incomes and expenditures contributes to the long-term development of catering businesses.

Overall, the trajectory of the T-value of the harmonisation index reflects the complex relationship between the income and expenditure stability of the population and the growth of restaurant chains. This analysis illuminates the study by highlighting the impact of external economic and policy factors on the catering industry. Future research will necessitate more in-depth quantitative and qualitative studies to investigate more details and mechanisms of this relationship. In addition, we may contemplate conducting the study in a broader geographical context in order to comprehend the various regional responses to this relationship. Lastly, for both catering companies and policymakers, the findings of this study emphasise the importance of maintaining the stability of the population's income and expenditures in order to support the healthy growth of the catering industry, while also highlighting the potential benefits of policy interventions, especially during times of economic instability.

In conclusion, this study provides a comprehensive analysis of the effect of residents' income and expenditures on the growth of restaurant chains by tracing the evolution of the T-value of the coordination index. This study provides valuable insights for related fields and solid support for future research and policy development.

**Table 7**  
Results of coupling coordination calculations.

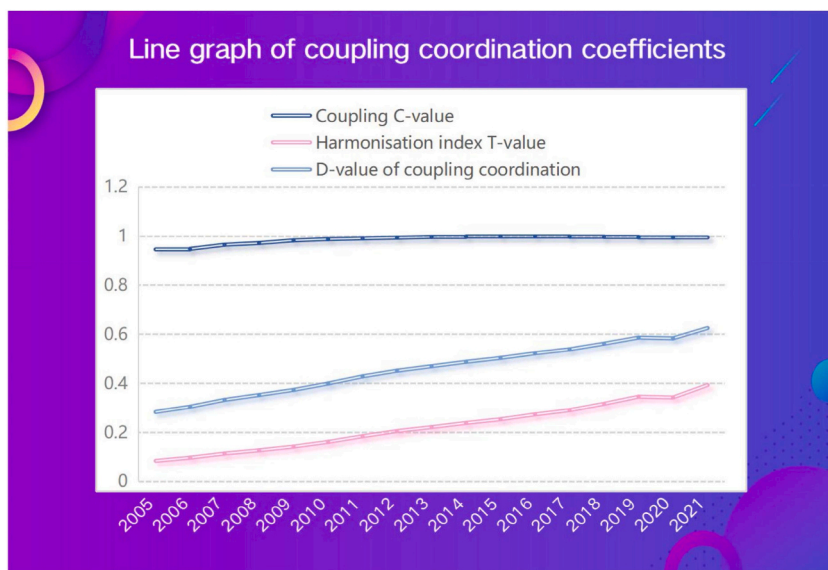
Vintages	Coupling C-value	Harmonisation index T-value	D-value of coupling coordination	Level of coordination	Degree of coupling coordination
2005	0.946	0.085	0.284	3	moderate disorder
2006	0.948	0.098	0.305	4	mild disorder
2007	0.965	0.115	0.333	4	mild disorder
2008	0.972	0.128	0.353	4	mild disorder
2009	0.983	0.143	0.374	4	mild disorder
2010	0.988	0.162	0.400	5	on the verge of becoming dysfunctional
2011	0.991	0.185	0.429	5	on the verge of becoming dysfunctional
2012	0.994	0.206	0.452	5	on the verge of becoming dysfunctional
2013	0.997	0.222	0.470	5	on the verge of becoming dysfunctional
2014	0.999	0.239	0.488	5	on the verge of becoming dysfunctional
2015	0.999	0.254	0.504	6	sue for coordination
2016	0.999	0.274	0.523	6	sue for coordination
2017	0.998	0.291	0.539	6	sue for coordination
2018	0.997	0.317	0.562	6	sue for coordination
2019	0.995	0.346	0.587	6	sue for coordination
2020	0.995	0.343	0.584	6	sue for coordination
2021	0.994	0.394	0.626	7	Primary coordination

**4.3.2. Evolutionary stages of coupling coordination degree and comprehensive analysis**

By analysing the coupled co-ordination D-values from 2005 to 2021 (Fig. 5), we can obtain a more in-depth comprehension of the evolution of this relationship and the effect of the population’s income and expenditures on the development of restaurant chains. This section examines each time period in greater depth, elaborating on the available data to disclose the causes and implications of these key trends.

From 2005 to 2009, we observed an erratic trend in the character of the relationship between residents’ income and expenditures and the growth of restaurant chains. During this time period, the value of the coupling coordination degree D increased from 0.284 to 0.374. This transformation may reflect the economic uncertainty and volatility of China at that time. The 2008 global financial crisis had a significant impact on all world economies, including China. During this time period, some unfavourable factors, such as rising inflation and unemployment, may have reduced the purchasing power of the locals, which had a negative effect on the growth of the catering chain businesses. In addition, the catering industry may have been impacted by supply chain issues and market competition, resulting in an unstable relationship between population income and expenditures.

Between 2010 and 2014, the value of D gradually increased to 0.488, indicating that this relationship continued to be unbalanced.



**Fig. 5.** Line graph of coupling coordination factor.



During this time, China's economic development entered a new phase, with the government employing a series of macro-control policies in response to inflation and property market excesses. These policies may have had an effect on the residents' financial situation, causing them to remain cautious with regard to food consumption. In addition, the rapid expansion of the catering industry may have increased market competition and operational difficulties for businesses. This imbalance may be a result of the competition between residents' income and expenditures and restaurant chains.

Nonetheless, from 2015 to 2021, i.e., before the epidemic and during its early phases, we observe a synchronised trajectory in the relationship between the two, with  $D$  values oscillating between 0.504 and 0.626. This period's trend reflects some favourable modifications and adjustments. First, China's economy continued to expand during this time period, and residents' incomes increased, which may have contributed to their increased propensity to consume catering services. Second, catering chains may have employed more flexible business strategies to accommodate to the changing demands of the market, thereby contributing to their improved performance. In addition, the rise of digital technology and delivery services has created new opportunities for hospitality companies, allowing residents to more conveniently access food and beverage services. Lastly, the government adopted a series of measures to assist businesses and residents during the early phases of the epidemic, which may have had a positive effect on the trend of coordination during this time period.

This analysis of the degree of coupled coordination reveals the effect of the population's income and expenditures on the development of restaurant chains. It emphasises the influence of external factors such as economic vicissitudes, policy shifts, and market competition on the complexity of this relationship. In the future, catering companies will be able to better respond to market challenges and formulate strategies for more coordinated and sustainable development if they continuously monitor and comprehend these key trends.

#### 4.4. Analysis of results

A thorough analysis of the extent to which residents' income and expenditures are correlated with the expansion of restaurant chains has yielded several noteworthy results that not only contribute to our understanding of the complexities of this intricate relationship but also have far-reaching consequences for market participants.

Primarily, the progression of the degree of coupling coordination exhibits a discernible temporal correlation. During the period spanning from 2005 to 2009, the relationship demonstrated an irregular course, which could have been impacted by exogenous economic factors such as the worldwide financial crisis. Potentially as a consequence of China's economic policy adjustments and increased market competition, the relationship grew even more unbalanced between 2010 and 2014. However, an analysis of the correlation between the two variables from 2015 to 2021 reveals a significant pattern: a persistent upward trajectory, especially in the period surrounding the outbreak of the epidemic. The encouragement of digital technology, the adaptation of business strategies by restaurant chains, and the upward trend in resident incomes are all potential contributors to favourable developments during this time period.

In addition, the economic and policy environment of China is not unrelated to the formation of this organisation. Historically, the correlation between the income and expenditure of residents and catering firms has been substantially impacted by economic fluctuations, government policies, and market competition. This provides a clear explanation for the dynamic and variable nature of the association by highlighting the impact of extraneous variables.

Furthermore, the research findings indicate that the restaurant chains' expansion is significantly impacted by the income and spending patterns of the local populace. Significant increases in the purchasing power of the general public occurred during the era of coordinated development, thereby generating favourable conditions for the hospitality industry. The businesses' market innovations and business strategies had a substantial impact on this process, enabling them to more effectively cater to the needs of the local population. This suggests that the catering industry's exponential expansion is interdependent on the economic prosperity of its residents; additionally, reciprocal advertising can be advantageous for both domains.

To reach strategic conclusions, catering companies must, as demonstrated by the analysis of the empirical data, continuously monitor and comprehend the development of this correlation. In order to adapt to changes in the market and economy, it is imperative for organisations to have the ability to pragmatically modify their business strategies. Furthermore, it is imperative for businesses to diligently observe policy shifts as they may exert a substantial influence on market regulation. Catering enterprises can improve their capacity to address market challenges and achieve coordinated development by conducting comprehensive analysis and understanding of the complexities of this relationship. The significance of revenue and expenditure stability for government policymakers, catering companies, and the tourism industry to inform their operations and develop policies is highlighted by the aforementioned findings.

## 5. Discussion: policy impact analysis

This investigation emphasises the critical role of policy in the correlation between the stability of the population's income and expenditure and the growth of restaurant franchises. Please locate below a number of significant discoveries.

### (1) The Policy Consequences of the Global Financial Crisis 2005–2009

China's economy was significantly affected by the global financial crisis of 2008, prompting the government to implement a series of policy measures to stabilise the market. The policy's restricting orientation during this period had a detrimental effect on restaurant

chains and suppressed residents' spending. To be more precise, the government implemented measures to stabilise the financial market, including increasing interest rates and reducing the availability of credit. This resulted in a rise in the cost of credit for residents and a decrease in consumer spending, which subsequently impacted the growth of restaurant chains.

## (2) Macro-control policies throughout 2010 and 2014.

In an effort to mitigate inflation and the property market rise, the Chinese government has implemented a number of macro-control policies. However, these policies have also resulted in a downturn in the property market in specific regions, which has impacted related industrial sectors, including the hospitality industry. These policies, which include restrictions on real estate investment and house acquisitions, have succeeded in stabilising the property market to a certain extent. Also, inflation has resulted in an increase in the cost of food and living, which has further limited the consumption behaviour of residents.

## (3) 2015–2021 Domestic Demand Promotion Policy

The catering industry's development was facilitated by the government's implementation of a series of measures to increase domestic demand during this period, thereby bolstering consumer confidence. Specifically, the government implemented proactive economic stimulus policies during the COVID-19 epidemic, such as the issuance of consumption vouchers, tax reductions, interest rate cuts, and the raising of the minimum wage, to mitigate the devastating effects of the epidemic on the economy. These policy measures not only promoted the recovery and development of the hospitality industry, but also helped residents increase their disposable income and stimulate consumer purchasing.

Additionally, the government's proactive promotion of emerging industries, including digital payments and deliveries, during the epidemic has facilitated the digital transformation of the catering industry, offering catering companies additional growth opportunities. During the epidemic, the surge in popularity of digital payment methods and delivery platforms significantly altered consumer spending patterns, allowing catering companies to adjust more quickly to market fluctuations. These policies regarding urbanisation and transportation development may have indirectly but significantly affected the catering sector during this time. The country's ongoing advocacy for the new urbanisation strategy and the establishment of a "strong transport state" not only expedited the urbanisation process but also enhanced the urban transport infrastructure greatly. Although these urbanisation and transport development policies did not directly address the F&B sector, they may have altered urban patterns, enhanced accessibility, and encouraged technological innovation, potentially creating a more conducive environment for F&B development. Nevertheless, additional research and quantitative analysis are necessary to determine the precise size and mechanisms of the impact of these policies.

For the most part, policy has been instrumental in determining the relationship between catering businesses and residents' income and expenditure. The government will continue to be a vital player in economic policies that affect the relationship between hospitality enterprises and residents' income and expenditure in the future. A significant area of future research will be the comprehensive examination of the mechanisms and consequences of these policies.

## 6. Conclusion

### (1) General summary

Hotel and catering enterprises have consistently been a critical component of the tourism industry in China, and the economic status of these enterprises is directly correlated with the stability and volume of consumption among residents. This study examines the correlation between the development of chain catering enterprises and the income and expenditure of residents. It employs a diverse array of methodologies, such as the evaluation index system, entropy value method, and coupled coordination degree model, to analyse the data from 2005 to 2021. To gain a more comprehensive understanding of the relationship, we divided the study into two components: the income and expenditure situation of residents and the development of chain catering enterprises, using 16 evaluation indexes.

Complexity and dynamics of this relationship are demonstrated by the findings of the investigation. In the years 2005–2009, the global financial crisis resulted in economic instability, which in turn influenced the relationship between the development of restaurant chains and the income and expenditure of inhabitants. On the other hand, the economic growth of China was relatively consistent from 2010 to 2014. However, regional disparities resulted in imbalances in residents' expenditures, which resulted in a more unbalanced relationship. However, the government has implemented a series of policies to stimulate domestic demand between 2015 and 2021. This has contributed to the growth of the food and beverage industry and the increase in the disposable income of residents, thereby establishing a trend of coordinated development. In addition, we acknowledge that this relationship may be indirectly influenced by external factors, including urban development, infrastructure development, and transportation systems. Improved accessibility may broaden the scope of services provided by restaurant franchises, while the demand for food and beverage in a specific region may be augmented by the concentration of population as a consequence of urbanisation. By influencing consumer choices and business strategies, these factors may indirectly influence the development of catering chains. The precise nature and mechanisms of these effects, however, require further investigation in future research.

Upon examination of the macroeconomic environment, these modifications are indicative of the intricate influence of external factors, including the financial crisis, policy modifications, and regional disparities, on the income and expenditure of residents and catering enterprises. This investigation sheds light on the consumption patterns of residents, the development of tourism, and the

decision-making processes of hotel and catering enterprises. It is imperative for F&B enterprises and policymakers to adopt a more strategic business and policy direction, particularly in the current economic climate.

Overall, this investigation underscores the significance of income and expenditure stability in the context of the development of catering chains, emphasising the impact of the economic status of the population on the industry at various economic phases and policy environments. This serves as an additional avenue for future research to investigate the influence of social factors, consumer behaviour, and geographical disparities on this relationship. It is anticipated that this investigation will have furnished the industry, policymakers, and academics with valuable information to facilitate the implementation of a more sustainable and coordinated catering business development.

## (2) Prospective analysis

In this investigation, we explore the critical role of policy in determining the correlation between the stability of residents' income and expenditure and the growth of restaurant chains. After conducting an analysis of policy changes between 2005 and 2021, we discovered that government policies have significantly influenced this relationship. Nevertheless, this investigation is subject to certain constraints, which offer the potential for future research to be enhanced.

Beginning with the data, methodology, timeframe, and geographical variation, this investigation is subject to certain constraints. Completeness and availability of data are critical concerns. The analyses may have been inaccurate or insufficient as a result of the data used in this study. Future research should pursue more detailed and exhaustive data sources to enhance the reliability and validity of the study. Furthermore, the evaluation index system, the entropy method, and the coupled coordination degree model were implemented in this investigation. While these methodologies are beneficial in comprehending the influence of policies on the growth of catering enterprises and the income and expenditure of residents, they lack comprehensiveness and may not be capable of capturing all the intricate relationships. In order to acquire more comprehensive insights and data regarding the relationship between residents' income and expenditure and the development of catering enterprises, future research may contemplate the implementation of more diverse methodologies, including in-depth interviews, questionnaires, or field observations [44–49].

Secondly, this investigation concentrates on the period from 2005 to 2021. Despite the fact that it offers trend analyses during this timeframe, it does not analyse changes that occurred over an extended period. Future research could investigate extending the timeframe and analysing trends over an extended period of time to gain a more comprehensive understanding of the long-term impact of policies on the development of F&B enterprises and residents' income and expenditure. Furthermore, China exhibits substantial geographical disparities, with substantial disparities in economic conditions and policy environments among various regions. This investigation has been incapable of adequately evaluating these geographical disparities. The specific impact of policies within various regions could be more thoroughly analysed in future research to gain a more comprehensive understanding of the differences between them [50–53].

Future research should prioritise interdisciplinary examination, which involves the integration of a variety of disciplines, including sociology, economics, and cultural studies, to investigate the joint impact of social, cultural, and economic factors on the income and expenditure of residents, as well as the growth of catering enterprises. This interdisciplinary approach will facilitate a more thorough comprehension of intricate socio-economic phenomena and will allow for the development of more insightful analyses and conclusions [54].

The findings of this investigation offer numerous avenues for future research. For starters, future research could delve deeper into the purchasing decisions of consumers, including their preferences, flavours, and demand for various categories of catering. This will assist catering companies in significantly improving their competitiveness and ability to satisfy market demands. Secondly, future research could investigate the potential impact of social factors, including culture, social values, and family structure, on the consumption behaviour of residents and the development of catering enterprises. This would offer a more comprehensive understanding of economic behaviour in a social context. Furthermore, future research could consider cross-country comparisons of the relationship between residents' income and expenditure and the development of catering enterprises among different countries and regions to gain broader insights. This would assist in the comprehension of the similarities and differences across different policy and economic environments and provide valuable references for policymakers.

Similarly, future research could concentrate on the relationship between the consumption behaviour of the population and environmental protection in order to assist companies in the development of more socially responsible strategies. Enterprises will be able to pursue economic benefits while simultaneously accomplishing the objectives of environmental protection and social responsibility. In order to offer more precise policy recommendations, future research could conduct a more thorough examination of the impact of specific policies on the development of F&B enterprises and the income and expenditure of residents. This will enable policymakers to devise policies that are more effective in fostering economic development and social stability.

With the aforementioned more comprehensive discussion and future research directions, this study not only offers new perspectives for understanding the relationship between policy on residents' income and expenditure and the development of catering enterprises, but also provides valuable insights for future research. The expectation is that these observations will serve as valuable resources for researchers, policymakers, and hospitality enterprises.

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## Data availability statement

The data used to support the findings of this study are included within the article.

## CRedit authorship contribution statement

**Weidi Zhang:** Writing – review & editing, Writing – original draft, Visualization, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Jinruixue Liu:** Writing – review & editing, Writing – original draft, Project administration, Investigation, Formal analysis, Data curation, Conceptualization. **Lei Wen:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

## Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Weidi Zhang reports was provided by the Humanities and Social Sciences Research Fund of the Ministry of Education (23XJC760003). Weidi Zhang reports was provided by the Philosophy and Social Sciences Research Fund of Shaanxi Province (2023ZD1825). Weidi Zhang reports was provided by Shaanxi Provincial Social Science Foundation Project(2023GM03). If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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