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HIGH-QUALITY DEVELOPMENT DYNAMICS: SPATIO-TEMPORAL PERSPECTIVES FROM THE PEARL RIVER-WEST RIVER ECONOMIC BELT

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Abstract: China's economic growth is evolving from high-speed expansion to high-quality development, encompassing various dimensions like socioeconomic, energy, environmental protection, and institutional factors. Scholars have proposed different approaches to measure this shift, considering indicators ranging from single metrics to composite indices. Domestic and foreign experts emphasize the importance of efficient, equitable, and sustainable development, encapsulating multiple components beyond mere GDP growth. High-quality development is seen as a comprehensive evaluation that includes the efficiency of inputs and outputs, future growth potential, industrial structure, and equitable distribution of development outcomes.

This multifaceted concept of high-quality economic development is closely aligned with China's five development concepts, emphasizing holistic progress in economic, political, humanistic, social, and ecological dimensions. Researchers have employed diverse methodologies and evaluation systems to analyze and empirically assess high-quality economic development, providing valuable insights into its various aspects. Overall, this study recognizes the intricate nature of high-quality development and the need for a comprehensive, multidimensional approach to measure its progress.

Keywords: High-quality economic development, Sustainable development, Economic growth, Multidimensional assessment, China's development concepts

Introduction

China's economy is no longer just about high-speed growth but the pursuit of high-quality development. Moreover, as the country continues to develop, the sources of economic growth drivers have been enriched, and the economic structure has been optimized and upgraded. As scholars continue to study in-depth, the meaning expressed by economic growth has encompassed more meanings. Hinckley et al. suggested that socioeconomic, energy, and environmental protection should be considered in economic growth. Clean growth, high efficiency, and rational development should be the main factors to improve the efficiency of economic operations [1]. On the other hand, Barro further defined the quantity and quality of national economic development, arguing that the economic quality of development is closely related to economic culture, education, health, and institutions [2]. In evaluating the issue of measuring the rate of economic development, foreign experts and scholars have used a variety of approaches, some of them using a single indicator and others using a composite one [3-5]. Some other scholars have studied and analyzed the specific impact of different drivers of economic development on the quantity of economic growth through different econometric models [6-7]. Domestic scholars have incorporated the five development

concepts of economic growth, and the high quality and vigorous development of China's economy are mutually corroborative and better reflect the degree of realization of people's aspirations for a better life [8]. High-quality development has a broad connotation, including economic development, political direction, humanistic construction, social form, and ecological civilization. At the same time, high-quality development should also adhere to efficient, equitable, and green sustainable development [9]. High-quality economic development is simply with rapid GDP growth; it is a comprehensive measure that includes a wide range of components, such as whether the inputs and outputs are efficient, whether the future development of the economy has potential, whether the industrial structure is reasonable, and whether the results of economic growth and development are shared [10-11]. Different scholars have empirically analyzed the case of high-quality economic development with varying scales of research and evaluation systems [12-14]. Combining the existing literature, the connotation of high-quality economic development has the following common points: high-quality economic development and the five development concepts are unified and complementary. When selecting indicators, it is essential to recognize that high-quality development is a multifaceted concept, and using only one hand can only partially reflect its actual level. In general, the dimensions of research on high-quality development are diverse and have yielded very fruitful results.

In July 2014, the "Pearl River-West River Economic Belt Development Plan" was successfully reviewed and adopted by the State Council, and the adoption of the plan marked the ascension of the Pearl River-West River Economic Belt to the middle of the strategic stage at the national level. As China's first inter-provincial economic belt, the Pearl River-West River Economic Belt has an excellent natural endowment and industrial foundation. It is thus clear that the development of the Pearl River- West River Economic Belt is of vital importance to the country. Based on this, this paper provides relevant suggestions for promoting regional economic quality development by analyzing the level of economic quality development and inter-regional disparity among 11 cities in the Pearl River-West River Economic Belt from 2015 to 2020.

Study area and data sources

Study area

The Pearl River-West River Economic Belt traverses Guangxi and Guangdong, neighboring Yunnan and Guizhou above and Hong Kong and Macao below, connecting the cooperation and exchange between autonomous regions and non-autonomous regions, and is the first cooperation between developed cities in the east and sub-developed cities in the west. The Pearl River-West River Economic Belt is the trade entry point between China and the Southeast Asian side. It is essential in promoting coordinated domestic development and ensuring international sharing for mutual benefit. From east to west, the 11 cities in this economic belt are Guangzhou, Foshan, Zhaoqing, Yunfu, Wuzhou, Liuzhou, Guigang, Laibin, Nanning, Baise, and Chongzuo. There are specific differences between these cities in terms of advantages and disadvantages, leading to a particular gap in the level of economic development between them, which affects their overall high-quality development.

Data Sources and Processing

Most of the data sources are extracted from the statistical yearbooks of Guangdong and Guangxi provinces from 2016-2021 and the statistical bulletins released by each city. The required data of

individual cities in Guangxi need to be included. For the missing part of the statistics, the thesis replaces them with approximate indicators that can express the same meaning. Also, the names in the statistical yearbooks or bulletins of different provinces or cities are inconsistent, so the data and indicators were unified when the data were processed.

Methodology

Evaluation index system construction

High-quality economic development has a rich connotation, including humanities, science, technology, ecology, etc., and economic growth alone. To better measure the level of high-quality economic development, based on the five development concepts proposed by the existing reference countries [15], 15 specific indicators were finally selected to evaluate the level of high-quality development of the Pearl River-West River Economic Belt from a comprehensive perspective. The specific indicators are calculated in Table 1.

Table 1: High-quality Development Index System of the Pearl River-West River Economic Belt

Target layer	Criterion layer	Indicator layer	Explanation of indicators	Indicator properties	Indicator unit
High-quality development of the Pearl River-West River Economic Belt	Innovation and development	Investment intensity of science and technology	The proportion of expenditure on science and technology in local general public budget expenditure	Positive	%
		Number of patent applications accepted by 10,000 people	Number of patent applications/resident population	Positive	A
		The intensity of investment in education	The proportion of education expenditure in local general public budget expenditure	Positive	%
	Coordinated development	GDP per capita	GDP/resident population	Positive	RMB 10,000/person
		Industrial Structure Coefficient	Tertiary industry added value/GDP	Positive	%
		Registered urban unemployment rate	Registered urban unemployment rate	Negative	%
	Green development	Power Consumption per Unit GDP	Total electricity consumption/GDP	Negative	Hour/10,000 yuan

		Degree of environmental protection input	Expenditure on energy conservation and environmental protection/local general public budget expenditure	Positive	%
		natural reserve	Area of nature reserve/area under the jurisdiction	Positive	%
	Open development	The proportion of actually utilized foreign capital in GDP	Total Foreign Direct Investment/GDP	Positive	%
		Of total imports and exports Proportion of GDP	Total Imports and Exports/GDP	Positive	%
		The number of foreign visitors received	Reception of inbound overnight visitors (foreigners)	Positive	Ten thousand people
	Shared development	Number of health technicians per 10,000 people	Number of health technicians/resident population	Positive	People
		Per capita investment in fixed assets of the whole society	Investment in fixed assets/resident population	Positive	RMB 10,000/person
		Per capita urban road area	Road area/resident population	Positive	Square meters/person

Entropy weighting method

The entropy weight method is a method to evaluate from a static perspective by determining the weight of each indicator, and it can well reflect the differences among indicators. The consequences of the indicator system can be objectively assigned, and the entropy of the indicators is obtained by calculating the information of the indicator items and determining the weights of each indicator.

Gini coefficient

The Gini coefficient elaborates on the spatial unevenness of the level of high-quality development. The Gini coefficient and the method of decomposition by different subgroups, and then the Gini coefficient is decomposed into three specific directions of analysis, which are regional differences,

the net value of hyper invariance of inter-regional differences, and the density of hyper invariance expressing the causes of disparities. The regional differences are specifically the size of the differences in the level of economic quality development compared to different members within the region in question; the interregional differences in the net hypervariable are specifically the size of the differences between these other wholes when different regions are considered as an independent whole; and the hypervariable density is the cross-over part that originates from the existence of areas between different regions.

Results

Time change

Changes in the level of high-quality economic development of each city

The total scores of economic high-quality development levels of 11 cities in the Pearl River-West River Economic Belt over the years, measured by the above method, are shown in Table 2. Between 2015 and 2020 in the Pearl River-West River Economic Belt, in general, the economic high-quality development level of 11 cities is increasing yearly, and the rate of increase is relatively flat. However, in 2020, Guangzhou, located in the east, had the highest economic development level with a score of 0.827, while Laibin, situated in the center, had the lowest score of 0.479. It can be found that Guangzhou's development level score is 1.73 times higher than that of Laibin, and this value visually shows that the development gap among cities in the Pearl River-West River economic belt is more prominent. By region, Guangzhou (0.827) and Foshan (0.763) in Guangdong province are in the top two development levels, while Nanning (0.735), the provincial capital, and Liuzhou (0.728), the industrial city in Guangxi region are in the top two in this autonomous region, but compared with the two areas, the quality of economic development of towns in Guangxi region is still a big gap from Guangdong.

Table 2: Comprehensive score of high-quality economic development level of cities in the Pearl River- West River Economic Belt from 2015 to 2020

	2015	2016	2017	2018	2019	2020
Guangzhou	0.699	0.725	0.753	0.782	0.811	0.827
Foshan	0.630	0.657	0.686	0.716	0.747	0.763
Zhaoqing	0.559	0.581	0.604	0.627	0.652	0.665
Yunfu	0.420	0.437	0.454	0.472	0.491	0.501
Nanning	0.607	0.633	0.661	0.689	0.719	0.735
Liuzhou	0.602	0.628	0.655	0.683	0.713	0.728
Wuzhou	0.471	0.490	0.510	0.530	0.552	0.563
Guigang	0.507	0.527	0.547	0.568	0.591	0.602
Baise	0.488	0.507	0.526	0.547	0.568	0.579
Laibin	0.398	0.415	0.432	0.450	0.469	0.479
Chongzuo	0.406	0.423	0.440	0.458	0.477	0.487

Changes in the development level of each dimension

In terms of innovation development, the innovation-driven index of the Pearl River-West River Economic Belt shows an apparent upward trend, rising from 0.524 in 2015 to 0.690 in 2020, an

increase of about 31.68%, indicating that national policies have greatly helped the high-quality development of the Pearl River-West River Economic Belt. The Pearl River -West River Economic Belt increases its investment in innovation. In terms of coordinated development, the Pearl River - West River Economic Belt is continuously improving. From 0.28972 in 2015 to 0.56491 in 2020, an increase of about 22.88%, coordinated development is the most critical concern of the people. The Pearl River - West River Economic Belt is a link between the faster developing eastern regions and the backward developing western regions, so in addition to national policies, the two provinces and cities have also repeatedly introduced related development policies to promote and boost the high-quality development of the Pearl River-West River Economic Belt. In terms of green development, the Pearl River-West River Economic Belt is improving, but it is weaker than the innovation and coordination dimension development, which rose from 0.513 in 2015 to 0.613 in 2020; in terms of open development, the Pearl River-West River Economic Belt rose from 0.413 in 2015 to 0.509 in 2019 0.509, the situation is improving, but in 20192020, there is a substantial decrease in total import and export, actual utilization of foreign investment, and the number of visitors to inbound tourism due to the impact of the new crown epidemic. Regarding shared development, the Pearl River-West River Economic Belt is constantly improving. It rose from 0.586 in 2015 to 0.770 in 2020, an increase of about 31.40%, indicating that both health, cultural, and transportation facilities in the Pearl River-West River Economic Belt are improving day by day, and the progress of improvement has changed drastically compared to the previous ones.

Regional differences

Intra-regional differences

By using the dual perspective of intra-regional and inter-regional disparities, the overall Gini coefficient of the Pearl River-West River Economic Belt, the Gini coefficients of the level of economic quality development within and among the central cities, sub-central cities, more backward cities, and cities are measured and decomposed, with the major cities including Guangzhou and Nanning; the subcentral cities are Foshan, Zhaoqing, Liuzhou, Wuzhou and Guigang City; the more lagging cities include Yunfu, Baise, Laibin, and Chongzuo. The calculation results are shown in Table 3.

Table 3: Regional differences in the development level of the Pearl River-West River Economic Belt from 2015 to 2020

year	Overall coefficient	Urban Gini coefficient			Inter-city Gini coefficient			Contribution rate		
		center City	Sub-central cities	Less developed cities	Centers – less developed cities	Sub-center – less developed cities	Central – Sub-central city	Within the region	Interregion	Supervariable density
2015	0.076	0.092	0.072	0.045	0.100	0.079	0.093	31.574	33.762	39.664
2016	0.064	0.081	0.062	0.033	0.086	0.068	0.082	30.438	25.119	49.443
2017	0.067	0.065	0.083	0.034	0.076	0.086	0.083	30.217	30.099	44.683

2018	0.060	0.050	0.072	0.035	0.069	0.074	0.076	31.337	36.629	37.034
2019	0.069	0.048	0.081	0.046	0.074	0.088	0.079	32.486	40.137	32.378
2020	0.044	0.019	0.040	0.034	0.059	0.045	0.050	33.630	44.480	26.890

The results show that the overall Gini coefficient decreased from 0.076 in 2015 to 0.044 in 2020, a decrease of 42.03% during the period 2015-2020. It indicates that the difference in the level of highquality development in the Pearl River-West River Economic Belt during the study period is decreasing. The changing trend of the differences within the three regions of central cities, sub-central cities, and more backward cities in the Pearl River-West River Economic Belt is seen: from 2015 to 2016, the Gini coefficient within the significant city area is always higher than the middle and lower reaches, indicating that there is a large gap between the central cities Guangzhou and Nanning, which mainly include Guangzhou and Nanning, and these 2 The overall natural conditions of the cities are better, and the transportation is very convenient, which is very convenient for population clustering and economic development, but the intensity of economic growth, stability, extroversion and rationalization of the cities in the region are very different, so the level of economic quality development within the central city region shows a significant difference instead. 2017-2020, the sub-Gini coefficient within the central city region is higher than that of the central and more backward cities, indicating that Foshan, Zhaoqing, Liuzhou, Wuzhou, and Guigang cities have higher differences in the level of high-quality development in 2017-2020 than those within each region of the central and more backward cities. The Gini coefficients of sub-central cities and more backward cities were similar in 2015-2016. Still, after 2016, the Gini coefficients within the regions of more backward cities show a faster-decreasing trend. This is because the infrastructure and social life of the Pearl River-West River Economic Belt have changed significantly through the 3-year construction. Guangxi has opened a construction war to keep up with the national development train. This was decided to build and optimize the related infrastructure through an investment of more than 630 billion yuan, and 200 projects are expected to be implemented, involving all aspects of production and life, such as transportation, municipal construction, ecological civilization construction, and the treatment of living and production waste, etc., making the level of economic development increase significantly. The quality of the ecological environment has improved. A comprehensive pattern of opening up to the outside world has been formed, so the Gini coefficient in the region has declined to a certain extent. In 2020, the intra-regional Gini coefficient of the central cities and the more backward cities will be at a lower value, indicating that the differences between the regions in the Pearl River-West River Economic Belt are narrowing.

Inter-regional differences

The inter-regional differences show a fluctuating decline over time, and the fluctuations are not significant, and the decreases are center-more backward cities: 41.2%; backward sub-center-more towns: 43.4%; center-sub-center cities: 46.4%. The difference between the upstream and downstream regions, middle and downstream, and upstream and midstream decreased from 0.100, 0.079, and 0.093 in 2015 to 0.059, 0.048, and 0.050, respectively. This indicates that the difference is decreasing year by year, and the coordinated development of regions is in steady progress. The

gap between regions does exist, but it has been narrowing. To further reduce the difference between regions, regions are required to take the initiative to take corresponding measures, such as: increasing environmental protection, improving innovation capacity, expanding opening to the outside world, etc., to promote the realization of coordinated regional development.

Reasons for the differences in the level of high-quality development

To show the specific situation of high-quality products and the causes of differences in the Pearl River-West River Economic Belt, in addition to analyzing the Gini coefficients between different categories of cities, it is also necessary to examine the related contribution rates. The results show that the inter-regional differences mainly show a rising, falling, and increasing trend, and their contribution rate values are roughly distributed between 25.12% and 44.48%; the intra-regional differences contribution rate is basically in a relatively stable state, mainly distributed between 30.21% and 33.63%; the contribution rate of super-variable density in In 2015, it was 39.66%, and rose to 49.44% in 2016, and decreased in 2017-2020, but still 26.89% in 2020. Thus, it can be seen that the differences in economic quality development in the Pearl River-West River economic Belt mainly originate from two aspects: inter-regional differences and hypervariable density. The reasons are roughly divided into two parts: firstly, the requirement of high-quality development is that the whole system is in a dynamic, efficient, and high-quality state, and secondly, the Pearl River-West River Economic Belt covers a wide area, and the central cities, sub-central cities, and more backward urban areas have significant variability in terms of geographical location, resource endowment, technology, education, and humanities. Therefore, under the inertia of economic development, the central cities keep forming new clusters. In contrast, the more backward cities have limitations on population clustering and resource development due to inconvenient transportation and weak economic take-off. At the same time, central cities are facing many environmental problems, such as ecological degradation. Sub-central cities' economic and social development needs to be sufficiently concentrated on innovation resources compared with central city regions, the development of the outward-oriented economy needs to be improved, and the connection between East and West needs to be more prominent.

Conclusions and Recommendations

Conclusion

The level of high-quality economic development of 11 cities in the Pearl River-West River Economic Belt is rising yearly, and the speed is relatively flat. Except for the openness dimension, which has declined, the development of all other dimensions has maintained steady growth.

From 2015 to 2020, the overall Gini coefficient decreased from 0.076 in 2015 to 0.044 in 2020, a decrease of 42.03%. The difference in the level of high-quality development in the Pearl River-West River Economic Belt shows a decreasing trend. However, the development gap between cities is more apparent. The quality of urban economic development in the Guangxi region is still a big gap from Guangdong. The overall level of high-quality economic growth needs to be improved urgently. The difference between regions shows a decreasing trend over time; the fluctuation is insignificant, and the decrease is a center-more backward city, sub-center-more backward city, and center-sub-center city, respectively.

Suggestions

To highlight the transportation advantages of the Pearl River-West River system, realize the seamless connection of road, waterway, railroad, and air transportation, improve the comprehensive transportation efficiency, and give full play to the transportation advantages of the economic belt, during the 14th FiveYear Plan development period, the Pearl River-West River Economic Belt should attach great importance to high-tech enterprises and new industries, put the talents and scientific and technological resources of Guangzhou and Nanning to high use, give full play to the leading role of Guangzhou and Nanning, make them the innovation centers of the cities in the two regions, and continuously lead and strengthen the development and exchange and interaction of the cities.

Foshan and Liuzhou, which have more excellent development prospects, should strive to improve the economic radiation capacity of the two cities, actively absorbing the scientific and technological innovation and town development capacity of Guangzhou and Nanning on the one hand and trying to integrate their development advantages and experience curves to other categories of cities on the other hand to help the high-quality development of the economic belt.

To interconnect cities with industrial development capacity with Guangzhou and Foshan, it is necessary to strengthen the reasonable allocation and support of financial capital and promote the effective accumulation of technological innovation and talent. Sub-developed and backward cities should still actively seek opportunities for industrial transformation, give full play to their natural resource advantages, strengthen the development of profitable industries, and further promote the cities of Zhaoqing, Yunfu, Wuzhou, Guigang, Chongzuo, Baise, and Laibin to continuously upgrade and optimize their industrial structures and become innovative production bases.

References

Hinckley A. Dexter. The limits to growth: by Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, &William W. Behrens III. A Potomac Associates Book: A Report for the Club of Rome's Project on the Predicament of Mankind[J]. Universe Books, 1973, 5(01):205-212.

Barro R J. Inequality and Growth in a panel of Countries[J]. Journal of Economic Growth, 2000, 5(1): 5-32.

Gelb A, Jefferson G, Singh I. Can Communist Economies Transform Incrementally The Experience of China [J]? NBER Macroeconomics Annual, 1993, (8):87-133.

German C, B. Ravikumar, Gustavo Ventura. Talent, Labor Quality and Economic Development[J]. Review of Economic Dynamics, 2016, (21):160-181.

Qi J. Fiscal expenditure incentives, spatial correlation and quality of economic growth: evidence from a Chinese province [J]. International Journal of Business and Management, 2016, 11(07):191-201.

Niebel, Thomas. ICT and economic growth–Comparing developing, emerging, and developed countries [J]. World Development, 2018, 104(4):197-211.

He L. Deeply implement the new development concept to promote China's economy to high-quality development [J]. Macroeconomic Management, 2018, (4):4-5.

Zhang J, Hou Y, Liu P, et al. The Goals and Strategy Path of High-quality Development [J]. Management World, 2019, 35(7):1-7.

Zhang H. Reseach on Measurement of Yangtze EconomicsBelt's Economic Development Quality [J]. Shanghai Finance, 2015(12):19-24.

Liu X. Six Dimensions for Measuring the Quality of Economic Development [J]. Chinese Cadres Tribune, 2017(12):55-56.

Jin B. Study on the "High-Quality Development" Economics [J]. China Industrial Economics, 2018(4):5-18(12).

Xiao Z. Research on the Causes of China's High-Quality Development–Based on the Perspective of Economic and Social Development [J]. Soft Science, 2019, 33(4):1-5.

Fan J, Wang Y, Wang Y. High Quality, Regional Development Research, Based on Geographical Units: Discuss on the Difference in Development Conditions and Priorities of the Yellow River Basin Compared to the Yangtze River Basin [J]. Economic Geography, 2020, 40(1):1-11.

Li M, Ren B. Comprehensive Evaluation and Path Choice of China's High-Ouality Development in the New Era[J]. Finance & Economics, 2019(5):26-40.

Yang R, Yang C. The high-quality development measurement of the Yangtze River Economic Belt and the evolution of time and space [J]. Journal of Central China Normal University (Natural Sciences), 2019, 53(5):631-642.