

Appendix

Introduction

At present, the provincial capital cities are still at the historical stage of industrialization and urbanization. The development of green and low-carbon policies in the provincial capital faces the following problems: (1) Energy structure partial coal and low energy efficiency have not been fundamentally changed; (2) Pollution problems in key areas and key industries have not been solved fundamentally; (3) Intensified constraints on urban energy resources and the environment; (4) The time window for carbon peak and carbon neutrality is tightened; (5) The extent that the ecosystem structure is affected by human activity is getting deeper and more profound; (6) The development and construction of ecosystems continuously intensify; (7) Biological diversity protection is seriously threatened.

Policy Background and Literature Review

Policy Background

Provincial capital cities are often the central cities of a province (autonomous region), which are the administrative center (government resident) of the province. The provincial capital is the core of the entire regional economic development, thus has strong representative and high research value. As the growth poles of the economic development of each province, the provincial capital cities enjoy a global strategic significance. The “strong provincial capital” strategy is implemented to expand the city’s capital development space by administrative means and economic means to lead the province’s economic development. After the development of the provincial capital to a certain level, it is not possible to effectively solve the problems of urban economic development alone on the surface. It is also necessary to explore the factors of the administrative division and adjustment from the planning laws that affect urban development. In the new era of optimizing the setting of administrative divisions and cultivating the development of modern urban areas, Jinan, Nanjing, Harbin, and other cities have been named “inadequate provincial capital” and “insufficient role in central cities” by the country. Summary of various practical cases found that the implementation path of the “strong provincial capital” strategy is relatively uniform, mainly including adjusting the administrative division to expand the space for the development of the provincial capital with its own high administrative level.

The increase in the level of administrative jurisdiction of the provincial capital means that its development priority improved and its opportunities increased. The expansion of the provincial capital’s jurisdiction shows the sharp expansion of its urban and

rural development at the space level. In recent years, many provinces in China have implemented relevant policies to develop bigger and stronger provinces and cities, which has sounded the first and rapid development of the “strong provincial capital”. The “strong provincial capital” strategy has become the new space logic of urban development, co-selected by multiple provinces, and has begun to take effect. Regardless of whether in eastern, central, or western regions, the provincial capital cities are actively exploring saving resources, reducing ecological environmental pollution, and changing economic green low-carbon driving models to low energy, low pollution, and high-efficiency. The urban population of Chinese provincial capitals accounted for the national population proportion of the country’s population from 7.8% in 1978 to 14.2% in 2019, an increase of nearly 7 percentage points; The GDP of Chinese provincial capitals accounted for the national proportion of the country from 11.8% in 1978 to 20.8% in 2019, an increase of about 10 percentage points.

New dominant models of the province’s strength to become bigger and stronger are changing, and the development strategy of the “strong provincial capital” has continued to become a new approach and new trend. As the first provincial and municipalities in the country, it is the first time that the administrative division of the “Chaohu withdrawal” is the first time, and it has become a rare sample to study the process of urbanization in China today. In 2011, the Anhui Provincial Government was approved by the State Council to decide to revoke Chaohu City, a prefecture-level city. Lujiang County under the jurisdiction of Chaohu City at the same place is placed under the jurisdiction of Hefei. This is also known as “incorporating the cities of Chaohu City into Hefei City.” The adjustment of the administrative division is accompanied by the adjustment of administrative governance agencies, which is essentially the institutional reform of a regional administrative governance system and institution. In 2011, the Chaohu Lake District was mild and nutritious. The average water quality category of Chaohu Lake is Class IV, and the River River is generally moderately polluted. The water quality category in the east of the East Lake is a mild pollution, which shows a mild nutritional state. The water quality category in the western half of the lake is a category, which is a moderate pollution and presents a moderate nutritional state.

After revoking the prefecture-level Chaohu City and the county-level Chaohu City, Anhui Province quickly established the Chaohu Management Bureau to accelerate the coordination of the work of promoting the comprehensive management of Chaohu. Hefei City took the lead in implementing the five-head leadership of the “River and Lake Chiefs, Ceremony, Civil River Chiefs, Sheriff Chiefs, Attorney General” in Anhui Province. After the expansion of the provincial capital border, the

urban space of Hefei City continued to expand south, thereby laid the comprehensive foundation for Hefei to become the sub-center of the Yangtze River Delta urban agglomeration. The adjustment of the administrative division is conducive to strengthening the comprehensive governance of the Chaohu Basin, implementing the red line and development boundaries of ecological protection, improving the control of the use of ecological space partitions, and enhancing regional economic green and low-carbon sustainable development capabilities. The expansion of the provincial capital border is conducive to giving full play to the role of economic radiation in Hefei, and then coordinates the productivity layout and infrastructure construction in a larger area. The expansion of the provincial capital's urban boundaries can improve the efficiency of factor resource allocation, and then promote the optimization of urban production and lifestyle to green low-carbon cycles.

Research Design

Methods

Spatio-Temporal Entropy Weight Method

If the administrative division adjusts the short-term benefits of enhancing economic momentum, and ignore the impact of the environmental pollution, high-carbon industry, and the benefits of public services, it will increase the size of the scale and not economic phenomenon.

The steps of time and space difference entropy rights are:

First, select indicators: there are ς years, n areas, and v indicators, $x_{\lambda ij}$ is the j -indicator of the province i of the first λ -year province.

Second, the standardized treatment of the indicator. Because the quantitative outlines, economic significance, expression forms, and the role of the overall goals in each evaluation index system tend to be different, it must be processed by infinitely out. The process of eliminating the influence of the original indicator outline through mathematical changes is the process of transforming the actual value of the indicator into an index evaluation value. The value after the infinite outline is the evaluation value of each indicator. Due to the positive indicators and reverse indicators in the indicator system, the direction of the actual economic significance of the two is slightly different. Standardization of positive indicators to $x'_{\lambda ij} = x_{\lambda ij} / \text{Max}(x_{\lambda ij})$; Negative direction

indicator standardized to $x'_{\lambda ij} = \text{Min}(x_{\lambda ij}) / x_{\lambda ij}$.

Third, determine the index weight:

$$\psi_{\lambda ij} = x'_{\lambda ij} / \sum_{\lambda} \sum_i x'_{\lambda ij}$$

Fourth, calculate the entropy value of the first j index: $\zeta_j = -u \sum_{j,i} \psi_{ij} \text{Ln}(\psi_{ij})$. $u > 0, u = \text{Ln}(\varsigma n)$.

Fifth, calculate the information utility value of the j indicator: $c_j = 1 - \zeta_j$.

Sixth, calculate the weight of each indicator

$$\chi_j = c_j / \sum_j c_j$$

Seventh, calculate comprehensive score

$$Z_{\lambda i} = \sum_j \chi_j x'_{\lambda ij}$$

After getting the scores and weights of each indicator, the comprehensive score value is calculated on average through the score of individual index individuals. The original indicators that belong to each type through weighted calculations, so that the original multi-indicator is converted into a single indicator, making the judgment results more intuitive.

Synthetic Control Method

The synthetic control method is an emerging research method in the field of modern scientific social. Through comprehensive quantitative research and qualitative research, this method selects the optimal weight of the best fit linear combination according to the data driver. This method can prevent researchers from subjectively selecting the subjective and randomness of the sample unit of the control group.

The basic steps are as follows: First, choose the appropriate explanation variable based on the "Rubin anti-factual framework" by selecting a reasonable control group sample.

Secondly, the SCM method is used to combine the most suitable anti-factual synthesis group. As a non-parameter method, when building an anti-fact synthetic group, it is clearly pointed out by weighted average, which clearly pointed out the contribution component made by each control group sample matching unit. The degree of contribution of synthetic weights is purely determined by data, and the value of the weight requires the weight of the weight. The sum of ownership is equal to 1, so as to avoid the trap that falls into extrapolation.

Finally, through the long-term differences between the processing group and the anti-affairs synthesis group after the implementation of the policy, accurately evaluate the net effect of the provincial capital expansion policy on the quality of regional green and low-carbon development. On the left side of the intervention (before the processing group's case is affected by variables), the anti-factual synthesis group and the policy intervention group have the same historical development trend. The synthesis path of the two should be basically re-coefficient, indicating that variables that affect the quality trend of the green and low-carbon development quality of the two groups have similar consistency on the "average value". After the policy impact (explaining variables on

the sample case), if a relatively large economic difference effect is produced, it indicates that the green and low-carbon effect of the regional administrative unit may only be produced by the policy. While getting rid of the problem of endogenous problems, this method can determine the causal relationship between condition variables and potential results.

Variables

Explained variables: quality of urban green and low-carbon development (*GRECO*).

Due to the availability of data indicators, the article selected 63 prefecture-level city green development quality (Non-hazardous treatment rate of domestic waste, urban green space area, naturalized vegetation index, industrial sulfur dioxide emissions, industrial smoke dust discharge, industrial wastewater discharge volume) and urban low-carbon development quality indicators (Carbon dioxide emissions, power consumption in the whole society). On this basis, the article uses data from 2003 to 2019 to build a prefecture-level green low-carbon development quality index system with the help of the time and space difference entropy rights.

Samples

In order to ensure the acquisition and consistency of various data indicators, finally selected 63 prefecture-level cities in mainland China to analyze the balanced panel data from 2003 to 2019. First, due to the lack of data from two special administrative regions of Hong Kong and Macau in China and Macau, it has not been covered. Second, because of the particularity of regional attributes, four municipalities, including Beijing, Tianjin, Shanghai, and Chongqing. Third, it is difficult to find and difficult to make up for an important data indicator such as Lhasa, Lhasa City, Tibet Autonomous Region, and the provincial capital of Haikou City in Hainan Province. The fourth is to refer to select prefecture-level cities that have not changed administrative divisions during the sample period. This processing can ensure the stability and homogeneity of the individual control group.

The reason why 2003 is the starting year is: The lack of environmental data indicators before 2003 and 2020, and it is difficult to make up for the missing value. This processing can reduce the error of the evidence results of this article due to other factors. Empirical analysis methods require the scope of a certain length before and after the implementation of the policy intervention to ensure that the conclusion is true and reliable, and it helps the follow-up effect assessment and analysis.

Data Sources

The calculation method of the article (Zhang, 2022) to calculate the total amount of carbon dioxide emissions in the city. Direct energy carbon emissions are obtained by multiplying the total urban natural gas and LPG supply by the relevant conversion factors provided by IPCC2006. The CO₂ emission coefficient of natural gas is 2.1622 kg-CO₂/m³. The CO₂ emission coefficient of LPG is 3.1013 kg-CO₂/kg. The CO₂ emission coefficient of raw coal is 1.9003 kg-CO₂/kg. There are six regional power grids in China: North China, Northeast China, East China, Central China, Northwest China, and South China. The carbon emissions generated by urban electric energy consumption are calculated by multiplying the annual emission factors of the regional grid baselines and the urban electric energy consumption (the electricity consumption of the whole society). It is assumed that the speed of urban public transportation is 16 km/h, the daily driving time is about 12 h, and the fuel consumption per 100 km is 32 L/100 km. The annual driving mileage of urban taxis is 12,000 km/year, and the fuel consumption per 100 km is 10 L/100 km. The gasoline emission factor provided by the IPCC guidelines is 6.93×10^4 kg/TJ (as CO₂). The net calorific value of gasoline is 44.3 TJ/Gg, which is 44.3×10^{-6} TJ/kg. The diesel emission factor is 7.41×10^4 kg/TJ (as CO₂). The net calorific value of diesel is 43 TJ/Gg, which is 43×10^{-6} TJ/kg. The emission coefficient of raw coal is 9.46×10^4 kg/TJ (calculated as CO₂), and the net calorific value is 25.8 TJ/Gg, which is 25.8×10^{-6} TJ/kg. The urban public transportation uses diesel as the main fuel, and the density of diesel is 0.835 kg/L. Taxis

Table S1. Descriptive statistics of variables.

Variable	Mean	Sd	P25	P50	P75	Min	Max
<i>GRECO</i>	0.93	0.44	0.72	0.82	0.98	0.45	5.93
<i>Lnpergdp</i>	10.59	0.77	10.06	10.66	11.16	8.13	13.06
<i>Oinvest</i>	0.65	0.29	0.45	0.60	0.81	0.03	2.49
<i>Marademo</i>	0.24	0.23	0.08	0.17	0.32	0.00	1.66
<i>Lnwaizic</i>	12.83	1.64	11.69	13.06	14.11	6.79	15.97
<i>Educ</i>	0.38	0.34	0.11	0.25	0.56	0.01	1.72
<i>Teleinsc</i>	1.40	1.21	0.78	1.14	1.72	0.15	11.76

use gasoline as fuel, and the density of gasoline is 0.725 kg/L. The urban thermal energy data were not taken into account due to the large area of missing values in the total urban heating supply and heating area.

The Native Valley Vegetation Index (NDVI) has a high correlation with indicators such as biomass density, vegetation cover, and leaf area index due to its wider monitoring range. This indicator is used to comprehensively evaluate vegetation coverage and its growth vitality in multiple aspects: all-round, wide fields, and deep-seated vitality, and reflects the radiation value of green or vegetation relative abundance and activity. The data of the county region ingredients (NDVI) data is derived from the Modis (<https://modis.gsfc.nasa.gov/>), and the spatial resolution is 500 meters. The value range of NDVI (NORMALized Difference Vegetation Index) is -1~1. Negative values indicate that the ground covers cloud, rain, water, and snow, etc., and high reflection of visible light; 0 indicates that there are rocks or nudity; it means vegetation coverage, and it increases with the increase of the coverage of vegetation in the county.

Source of electricity and data for the whole society. JIANDONG Chen provides a grid data for the world's 1992-2018, 1kmx1km resolution. By extracting the grid data in China, the electricity panel data of the county in China is summarized, and the unit is a kilowatt-hour. The author provides “+proj = moll+long_0 = 0+x_0 = 0+y_0 = 0+datum = wgs84+units = m+no_defs” z coordinate system. The projection of the grid data may produce error calculation results, so the data processing still uses the projection. Affiliated website: <https://www.nature.com/articles/S41597-022-01322-5>.

Other data are derived from the 2003-2019 “China Regional Economic Statistical Yearbook”, “China Environmental Statistics Yearbook”, “China Energy Statistics Yearbook”, “Chinese City Statistical

Yearbook”, and statistical yearbooks of provinces (cities and autonomous regions). If there is a lack of data in a few years, it will be made up on the basis of consulting the relevant cities’ national economic and social statistics.

Empirical Results Estimation

Empirical Results: All Samples

Based on the area where the border expansion of the provincial capital cities is sample, this chapter discusses the overall effect of the expansion of the provincial capital. According to Fig. S1 analysis results, on the basis of using all samples as the research object, the implementation of the provincial capital expansion policy can bring significant green and low-carbon effects. From the perspective of specific changes, in the early stage of policy implementation, the green and low-carbon effects generated by the provincial capital cities are small; in the later stage of policy implementation, the green and low-carbon effects generated by the provincial capital cities have reached the largest.

After the implementation of the provincial capital expansion policy, the provincial capital city government put climate change in a more prominent position, strictly implements the main responsibility of green low-carbon governance, and continuously enhances the synergy of ecological and environmental policies. The provincial capital government has continuously improved carbon emissions and energy reduction, and further deepened ecological environmental governance with carbon peak operations. The government insists on implementing the concept of energy conservation, promoting the adjustment of energy structure, and increasing the proportion of renewable energy utilization. After the expansion of the provincial capital's urban space, the government has continuously accelerated the use of clean energy utilization, comprehensively improves the output rate of resource, and gradually realizes the “decoupling” of economic development and energy consumption.

Empirical Results: Case Sample

As the provincial capital of Anhui Province, Hefei is in an important position in the province's economic pattern and the construction of the urban system. The construction of Hefei into a modern city is not only the objective of laws and trends of the development of the city itself, it is an inevitable requirement for the economic and social development of the province, but also the need for the world economy. In the process of strong provincial capital strategy, through the provincial capital cities, the development model of small and medium-sized cities and satellite cities in the provincial capital can create a green and low-carbon

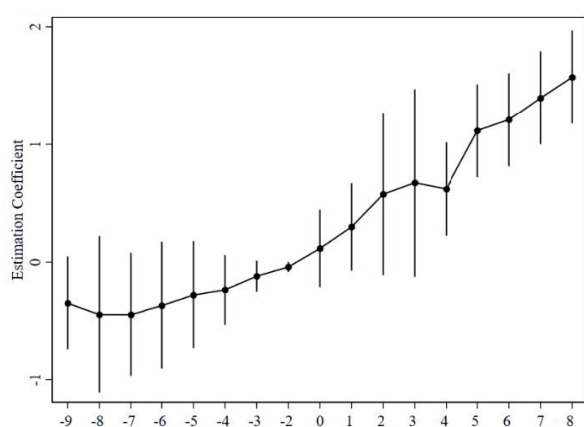


Fig. S1. Evaluation of the policy effect of the provincial capital expansion policy: All samples estimation

Note: In this figure, the “-3” represents the 3rd year before the implementation of the policy, and “3” represents the 3rd year after the implementation of the policy.

ecological barrier in the provincial capital's economic circle, and then achieve the win-win development of the global economic, social, resources, and environmental coordination of Hefei. Therefore, building Hefei into a modern city with strong economic strength and blue, green, and clear water has become a top priority for the economic and social development of Anhui Province.

After 2011, Hefei City further promoted the ecological civilization system, adhered to green development orientation, systematically enhanced regional ecological functions, and continued to reduce pollution discharge load. The government has implemented the pollution prevention and control plans for the atmosphere, water, and soil. After the expansion of the provincial capital's urban space, the government has continuously coordinated the use of solid waste sources and resource utilization, and actively promotes the modernization of the ecological environmental governance system and governance capacity. In addition, the provincial capital government maintains strategic fixed force and bottom-line thinking, continuously improves green standards and maintenance quality standards, implements greening projects across the region, and expands ecological recreation space and carbon exchange capacity. The natural ecosystem has basically reached a virtuous circle, which has caused the quality of the ecological environment of Hefei to significantly improve, and the ecological background of continuously planting regional development.

Robustness Test

Replace sample test

Will the core conclusions obtained by the benchmarking validation estimate be different due to the different expansion policies of the provincial

capital? Do other provincial capital cities show different evolutionary paths when the policy is implemented? In view of this issue, the introduction of the Sichuan Provincial capital of the Sichuan Provincial capital in 2016 was introduced as a stable test.

Through the quality evolution path of green and low-carbon development in the pilot area, and the synthetic green low-carbon development quality development path can be analyzed: Same as the previous conclusion. For the pilot area, the real green low-carbon effect and the synthetic fitting path are separated after the implementation of the provincial capital expansion policy. The real values of the pilot areas and the fitting value have obvious deviations. Due to the restrictions of the sample section after the policy implementation, the sample span is longer, and the data of only 3 years is used in the later period. The special status and data characteristics of the city are not exactly the same as the change trend of the control group, and there is a large difference in the average value of the coordinated variables. In 2016, after the expansion of the boundaries of Chengdu, its green and low-carbon development quality did not show a rapid rise. On the contrary, there is also a slow increase in the first. In summary, the implementation of the provincial capital expansion policy can bring positive green and low-carbon effects, and once again shows that the core conclusions are accurate and reliable.

City Anti-Factual Test

Although the results of the empirical analysis show that the implementation of the provincial capital expansion policy has caused a positive green and low-carbon effect in the pilot area to have a significant difference in the real values and fitting values of the pilot area. But is the existence of this difference caused by the occasional factors that are not observed? To this end, a prefecture-level city

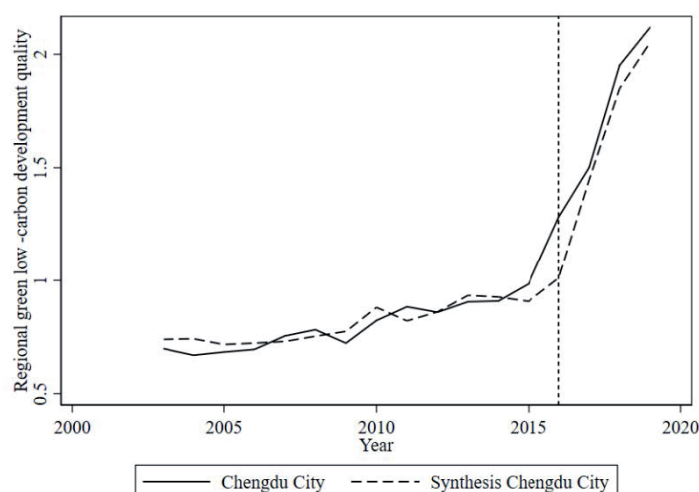


Fig. S2. Robustness test analysis- Replace sample test.

with no policy intervention again. Generally, a large-scale prefecture-level city is selected. Large weights indicate that other prefecture-level cities and pilot prefecture-level cities have high similarity in terms of economic development characteristics and external environment. Assume that the prefecture-level city implements the policy like the sample unit (Hefei) at the same time (2011), and use the SCM method to use other prefecture-level cities to build the city's synthetic object value. If the intervention of the provincial capital expansion policy has a large degree of difference in the sample objects of the processing group and the synthetic control group, it will indicate that the empirical green low-carbon effects of the previous article cannot be completely attributed to the results of the provincial capital expansion policy. After the policy intervention, the difference between the processing group and the synthetic control object is small, and the quality gap between the green and low-carbon

development of the processing group is far lower than the processing group, which indicates that the conclusion is correct.

The prefecture-level city with the highest weights in Hefei is Nanchang (weight is 0.587), followed by Baotou City (weight is 0.196). Therefore, the two prefecture-level cities are selected for inspection. The weights participating in the synthetic prefecture-level city are different, indicating that there is no linear relationship between the weights of the pilot area and other synthetic objects. The greater the composite weight of the control group, the more similar the relevant characteristics it is to the pilot area. If the weight is 0, it shows that it is different from the characteristics of the pilot prefecture-level city. In summary, all synthetic weights are not negative, and there is no problem of linear internal push.

Through comparison of the policy effects of Nanchang and Baotou City, it is found that the

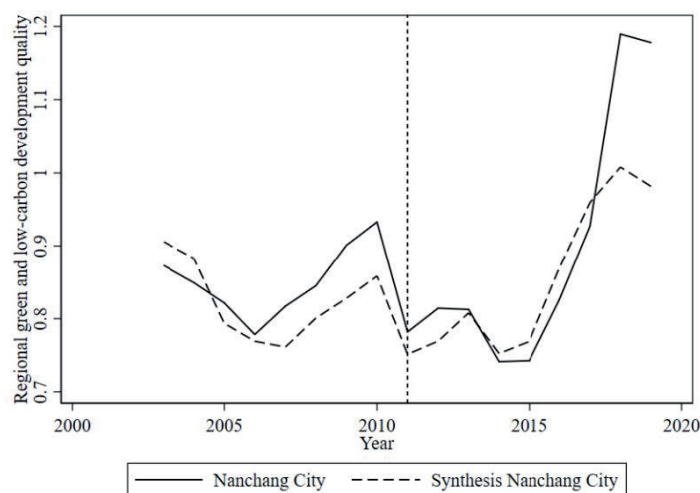


Fig. S3. City anti-factual test -Nanchang City.

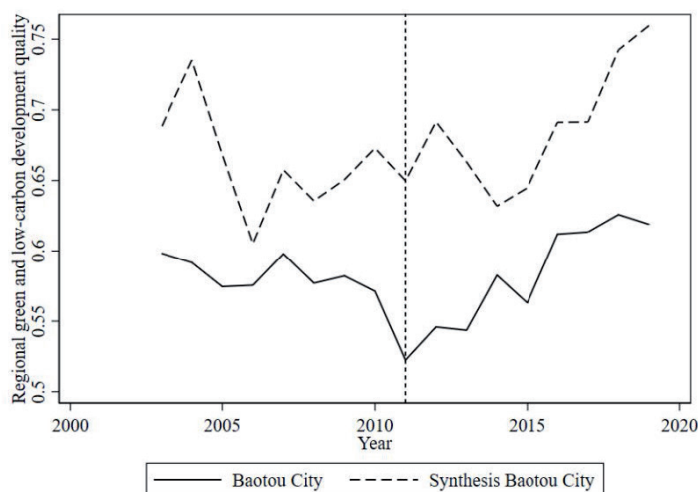


Fig. S4. City anti-factual test -Baotou City.

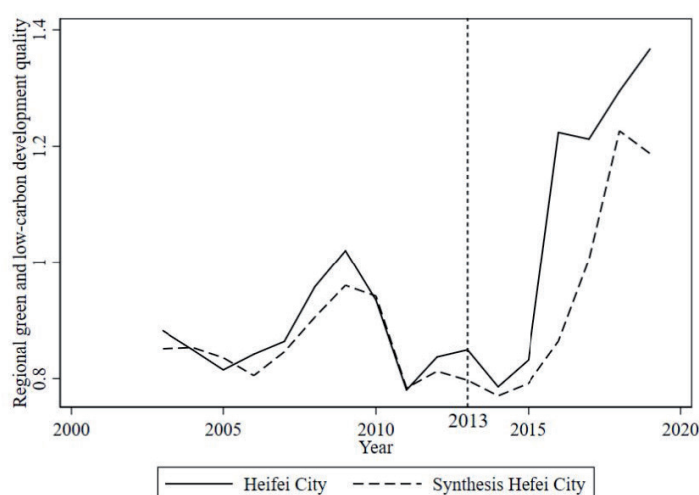


Fig. S5. Robustness test analysis- Time anti-factual test.

Table S2. Mechanism Path Analysis: all samples.

	Land use intensity	Pollution industry transfer	Industrial agglomeration scale	Government fiscal expenditure autonomous
	(1)	(2)	(3)	(4)
Estimation coefficient (Current)	-0.0066	0.0076	-0.0604	0.0012
Estimation coefficient (After1)	-0.0006	-0.0110	0.0143	0.0022
Estimation coefficient (After2)	0.0012	-0.0280	0.0798	0.0098
Estimation coefficient (After3)	-0.0032	-0.0441	0.1509	0.0119
Estimation coefficient (After4)	0.0001	-0.0692	0.1931	0.0199
Estimation coefficient (After5)	-0.0094	-0.0863	0.2598	0.0236
Estimation coefficient (After6)	-0.0152	-0.1099	0.3367	0.0267
Estimation coefficient (After7)	-0.0224	-0.1218	0.4218	0.0336
Estimation coefficient (After8)	-0.0276	-0.1418	0.5728	0.0377

Note: After1 is the first year after policy implementation.

Table S3. Mechanism Path Analysis: case sample.

	Land use intensity	Pollution industry transfer	Industrial agglomeration scale	Government fiscal expenditure autonomous
	(1)	(2)	(3)	(4)
Policy effect (2011)	0.1106	0.0622	-3.9356	0.0350
Policy effect (2012)	0.2044	0.0437	-3.8935	0.0356
Policy effect (2013)	0.0667	0.0507	-3.7995	0.0209
Policy effect (2014)	0.0495	0.0280	-3.0962	0.0348
Policy effect (2015)	0.0861	0.0280	-1.2650	0.0284
Policy effect (2016)	0.0493	0.0277	4.5263	0.0397
Policy effect (2017)	-0.0615	0.0105	5.6837	0.0566
Policy effect (2018)	-0.0741	0.0262	7.7639	0.0451
Policy effect (2019)	-0.1036	0.0187	15.3227	0.0506

difference between the quality of the quality of green and low-carbon development in the prefecture-level cities above is small before and after the implementation of the provincial capital expansion policy. The path of Baotou and the synthetic prefecture-level city is even completely unconnected. There is no mutation like Hefei City in Nanchang and Baotou City, which is far less than the difference between the synthesis value of Fig. 3. Comprehensive analysis shows that the green and low-carbon growth effect of the pilot area is indeed caused by the provincial capital expansion policy. The inspection confirmed that the positive green and low carbon effects generated by the policy implementation are not from accidental factors or selective errors.

Time Anti-Factual Test

The inspection of the transformation intervention is an empirical analysis of the implementation of the implementation of the provincial capital expansion policy. Due to the impact of random factors, other factors will also lead to the implementation of the green low-carbon improvement effect of policy implementation, resulting in major contradictions in the conclusion of policy implementation in the sample range. To this end, the policy of implementing the policies in the pilot area is early or lagging for 2-3 years, which is 2009 and 2013.

Studies have found that when the policy presented by time and anti-factual testing is pushing forward and delayed, the gap between the quality of green and low-carbon development of the pilot area and the quality of green and low-carbon development is found: Taking Hefei as an example, there was no mutation in Fig. 3 around 2013. The evolution of the green and low-carbon effects has produced significant deviations around 2011, and after the difference, its value remains expanding. This is consistent with the time and analysis of the year's intervention year in 2011. The integration description, the assumption of the implementation of the provincial capital expansion policy to produce a positive green and low-carbon effect is obviously established.

Mechanism Path Analysis

Mechanism Analysis: All Samples

With all provincial capital cities that occur in the border expansion, this chapter discusses the mechanism generated by the green low-carbon effect. Empirical inspection still shows that policy implementation can achieve green and low-carbon development by reducing the degree of land development, reducing the entry threshold for the pollution industry, increasing the scale of spatial agglomeration, and expanding fiscal autonomy.

Mechanism Analysis: Case Sample (Table S3)

Conclusions and Policy Suggestions

Conclusions

In the future, to accelerate the establishment of a strong provincial capital strategy, the government should avoid simple expansion of large scale stocks, but should focus on the continuous improvement of connotation quality. Relevant governments must be blindly expanded under the scale of strict control of the provincial capital. By selecting the panel data of 63 prefecture-level cities in mainland China from 2003 to 2019, the article explores the net impact of the expansion of the provincial capital's urban boundaries on the quality of green and low-carbon development in the region.

Policy Suggestions

(1) Optimize the adjustment of the administrative division to adjust the goals, and focus on regional green and low-carbon development. The implementation of the "strong provincial capital" development strategy is conducive to building a reasonable layout of functional areas, and improving the efficiency of factor resource allocation. The government should adhere to the national strategic layout and gradually eliminate the gap between the ecological environment of the political district structure. The provincial capital government should pay more attention to the fairness of space, establish an inclusive space order, and improve the efficiency of the administrative division's regional green low-carbon space management efficiency.

(2) Strengthen the top-level design of the administrative division and improve the quality of green and low-carbon development. The government should focus on the overall and healthy development of regional economic and social coordinated and healthy development. From solving the key difficult problems faced in the current administrative division work, we will optimize the setting of administrative divisions and the combination of regional green and low-carbon development tasks. The provincial capital government should thoroughly analyze and grasp the existing administrative districts' problems and reform requirements, and actively promote the reform and innovation of the administrative division system and mechanism. On the one hand, strengthening the research of strategic paths must have forward-looking arrangements for the direction of the reform of the administrative division. The adjustment of the administrative division should focus on the long-term development needs of the local area, and consider overall considerations; on the other hand, strengthen the research of individual cases so that the administrative division settings can better serve the sustainable development of local economic and social and improve

government management capabilities. The government must learn to summarize the experience of administrative divisions and adjust the experience from the theory, and enhance the understanding of administrative divisions and the laws of urban development.

(3) Adjust the regional formula according to local conditions to promote the development of regional green and low-carbon. The provincial capital government should properly handle the overall and local interests under the principles of efficiency and fairness,

and optimize the rationalized allocation of factor resources within its scope. Therefore, when formulating a planning and adjustment plan, the administrative division is adjusted on the basis of field investigations and recognition of its own factor endowment, and in-depth demonstration and feasibility of planning and adjustment. In the process of strengthening the provincial capital, the government has given full play to its own comparative advantages, and it should also focus on clear and avoid major risks that may exist.