


**EMPIRICAL STUDY OF CULTURAL INDUSTRY COMPETITIVENESS IN ANHUI PROVINCE BASED ON THE DIAMOND MODEL**

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ARTICLE INFO	ABSTRACT
<p><b>Article history:</b></p> <p><b>Received</b> 17 March 2023</p> <p><b>Accepted</b> 12 June 2023</p>	<p><b>Purpose:</b> Cultural industry is such a profound emerging industry that developing cultural industry is the strategic task of building a modern and strong cultural province. As a strong economic and cultural province in China, Anhui province is rich in cultural resources and has a high level of economic development, which provides unique conditions for the development of cultural industries. However, the development of cultural industry in Anhui province lags behind other parts of the nation.</p>
<p><b>Keywords:</b></p> <p>Cultural Industry; Diamond Model; Anhui Province; Competitiveness.</p>	<p><b>Theoretical framework:</b> This study, which takes the cultural industry competitiveness of Anhui province as the research object, examines the current situation of cultural industry competitiveness in Anhui province based on the diamond model and presents a holistic approach to cultural industry competitiveness and then investigates the influencing factors that determine and contribute to the growth of cultural industry competitiveness in Anhui province.</p>
	<p><b>Design/methodology/approach:</b> this study selected 9 indicators as influencing factors to analyze the cultural industry competitiveness in Anhui province, namely, total collections in public libraries (X1), collections of public libraries owned per person (X2), number of performance by art performance troupes (X3), number of students enrollment of regular institutions of higher education (X4), consumer price indices (preceding year=100), education, culture and recreation (X5), foreign exchange earnings from international tourism (X6), total investment of foreign funded enterprises (X7), local governments expenditure, science and technology (X8), number of patent applications for inventions of industrial enterprises above designated size (X9).</p> <p><b>Findings:</b> The results showed the overall competitiveness factor and industry operation factor are determined as the driving factors. This study also puts forward suggestions to improve the cultural industry competitiveness of Anhui province.</p> <p><b>Research, Practical &amp; Social implications:</b> The study analyzes the current developing situation of cultural industry in Anhui province based on Porter's diamond model. Secondly, an empirical analysis was performed to determine the influencing factors of cultural industry competitiveness in Anhui province. Thirdly, on the basis of the above analysis, this paper puts forward suggestions for the development of cultural industry competitiveness in Anhui province.</p> <p><b>Originality/value:</b> The value of the study formulated differentiated policies to support and develop cultural industries and guide the investment directions of cultural industries in different regions of the province and promote the coordinated development of overall cultural industry competitiveness.</p>

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## ESTUDO EMPÍRICO DA COMPETITIVIDADE DO SETOR CULTURAL NA PROVÍNCIA DE ANHUI COM BASE NO MODELO DIAMANTE

### RESUMO

**Objetivo:** O setor cultural é um setor emergente tão profundo que desenvolver o setor cultural é a tarefa estratégica de construir uma província cultural moderna e forte. Como uma província econômica e cultural forte na China, a província de Anhui é rica em recursos culturais e tem um alto nível de desenvolvimento econômico, o que proporciona condições únicas para o desenvolvimento de indústrias culturais. Entretanto, o desenvolvimento do setor cultural na província de Anhui está atrasado em relação a outras partes do país.

**Estrutura teórica:** Este estudo, que toma a competitividade do setor cultural da província de Anhui como objeto de pesquisa, examina a situação atual da competitividade do setor cultural na província de Anhui com base no modelo de diamante e apresenta uma abordagem holística da competitividade do setor cultural e, em seguida, investiga os fatores de influência que determinam e contribuem para o crescimento da competitividade do setor cultural na província de Anhui.

**Projeto/metodologia/abordagem:** Este estudo selecionou 9 indicadores como fatores de influência para analisar a competitividade do setor cultural na província de Anhui, a saber, o total de coleções em bibliotecas públicas (X1), coleções de bibliotecas públicas de propriedade de cada pessoa (X2), número de apresentações de trupes de arte (X3), número de matrículas de alunos em instituições regulares de ensino superior (X4), índices de preços ao consumidor (ano anterior=100), educação, cultura e recreação (X5), ganhos em moeda estrangeira provenientes do turismo internacional (X6), investimento total de empresas com financiamento estrangeiro (X7), gastos de governos locais, ciência e tecnologia (X8), número de pedidos de patentes para invenções de empresas industriais acima do tamanho designado (X9).

**Conclusões:** Os resultados mostraram que o fator de competitividade geral e o fator de operação do setor são determinados como os fatores determinantes. Esse estudo também apresenta sugestões para melhorar a competitividade do setor cultural da província de Anhui.

**Implicações sociais, práticas e de pesquisa:** O estudo analisa a situação atual de desenvolvimento do setor cultural na província de Anhui com base no modelo de diamante de Porter. Em segundo lugar, foi realizada uma análise empírica para determinar os fatores que influenciam a competitividade do setor cultural na província de Anhui. Em terceiro lugar, com base na análise acima, este artigo apresenta sugestões para o desenvolvimento da competitividade do setor cultural na província de Anhui.

**Originalidade/valor:** O valor do estudo formulou políticas diferenciadas para apoiar e desenvolver os setores culturais e orientar as direções de investimento dos setores culturais em diferentes regiões da província e promover o desenvolvimento coordenado da competitividade geral do setor cultural.

**Palavras-chave:** Indústria Cultural, Modelo Diamante, Província de Anhui, Competitividade.

## ESTUDIO EMPÍRICO DE LA COMPETITIVIDAD DEL SECTOR CULTURAL EN LA PROVINCIA DE ANHUI BASADO EN EL MODELO DEL DIAMANTE

### RESUMEN

**Propósito:** El sector cultural es un sector emergente tan profundo que desarrollar el sector cultural es la tarea estratégica de construir una provincia cultural moderna y fuerte. Como provincia económica y cultural fuerte de China, la provincia de Anhui es rica en recursos culturales y tiene un alto nivel de desarrollo económico, lo que proporciona unas condiciones únicas para el desarrollo de las industrias culturales. Sin embargo, el desarrollo de la industria cultural en la provincia de Anhui va a la zaga de otras partes del país.

**Marco teórico:** Este estudio, que toma como objeto de investigación la competitividad del sector cultural en la provincia de Anhui, examina la situación actual de la competitividad del sector cultural en la provincia de Anhui basándose en el modelo del diamante y presenta un enfoque holístico de la competitividad del sector cultural, para después investigar los factores de influencia que determinan y contribuyen al crecimiento de la competitividad del sector cultural en la provincia de Anhui.

**Diseño/metodología/enfoque:** Este estudio seleccionó 9 indicadores como factores de influencia para analizar la competitividad del sector cultural en la provincia de Anhui, a saber, las colecciones totales en bibliotecas públicas (X1), las colecciones de bibliotecas públicas propiedad de cada persona (X2), el número de actuaciones de compañías artísticas (X3), el número de matrículas de estudiantes en instituciones regulares de enseñanza superior (X4), índices de precios al consumo (año anterior=100), educación, cultura y ocio (X5), ingresos en divisas procedentes del turismo internacional (X6), inversión total de las empresas financiadas con fondos extranjeros

(X7), gasto de la administración local, ciencia y tecnología (X8), número de solicitudes de patentes de invención de empresas industriales por encima del tamaño designado (X9).

**Conclusiones:** Los resultados mostraron que el factor general de competitividad y el factor de funcionamiento de la industria se determinan como los factores determinantes. Este estudio también aporta sugerencias para mejorar la competitividad del sector cultural en la provincia de Anhui.

**Implicaciones sociales, prácticas y de investigación:** El estudio analiza la situación actual de desarrollo del sector cultural en la provincia de Anhui basándose en el modelo del diamante de Porter. En segundo lugar, se realiza un análisis empírico para determinar los factores que influyen en la competitividad del sector cultural de la provincia de Anhui. En tercer lugar, basándose en el análisis anterior, este documento ofrece sugerencias para el desarrollo de la competitividad del sector cultural en la provincia de Anhui.

**Originalidad/valor:** El valor del estudio formula políticas diferenciadas para apoyar y desarrollar los sectores culturales y orientar las direcciones de inversión de los sectores culturales en las diferentes regiones de la provincia y promover el desarrollo coordinado de la competitividad global del sector cultural.

**Palabras clave:** Industria Cultural, Modelo del Diamante, Provincia de Anhui, Competitividad.

## INTRODUCTION

At present, China's cultural industry is undergoing a good start with profound transformation and gaining a strong momentum, exerting influence on promoting economic restructuring and transforming economic development mode (J. Li, 2021a; Zhou et al., 2020a). Moreover, the characteristics of low cost, less energy-consuming and high intangible economic value of cultural industry contributes to the sustainable development of the third tertiary sector and the entire economy (Fan & Xue, 2018). In the *14th Five-Year Plan for Cultural Development (2021-2025)* issued by the General Office of the CPC (Communist Party of China) Central Committee and the State Council, the main task of Chinese cultural industry during the year of 2021 to 2025 is to make cultural programs and industries have become more prosperous, and the system of public cultural services, cultural industries, media communication, cultural heritage inheritance and protection have been improved. However, as a major emerging industry, cultural industry is still in a stage of exploration and trial (J. Li, 2021b). Thus, China should seize the opportunity and determine the influencing factors of cultural industry competitiveness to make good use of the driving force of soft power for high-quality national economy (Zhou et al., 2020b).

As a strong economic and cultural province in China, Anhui province is rich in cultural resources and has a high level of economic development, which provides unique conditions for the development of cultural industries (Zeng & Yang, 2022). As shown in Table 1, the value-added of cultural and related industries in Anhui province grew from RMB 105.231 billion in 2016, to RMB 119.595 billion in 2017, and to RMB153.728 billion in 2018, occupying compositions of gross domestic product (GDP) 4.03%, 4.00% and 4.52% respectively. In 2019, the value-added of cultural and related industries in Anhui province reached RMB 166.542

billion but has the same share of composition in GDP as in 2018. While in 2020, value-added of cultural and related industries in Anhui province decreased to RMB 160.720 billion and its share of proportion in GDP fell to 4.22%.

However, the development of cultural industry in Anhui province lags behind with other parts of the nation. In 2020, the value-added of the national culture and related industries was 4,494.5 billion yuan, with an increase of 1.3% over the previous year (not deducting price factors), accounting for 4.43% of the GDP, falling down 0.07% points over the previous year. Moreover, the value-added of cultural and related industries in the capital city Beijing in 2020 reached RMB 377.02 billion, accounting for 10.5% of the regional GDP, and ranks the first in China. In 2020, the value-added of Shanghai's cultural and related industries reached RMB 238.964 billion, representing 6.1% of GDP. According to the above-mentioned statistics, it is obvious that there is still a big gap in the economic contribution and development degree of cultural and related industries in Anhui province compared with Beijing, Shanghai, and other provinces and cities in China. Therefore, it has become increasingly important to investigate the influencing factors and put forward related strategies to make the cultural industry sustainable to the national and provincial competitiveness since it has been considered as the locomotive of the national technology move (Bilan et al., 2019).

In the *14th Five-Year Plan for National Economic and Social Development of Anhui Province and 2035 Vision Outline* published by the Anhui provincial government in 2021, it clearly points out that it is urgent to speed up the construction of modern cultural industry system, promote the development of cultural tourism integration and consolidate the strategic pillar industry position of cultural tourism industry in the national economy, foster a vibrant and innovative ecosystem for cultural industries and enhance the competitiveness of cultural industries. In this context, this study analyzes the current situation of the cultural industry development of Anhui province based on Porter's diamond model to make an empirical analysis on the influencing factors of cultural industry competitiveness in Anhui province with the aim of putting forward corresponding countermeasures and suggestions for the development of cultural industry competitiveness in Anhui province.

## LITERATURE REVIEW

The research method of any scientific research consists of quantitative analysis, qualitative analysis and the combination of quantitative and qualitative analysis (Strijker et al., 2020). Quantitative analysis mainly obtains primary data or secondary data such as sample

statistics from statistical yearbook, statistical bulletin or other channels, and then carries out quantitative analysis such as factor analysis, principal component analysis, cluster analysis, gray correlation degree analysis or other statistical analysis (Khaldi, 2017). Qualitative analysis means that only indicators are designed without quantitative processing (Aspers & Corte, 2021). There are also some scholars using a combination of qualitative and quantitative analysis in their researches (Timans et al., 2019).

Scholars in different countries study competitiveness in various aspects by applying various approaches and methods: analyze the determinants affects the industrial competitiveness of electronic manufacturing by analytic hierarchy process (AHP) (Singh et al., 2018); analyze Turkey's defense industry by applying the diamond model and expert opinion survey to collect variables under determinants (Bilgen & Varoglu, 2016); analyze the determinants and effects of national competitiveness through the role of digitalization in the European economics by using factor analysis and cluster analysis (Boikova et al., 2021); analyze the global tourism competitiveness by proposing a synthetic indicator and using the multi criteria double reference method (Rodríguez-Díaz & Pulido-Fernández, 2020).

Table 1 Value-added of Cultural and Related Industries of Anhui Province in 2016-2020

Year	2016	2017	2018	2019	2020
Value-added of cultural and related industries (RMB billion yuan)	105.231	119.595	153.728	166.542	160.720
Composition of GDP (%)	4.00	4.03	4.52	4.52	4.22

(Source: Anhui Bureau of Statistics)

In this research, the main purpose is to examine the current situation of cultural industry competitiveness in Anhui province based on the diamond theory and to present a holistic approach to cultural industry competitiveness and then investigate the influencing factors that determine and contribute to the growth of cultural industry competitiveness in Anhui province. Thus, this research will focus on a critical literature review on cultural industry competitiveness.

In order to get a comprehensive understanding of cultural industry competitiveness, an organized technique was implemented and carried out in a sequential manner. The literature review was based on research articles published in reputed journals. Pertinent literature review and theoretical review was based on preliminary and full literature searches conducted through peer-reviewed journal articles, books, SCOPUS, Emerald, EBSCO, Science Direct, CNKI (China National Knowledge Internet), Web of Science, ProQuest, Springer Link, Google Scholar. Primary key words included *cultural industry*, *competitiveness*, *comparative*

*advantage, diamond model*, etc. Simultaneously, the Google Scholar search engine was also explored for the terms like *cultural industry, industrial competitiveness, cultural industry competitiveness, Anhui province*, etc. Various context research papers were also found which were not considered in the research study. This research also reviewed *the Global Competitiveness Report (2019)* of World Economic Forum as well as both the national and Anhui provincial *14th five-year Plan for Cultural Development (2021-2025)*. This dissertation conducted a citation analysis of the selected articles obtainable and applicable from the above steps.

Some scholars applied a quantitative method to study this topic. Rodríguez-Díaz & Pulido-Fernández (2020) used the term cultural and creative industries and analyzed multiple definitions and applied innovation system approach to sort out the relationship between innovation of cultural and related industries and regional economy. The study pointed that the innovative performance of cultural and creative firms poses as a source of potential benefits for social economy and affects peoples' living standard in social and cultural aspects. By building a competitiveness index based on the diamond theory, Dou et al. (2021) analyzed the recent development trends of manufacturing in G20 participating countries from 2008 to 2018. In the context, they adopted a panel regression model to conduct an empirical analysis on various factors that affect the sustainable competitiveness of manufacturing.

Other researchers qualitatively analyze the competitiveness in their studies. Fernando (2021) identifies the recovering strategies of the tourism industry in Sri Lanka by adopting the diamond model. The study gathered qualitative data from six facets that are identified as "Themes". Zeng & Yang (2022) uses qualitative analysis to investigate the regional cultural characteristics and development status of Anhui Province firstly and makes in-depth analysis of 20 policy texts about Chinese cultural and creative industry development by performing grounded research and qualitative text analysis through the Nvivo12 qualitative analysis software. This study put forward three core elements, namely, development task, development goal and development guarantee, which may inspire policy makers for further innovation and development of cultural and creative industries in Anhui province.

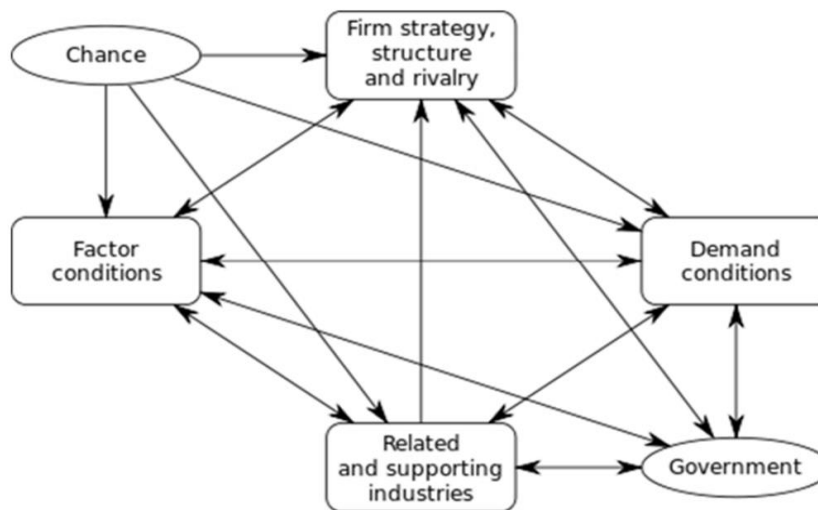
There are also scholars applied different analysis methods to analyze cultural industry competitiveness in Anhui province. Among them, some researches were based on the diamond method. For example, Zhou & Liu (2018) used the diamond method to specify affecting factors and made an empirical study with principal component analysis (PCA) to expose strategies for enhancing development of Anhui's culture. This study pointed out that the development of

cultural industry has been highly valued throughout China, and a series of policies to accelerate the development of cultural industry have been carried out, contributing to vigorous promotion of cultural industry development in the province. However, due to the weak foundation of China's cultural industry, there still exist contradiction between supply and demand in the structure of cultural industry structure. At present, cultural industry in Anhui province has achieved rapid development, but there are still some weaknesses in basic infrastructure, financing channels, governmental investment etc. Another example is the one offered by Su (2019), who evaluated the indicators and explored the method to promote cultural industry competitiveness in Anhui province. The study highlighted that Anhui cultural industry competitiveness could be enhanced by strengthening top-level design, taking advantage of regional predominance, applying mixed approaches of investment, innovation and consumption. Except the above-mentioned cases, Zhao & Wang (2020) applied the SWOT theory and emphasized that government policy *Going Out Strategy* should be implemented steadily in developing Anhui culture.

Every theoretical discussion and method attempted in the academic circle is a contribution to the study of cultural industry competitiveness, and also provides useful reference and inspiration for this research on this topic. However, there is still no agreeable idea on the influencing factors of cultural industry competitiveness. Thus, this study makes an attempt to make an analysis of current development status of cultural industry competitiveness in Anhui province based on Porter's diamond model and investigate the influencing factors by the usage of an empirical analysis.

In 1990, Michael Porter, Harvard University professor in management, proposed the theory of national competitive advantage in the study of international economic and trade competition (Porter, 1990). In the study, he pointed that the core of the competitive advantage theory referring to the root cause of the rise and fall of a country lies in whether it can win an advantage in the international competition (Porter, 1981, 1990). Moreover, the key of a country to acquire competitive advantage lies in the integration of four basic elements and two auxiliary elements. Among them, factors conditions, demand conditions, related and supporting industries, firm strategy, structure and rivalries are the basic elements, while government and chance are the two auxiliary elements (Porter, 1990; Vlados, 2019). These factors influence each other interactively and form a diamond-shaped system (see Figure 1).

Figure 1 Porter's Diamond Model



Source: Porter, 1990

Porter believes that the possibility of a country to achieve international success in a certain industry is the result of the comprehensive effect of the four basic elements and two auxiliary elements in the diamond model. Moreover, the four elements should exist at the same time in order to effectively affect and promote the development of competitiveness (Porter, 1990; Rugman & D'cruz, 1993). Comparing with other industrial competition theories, diamond model is more comprehensive and systematic for the reason that it analyzes the micro, meso and macro factors that affect industrial competitiveness from the perspective of industrial chain (Garcia et al., 2017). Meanwhile, diamond model makes competitive advantage dynamic, and it emphasizes the importance of domestic demand and highlights the dynamic role of government (Xu, 2019).

It seems that diamond model was applied with different methods within the scope of academic studies. For example, numerous scholars analyzed the influencing factors of a certain industry based on the diamond theory with the perspective to enhance the competitiveness, such as in agricultural industry (Huo et al., 2020), tourism (Xu, 2019), manufacturing industry (Dou et al., 2021) etc.

Moreover, Liu (2021) applied Porter's diamond model to analyzes the competitiveness of Hong Kong's cultural and creative industry (CCI). The study explored the six elements, factor conditions, demand conditions, strategy, market structure and rival firms, related supporting industries and the role of government and chance. As the author stated in the study, there are 11 component domains of Hong Kong's CCI: art, antiques and crafts; cultural



education and library, archive and museum services; performing arts; film, video and music; television and radio; publishing; software, computer games and interactive media; design; architecture; advertising and amusement service. Based on analysis of added value of creative industries in nominal terms, it concluded that Hong Kong's CCI enjoys great advantages in capital, talents and technology. Korkmaz & Topcu (2021) made an evaluation of Turkish defense industry competitiveness with Porter's diamond model in the aspects of factor conditions, demand conditions, related and supporting industries, business strategy, structure and competitiveness, chance, and the role of state. This study, which is also based on Porter's diamond model, is to analyze the current situation of cultural industry competitiveness in Anhui province from the following six aspects, namely, factor conditions, demand conditions, related and supporting industries, firm strategy, structure and rivalry, government and chance.

Factor conditions are not only the starting point of any production activities, but also the basis of cultural industry competitiveness (Vlados, 2019). According to Porter's analysis (Porter, 1990); factor conditions in this research include human resources, public cultural resources, knowledge resources, capital resources and infrastructure, which consist of the primary conditions for a certain industry. Take the study case, Anhui province, as an example. Anhui province, located in central and eastern China, is the most dynamic part of the Yangtze River Delta. The province is about 570 kilometers long from north to south and 450 kilometers wide from east to west. The total area is 140,100 square kilometers, accounting for about 1.45 % of China's land area. According to Anhui Provincial Statistical Bulletin of National Economic and Social Development, the province had a permanent population of 61.13 million at the end of 2021. Anhui province has 16 prefecture-level cities, 9 county-level cities, 50 counties and 45 metropolitan areas, with Hefei as its capital city.

In 2020, there were 2,334 art performance groups in Anhui Province, with 39,174 employees, 17 municipal and mass cultural centers with 299 employees; 105 county and city-level cultural centers, employing 1,115 people; 1,505 cultural stations with 4,808 employees; 10 cultural and scientific research institutions with 148 employees; There were 9,810 operating units in cultural market, employing 37,801 people; 131 libraries with 1,572 employees and 230 museums with 3,342 employees (see Table 2).

Table 2 Number of Culture and Art Institutions and Personnel of Anhui Province in 2020

<b>Institution</b>	<b>Number of intuitions (unit)</b>	<b>Number of Employees (person)</b>
Art Performance Group	2334	39174
Municipal and Mass Cultural Center	17	299
County and City-level Cultural Center	105	1115

Cultural Station	1505	4808
Cultural and Scientific Research Institution	10	148
Operating Units in Cultural Market	9810	37801
Library	131	1572
Museum	230	3342

Source: Anhui Statistical Yearbook

According to *Anhui Province 2021 Statistical Bulletin of National Economic and Social Development*, by the end of 2021, there were 175 national and 915 provincial key cultural relics under protection, 99 items on the National Intangible Cultural Heritage List and 479 items on the provincial list. Besides, the province has 78 radio and television stations, covering 99.9% of the population with radio programs and 99.9 % of the population with television programs. Cable TV subscribers reached 7.717 million households. In 2021, 88 newspapers were published with a total print run of 560 million copies, 181 kinds of periodicals (magazines), with a total print run of 34 million copies and 10,126 kinds of books with a total print run of 320 million copies. At the end of the year, there were 125 national general archives at various levels in Anhui province, with a collection of 55.548 million volumes (pieces and volumes), and a total construction area of archives was 631,000 square meters.

Moreover, Anhui Province has continuously expanded the channels and fields of utilizing foreign capital and promotion of foreign capital to play an important role in the development of the provincial national economy. In 2021, the province actually used foreign direct investment (including reinvestment, retained earnings and other assets) of USD19.3 billion, with a year-on-year increase of 5.4%, had 475 new foreign-invested enterprises, with a year-on-year increase of 20.9%. All in all, Anhui Province's cultural industry has a good momentum of development (X. Li et al., 2021).

The demand of cultural consumption determines the capacity of cultural industry market. Only the market that can produce cultural products and services to meet the demand of people, can the cultural industry market have vitality (Jiang et al., 2019). Therefore, the scale of demand can be measured by the per capita disposable income of urban and rural residents and the per capita consumption expenditure of urban and rural residents.

In terms of demand scale, the current economic development momentum of Anhui province is very strong, and people's living standards are constantly improving, which provides sufficient impetus for the development of cultural industry in Anhui province. In 2019, the disposable income of urban and rural residents in Anhui province was RMB 37,540 per person and RMB 15,416 per person. In 2020, the per capita disposable income of urban and rural residents was RMB 39,442 per person and RMB 16,620 per person, which increased by 5.07%

and 7.81% respectively compared with 2019. In 2021, the per capita disposable income of permanent residents in Anhui province was RMB 30,904 and the per capita consumption expenditure was RMB 21,911. Among this, the per capita disposable income of permanent urban residents was RMB 43,009, the consumption expenditure per capita was RMB 26,495. The continuous improvement of people's living standards has provided sufficient impetus for the development of cultural industry in Anhui province.

The modern economic system contains many industries, among which the development of each industry cannot rely solely on its own strength, but needs the support and promotion of other industries, and the cultural industry is no exception (Jiang et al., 2019). Information technology not only opens up a new space for the development of cultural industry, but also has a revolutionary impact on communication channels, business models, target audiences and people's consumption habits. Zhou et al. (2020b) indicates in the study that science and technology needs to be integrated with cultural industry for the development of cultural industry. In 2021, the total number of high-tech enterprises in Anhui province reached RMB 11,368, with a year-on-year growth of 32.8%. The output value and added value of high-tech industries increased by 21.4% and 15.5%, respectively. The province registered 17,755 scientific and technological achievements; The number of invention patents owned by 10,000 people was 19.9, with a net increase of 4.5.

It has been emphasized that travel and tourism is an important source of foreign exchange as well as an emerging economic sector all over the world (Fernando, 2021; Zhang, 2019). Tourism industry and cultural industry are mutually integrated and can promote each other. Anhui Province has accelerated the integration of culture and tourism and established the Yangtze River Delta Integrated Tourism Alliance, with more than 600 A-level and above tourist attractions in the province. In addition, the Southern Anhui International Cultural Tourism Demonstration Area and 53 red tourism scenic spots have been built. In 2020, Anhui province earned USD 274.658 million in foreign exchange from international tourism and RMB 422.15 billion from domestic tourism.

The development of cultural industry mainly examines the enterprise's strategy, management, organizational structure, competitors, competitive environment, and other conditions (Rodríguez-Gulías et al., 2020). This indicator reflects the scale and relative intensity of the development of cultural industry, and relates to the industrial scale and market operation ability. The industrial scale can be measured from the perspectives of scale and proportion. The added value of cultural industry and the proportion of the added value of cultural industry in

the national cultural industry can be used as measuring indicators. In 2021, Anhui's regional innovation capacity continued to rank eighth in the country with Guangdong, Beijing, Jiangsu, Shanghai and Zhejiang occupying the top five, and remained among the top ten for 10 consecutive years. This reflects the capacity of enterprises in management innovation, basic research and original innovation, the commercialization of scientific and technological achievements etc.

The role of government refers to the intervention or influence of the government on the other four elements through the formulation of policies and strategies, so as to ultimately affect competitiveness (Zeng & Yang, 2022). The supportive behaviors of the government are mainly reflected in the aspects of policies, funds and basic services.

In 2020, Anhui Province developed the *Grade Evaluation Standard for Township Comprehensive Cultural Stations in Anhui Province*, *Action Plan for the High-quality Development of Rural Tourism in Anhui Province (2022-2024)*, *Measures for the Establishment and Accreditation of the Whole Tourism Demonstration Zone in Anhui Province (for trial implementation)*, *Development Report of Digital Creative Industry in Anhui Province (2021)* and other documents. Besides, a number of smart museums and other new public cultural spaces were built. Cities in the southern Anhui International Cultural Tourism Demonstration Zone were encouraged to apply for the 2022 National Intangible Cultural Heritage Protection Special Fund. The provincial digital creative industry development promotion meeting was held. All the above-mentioned actions under the guide of government were to provide preferential policies, investment environment and well-established infrastructure to Anhui's cultural industry development.

Anhui province plays an active role in hosting international exhibitions. For example, the 2021 World Manufacturing Conference was successfully held in the capital city Hefei from November 19 to 22. More than 1,400 guests from 24 countries and regions attended the conference. More than 20 events were held at the conference, resulting in 703 cooperation projects with a total investment of RMB 582.18 billion. More than 400 leading enterprises in the industry participated in the exhibition. More than 40 CIIE (China International Import Expo) exhibitors gathered in the import goods exhibition area. The online exhibition hall operates 365 days a year, creating a never-ending cloud exhibition. It has been spread by more than 400 million people on the whole network, conveying the voice of Anhui to the world and exerting a great influence of Anhui province, which is also helpful to improve the competitiveness of cultural industry in Anhui Province.

## MATERIAL AND METHODOLOGY

After reviewing many literature related to research on cultural industry competitiveness and considering the availability and authenticity of the data, this study selected 9 indicators as influencing factors to analyze the cultural industry competitiveness in Anhui province, namely, total collections in public libraries (X1), collections of public libraries owned per person (X2), number of performance by art performance troupes (X3), number of students enrollment of regular institutions of higher education (X4), consumer price indices (preceding year=100), education, culture and recreation (X5), foreign exchange earnings from international tourism (X6), total investment of foreign funded enterprises (X7), local governments expenditure, science and technology (X8), number of patent applications for inventions of industrial enterprises above designated size (X9). The selected factors are shown in Table 3.

Table 3 Indicators for Evaluation of Cultural Industry Competitiveness

Indicator	Unit	Name
Total Collections in Public Libraries	10000 volumes	X1
Collections of Public Libraries Owned per Person	volume/person	X2
Number of Performance by Art Performances Troupes	10000 shows	X3
Number of Students Enrollment of Regular Institutions of Higher Education	10000 persons	X4
Consumer Price Indices (preceding year=100), Education, Culture and Recreation	%	X5
Foreign Exchange Earnings from International Tourism	USD million	X6
Total Investment of Foreign Funded Enterprises	USD million	X7
Local Governments Expenditure, Science and Technology	100 million yuan	X8
Number of Patent Applications for Inventions of Industrial Enterprises above Designated Size	piece	X9

Source: (Lin, 2013, 2020, 2021); (Porter, 1990, 1998); (Krugman, 1994)

In order to find out the main factors affecting the competitiveness of cultural industry in Anhui province, this study uses statistical software Statistical Product Service Solutions (SPSS) 24.0 to carry out empirical analysis and put forward corresponding suggestions to improve the competitiveness of cultural industry.

In this study, a large number of original data are used to conduct principal component analysis (PCA) on independent variables, and some original variables are selected on the basis of authenticity and availability to analyze the relationship between indicators affecting the competitiveness of cultural industry in Anhui province. The ideas of the PCA were carried out on the original data dimension reduction processing, according to the principle of variance contribution rate is more than 85% to determine the main composition (Rummel, 1967; Salih Hasan & Abdulazeez, 2021). In addition, due to the difference of magnitude and unit in each

variable, this paper carries out dimensionless processing of index data through standardization method.

Steps of factor analysis in this study are outlined as follows:

Step 1. Standardized data.

Step 2. Estimate factor loading matrix.

Step 3. Factor rotation.

Step 4. Estimate factor scores.

The common factor is used to represent the linear combination of original independent variables, and common factors of the score function can be obtained (Kherif & Latypova, 2019). Then, scores of the observed of each common factors can be calculated so as to solve the problems which are unobservant for common factors (Beattie & Esmonde-White, 2021).

Combined with the evaluation index system, the index data of sample regions from the year of 2011 to 2020 were selected to evaluate and analyze the competitiveness of cultural industries in Anhui province. The data were obtained from Anhui Statistical Yearbook, China Statistical Yearbook, the website of Anhui Provincial Bureau of Statistics, National Bureau of Statistics and relevant communiques and statistical data published by government departments.

## RESULTS AND DISCUSSION

### KMO and Bartlett Test

In order to examine the sampling adequacy, Kaiser-Meyer-Olkin (KMO) test was used for inspection. The KMO value can range from 0 to 1. A KMO value which is above 0.600 to 0.700 is considered to be sufficient for further exploration of the exploratory factor analysis (EFA) output (Shrestha, 2021a). The Bartlett's Test of Sphericity tests the null hypothesis that the original correlation matrix is an identity matrix. It is believed to be significant if chi-square output of the Bartlett's test of Sphericity to have a p value of less than 0.050 (Shrestha, 2021b).

Based on the KMO measure of sampling adequacy, the score was 0.703, which is well above the minimum criterion of 0.500, so the sample size is adequate for EFA. The test was for Bartlett's Test of Sphericity is significant as the p value was 0.000 ( $p < 0.001$ ) (See Table 4). This indicates that the data are correlated and selected from a normally distributed population, which also indicates that this group of data is suitable for factor analysis.

Table 4 KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.703
Bartlett's Test of Sphericity	Approx. Chi-Square	113.345

df	36
Sig.	.000

Source: Authors

### Communalities

Communalities indicate the degree to which the original information contained in each variable can be explained by the extracted common factors. As shown in the Table 5, the communalities of all variables in this study are above 85%, except for X5 which is 84.8%, so the extracted factors have a strong ability to explain each variable.

Table 5 Communalities

Communalities	Initial	Extraction
Zscore: Total Collections in Public Libraries X1	1.000	.908
Zscore: Collections of Public Libraries Owned per Person X2	1.000	.910
Zscore: Number of Performances by Art Performance Troupes X3	1.000	.889
Zscore: Number of Students Enrollment of Regular Institutions of Higher Education X4	1.000	.952
Zscore: Consumer Price Indices (preceding year=100), Education, Culture and Recreation X5	1.000	.848
Zscore: Foreign Exchange Earnings from International Tourism X6	1.000	.868
Zscore: Total Investment of Foreign Funded Enterprises X7	1.000	.975
Zscore: Local Governments Expenditure, Science and Technology X8	1.000	.923
Zscore: Number of Patent Applications for Inventions of Industrial Enterprises above Designated Size X9	1.000	.936

Extraction Method: Principal Component Analysis.

Source: Authors

### Total Variance Explained

The total variance explained can be seen from the following Table 6. The initial eigenvalues column shows that only the first two eigenvalues are greater than 1, so SPSS only selects the first two principal components. The extraction sums of squared loadings shows that the variance contribution rate of the first principal component is 68.933% and that of the second principal component is 22.296%. Therefore, the variance of the first two principal components accounts for 91.229% of the variance of all principal components. The first two principal components are enough to represent the original variables, almost covering all the information of the original variables. The rotation sums of squared loadings show the results of the total cumulative variance after being rotated, and there is no obvious difference from before, which is greater than 85%.

Table 6 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	Of Variance	Cumulative %	Total	% of Variance	Cumulative %
	1	6.204	68.933	68.933	6.204	68.933	68.933	5.368	59.641
2	2.007	22.296	91.229	2.007	22.296	91.229	2.843	31.588	91.229
3	.328	3.642	94.871						
4	.251	2.785	97.656						
5	.151	1.681	99.336						
6	.027	.299	99.636						
7	.022	.241	99.877						
8	.011	.120	99.997						
9	.000	.003	100.000						

Extraction Method: Principal Component Analysis.

Source: Authors

### Rotated Component Matrix

Components extraction is to decrease the number of original factors to several main component. This study applied PCA to extract the main components according to initial eigenvalue and variance contribution of each variable. After orthogonal rotation in this study, the extracted components still hold 91.229% (as shown in table 6) of the original variables, which effectively avoids information omission. Therefore, under the condition of retaining the original information of selected factors as much as possible, the first two components are extracted as the principal components, which can reflect all the relevant variables of the study and get the measurement of its influence on the cultural industry competitiveness of Anhui province.

In the initial extraction phase, factors obtained are usually not easy to interpret for the reason that some factors are correlated with some variables in the significant cross loadings (Shrestha, 2021b). For the aim of minimizing the number of variables that have high loadings on each factor, Henry F. Kaiser, (1970) proposed varimax method to emphasize maximizing the differences between the squared pattern structure coefficients on a factor. The results of varimax rotation in this study is shown in Table 7. After varimax rotation, it can be observed that variables in the first principal component, namely, total investment of foreign funded enterprises (X7), number of students enrollment of regular institutions of higher education (X4), foreign exchange earnings from international tourism (X6), collections of public libraries owned per person (X2), total collections in public libraries (X1), local governments expenditure, science, and technology (X8) own larger loadings. Because these variables are from different influencing factors and represent the overall competitiveness of cultural industry



in Anhui province, the first principal component is named as overall competitiveness factor. As for the second principal component, number of performances by art performance troupes (X3), consumer price indices (preceding year=100), in education, culture and recreation (X5), number of patent applications for inventions of industrial enterprises above designated size (X9) occupies larger loadings, it is named industry operation factor.

Table 7 Rotated Component Matrix

Rotated Component Matrix <sup>a</sup>	Component	
	1	2
Zscore: Total Investment of Foreign Funded Enterprises X7	.987	
Zscore: Number of Students Enrollment of Regular Institutions of Higher Education X4	.936	
Zscore: Foreign Exchange Earnings from International Tourism X6	.911	
Zscore: Collections of Public Libraries Owned per Person X2	.908	
Zscore: Total Collections in Public Libraries X1	.893	
Zscore: Local Governments Expenditure in Science and Technology X8	.800	.533
Zscore: Number of Performances by Art Performance Troupes X3		.941
Zscore: Consumer Price Indices (preceding year=100), Education, Culture and Recreation X5		.919
Zscore: Number of Patent Applications for Inventions of Industrial Enterprises above Designated Size X9	.645	.721

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.  
 a. Rotation converged in 3 iterations.  
 Source: Authors

### Analysis of Research Result

It can be concluded from Table 5 and Table 6, the total variance explained of the first principal component is 68.933%, which means it can represent 68.933% of the 9 original indicators. The great proportion it explained indicates the great representation of the principal component for the original indicators. From Table 6, it is noticeable that the fundamental way to improve the cultural industry competitiveness in Anhui province is to enhance the overall competitiveness power for Anhui's cultural industry. Meanwhile, four indicators the first principal component, namely, total investment of foreign funded enterprises (X7), number of students enrollment of regular institutions of higher education (X4), foreign exchange earnings from international tourism (X6), collections of public libraries owned per person (X2) have the larger loading of 98.7%, 93.6%, 91.1%, and 90.8%, respectively. This indicates these four elements have great influence on Anhui's cultural industry competitiveness. As for the second principal component, number of performances by art performance troupes (X3), consumer price indices (preceding year=100), education, culture, and recreation (X5) have great loadings of 94.1% and 91.9% respectively. This means the industry operation factors influencing the

cultural industry competitiveness in Anhui province. Number of patent applications for inventions of industrial enterprises above designated size (X9) has the larger loading of 72.1%, indicating this influencing less on the cultural industry competitiveness in Anhui province.

## CONCLUSION

Firstly, this paper analyzes the current developing situation of cultural industry in Anhui province based on Porter's diamond model. Secondly, an empirical analysis was performed to determine the influencing factors of cultural industry competitiveness in Anhui province. Thirdly, on the basis of the above analysis, this paper puts forward suggestions for the development of cultural industry competitiveness in Anhui province. Great importance should be attached to the construction of cultural industry infrastructure, and constantly improve the culture-related supporting service system. On the one hand, Anhui province should increase the number of libraries, museums, and other basic facilities to provide places for cultural activities, to develop the cultural industry vigorously and realize the popularization, diversification and personalization of cultural consumption. On the other hand, Anhui province should make good use of the opportunity of the construction of Rural Library Project and National Cultural Information Resources Sharing Project to strengthen the construction of cultural industry in rural areas, and promote the development of cultural industry comprehensively.

Anhui province should supply policy support and strengthen top-level design for investment in the cultural industry (Zeng & Yang, 2022). First of all, modern financial tools and leverage and financing functions of finance need to be used to raise funds should be attracted to invest in the development of cultural industries. Secondly, we should attract social funds to the development of cultural industries, especially make full use of private capital, and constantly optimize the structure of investment and financing in cultural industries. Besides, foreign capital is to be encouraged to invest in cultural and related industry in Anhui province. Fourthly, the fiscal and taxation system should be implemented to reduce the investment burden of small and medium-sized cultural enterprises.

Colleges and universities should be regarded as the base of talent training and strive to make the cultivated college students become the main talents in the development of cultural industry. In addition, great efforts should be made to promote the cultivation of talents in the process of cultural industry development, and cultivate a group of cultural industry talents with professional quality and professional skills in the development of cultural industry.

By expanding government investment in cultural industries and increasing social capital investment, cultural facilities and conditions are to be improved for cultural consumption. The government should guide and support the cultural industry enterprises to increase the variety and quantity of cultural products and services to meet the needs of cultural consumption at different levels. Also, the digitalization and network process of cultural products and services needs to be accelerated, and the consumption of new media culture also need to be encouraged and expanded. Through the cooperation of government and personal cooperation, a service platform for sharing cultural consumption resources will be built. Thus, supporting services for cultural consumption will be improved.

There are some similarities in the development mode of cultural industry of different regions in Anhui Province. Therefore, when formulating the development plan and policy of cultural industry, the government should strengthen communication among cities, encourage them to learn from each other and promote the overall development of regional cultural industry in Anhui province. At the same time, according to the development degree and characteristics of cultural industries in various regions, Anhui province should formulate differentiated policies to support and develop cultural industries and guide the investment directions of cultural industries in different regions of the province and promote the coordinated development of overall cultural industry competitiveness.

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