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Understanding China's Economic Growth from a Regional Policy Perspective

*Jiashun Huang, Jim Huangnan Shen, Zhiyan Sun**

Abstract

There has been ongoing interest in China's economic growth. What were the drivers of China's economic growth in past years? What policies were used to promote China's economic growth? Although different lenses may be used to understand and explain China's economic growth, this paper draws on historical, theoretical, and empirical perspectives to discuss the nexus between China's regional policies and economic growth. First, we review the evolution of China's regional policy and the policy's changing emphasis in different development stages, from balanced, unbalanced, and coordinated development to synergistic development. Then we construct a theoretical model to illustrate the impact of regional policy on the local economy and conduct an empirical examination with a case study of regional policy using regression discontinuity design. This paper analyzes the concept of regional policy and the underpinning logic of economic growth and presents practical approaches to formulate a better regional policy framework.

Keywords: economic growth, spatial distribution, regional governance, regional policy
JEL codes: O10, O21, R10, R58

I. Introduction

China has experienced remarkable economic growth in the past 70 years, and there are numerous explanations for this. It has transformed from an impoverished country to the second-largest economy and has maintained rapid economic growth for decades.

*Jiashun Huang, Professor, School of Public Affairs and Institute of Intellectual Property, University of Science and Technology of China, China. Email: jh993@ustc.edu.cn; Jim Huangnan Shen, Assistant Professor, Department of Applied Economics, School of Management, Fudan University, China. Email: hnshen@fudan.edu.cn; Zhiyan Sun (corresponding author), Senior Research Fellow, Department of Development Strategy and Regional Economy, Development Research Center of the State Council, China. Email: sunzhiyan-drc@139.com. The authors are listed in alphabetical order, and they contributed equally to this paper. They would like to thank the editors, reviewers, Martin Williams, Yongzhi Hou, Joe Walsh, and Xi Hu for their helpful comments. This study is supported by the Fundamental Research Funds for the Central Universities, the Center for International Knowledge on Development, and the Department for International Development.

China has risen out of poverty from 1981 to 2020, contributing to more than 70 percent of world poverty reduction (Liu et al., 2020). One of the prevailing views to explain its economic growth among academics and policymakers is that market economy reform and a policy of opening up in eastern China boosted its rapid growth, and the regional policy of Open up the West program in western China reduced the regional disequilibrium (Lin and Wang, 2020; Cheong et al., 2022). However, some are critical of regional policies and claim that the market would allocate resources more efficiently; regional development should be driven by the market rather than constrained by specific place-based policies resulting from government intervention (Acemoglu et al., 2008). Some evidence of little contribution (Driffield, 2004) or even negative effect (Mancha and Yserte, 2008; Bernini and Pellegrini, 2011) of regional policies on growth raised concerns regarding government interventions. There are increasing debates regarding regional policy in the literature, while it remains underinvestigated in terms of how policy intervention influences economic growth and whether place-based policies could be applied to facilitate rapid economic growth (Martins, 2021; Mogila et al., 2022).

Regional policy could play a critical role in economic growth; however, topics such as the kinds of regional policy that should be enacted and how to implement regional policy have long been controversial (Armstrong, 1983; Martin and Sunley, 1998; Qin and Fang, 2022; Wang, 2022). To help understand the role of regional policy in stimulating economic growth, this study enriches the literature from several perspectives.

First, this study reviews the development of China's regional policies at different stages. Then, it presents a theoretical model of the relocation of public spending across regions and its impact on economic growth. It presents an empirical analysis of regression discontinuity by adopting the Open up the West Program as a case study to illustrate the impact of regional policy on the western regions.

This paper explores the relationship between regional policy and economic growth with a two-region model, and draws on empirical research from China to discuss the issues around regional development policy and economic growth. The primary aim of the paper is to illustrate the theoretical foundations of regional policy and the economy, verify the linkage between regional policy and growth, explain the logic behind China's regional economic growth, and reflect upon how other developing countries can achieve economic growth through their own approaches to regional policy. From a historical perspective, this study comprehensively summarizes the regional policy of China in different stages since the establishment of the People's Republic of China.

Unlike other studies, after reviewing the evolution of China's regional policy, this study aims to contribute to the literature by identifying China's regional policy design,

providing a theoretical foundation of its rationale in different scenarios, and validating the effect of regional policy. This study also aims to contribute to policy implementation in practice, especially in developing countries.

The remainders of this paper are as follows. Section II reviews the evolution of Chinese regional development policy since 1949. Section III proposes a theoretical foundation to illustrate the impact of regional policy on the local economy. Section IV examines a case study of regional policy in a natural experiment design. Section V presents the rationale behind the regional policy approach and the ways in which policymakers could employ this. Section VI concludes.

II. Evolution of regional policy in China

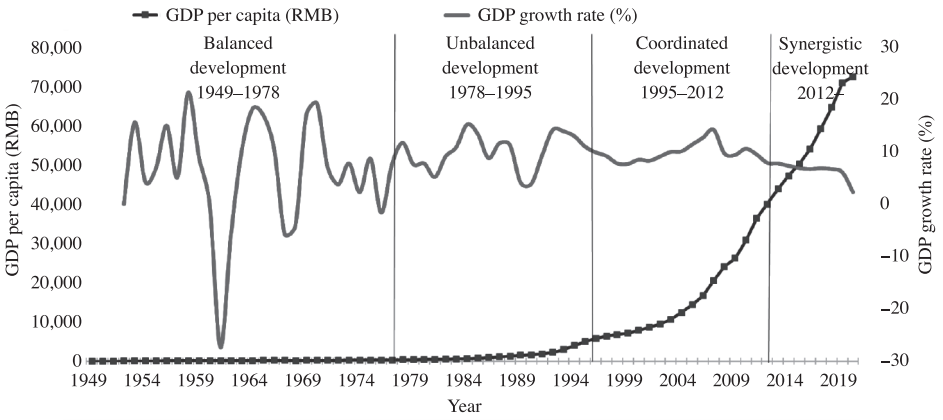
Interest in regional problems dated back to the world crisis of the 1930s. Regional policy was first widely adopted in European countries and has been applied in most countries (Hooghe and Keating, 1994). Table 1 lists some examples. A regional policy could be a combination of a group of policy instruments (e.g., tax, investment, fiscal grant, planning, industry policy, land policy, and environment policy) to construct a platform for economic growth, or economic growth ecosystem. In other words, the implementation of regional policy is a process of spatial structural optimization, which affects economic growth by creating a difference in costs versus benefits across regions to guide various factors' spatial distribution. This process itself is also a driver of economic growth.

Table 1. Examples of regional policy in different countries

	Regional policy
China	Special Economic Zone, eastern area priority development, western development, promoting the rise of central China, revitalizing the northeast and other old industrial cities, Yangtze River Economic Belt, Beijing–Tianjin–Hebei synergetic development
Japan	A grand design for national spatial policy towards 2050, industrial decentralization, nodal development, relocation of the functions of the capital, decentralization of corporate headquarters, hometown revitalization, the development of "regional core cities" and "wide community areas"
US	Tennessee Valley Authority and regional innovation clusters (Barrow, 1998; Yu and Jackson, 2011; Kline and Moretti, 2013)
UK	Launching local enterprise partnerships, the Northern Way city-region growth strategy, establishing the Greater London Authority, the Thames Gateway program, the White Paper Unlocking Growth in Cities
Germany	The improvement of regional economic structure and its multiannual coordination framework, municipal mergers are the responsibility of the regions
Netherlands	Provinces are responsible for regional development; regional strategies developed under Peaks in the Delta
France	State–region planning contracts

From the recent debate in the field of regional policy, a fundamental question has been raised: "should all regions grow simultaneously or just a few?" (Seravalli, 2015). China has indicated different answers in different developmental stages since the founding of the new China in 1949. China's regional policy has experienced four stages of adjustment (Figure 1). Each stage had different goals and a mixture of policy instruments (see Table 2 for a comparative illustration), and each adjustment was relevant to the transition of the economy and society.

Figure 1. China's regional policy choice in different development stages



Source: NBS, *China Statistical Yearbook*, various years.

Table 2. Regional policy mixes in different stages in China

Regional policy adjustment		Policy aim priority	Policy mix
Stage I	Balanced	Set up a basic industry system and foster multilevel human capital	Administrative order, industry layout by central government, agricultural production cooperative organization, recruitment of workers system, vocational school, etc.
Stage II	Unbalanced	Improve economic efficiency	Devolution, land reform, opening policy, financial policy, profit retention, tax incentive, technology innovation, rural family contract responsibility system, etc.
Stage III	Coordinated	Alleviate regional gaps	Encouraging the rational flow of land-use rights, housing system, integrated planning of infrastructure and basic industry, one-to-one aid between eastern and western regions/price reform of resource products, set up of capital funds system, reform of state-owned enterprises/set up multilevel social security system, enlarged employment policy, etc.
Stage IV	Synergistic	Improve development quality	Regional development planning across provinces, set up of regional division and cooperation mechanism, tax-sharing policy across provinces, unified social security policy, promoting human capital and knowledge mobility, regional innovation policy, reform of local government performance evaluation, etc.

The first stage was from the founding of the People's Republic of China in 1949 to the start of reform and opening up in 1978. After decades of wars, almost all aspects, including the economy and political framework, needed to be rebuilt. In this context, China adopted "balanced regional development" to promote each region's economic growth. The whole country was divided into five subregions. The central government-controlled plan spread the basic industries in balanced distributions across regions, such as the power industry, raw material mining, the steel industry, and equipment manufacturing. The aim of balanced development was to change the pattern of the overconcentration of industry in the coastal areas; in 1953, three coastal provinces/municipalities, including Shanghai, Jiangsu, and Liaoning, contributed to almost 30 percent of the national GDP, which did not represent "balanced" development for each region.

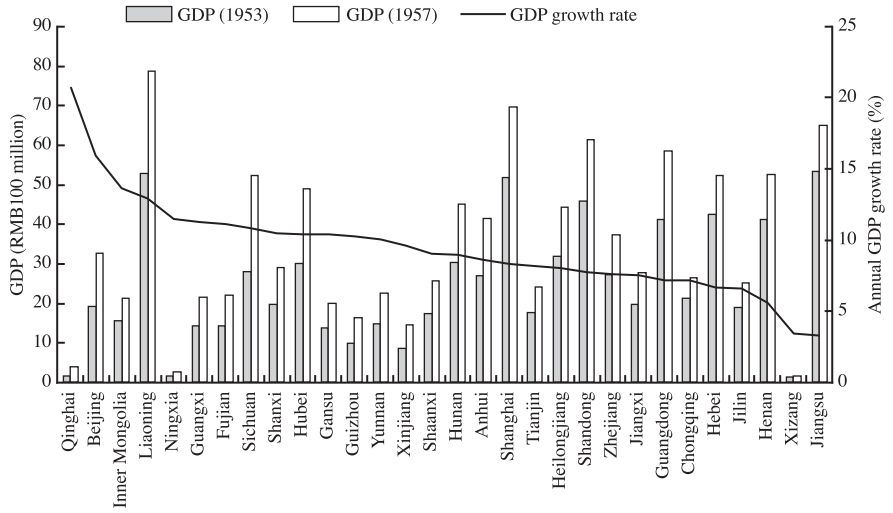
To achieve this policy aim, China set up two basic principles to distribute industries. One was to deploy the industries close to raw material areas or consumption areas. The other was to avoid excessive industry agglomeration in any region, attempting to balance the main industries' production capacity among different regions. Within the context of the post-war economic transition, China had not yet established its transport system, so logistic costs were very high for either freight or labor, and thus a balanced development trajectory was a cost-effective solution to China's economic growth. It is necessary to note that not all industries were required to achieve "balanced development"; there was relatively more emphasis on the spatial balance of coal, power, and other basic energy production enterprises during the balanced development process. The main objective was to reduce long-distance transportation and facilitate other industrial development.

The balanced development policy had a significant role in spurring China's economic growth. In the First Five-Year Plan (1953–1957), some economically lagging areas grew rapidly. For instance, the annual average growth rate of the GDP of Qinghai province was 20.8 percent during this period, and Sichuan was 10.8 percent. The GDP share of the central western areas, including Hubei, Sichuan, and Hunan, increased significantly (Figure 2).

Driven by these areas, China's national economy experienced rapid growth, with an annual average growth rate of GDP of 10.3 percent (1953–1957). In the same period, the government revenue growth rate was 12.3 percent. Employment growth in urban areas more than tripled, and total employment quadrupled in the first 5 years. Nonetheless, the economic growth stagnated due to political factors (the Cultural Revolution).

The second stage was from 1978 to 1995, the end of the Eighth Five-Year Plan. In this stage, China's regional policy shifted to "unbalanced development." Despite China's economy maintaining relatively fast growth, the level of economic development

Figure 2. GDP and growth rate by province, China (1953–1957)



Source: NBS, *China Statistical Yearbook*, various years.

was still low, and basic production capacity was also weak. If China had continued to choose "balanced regional development," limited resources would have been spread too thin, and scale efficiency would have been lost. Based on this justification, China again made a significant reform in regional policy, from balanced to unbalanced, and implemented a set of place-based policies, which were only applied to some coastal cities and provinces, giving higher priority and more public resources to these areas.

In contrast with "policy adjustments" in the three other stages, it was a relatively radical stage of reform. The most prominent policy measures were special economic zones and downward-devolution reform. In more concrete terms, it mainly included the following: (i) the deduction and exemption of business income tax; (ii) devolving investment powers towards local government; (iii) increasing the proportion of local foreign exchange retention; (iv) opening financial services, allowing foreign financial institutions in the coastal areas to set up headquarters or branches, nurturing and developing capital markets in Shenzhen and Shanghai to establish a stock exchange; and (v) encouraging greater institutional innovation and experimentation in these coastal areas, making them exempt from the central government's policy restrictions.

These policies generated impressive outcomes. The national economy grew rapidly over the period from 1978 to 1995. The annual growth rate of GDP was around 10 percent; GDP per capita grew from US$156 (in 1978, lower-middle-income countries had a GDP per capita of US$314 based on the criteria of the World Bank) up to US$609, above the average level of lower-middle-income countries (which was US$531 in 1995).

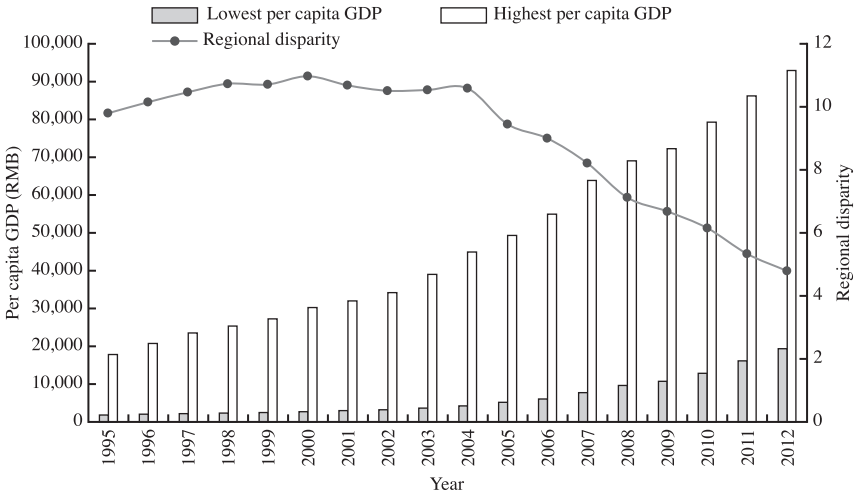
About 280 million employment opportunities were added in this period, the trade deficit had been turned into a trade surplus, and net exports amounted to US$11.9 billion in 1995. This kind of unbalanced spatial development laid a solid foundation for the next step of pursuing regional equity.

The third stage was from 1995 (the beginning of the Ninth Five-Year Plan) to 2012 (before the 18th CPC National Congress). China's regional policy readjusted from "unbalanced development" to "coordinated development," which means that priority was not given only to the coastal areas. More policies could be geared to support inland economic development. Over that period, the Chinese government implemented a series of regional development strategies, such as the Open up the West Program. The core target of these regional policies was to provide extra support for the relatively lagging areas and stimulate their economic growth. After the regional policy of coordinated development, the focus of policies has shifted to solutions to address the rapidly widening regional gaps. The coordinated development policy represents a policy to achieve a more effective and realistic growth pathway. It did not utterly deny the existence of development gaps across regions because each region had a different history, culture, resource endowment, and geographic environment. However, this policy constructed more practical development policies giving priority to efficiency and equal importance to equity and sustainability. As the difference between regions in terms of per capita GDP increased significantly from the reform and opening up policy in 1978, there has been a significant regional disparity in China. The region with the highest regional GDP per capita increased it so that it was approximately 10 times greater than that of the region with the lowest per capita GDP. After the implementation of the coordinated development policy, the specific value of regional disparity between the region with the highest per capita GDP and the region with the lowest per capita GDP reduced to 4.80 times in 2012, when all the regions kept an upward trend (Figure 3).

The fourth stage was the most recent readjustment of regional policy from "coordinated" to "synergistic," which relates to a new wave of economic restructuring that took place in 2012 when China entered the "new normal" development stage. The signal was the Beijing–Tianjin–Hebei Synergistic Development Strategy, another exploratory experiment driving economic growth through regional policy. This regional strategy aimed to tackle four fundamental issues. First, to address the issues caused by the blind expansion of giant cities, especially the issues in Beijing, and to explore a path of sustainable development for the metropolitan cities. Second, to optimize the spatial layout of economic activities and foster a new economic growth pole. Third, to make more significant environmental renovation and improvement of the Beijing–Tianjin–Hebei region. Fourth, to narrow the widening income disparity within the

Beijing–Tianjin–Hebei region, and promote equalization of basic public goods and services.

Figure 3. The change in China's regional disparity (1995–2012)



Source: NBS, *China Statistical Yearbook*, various years.

This strategy gave attention to transboundary cooperation and integrated regional development planning. From a historical perspective, this adjustment was a successive innovation rather than a simple change, which could better meet the endogenous needs of economic growth in the context of the revolution in new technology. However, this process is still in its infancy, and policy effects need to be observed.

After reviewing China's policy goals at different stages, we can find that efficiency, equity, and sustainability are the three basic goals of regional policy, of which "efficiency" is the priority and long-term target. To some extent, some policymakers and politicians may disagree with this inference. Opponents usually contend that "efficiency priority" would widen the regional gap and lead to a severe spatial structural imbalance. However, even in the latest regional policy of China, improving efficiency is still placed in an important position. The only difference is the pathway. In the stage of unbalanced development, the pathway concentrated more on resources; in the stage of coordinated development, the pathway aimed at optimizing spatial structure; and in the stage of synergetic development, the pathway laid more emphasis on regional division and cooperation. These policy goals had inherent linkages, which should not simply be separated. The aim of the efficiency priority was to solve regional equity and environmental problems in a better way. This is like the idea of "if there is no cake,

how to divide the cake?" Without "cake," there would have been no efficiency, no scale, and no ability to achieve them. Particularly at the preliminary stage of development, efficiency should be highlighted more.

III. Theoretical foundation of regional policy

After introducing China's regional policy, we construct a theoretical model to validate the relationship between regional policy and economic growth. Theoretically, regional disequilibrium was once regarded as a temporary issue in general economic equilibrium (Vanhove, 2018). It was considered that geographical distribution is determined by natural circumstances, and thus spatial characteristics are usually ignored. However, starting from the seminal work of Harold (1929), space was regarded as a crucial variable in theoretical models. With an emphasis on location-based intervention, regional policy is considered to be a policy intended to boost economic activities in a specific geographical area and, typically, in less developed regions (Bishop, 2016; Kaufmann and Sager, 2019). In this study, we examine regional policies in a narrower sense by focusing on the policies aiming at specific regions with an explicit spatial boundary during different stages of development. In line with the spirit of Zhang and Zou (2001), we develop a two-region model that links economic growth with the multiple sectors of public spending by the two local government units during the era of post-opening-up policies in 1978. The model defines fiscal decentralization as spending by respective two local regions as a fraction of the total public spending.[1] For example, if region A has more autonomy in terms of providing the public goods, its public spending increases relative to spending by region B. Hence, this model allows us to evaluate the impact of regional policy like public spending by a local region on economic growth.

In line with Barro's (1990) model, this study proposes an endogenous growth model framework consisting of a production function with multiple inputs. These inputs include private capital and multiple public spending by private firms and local regions. Denote k as private capital stock, g the total public spending, $\boldsymbol{h}$ the vector of region A's public spending, $\boldsymbol{l}$ the vector of public spending by region B. We then have the following:

$$\boldsymbol{h}=\left(h_1,\ldots,h_i,\ldots,h_I\right), \tag{1}$$

where h_i denotes the ith public spending program initiated by region A.

$$\boldsymbol{l}=\left(l_1,\ldots,l_j,\ldots,l_J\right), \tag{2}$$

[1]In our model, the local regions and local governments are equivalent and used interchangeably.

where l_j denotes the jth public spending program initiated by region B.

$$g = \sum_{i=1}^{I} h_i + \sum_{j=1}^{J} l_j, \tag{3}$$

where g is the total number of public spending programs across two regions.

The production function is a nested Cobb–Douglas production function, which is the same approach that was used by Zhang and Zou (2001):

$$y = k^{\alpha}\left[\prod_{i=1}^{I} h_i^{\beta_i}\right]^{\beta}\left[\prod_{j=1}^{J} l_j^{\gamma_j}\right]^{\gamma}, \tag{4}$$

where y is the per capita output, $0 < \alpha < 1$, $0 < \beta < 1$, $0 < \gamma < 1$, $\alpha + \beta + \gamma = 1$; $\beta_i > 0$ for $i = 1,..., I$, $\Sigma_i \beta_i \leqslant 1$, and $\gamma_j > 0$ for $j = 1,.., J$, $\Sigma_j \gamma_j \leqslant 1$.

The division of total public spending g between regions A and B takes the following form:

$$\sum_{i=1}^{I} h_i = \theta_h g, \tag{5}$$

$$\sum_{j=1}^{J} l_j = \theta_l g. \tag{6}$$

Here $\theta_h + \theta_l = 1$ and $0 < \theta_s < 1$ for $s = h, l$. One could interpret θ_h as the proportion or share of the hth public spending program by region A in total public spending. θ_l is the share of lth public spending by region B in total public spending. We further assume that region A spends a share of δ_i ($i = 1,..., I$) on its ith public spending program h_i. Likewise, region B spends a share of δ_j ($j = 1,..., J$) on its jth public spending program l_j. Thus we have the following equation:

$$h_i = \delta_i \theta_h g \quad \text{for } i=1,\ldots,I \text{ and } \sum \delta_i = 1, \tag{7}$$

$$l_j = \delta_j \theta_l g \quad \text{for } j=1,\ldots,J \text{ and } \sum \delta_j = 1. \tag{8}$$

It is assumed in this paper that the difference between region A and region B is that region A has free-tax policies in terms of attracting foreign direct investment, whereas region B has to charge a flat income tax in its region. The consequence is that region A does not need the income tax to finance its public spending, and region B, in contrast, has to use the income tax to finance its public spending.

Hence, we suppose region B's spending $\theta_l g$ is financed by a flat income tax at rate τ:

$$\theta_l g = \tau y, \tag{9}$$

this is to say,

$$g = \frac{\tau y}{\theta_l}. \tag{10}$$

For the representative agent's preference, we can have

$$U = \int_0^{\infty} u(c, h, l) e^{-\rho t} dt, \tag{11}$$

where c denotes per capita private consumption, ρ denotes the positive time discount rate, and $u(c, h, l)$ denotes an increasing concave and differentiable utility function.

We can also have the dynamic budget constraint of the representative agent as follows:

$$\frac{dk}{dt} = (1-\tau)y - c = (1-\tau)k^{\alpha}\left[\prod_{i=1}^{I} h_i^{\beta_i}\right]^{\beta}\left[\prod_{j=1}^{J} l_j^{\gamma_j}\right]^{\gamma} - c. \tag{12}$$

To obtain the closed-form solution, let:

$$u(c,h,l) = \ln c + \sigma_h \ln \prod_{i=1}^{I} h_i^{\beta_i} + \sigma_l \prod_{j=1}^{J} l_j^{\gamma_j}, \tag{13}$$

where σ_h and σ_l are positive. The productivity of the expenditures by regions A and B is captured by β and γ, respectively. The Cobb–Douglas production function is applied as a utility function.

Based on the above results, we assume a constant tax rate τ along the balanced growth path. The ratio $\frac{g}{y}$ is therefore a constant value, implying that:

$$\frac{y}{k} = \frac{g\theta_l}{\tau k} = \tau^{\frac{1-\alpha}{\alpha}}\left[\prod_{i=1}^{I} \delta_i^{\beta_i}\right]^{\frac{\beta}{\alpha}}\left[\prod_{j=1}^{J} \delta_j^{\gamma_j}\right]^{\frac{\gamma}{\alpha}} \theta_h^{1+\frac{\beta}{\alpha}\sum_{i=1}^{I}\beta_i} \theta_l^{\frac{\gamma}{\alpha}\sum_{j=1}^{J}\gamma_j}. \tag{14}$$

In the equation, we denote the total public spending g, the constant tax rate τ and the shares of spending by regions A and B (θ_s, $s = h, l$) among the aggregate public spending, and the shares of allocations of different public expenditures programs among various sectors by regions A and B (δ_i, $i = 1,\ldots, I$ and δ_j, $j = 1,\ldots, J$). We maximize Equation (11) with respect to c and k subject to Equation (12) and initial conditions to determine the choices of the representative agent. For the balanced growth path, we can capture the solution for the per capita growth rate of the economy:

$$\frac{\tilde{y}}{y} = \alpha(1-\tau)\frac{y}{k} - \rho, \tag{15}$$

this is to say,

$$\frac{\tilde{y}}{y} = \alpha(1-\tau)\tau^{\frac{1-\alpha}{\alpha}}\left[\prod_{i=1}^{I} \delta_i^{\beta_i}\right]^{\frac{\beta}{\alpha}}\left[\prod_{j=1}^{J} \delta_j^{\gamma_j}\right]^{\frac{\gamma}{\alpha}} \theta_h^{1+\frac{\beta}{\alpha}\sum_{i=1}^{I}\beta_i} \theta_l^{\frac{\gamma}{\alpha}\sum_{j=1}^{J}\gamma_j} - \rho. \tag{16}$$

Since $\sum_{i=1}^{I}\beta_i = 1$, $\sum_{j=1}^{J}\gamma_j = 1$, Equation (16) could be further converted to the following:

$$\frac{\tilde{y}}{y} = \alpha(1-\tau)\tau^{\frac{1-\alpha}{\alpha}}\left[\prod_{i=1}^{I} \delta_i^{\beta_i}\right]^{\frac{\beta}{\alpha}}\left[\prod_{j=1}^{J} \delta_j^{\gamma_j}\right]^{\frac{\gamma}{\alpha}} \theta_h^{1+\frac{\beta}{\alpha}} \theta_l^{\frac{\gamma}{\alpha}} - \rho. \tag{17}$$

Equation (17) indicates that the long-run economic growth rate of per capita output is determined by the level of the tax rate, shares of spending by regions A and B, and

the shares of spending allocation on different public expenditures by regions A and B. One point to bear in mind is that, for a given share of aggregate public spending in GDP, a reallocation of public spending between regions A and B can contribute to higher economic growth if the existing allocation differs from the growth-maximizing allocation of public spending (Zhang and Zou, 2001). To illustrate this, the growth rate in the Equation (17) is maximized:

$$Max\left\{\alpha(1-\tau)\tau^{\frac{1-\alpha}{\alpha}}\left[\prod_{i=1}^{I}\delta_i^{\beta_i}\right]^{\frac{\beta}{\alpha}}\left[\prod_{j=1}^{J}\delta_j^{\gamma_j}\right]^{\frac{\gamma}{\alpha}}\theta_h^{\frac{\alpha+\beta}{\alpha}}\theta_l^{\frac{\gamma}{\alpha}}-\rho\right\}. \tag{18}$$

By choosing δ_i (i = 1,..., I), δ_j (j = 1,..., J), θ_h *and* θ_l subject to the constraint $\theta_h + \theta_l = 1$, $\Sigma\delta_i = 1$, $\Sigma\delta_j = 1$, we find the solution to this problem below:

$$\theta_l^* = \frac{\gamma}{\beta+\gamma+\alpha}, \tag{19}$$

$$\theta_h^* = \frac{\alpha+\beta}{\beta+\gamma+\alpha}, \tag{20}$$

$$\delta_i^* = \frac{\beta_i}{\Sigma\beta_i} = \beta_i \quad \text{for } i = 1,\ldots,I, \tag{21}$$

$$\delta_j^* = \frac{\gamma_j}{\Sigma\gamma_j} = \gamma_j \quad \text{for } j = 1,\ldots,J. \tag{22}$$

From Equations (19) to (22), we could obtain the following proposition in this paper:

Proposition 1. As long as the actual θ_h, θ_l, δ_i and δ_j differ from the growth-maximizing ones θ_h^*, θ_l^*, δ_i^* and δ_j^* as in Equations (19) to (22), the growth rate can always be increased without any change in the tax rate and total budget size in the GDP.

We could deem γ and β as the total productivity of respective regions A and B's public spending. Similarly, we treat $\beta + \gamma + \alpha$ as the aggregate productivity of this economy. The growth-maximizing shares for public spending allocation between regions A and B are just the ratios of individual productivity over the total productivity of this economy. One could demonstrate that, since the productivity of private capital stock enters Equation (20), which is k, it is more likely that the productivity of region A or amount of public spending allocated to region A is larger than that of region B, which contributed more to the economic growth overall. In the following parts, as the regional policies in the four different stages were different, we present four scenarios of theoretical models to demonstrate their relationships.

1. A theoretical framework for the regional policy with balanced development (1949–1978)

One of the essential features of China's regional policy of balanced development during the era of the planned economy is that the whole country was divided into five subregions. The central government evenly prioritized the development of different industries across different regions throughout the whole country. In other words, however economically lagging the region or province was, all of it would be prioritized for industrial development. In this case, in the model, it is assumed that $i = j$ because the number of public spending programs initiated across different regions within the country has to be equally assigned by the local state government due to the aim of promoting the balanced development pattern of local growth. If this holds, the growth rate maximization problem converts into the following:

$$Max\left\{\alpha(1-\tau)\tau^{\frac{1-\alpha}{\alpha}}\left[\prod\nolimits_{i=1}^{I}\delta_i^{I\beta}\right]^{\frac{\beta}{\alpha}}\left[\prod\nolimits_{i=1}^{I}\delta_i^{I\gamma}\right]^{\frac{\gamma}{\alpha}}\theta^{\frac{\alpha+\beta+\gamma}{\alpha}}-\rho\right\}. \tag{23}$$

By choosing δ_i and θ subject to the constraint $\theta = 1$, $\Sigma\delta_i = 1$, we can get the values of $(\delta_i)^*$ and θ^*. Hence, we have Proposition 1.1.

Proposition 1.1. During the period of China's planned economy with the features of a balanced development growth pattern, with each administrative region or province being assigned equal numbers of public spending programs, as long as the actual δ_i and θ differ from the growth maximizing ones $(\delta_i)^*$ and θ^* as in Equation (23), the growth rate can be increased without any change in the tax rate and total budget size in the GDP.

2. A theoretical framework for the regional policy with an unbalanced development pattern since the opening-up policies (1978–1995)

For the second stage of China's regional policies, mainly from 1978 to 1995, its main feature is that the coastal cities in China were given the highest priority for regional economic growth. Hence, given the unbalanced nature of development for the implementation of the regional policy during this period, it could be assumed that the number of public spending programs being assigned to a coastal and pearl region will be higher than that of a non-coastal and pearl region. Suppose that in the modeling framework we illustrate above, region A is a coastal and pearl region, whereas region B is the inner-land region. To formalize the unbalanced nature of the regional policies enacted during this period, it is the case that $i > j$. If this is verified, the growth rate maximization problem converts into the following:

$$Max\left\{\alpha(1-\tau)\tau^{\frac{1-\alpha}{\alpha}}\left[\prod\nolimits_{i=1}^{I}\delta_i^{\beta_i}\right]^{\frac{\beta}{\alpha}}\left[\prod\nolimits_{j=1}^{J}\delta_j^{\gamma_j}\right]^{\frac{\gamma}{\alpha}}\theta_h^{\frac{\alpha+\beta}{\alpha}}\theta_l^{\frac{\gamma}{\alpha}}-\rho\right\}. \tag{24}$$

By choosing δ_i ($i = 1,\ldots, I$), δ_j ($j = 1,\ldots, J$), θ_h and θ_l subject to the constraint $\theta_h + \theta_l > 1$, $\Sigma\delta_i > 1$, $\Sigma\delta_j = 1$, we can obtain the values of $(\delta_i)^*$ and θ^*. Hence, we have Proposition 1.2.

Proposition 1.2. During the period of Chinese economic growth since the opening-up policies, with the features of an unbalanced development pattern, with each coastal or pearl administrative region or province being assigned a larger number of public spending programs compared with that of those non-coastal ones, as long as the actual δ_i and θ differ from the growth maximizing ones $(\delta_i)^*$ and θ^*, as in Equation (24), the growth rate can be increased.

3. A theoretical framework for the regional growth policy with a coordinated development pattern from 1995 to 2012

One of the main features of the coordinated development pattern exhibited by the regional growth policy enacted from 1995 to 2012 is that the degree to which the public spending programs being assigned across eastern coastal and western inner regions should supposedly be equivalent. In other words, the main aim of the regional growth policy with the features of a coordinated development pattern from 1995 to 2012 is to ensure that the local public spending programs ought to equally or in a coordinated way contribute to the growth of local regions, regardless of whether they are inner or coastal ones. As local public spending in the inner areas was historically much lower than in coastal regions, there could be a dramatic increase in the local public spending in the inner areas. Mathematically speaking, we assume that $\beta = \gamma$. In this case, the growth rate maximization problem becomes the following:

$$Max\left\{\alpha(1-\tau)\tau^{\frac{1-\alpha}{\alpha}}\left[\prod_{i=1}^{I}\delta_i^{\beta_i}\right]^{\frac{\beta}{\alpha}}\left[\prod_{j=1}^{J}\delta_j^{\gamma_j}\right]^{\frac{\beta}{\alpha}}\theta_h^{\frac{\alpha+\beta}{\alpha}}\theta_l^{\frac{\beta}{\alpha}}-\rho\right\}. \tag{25}$$

By choosing δ_i ($i = 1,\ldots, I$), δ_j ($j = 1,\ldots, J$), θ_h and θ_l subject to the constraint $\theta_h + \theta_l = 1$, $\Sigma\delta_i = 1$, $\Sigma\delta_j = 1$, we can obtain the values of $(\delta_i)^*$ and θ^*. Hence, we have Proposition 1.3.

Proposition 1.3. During the period of Chinese economic growth from 1995 to 2012 with the features of a coordinated development pattern, with each public spending program contributing in a coordinated way to the growth of both inner and coastal regions, as long as the actual δ_i and θ differ from the growth maximizing ones $(\delta_i)^*$ and θ^*, as in Equation (25), the growth rate can be increased.

4. A theoretical framework for the regional policy with a "synergistic" growth pattern since 2012

Since 2012 when the Chinese economy entered the period of the so-called new normal economic development stage, the elimination of the divide between economically

advanced regions and backward ones was regarded as one of the highest priorities by the Chinese government to promote the sustainable economic growth of the economy. Hence, the aim of synergistic growth regional policies is to integrate fully the resources endowed by different regions throughout the country. By synergizing various public spending programs initially assigned to different regions, the regional disparity largely prevailing throughout the country will be mitigated. Given this fact, it leads the cases in which $\left[\prod_{i=1}^{I} h_i^{\beta_i}\right]^{\beta} = \left[\prod_{j=1}^{J} l_j^{\gamma_j}\right]^{\gamma}$. The growth rate maximizing problem becomes the following:

$$Max\left\{\alpha(1-\tau)\tau^{\frac{1-\alpha}{\alpha}} 2\left[\prod\nolimits_{i=1}^{I} \delta_i^{\beta_i}\right]^{\frac{\beta}{\alpha}} \theta_h^{\frac{\alpha+\beta}{\alpha}} \theta_l^{\frac{\gamma}{\alpha}} - \rho\right\}. \tag{26}$$

By choosing δ_i (i = 1,…, I), δ_j (j = 1,…, J), θ_h and θ_l subject to the constraint $\theta_h + \theta_l = 1$, $\Sigma\delta_i = 1$, and $\Sigma\delta_j = 1$, we can obtain the values of $(\delta_i)^*$ and θ^*. Hence, we have Proposition 1.4.

Proposition 1.4. During the period of Chinese new normal growth since 2012 with the features of synergistic development pattern, with the full integration of the resources as well as the public spending programs across regions throughout the country, as long as the actual δ_i and θ differ from the growth-maximizing ones $(\delta_i)^*$ and θ^* as in Equation (26), the growth rate can be increased.

With Propositions 1.1, 1.2, 1.3, and 1.4, it could be demonstrated that there is no large disturbance and volatility of the tax rate as well as the aggregate budget size of the GDP. The growth rate of the Chinese economy since the founding of the People's Republic of China until now can be increased with the bulwark of these various regional policies designing for the different growth patterns throughout different historical periods.

IV. Empirical evidence: The Open up the West Program

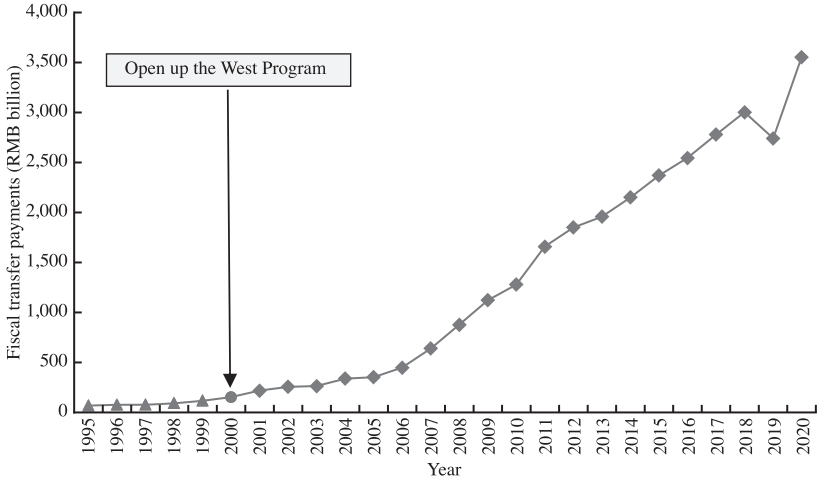
As introduced in the previous section, there have been several regional policies implemented in China, but is there any empirical evidence that could demonstrate their impact? Does regional policy really contribute to economic growth? In the section on theoretical foundations we have demonstrated a two-region model. In this section, we take a key regional policy, the Open up the West Program, as an example of a coordinated development pattern and examine its effect on regional economic growth empirically.

After the reform and opening-up in 1978 led by Deng Xiaoping, the coastal regions and eastern regions experienced rapid development. However, the western regions lagged severely. Given the economic and development gap between eastern

and interior regions, it is critical to develop the western regions. In 1999, a regional policy and strategy for western China's development were proposed at the 9th National People's Congress, and the Open up the West Program was first introduced, marking the start of the policy. This program targets a critical developmental issue and has been a major national strategic task for the government for decades. The central government introduced it with a multifaceted approach to support the western region's economy, ecology, and society, and to reduce regional inequality between the coastal and interior regions. It is a long-term project that focuses on infrastructure, incentives for investment, environmental protection, and poverty alleviation. The Open up the West Program mainly covers six provinces (Gansu, Qinghai, Yunnan, Guizhou, Shaanxi, and Sichuan), five autonomous regions (Inner Mongolia, Ningxia, Guangxi, Xinjiang, and Xizang), and one municipality (Chongqing). According to the data from the National Bureau of Statistics of China, the regions that the Open up the West Program targeted contain 71.4 percent of Chinese mainland area, but they only accounted for 17.13 percent of the GDP contribution of China's total economic output as of 2000, and only 60.87 percent of relative levels of GDP per capita compared to the East as of 2000. The regional policy of the Open up the West attempted to develop infrastructure, attract foreign investment, enhance environmental protection, improve education, and reduce social inequality in West China. In the Open up the West Program, strengthening the central government fiscal transfer payments to the western regions has been a critical strategy. The central government widely uses fiscal transfer payments to narrow the regional gaps and promote public services. As shown in Figure 4, after implementing the Open up the West Program in 2000, the central government vigorously increased the intensity of transfer payments to the western regions. Before the year 2000, the central government fiscal transfer payment was lower than RMB120 billion in the 11 provinces, autonomous regions, and municipalities. It started to increase rapidly after the Open up the West Program, and increased to RMB3,565 billion in 2020.

In the theoretical model, we demonstrated the economic growth in different regions from the perspective of public spending. In the empirical analysis, we investigate the impact of regional policy on economic growth. In Figure 4, the central government fiscal transfer payments in the west imply that the regional policies of the Open up the West Program increased government spending in the western regions. In the literature, Psycharis et al. (2022) and Gonzalez Alegre (2012) indicated that regional policy increased investment, and Brachert et al. (2019) demonstrated that regional policy affected regional government spending, which had a positive effect on productivity growth. To avoid estimation bias, following Dell (2010), Jia et al. (2020), and Ang (2021), we employ a spatial regression discontinuity to test the effect of the regional policy

Figure 4. Central governmental fiscal transfer payments in the west during 1995–2020



Source: Data are collected from the Ministry of Finance of the People's Republic of China.

on the economic growth of western regions, with the Open up the West Program as a natural experiment. The empirical setting takes the geographical boundaries between the areas covered by the Open up West Program and those beyond the regions as the cut-off points. In the empirical examination, the distance to the boundary is calculated by using the latitude and longitude of the centroid of each county to compute the nearest distance from the county centroid to the boundary of the Open up the West Program. In the regression discontinuity design, the samples of counties are split into two groups. The treatment group consists of the sample counties on the left side of the boundary that are all covered by the Open up the West Program, and the control group consists of the counties on the right side of the boundary. This study chooses the research observation period for 15 years after its introduction. The main data sources are from the National Bureau of Statistics of China, including the China County Database (Jia et al., 2020). Figure 5 presents an analysis framework of the regression discontinuity design application examining regional policy's impact on economic growth.

In line with the practice in the empirical literature, we examine via graphical discontinuity evidence to intuitively illustrate the discontinuous change (Lee and Lemieux, 2010; MacPherson and Sterck, 2021). In Figure 6, we find that the economic growth variable obviously "jumps" at the cut-off point, demonstrating that the regional policy has a significant and positive impact on economic growth. The results validate that the counties near both sides of the cut-off point show distinct trends of economic growth due to the implementation of the regional policy of the Open up the West Program.

Figure 5. An analysis framework of regression discontinuity design in regional policy

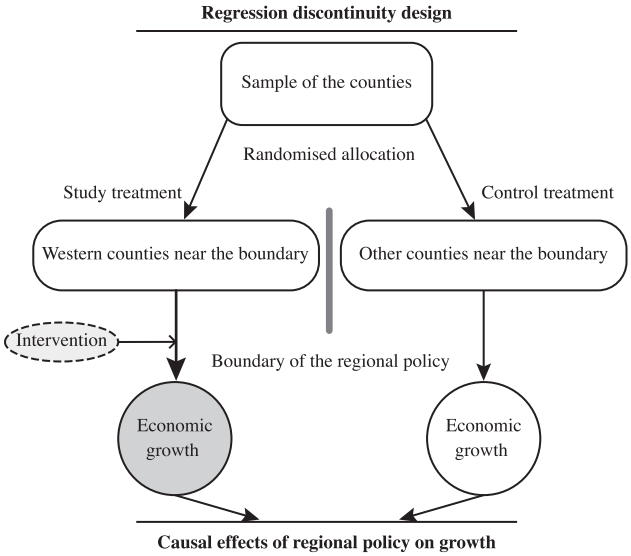
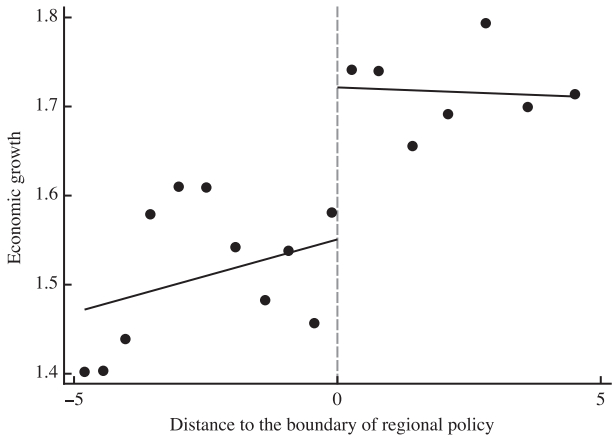


Figure 6. Discontinuity result of regional policy on economic growth



Notes: The positive value (horizontal axis) denotes the distance from the western counties to the boundary of the Open up the West Program, and the negative value (horizontal axis) denotes the locations of other counties. Each point in the figure denotes the mean of the outcome variable in each bin.

To verify the results of the regression discontinuity design, we use n = 0.3, 1.5, and 3 kilometers to estimate the treatment effect in different buffers; we choose bandwidths of 30 km, 150 km, and 300 km in the estimations. Table 3 presents the main empirical

results from the regression discontinuity estimation for different bandwidths. As shown in Table 3, the coefficients of regional policy in the models (1)–(3) are 0.285, 0.269, and 0.274, all significant and positive. The effect of regional policy on economic growth is in the range from 30.87 percent to 32.98 percent, as it implies its economic significance (exp(0.269) – 1 = 0.3087 or exp(0.285) – 1 = 0.3298). The results of the estimates verify the graphical evidence and confirm that the regional policy significantly improved the economic growth of the western areas.

Table 3. Effect of regional policy on economic growth

	Economic growth (1)	Economic growth (2)	Economic growth (3)
Regional policy	0.285*** (0.085)	0.269*** (0.098)	0.274** (0.114)
Bandwidth	30 km	150 km	300 km
Polynomial	Linear	Linear	Linear
Constant	−8.796 (14.817)	0.903 (5.375)	0.642 (3.162)
Observations	87	284	492
R^2	0.597	0.321	0.259

Notes: *** and ** represent significance at the 1 and 5 percent levels, respectively. In columns (1)–(3), we report the results of regression discontinuity with different bandwidth, which is < 30, < 150, and < 300 km, respectively. km, kilometers. City-level clustered standard errors are reported in parentheses.

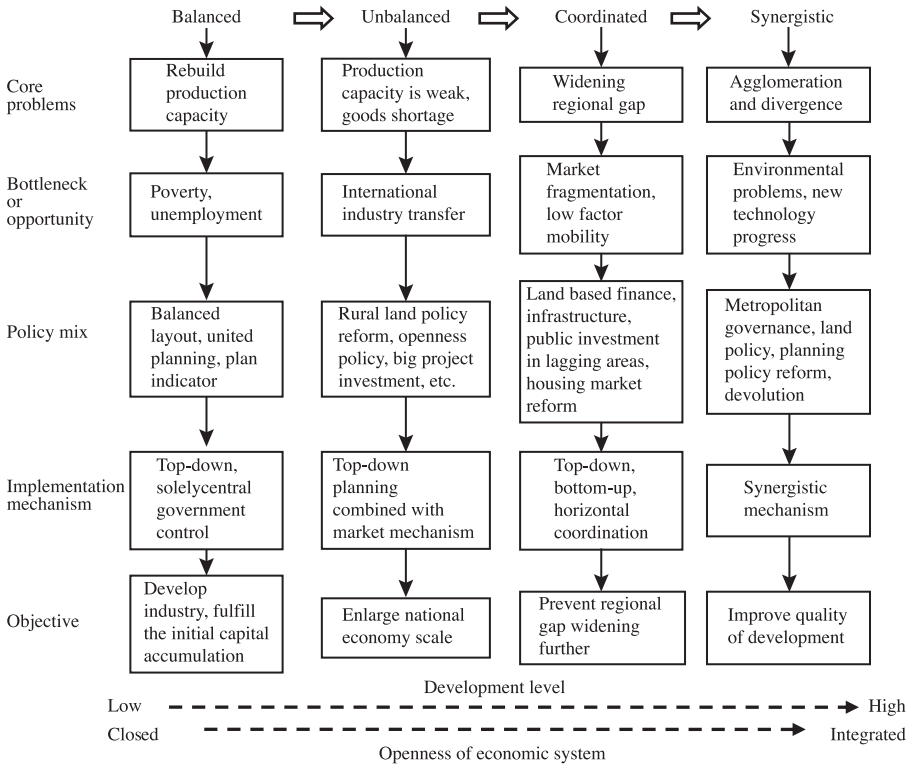
V. Understanding regional policy approaches to promoting economic growth

After validating the impact of regional policy on economic growth, one interesting research question relates to the approaches taken in regional policy. Fundamentally, there are two pathways to economic growth. One is to adjust resource allocation among industry sectors to improve efficiency; the other is to adjust the spatial distribution of resources across regions. Both pathways promote economic growth by optimizing the resource allocation structure. In this regard, a region-based policy is not merely a policy instrument but an approach to developing the economy. Evidence from China's past 60 years of development has demonstrated the effect of this approach.

Region-based policy in promting growth is a dynamic and long-term process. In different development stages, as the internal and external environments may feature dramatic changes, and the spatial scope of a region is not fixed, the policy initiatives

mix should be diversified. This study takes China's experience as an example to illustrate how to apply the regional policy approach to achieve economic growth, tracing the underlying logic from "core problems" (or "principal contradiction") to "possible opportunities/bottlenecks," "key policy mix," and "implementation mechanism," as shown in Figure 7.

Figure 7. How to apply the regional policy approach to promoting growth



Step I. Identify the core problem/key issue for each development stage

The regional policy approach to pro-economic growth is question-oriented. Before designing regional policy, it is necessary to consider the critical issues for economic development and to select the key issue from a range of questions concerning, e.g., unemployment, economic growth, the income gap, social security, public services, and the environment. The core problem, the so-called "principal contradiction," needs to be addressed. Just like the key domino in a line, if chosen correctly, it will cause a favorable knock-on effect and allow other development issues to be solved easily and successively. This is therefore the most crucial step for applying the regional policy approach.

In the early stage of economic growth (1949), China had long been plagued by severe and widespread poverty and backwardness. The government did not have revenue sources, and the people did not have jobs or an income. This was undoubtedly an urgent issue for China. Whatever the future goal was, the foundations for survival needed to be secured first. After finishing the initial capital accumulation, the core problem changed to "how to increase production capacity and enlarge economic scale," a threshold condition for better economic growth. It took nearly two decades to be done in China. During the following development stages, the key issue further adjusted to the "regional gap," and the "regional divergence and environmental problem," respectively. These core problems changed with the progression of basic development needs, from basic survival needs (the food and clothing stage) to higher quality growth (the affluence stage). This was a continuous process that almost no country could surpass. Accurately identifying the core problems directly influences regional policy outcomes, so it is imperative and should not be neglected.

Step II. Explore possible opportunities/bottlenecks

Many opportunities need to be seized on the path of economic growth, and the bottlenecks need to be broken through. Hence, after identifying the core problems, we should explore the opportunities or bottlenecks that China encountered. This requires a comprehensive analysis from both outside and inside one country. This study takes China's experience as an example showing how to respond to different forms of opportunities or bottlenecks faced by policymakers.

In the 1950s, China's economic development was in a relatively confined area. Regardless of capital, products, technology, or human capital, there was a shortage of almost every kind of resource. The whole country's production capacity was still extremely low. That was the biggest bottleneck for economic growth. For this reason, China had to choose "balanced development" to deploy each region's resources and quickly build basic industry systems at a low cost in a short time.

In the 1980s, for China, one of the most important opportunities was to take over labor-intensive manufacturing, e.g., the iron and steel industry and textile and mechanical manufacturing, transferring those industries from developed countries to developing countries. To seize the short-term opportunity, China adjusted its regional policy in time, putting more emphasis on developing the eastern coastal regions. Unbalanced regional development policy, location advantage and public resources, and global industry transfer were the three elements that formed a nearly perfect combination. It became the primary impetus underlying the rapid manufacturing growth in that period.

From the late 1990s to the present, the bottlenecks in economic growth have evolved into regional gaps, intensive competition, and environmental problems across regions. China's regional policies are therefore trying to solve these problems.

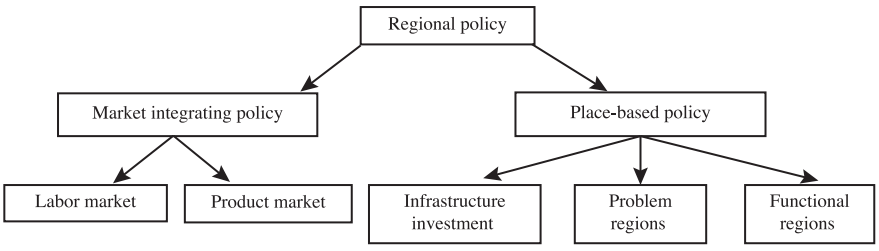
Step III. Design a well-matched regional policy mix

In each stage of development, the core problems are different, and economic status is also rapidly fluctuating. It is vital to design a policy mix that matches well with a region. The range of actors involved, including institutions, stakeholders, government, firms, and citizens, is wide and complex during the process of regional development. Hence, designing a regional policy mix requires, first of all, having very explicit goals, being outcome-oriented, and addressing the core problems. To achieve these "goals" by integrating different policy instruments, it is crucial to make the instruments act in a complementary manner; they should not conflict with each other but should generate a significant synergetic effect.

Secondly, appropriate policy tools should be chosen according to the goal/outcome that the policy expects. Regional economic growth is driven by interconnected factors, such as human capital/labor, financial capital, infrastructure, and innovative capacity, besides resource endowment. Corresponding to these factors, regional policies generally include land policy, regional planning policy, finance/investment policy, and the governance arrangements between the central government and local government.

Drawing on China's development experience, a regional policy can be divided into two categories and five subcategories (Figure 8). One category is market integrating policy, which aims to eliminate all kinds of institutional or policy barriers, increasing the mobility of factors, including labor, capital, knowledge, product, and information.

Figure 8. Regional policy system in China



The other is place-based policy. This can be divided into three subcategories. First, the infrastructure investment policy aims to improve connectivity among regions. It

has two roles: one is to help spread out economic growth benefits, and the other is to favor lagging regions to raise their standards. Second, policies are targeted at problem regions (e.g., resource-exhausted areas, poor areas, depressed areas, and ecologically degraded areas), usually including fiscal grants, public investment, distinctive-industry funds, and financial subsidies for essential public goods/services. Third, policies are tailored for key functional regions. For some leading regions that contribute more to national aggregate growth, their economic development is confronted by different opportunities and challenges from lagging areas, and they need more target-focused policies.

Step IV. Construct an effective policy implementation mechanism

Through its role in promoting growth, regional policy is indeed more complicated than other types of policies, and both internal and external factors may affect its final outcomes. Not every regional policy can achieve its expected targets. One of the reasons is the lack of effective and operable policy implementation mechanisms, which can be interpreted as the lack of governance arrangements. Some regional policies might be rigidly and thoughtlessly implemented. This seems to occur more when the administrative capacities of regions are relatively weak. In other words, a regional policy might not be well "grounded," which might lead to disruptions, causing the policy's implementation process to be interrupted. It is therefore necessary to construct effective policy implementation mechanisms across different levels of government.

VI. Concluding remarks

This study takes China as an example to analyze the linkage between China's regional policy and economic growth, with the aim of contributing to a better understanding of China's development. This study sheds light on the evaluation of regional policy, the theoretical foundation, and its effects on economic growth. The results demonstrate that regional policy plays a significant role in China's economic development. Although the circumstances and conditions for economic development may differ for many developing countries, regional policies implemented in China could be a reference when exploring the logic underpinning national economic growth. This study presents the following suggestions. First, it is essential to measure the role of the market and government and choose appropriate policies in specific regions when applying regional policy to promote economic growth. Second, as there are uncertain factors during the process of economic growth, it is necessary to construct a policy response mechanism.

References

Acemoglu, D., M. Golosov and A. Tsyvinski, 2008, "Markets versus governments," *Journal of Monetary Economics*, Vol. 55, No. 1, pp. 159–89.

Alecke, B., T. Mitze and G. Untiedt, 2013, "Growth effects of regional policy in Germany: Results from a spatially augmented multiplicative interaction model," *The Annals of Regional Science*, Vol. 50, No. 2, pp. 535–54.

Andersson, R., 2005, "The efficiency of Swedish regional policy," *The Annals of Regional Science*, Vol. 39, No. 4, pp. 811–32.

Ang, D., 2021, "The effects of police violence on inner-city students," *The Quarterly Journal of Economic*s, Vol. 136, No. 1, pp. 115–68.

Armstrong, H. W., 1983, "The assignment of regional policy powers within the EC," in Ali M. El-Agraa ed., *Britain Within the European Community*, London: Palgrave Macmillan.

Barro, R. J., 1990, "Government spending in a simple model of endogenous growth," *Journal of Political Economy*, Vol. 98, No. 5, S103–25.

Becker, S. O., P. H. Egger and M. Von Ehrlich, 2012, "Too much of a good thing? On the growth effects of the EU's regional policy," *European Economic Review*, Vol. 56, No. 4, pp. 648–68.

Bishop, M., 2016, *Economics: An A-Z Guide*, London: The Economist.

Bernini, C. and G. Pellegrini, 2011, "How are growth and productivity in private firms affected by public subsidy? Evidence from a regional policy," *Regional Science and Urban Economics*, Vol. 41, No. 3, pp. 253–65.

Brachert, M., E. Dettmann and M. Titze, 2019, "The regional effects of a place-based policy – Causal evidence from Germany," *Regional Science and Urban Economics*, Vol. 79, Article No. 103483.

Cheong, T., G. Wan and D. Chui, 2022, "Unveiling the relationship between economic growth and equality for developing countries," *China & World Economy*, Vol. 30, No. 5, pp. 1–28.

Dell, M., 2010, "The persistent effects of Peru's mining mita," *Econometrica*, Vol. 78, No. 6, pp. 1863–903.

Di Cataldo, M. and V. Monastiriotis, 2018, "Regional needs, regional targeting and regional growth: An assessment of EU Cohesion Policy in UK regions," *Regional Studies*, Vol. 54, No. 1, pp. 35–47.

Driffield, N., 2004, "Regional policy and spillovers from FDI in the UK," *The Annals of Regional Science*, Vol. 38, No. 4, pp. 579–94.

Gonzalez Alegre, J., 2012, "An evaluation of EU regional policy. Do structural actions crowd out public spending?" *Public Choice*, Vol. 151, No. 1–2, pp. 1–21.

Harold, H., 1929, "Stability in competition," *Economic Journal*, Vol. 39, No. 153, pp. 41–57.

Hooghe, L. and M. Keating, 1994, "The politics of European Union regional policy," *Journal of European Public Policy*, Vol. 1, No. 3, pp. 367–93.

Hou, Y., Y. Zhang and P. Liu, 2016, *Regional Synergistic Development: Mechanism and Policy*, Beijing: China Development Press.

Jia, J., G. Ma, C. Qin and L. Wang, 2020, "Place-based policies, state-led industrialization, and regional development: Evidence from China's Great Western Development Programme," *European Economic Review*, Vol. 123, Article No. 103398.

Kaufmann, D. and F. Sager, 2019, "How to organize secondary capital city regions: Institutional drivers of locational policy coordination," *Governance*, Vol. 32, No. 1, pp. 63–81.

Lee, D. S. and T. Lemieux, 2010, "Regression discontinuity designs in economics," *Journal of Economic Literature*, Vol. 48, No. 2, pp. 281–355.

Lin, J. Y. and Y. Wang, 2020, "Seventy years of economic development: A review from the angle of new structural economics," *China & World Economy*, Vol. 28, No. 4, pp. 26–50.

Liu, M., X. Feng, S. Wang and H. Qiu, 2020, "China's poverty alleviation over the last 40 years: Successes and challenges," *Australian Journal of Agricultural and Resource Economics*, Vol. 64, No. 1, pp. 209–28.

MacPherson, C. and O. Sterck, 2021, "Empowering refugees through cash and agriculture: A regression discontinuity design," *Journal of Development Economics*, Vol. 149, Article No. 102614.

Mancha-Navarro, T. and R. Garrido-Yserte, 2008, "Regional policy in the European Union: The cohesion-competitiveness dilemma," *Regional Science Policy & Practice*, Vol. 1, No. 1, pp. 47–66.

Márquez, M. A., J. Ramajo and G. J. Hewings, 2015, "Regional growth and spatial spillovers: Evidence from an SpVAR for the Spanish regions," *Papers in Regional Science*, Vol. 94, No. S1, pp. S1–S18.

Martin, R. and P. Sunley, 1998, "Slow convergence? The new endogenous growth theory and regional development," *Economic Geography*, Vol. 74, No. 3, pp. 201–27.

Martins, J. O., 2021, "Regional policy narratives and the 'geographies of discontent'," *Cambridge Journal of Regions Economy and Society*, Vol. 14, No. 3, pp. 625–9.

Mogila, Z., T. Miklosovi, I. Lichner, M. Radvansky and J. Zaleski, 2022, "Does cohesion policy help to combat intra-country regional disparities? A perspective on Central European countries," *Regional Studies*, Vol. 56, No. 10, pp. 1783–95.

NBS (National Bureau of Statistics of China), various year, *China Statistical Yearbook*, Beijing: China Statistics Press (in Chinese).

Ottaviano, G., 2003, "Regional policy in the global economy: Insights from new economic

geography," *Regional Studies*, Vol. 37, No. 6–7, pp. 665–73.

Pellegrini, G., F. Terribile, O. Tarola, T. Muccigrosso and F. Busillo, 2013, "Measuring the effects of European regional policy on economic growth: A regression discontinuity approach," *Papers in Regional Science*, Vol. 92, No. 1, pp. 217–33.

Psycharis, Y., A. Panori and D. Athanasopoulos, 2022, "Public investment and regional resilience: Empirical evidence from the Greek regions," *Tijdschrift Voor Economische En Sociale Geografie*, Vol. 113, No. 1, pp. 57–79.

Qin, Y. and Y. Fang, 2022, "The effects of e-commerce on regional poverty reduction: Evidence from China's rural e-commerce demonstration county program," *China & World Economy*, Vol. 30, No. 3, pp. 161–86.

Rondinelli, D. A., 1990, "Locational planning and regional economic development: Appropriate methods in developing countries," *International Regional Science Review*, Vol. 13, No. 3, pp. 241–8.

Rosés, J. R. and N. Wolf, 2021, "Regional growth and inequality in the long-run: Europe, 1900–2015," *Oxford Review of Economic Policy*, Vol. 37, No. 1, pp. 17–48.

Seravalli, G., 2015, *An Introduction to Place-based Development Economics and Policy*, New York: Springer.

Vanhove, N., 2018, *Regional Policy: A European Approach*, London: Routledge.

Walz, U., 1996, "Long-run effects of regional policy in an economic union," *The Annals of Regional Science*, Vol. 30, No. 2, pp. 165–83.

Wang, L., Z. Liu and H. Shi, 2022, "The impact of the pilot free trade zone on regional financial development," *China & World Economy*, Vol. 30, No. 5, pp. 154–84.

Zhang, T. and H. Zou, 2001, "The growth impact of intersectoral and intergovernmental allocation of public expenditure: With applications to China and India," *China Economic Review*, Vol. 12, No. 1, pp. 58–81.

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