Alleviating Poverty Like China: Evidence from the Poverty Alleviation and Development Plans

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Abstract: *Amid China's rapid economic growth, significant regional imbalances persisted. To address this disparity, it is essential to pursue high-quality development by fostering endogenous drivers within poverty-stricken areas. In late 2011, the Chinese government introduced a new nationwide regional poverty alleviation and development program. This study examines the macroeconomic impacts and micro-level mechanisms of these policies by leveraging manually compiled policy documents and macro and micro data (county economies, enterprises, and land transactions), using a DID approach. The findings reveal that the program significantly boosted economic growth in poor regions without causing negative spillovers to neighboring or paired-assistance areas. Economic growth in the assisted regions was primarily driven by industrialization, encompassing both scale expansion and efficiency gains. A cost-benefit analysis further confirms substantial economic returns and long-term fiscal sustainability. These results provide important policy implications for refining regional poverty policies and advancing balanced development.*

Keywords: *Regional poverty policy; High-quality development;* Difference-in-Differences (DID)

JEL Classification Codes: H50; O14; O25; R11
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1. Introduction

Since the launch of reform and opening up in 1978, China has achieved remarkable economic growth, while regional development disparities gradually emerged as a notable challenge. The *14th Five-Year Plan (2021-2025) for National Economic and Social Development of the People's Republic of China and the Long-Range Objectives Through 2035* calls for advancing the coordinated regional development strategy to "promote relative balance in development". Key to this is fostering growth in old revolutionary base areas, ethnic minority areas, border areas, and poverty-stricken mountainous areas, which typically have been trapped by economic disadvantage, harsh living conditions, and significant development gaps. Decades of relentless effort have accelerated development in these regions, significantly reducing region-wide poverty. This progress stems from China's inclusive economic

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growth and the central government's targeted poverty alleviation measures (Huang, 2016; Wang, 2018). Since the 1980s, the Chinese government has launched large-scale poverty alleviation and development programs for the less developed central and western regions, achieving economic growth rates above the national average. To further this momentum and meet the goal of building a moderately prosperous society in all respects, the Central Committee of the Communist Party of China (CPC) and the State Council released the *Outline for Poverty Alleviation and Development in China's Rural Areas (2011-2020)* in late 2011, marking a new phase of nationwide regional poverty alleviation and development programs.

Extensive research has quantitatively evaluated the effects of past poverty alleviation programs, with a general consensus that these policies made significant contributions to economic growth in targeted regions (Meng, 2013; Ma et al., 2016). However, compared with previous efforts, the 2011 Regional Poverty Alleviation and Development Program is distinct in its scope, selection criteria, and policy design. These unique features not only create more favorable conditions for rigorously identifying the policy's effects but also offer a valuable opportunity to explore the underlying mechanisms. Specifically, first, the program had significantly broader coverage. It re-designated 832 poor counties, accounting for 43% of the country's administrative land area and approximately 50% of China's poor population. These areas had poverty rates double the national average, making the evaluation of the program's impact highly representative and externally valid. Second, the selection criteria were relatively transparent. The designation of counties relied mainly on historical indicators strongly correlated with poverty levels, resulting in more objective and consistent standards. This approach helped reduce endogeneity stemming from political or non-economic considerations that often influenced previous identification processes (Park et al., 2002; Jia et al., 2017). Third, the policy support was unprecedented. Given that the success of this program was directly tied to the national goal of building a moderately prosperous society in all respects by 2020, it received significantly greater funding and more comprehensive supporting policies than earlier initiatives. This provided a rare and valuable setting to investigate the mechanisms through which large-scale poverty alleviation efforts operate.

China's new round of regional poverty alleviation and development programs ranks among its most significant place-based policies in recent years, playing a vital role in eradicating absolute poverty and achieving common prosperity. A thorough, scientific assessment of its effectiveness and a clear understanding of its mechanisms are crucial for distilling the replicable lessons from China's approach to poverty reduction.

This study comprehensively analyzes the macroeconomic impacts and micro-level mechanisms of these programs on county-level economic growth, drawing on diverse datasets including county statistical yearbooks, national tax surveys, and land transaction records. Key findings include: First, the policies significantly spurred economic growth in poor areas, raising total GDP and per capita GDP by 5.1 and 4.6 percentage points, respectively, without negative spillover effects on neighboring or paired-assistance regions. Second, growth was fueled by industrialization, encompassing both extensive development (production scale expansion) and intensive development (efficiency improvements), achieving dual goals of "increased output" and "improved quality". Targeted policy support and infrastructure development were key drivers. Third, the policies proved cost-effective, with monetary benefits outweighing costs. Fourth, economic growth boosted tax revenue in poor areas, quickly narrowing the fiscal deficit after a brief rise, affirming fiscal sustainability.

Compared to existing literature, this paper offers three main contributions. First, although some studies have explored the potential impacts of the latest round of poverty alleviation and development programs, the complexity of these policies has hindered efforts to conduct a comprehensive and scientifically rigorous evaluation of their effects on economic growth. This study addresses this gap by using official documents to clarify the distinctions and connections among various components of the poverty alleviation strategy, thereby contributing to a more systematic understanding. Second, while

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there is broad consensus on the growth effects of regional poverty alleviation policies, the micro-level mechanisms through which these policies operate remain poorly understood. Drawing on extensive macro and micro data, this paper examines how two key dimensions—targeted policy support and infrastructure development—contribute to growth by both expanding output and enhancing quality. This dual perspective enriches the literature with a more multidimensional understanding and provides useful insights for future policy design. Third, by leveraging China's unique poverty alleviation practices, this paper responds to a central question in development economics: can regional development policies promote economic growth? The findings suggest that development-oriented poverty alleviation policies that focus on enhancing the vitality of microeconomic actors can not only increase the overall size of the economy but also improve the quality of growth. In this sense, such policies demonstrate both cost-effectiveness and fiscal sustainability. These findings offer new explanations and perspectives on the economic effects and internal mechanisms of regional development policies, providing valuable guidance for China's pursuit of more balanced regional growth and offering important lessons for other developing countries seeking to lift over a billion people out of the poverty trap through economic development.

The paper proceeds as follows: Section 2 covers institutional background and literature review. Section 3 outlines research design. Section 4 presents policy growth effects. Section 5 analyzes mechanisms. Section 6 examines cost-effectiveness and fiscal sustainability. Section 7 concludes.

2. Institutional Background and Literature Review

2.1 Institutional Background

Since the launch of reform and opening up, China's economic growth has been marked by significant regional disparities, with some areas falling far behind others. In response to concerns over underdeveloped regions, the Chinese government has implemented four major nationwide regional poverty alleviation and development programs. The first program began in 1986 with the establishment of the State Council Leading Group for Economic Development in Poverty-Stricken Areas. This marked the formal initiation of a development-oriented poverty alleviation strategy focused on enhancing productivity and strengthening the self-sustaining capacity of poor regions. A total of 331 nationally designated poverty-stricken counties were identified for targeted support through development funds, interest-subsidized loans, and work-relief programs. The second program was the *National 8-7 Poverty Alleviation Plan* (aimed to lift 80 million people out of poverty in seven years between 1994 and 2000), introduced in 1994. It revised the criteria for identifying poverty-stricken counties and updated the list, expanding the number of national-level poverty counties to 592.

The third initiative was the *Outline for Poverty Alleviation and Development in China's Rural Areas (2001-2010)*, implemented in 2001. This plan prioritized poor populations in the central and western regions, particularly ethnic minority areas, old revolutionary base areas, border areas, and severely poor zones. While maintaining the total number of poverty-stricken counties, the plan reallocated poverty county designations from the eastern to the central and western regions. All counties in the Xizang Autonomous Region were granted special policy support and uniformly treated as national-level poverty-stricken counties[1]. The fourth program—this paper's focus—is the *Outline for Poverty Alleviation and Development in China's Rural Areas (2011-2020)*, launched at the end of 2011. This plan featured two key elements: first, targeted adjustments to the list of key counties, guided by clear principles—as counties that meet higher standards exit the program, new ones with lower standards are brought in,

[1] In this plan, the term "national poverty-stricken counties" was changed to "national key counties for poverty alleviation and development", hereafter referred to as "key counties". Together with the "contiguous area counties", these are jointly referred to as "poor counties".

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ensuring a one-to-one replacement, enforcing strict procedures, and maintaining a constant total number; second, the designation of 14 contiguous areas with extreme poverty, encompassing 680 counties (some overlapping with key counties), as the primary focus for poverty alleviation in this new phase. From this point on, "national poverty-stricken counties" referred to both "key counties" and "contiguous area counties" (hereafter "contiguous counties"), both of which received equivalent levels of financial and policy support.

Table 1: China's Historical Regional Poverty Alleviation and Development Programs

	Release time	Document	Main content	Number of poverty-stricken counties
First	1986	No public document	Established the State Council Leading Group for Economic Development in Poor Areas, designating 331 national-level poverty-stricken counties	331
Second	1994	*National 8-7 Poverty Alleviation Plan (1994-2000)*	Increased the designation of poverty-stricken counties to 592	592
Third	2001	*Outline for Poverty Alleviation and Development in China's Rural Areas (2001-2010)*	Abolished key county quotas for eastern regions; Xizang, as a contiguous poverty-stricken region, is entirely entitled to the treatment accorded to key counties	725 in total, including key counties plus Xizang, Tibetan-inhabited areas in four provinces, three prefectures of Xinjiang (special support)
Fourth	2011	*Outline for Poverty Alleviation and Development in China's Rural Areas (2011-2020)*	Partially adjusted the list of key counties; Designation of 14 contiguous poverty-stricken areas as the main battlefields for poverty alleviation, including 11 contiguous areas, plus Tibetan-inhabited areas in four provinces, and the three prefectures of Xinjiang	832 counties in total, including key counties + contiguous area counties

Source: Compiled by the authors.

Ever since the label was created, counties have vied for "poverty-stricken" status to tap the generous financial transfers and policy incentives that come with it. Since the 1994 tax-sharing reform, the gap between local fiscal revenues and expenditures has widened significantly, making intergovernmental transfers an increasingly vital source of income for local governments. According to the *National County-Level Fiscal Statistics*, transfer payments accounted for as much as 47.6% of total county-level fiscal revenues in 2009 (Ma et al., 2016). Being designated as a poverty-stricken county not only entitles a locality to greater general transfer payments but also unlocks access to significant earmarked funds for poverty alleviation, thereby easing fiscal pressures. In addition, higher-level governments offer a range of preferential policies, including tax exemptions, favorable land-use quotas, and subsidized poverty-relief loans. The central government also mandates that various departments enhance coordination and accelerate infrastructure development in poor regions. These policies not only directly stimulate economic growth in poverty-stricken counties but also profoundly reshape their development trajectories.

2.2 Literature Review

Regional development policies have long been widely adopted across countries as a key instrument to support relatively underdeveloped areas. In the United States, annual spending on regional development policies exceeds 40 billion US dollars, while the European Union allocated one-third of its total budget for 2014-2020 to regional industrial support and investment subsidies (Kline, 2010; Ehrlich

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& Seidel, 2018). There is a substantial body of research on the effectiveness of regional development policies. Many studies highlight their positive impact on economic growth in targeted regions (Alder et al., 2016; Criscuolo et al., 2019). However, some scholars remain skeptical about the extent of these benefits. Certain studies argue that the positive effects are limited (Neumark & Kolko, 2010; Liu & Zhao, 2015), while others emphasize the presence of spatial displacement effects—that is, economic activity may simply shift from non-targeted to targeted regions, resulting in no overall welfare improvement (Givord et al., 2013; Kline & Moretti, 2014). For example, Kline & Moretti (2014) examined the impact of the Tennessee Valley Authority (TVA) project in the United States and found that while the program significantly promoted development in the Tennessee River region, the gains in the target area were effectively offset by losses in other regions.

Since the beginning of the reform and opening-up period in 1978, China's rapid economic growth has been accompanied by a sharp rise in regional disparities. In response, the government has implemented a series of regional development policies, including Special Economic Zones, Economic Development Zones, and the Western Development Strategy (Wang, 2013; Sun et al., 2018; Lu et al., 2019; Jia et al., 2020). Among these, regional poverty alleviation policies—aimed at promoting the development of poor areas—have played a particularly important role. Over the years, China has introduced multiple large-scale regional poverty alleviation programs, prompting a broad body of research. Numerous studies have evaluated the economic impacts of the 1994 "8-7 Plan", finding that it significantly boosted economic growth in target areas (Ma et al., 2016), promoted local investment in production and education (Mao et al., 2012), increased household income levels (Meng, 2013), and reduced poverty rates while improving income distribution (Xu et al., 2020). Other studies have examined the effects of policies such as the "Whole Village Advancement" initiative (Park & Wang, 2010) and the establishment of Poverty Alleviation Reform Pilot Zones (Zhang et al., 2019; Zhang et al., 2019).

The release of the *Outline for Poverty Alleviation and Development in China's Rural Areas (2011-2020)* at the end of 2011 sparked a new wave of research on regional poverty alleviation policies (Huang, 2018; Fang, 2019; Liu & Zheng, 2021). These studies, though differing in focus and methodology, generally find that the regional poverty reduction plan had a positive effect on economic development in poor areas, thereby deepening our understanding of policy outcomes. However, due to the complexity of policy classification and limitations in empirical design, most existing research focuses on specific components of the plan rather than providing a comprehensive evaluation within a unified analytical framework. As a result, these studies often face substantial challenges in identifying causal effects with rigor. Moreover, the literature has largely concentrated on measuring economic growth outcomes, while questions related to underlying mechanisms and cost-benefit analyses remain underexplored. This study seeks to address these gaps by employing a robust empirical strategy to quantify the economic impact of the 2011 regional poverty alleviation plan, investigate its transmission mechanisms, and assess its cost-effectiveness. These efforts are crucial for distilling the practical experience of China's poverty alleviation efforts and refining future policy design aimed at narrowing regional development disparities, which are the core objectives of this paper. Notably, the 2011 plan marked a significant shift from previous poverty alleviation strategies in terms of its priorities, target groups, and policy goals. The introduction of the "Targeted Poverty Alleviation" strategy in 2013 further signaled a new phase in China's approach to poverty reduction. This strategy, together with a development-oriented approach, has joined to define the distinctive trajectory of poverty alleviation with Chinese characteristics. In recent years, a growing body of literature has used micro-level data to evaluate the effects of targeted poverty alleviation policies on household income (Zhang & Zhou, 2017), access to credit (Yin & Guo, 2021), and poverty incidence and depth (Zhou, 2021). In contrast, this paper utilizes a rich set of both macro- and micro-level data to examine the growth effects of development-oriented poverty alleviation policies and explore the underlying micro-level mechanisms that drive these outcomes.

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3. Research Design

3.1 Identification Strategy

This study adopts the Difference-in-Differences (DID) method as the primary identification strategy to evaluate the impact of the fourth regional poverty alleviation and development plan—launched in 2011—on economic development in poor areas. Several aspects of the policy warrant clarification:

First, the timing of the policy implementation. On May 27, 2011, the Central Committee of the Communist Party of China and the State Council issued the *Outline for Poverty Alleviation and Development in China's Rural Areas (2011-2020)* ("Poverty Alleviation Outline"). The document emphasized a development-oriented approach to poverty reduction, calling for increased investment, stronger policy measures, and prioritizing contiguous poverty-stricken areas as the central battleground in the new era of poverty alleviation. Although the *Outline* was released in mid-2011, the specific updates—such as the revised list of key counties and the designation of contiguous poverty areas—were implemented in the first half of 2012. Therefore, 2012 is considered the effective starting point of the reform.

Second, selection of treatment and control groups. As noted earlier, the poverty alleviation initiative consists of two main components: the policy targeting contiguous poverty-stricken areas and the continued support for national key poverty counties. These two policy frameworks were implemented independently but also overlap significantly in practice. Of the 680 counties identified as part of the contiguous poverty areas and the 592 national key poverty counties, 440 counties appear in both lists. After accounting for overlaps, the total number of counties involved is 832, collectively referred to in this study as "poverty counties". Furthermore, because both types of counties receive comparable financial support and policy benefits, the areas affected by the regional poverty alleviation plan can be categorized into three groups (see Figure 1): (1) Counties included in both the key county and contiguous area lists (440 counties); (2) Key poverty counties not located in contiguous poverty areas (152 counties); (3) Contiguous area counties not designated as key poverty counties (240 counties).

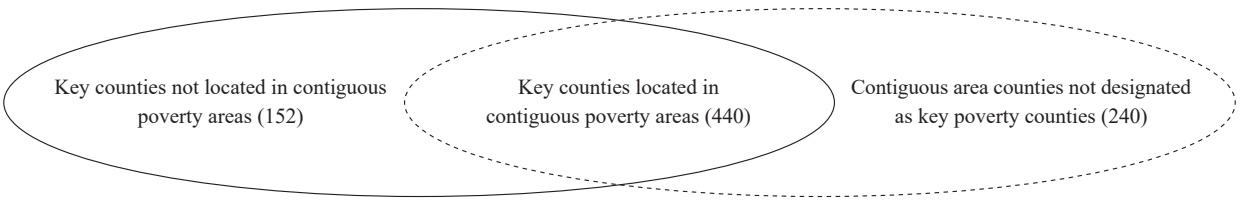

Figure 1: Relationship between Key Counties and Contiguous Area Counties

A critical prerequisite for using the DID method is the careful and rational selection of treatment and control groups. The specific criteria for selecting these groups are shown in Table 2.

First, counties designated as national key poverty counties before the reform were excluded, as they had already been receiving targeted support and would bias the estimate.

Second, counties located in regions that had previously implemented special poverty support policies—namely the Tibetan-inhabited areas in four provinces, the Xizang Autonomous Region, and the three prefectures of Southern Xinjiang—were also excluded.

Third, the treatment group consists of counties affected by the 2011 reform: specifically, those that were neither key counties nor located in special support areas prior to the reform but were newly designated as key counties or contiguous area counties afterward.

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Fourth, the control group includes non-poverty counties that were never subject to any regional poverty alleviation policies during the entire period. To improve the comparability between treatment and control groups in terms of geographic proximity and economic characteristics, we drop entire provinces that contain no treatment counties.

Table 2: Criteria for Treatment and Control Group Selection

Before policy impact	After policy impact	Region	Empirical treatment
Original key counties	Key counties	Non-special areas	
Original key counties	Non-key counties	Non-special areas	
Original non-key counties	Key counties	Tibetan-inhabited areas of four provinces, Xizang autonomous region, and the three prefectures in southern Xinjiang	
		Non-special areas	Treatment group
Original non-key counties	Contiguous area counties, non-key counties	Tibetan-inhabited areas of four provinces, Xizang autonomous region, and the three prefectures in southern Xinjiang	
		Non-special areas	Treatment group
Original non-key counties	Non-key counties, non-contiguous area counties	Non-special areas	Control group

3.2 Econometric Model

To assess the impact of regional poverty alleviation policies on county-level development, we estimate the following econometric model:

$$Y_{ct}=\alpha+\beta Post_t\times Treat_c+(X_c\times f_t)'\theta+\mu_c+\lambda_{pt}+\varepsilon_{ct} \quad (1)$$

In this equation, the subscripts c and t denote counties and years, respectively. The dependent variable Y_{ct} includes a range of development indicators, such as total GDP, per capita GDP, and industrial structure. The key explanatory variable is the interaction term $Post_t\times Treat_c$, where $Post_t$ is a binary indicator equal to 1 for $t\geq 2012$ (after the 2012 policy reform, 0 otherwise), and $Treat_c$ is a dummy variable equal to 1 for counties in the treatment group. The coefficient β captures the causal effect of the policy. County fixed effects μ_c are included to control for time-invariant observable characteristics at the county level, while province-by-year fixed effects λ_{pt} account for the differences in various economic reforms and policies implemented by different provinces. The error term ε_{ct} is clustered at the county level to address heteroskedasticity and serial correlation.

To strengthen identification, we include a set of control variables and their interactions with time trends $X_c\times f_t$. These include initial demographic and geographic characteristics, such as population distribution and terrain variation, to control for the influence of exogenous location-specific factors. We also include county-level shares of education, healthcare, and social security expenditures in 2007 fiscal budgets to reflect baseline public service capacity. In addition, we incorporate the average annual GDP growth rate in the pre-reform period to account for differences in pre-existing economic momentum across regions.

The identification of β relies on the Parallel Trends Assumption, which requires that, in the absence of the policy, treated and control counties would have followed similar development trajectories—after controlling for county and time fixed effects (μ_c and λ_{pt}) and other covariates ($X_c\times f_t$). Although this assumption cannot be tested directly, it can be indirectly assessed by examining whether the pre-policy trends of the treated and control groups are similar. Following Zhang & Huang (2023), we implement a

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flexible event-study specification to test the validity of the parallel trends assumption and to estimate the dynamic effects of the regional poverty alleviation policy over time.

$$Y_{ct}=\alpha+\sum_{t=2009}^{2010}\beta_t^{pre}Treat_c\times \mathrm{I}(Year=t)+\sum_{t=2012}^{2016}\beta_t^{post}Treat_c\times \mathrm{I}(Year=t) +(X_c\times f_t)'\theta+\mu_c+\lambda_{pt}+\varepsilon_{ct} \quad (2)$$

In equation (2), I(·) is an indicator function that equals 1 if the sample year is t, and 0 otherwise. All other variables are defined in the same way as in equation (1). We set the year prior to the policy intervention—2011—as the baseline period, so that the coefficient β_t represents the difference in Y_{ct} between poverty-stricken counties and non-poverty-stricken counties in each year relative to the base period. If the parallel trends assumption holds, we would expect no significant difference between treated and untreated counties in the years before the policy, meaning the estimated coefficient β_t^{pre} for the pre-policy years in equation (2) should be close to zero. Conversely, if the regional poverty alleviation policy had a real effect on the target regions, then we would expect the post-policy trends for treated and untreated counties to begin diverging—i. e., the coefficients β_t^{post} for post-policy years should differ significantly from zero. Moreover, the pattern of the estimated β_t^{post} coefficient provides insight into the dynamic effects of the policy over time.

3.3 Data Description

The empirical analysis uses panel data covering the period from 2009 to 2016. Economic and social indicators are primarily drawn from the China Center for Economic Research (CCER) Database, the China Economic and Social Development Statistical Database via CNKI, the *National Fiscal Statistics of Municipalities and Counties*, industrial and commercial registration records, and various provincial statistical yearbooks. Micro-level enterprise data are sourced from the National Tax Survey Database (2009-2016). Data on land concessions are obtained from the China Land Market Network, aggregated at the county-year level to measure annual land transaction volumes. To better characterize the counties, we construct two additional sets of indicators. First, population characteristics are derived using spatial population grid data from the Resource and Environment Science and Data Center of the Chinese Academy of Sciences (CAS), allowing us to calculate average population density and agglomeration at the county level for 2005 and 2010. Second, geographic characteristics are measured by the average terrain relief of each county, based on 1km-resolution elevation grid data. Missing values are imputed using linear interpolation, and continuous variables are winsorized at the top and bottom 1% to mitigate the influence of outliers. After cleaning and matching the data, we obtain a balanced panel consisting of 851 counties—138 in the treatment group and 713 in the control group—yielding a total of 6,808 county-year observations.

4. Economic Growth Effects of Regional Poverty Alleviation Policies

4.1 Benchmark Estimation Results

We begin by examining the direct impact of regional poverty alleviation policies on county-level economic growth. Table 3 presents the estimation results of regression equation (1). Columns (1) to (3) report results using total county GDP as the dependent variable, while columns (4) to (6) use per capita GDP. Under various identification strategies, the estimated coefficients are consistently positive and statistically significant. Taking columns (3) and (6) as examples, the estimated coefficients are 0.051 and 0.046, respectively, indicating that the policy has significantly promoted economic growth in poor regions. This implies that, compared to the control group, regional poverty alleviation policies increased total GDP and per capita GDP in target counties by 5.1 and 4.6 percentage points, respectively.

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Table 3: Regional Poverty Alleviation Policies and Economic Growth

	Total GDP			Per Capita GDP		
	(1)	(2)	(3)	(4)	(5)	(6)
$Post_t \times Treat_c$	0.080***	0.046***	0.051***	0.070***	0.041***	0.046***
	(0.013)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Control variables	No	No	Yes	No	No	Yes
Province-year fixed effects	No	Yes	Yes	No	Yes	Yes
Year fixed effects	Yes	No	No	Yes	No	No
County/district Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6808	6808	6808	6808	6808	6808
R^2	0.979	0.985	0.985	0.964	0.971	0.972

Note: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors clustered at the county level are reported in parentheses. The same notation applies to subsequent tables.

In addition to the baseline estimations, we conducted a series of robustness checks, including adjustments to the treatment group sample, exclusion of potential effects from the global financial crisis, and alternative specifications of control variables. Across all model variations, the results remain robust, confirming that regional poverty alleviation policies have a significant and stable effect on economic growth.

4.2 Pre-Trend Test and Dynamic Effects of the Policy

A core assumption of the DID framework is that, in the absence of the policy intervention, the treatment and control groups would have followed similar trends in economic growth. Although the counterfactual outcome is unobservable and the parallel trends assumption cannot be tested directly, we can examine whether there were systematic differences in pre-treatment trends to indirectly validate this assumption.

We implement regression equation (2) to test for parallel trends and simultaneously estimate the dynamic effects of the policy. Figure 2 (Panel A and Panel B) illustrates the time-varying impacts on total GDP and per capita GDP, respectively. Two key findings emerge: First, prior to the implementation of the regional poverty alleviation policy, there were no statistically significant differences in GDP trends—either total or per capita—between poor and non-poor counties, suggesting that the parallel trends assumption holds.

Second, after the policy was introduced, the estimated coefficients became significantly positive and increased over time, indicating persistent and intensifying effects. As the policy was rolled out and complementary measures were refined, local governments enhanced their understanding and execution capabilities, which in turn amplified the policy's economic impact in targeted areas.

To quantify the magnitude of this effect, we follow a simple back-of-the-envelope approach inspired by Nunn (2011). Between 2011 and 2016, the average growth in log total GDP among the 138 designated poor counties was 67.5 percentage points. Based on the dynamic estimates in Figure 2, 7.3 percentage points of this growth can be attributed to the regional poverty alleviation policy—equivalent to 11% of total growth. In other words, without the policy, GDP in these counties would have grown to only 89% of the observed level. Using the same method, we find that average growth in log per capita GDP during this period was 63.3 percentage points, with the policy again accounting for 11% of that growth. This implies a counterfactual growth rate of just 89% of the actual observed figure.

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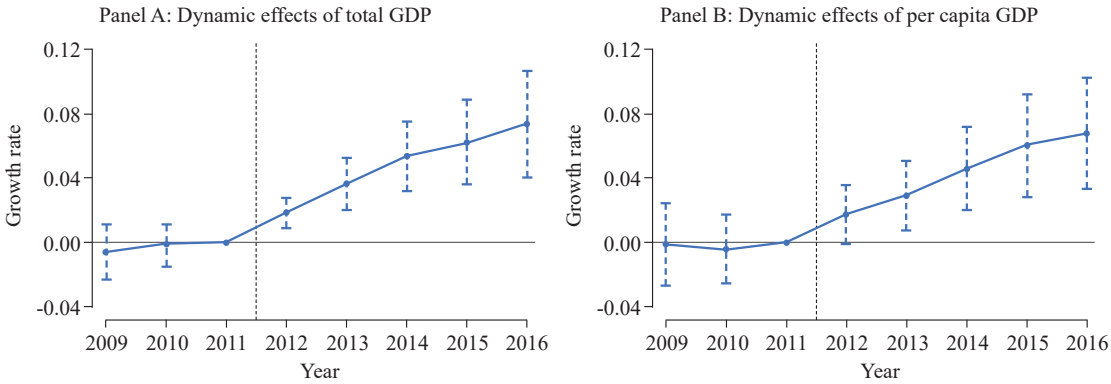

Figure 2: Dynamic Effects of Regional Poverty Alleviation Policies on Economic Growth

Note: Dashed lines represent 95% confidence intervals. The same applies to all subsequent figures.

4.3 Spatial Spillover Effects

A core assumption underlying the correct identification of treatment effects in the DID framework is that the policy should not affect the control group—a condition known as the Stable Unit Treatment Value Assumption (SUTVA). However, a substantial body of literature highlights the possibility that regional development policies may merely reallocate economic activity across regions, without increasing aggregate economic output (Kline & Moretti, 2014; Sun et al., 2018). In this context, a key question arises: have regional poverty alleviation policies stimulated economic growth within poor areas independently, or have they instead attracted economic activity from other regions? To address this, we examine two potential channels of spatial spillover: (1) regions neighboring poor counties and (2) counties engaged in paired-assistance programs.

4.3.1 Spatial spillover effects on neighboring regions

Theoretically, regional poverty alleviation policies may exert spatial spillover effects on regions adjacent to designated poor counties. On the one hand, firms in neighboring regions may relocate operations to poverty-stricken counties to benefit from preferential policies, potentially leading to negative economic consequences for the adjacent regions. On the other hand, positive effects could emerge through mechanisms such as agglomeration, market integration, and knowledge diffusion.

To empirically test for such spatial spillovers, we follow the approach of Kline & Moretti (2014). First, we exclude all poverty-stricken counties from the baseline sample. We then introduce a dummy variable $Neighbor_c$ indicating whether a county directly borders a designated poverty-stricken county and estimate the following regression specification:

$$Y_{ct}=\alpha+\delta Post_t\times Neighbor_c+(X_c\times f_t)'\theta+\mu_c+\lambda_{pt}+\varepsilon_{ct} \quad (3)$$

Compared to equation (1), equation (3) defines the treatment group as counties adjacent to poverty-stricken counties, while the control group consists of all non-poor counties that do not share a border with them. The coefficient δ captures the differential change in economic growth in neighboring counties relative to this broader control group. A statistically significant δ would provide evidence of spatial spillover effects; an insignificant result would suggest otherwise. Table 4 presents the results of this analysis. Although the estimated coefficients in columns (1) and (4) are positive, the interaction term between the policy shock and neighboring regions $Post_t\times Neighbor_c$ becomes statistically and economically insignificant after controlling for province-year fixed effects and other covariates. This suggests that regional poverty alleviation policies did not generate discernible spatial spillover effects in counties adjacent to poor areas.

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Table 4: Spatial Spillover Effects in Neighboring Regions

	Total GDP			Per capita GDP		
	(1)	(2)	(3)	(4)	(5)	(6)
$Post_t \times Neighbor_c$	0.026* (0.014)	0.008 (0.012)	0.008 (0.012)	0.026** (0.013)	0.012 (0.011)	0.011 (0.012)
Control variables	No	No	Yes	No	No	Yes
Province-year fixed effects	No	Yes	Yes	No	Yes	Yes
Year fixed effects	Yes	No	No	Yes	No	No
County/district fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5704	5704	5704	5704	5704	5704
R^2	0.976	0.983	0.983	0.960	0.968	0.969

4.3.2 Spatial spillover effects on paired-assistance regions

China's regional poverty alleviation policy is characterized by a distinctive cross-provincial paired-assistance model. This program has involved 23 provincial-level administrative regions, 33 developed eastern cities, and 832 poor counties in the central and western parts of the country (Wang, 2022). In 1996, the State Council issued a directive on organizing poverty alleviation cooperation between economically developed and underdeveloped regions, launching a large-scale paired-assistance initiative. This policy matched more developed provinces or municipalities with less developed regions to foster coordinated poverty alleviation. Subsequent adjustments to these pairings were made in 2002, 2010, 2013, and 2016, though most pairings remained unchanged. In terms of support methods, paired-assistance evolved from an early "blood-transfusion" approach —direct cash and in-kind transfers — to a multidimensional "blood-making" strategy that encompasses industrial support, labor cooperation, infrastructure development, technology transfer, and talent exchange (Lyu, 2021). This uniquely Chinese approach played a vital role in the national poverty reduction campaign. However, since it fundamentally leverages inter-governmental coordination to redistribute resources from more developed to less developed regions, a key question arises: could it lead to spatial spillover effects between paired-assistance regions? To explore this issue, we identified all counties and districts tasked with assisting poor counties during the sample period (i. e., the treatment group in the baseline analysis), using official documents, online searches, and policy consultations. We then excluded the poor counties from the baseline sample and created a dummy variable $help_c$ to indicate whether a given county was responsible for paired assistance. We estimated the following regression model:

$$Y_{ct}=\alpha+\delta Post_t \times help_c+(X_c \times f_t)'\theta+\mu_c+\lambda_{pt}+\varepsilon_{ct} \quad (4)$$

In equation (4), the treatment group consists of counties engaged in paired-assistance efforts, while the control group includes all other non-poor counties. A statistically significant δ would imply the presence of spatial spillover effects resulting from the policy. As shown in Table 5, the estimated coefficients are statistically insignificant across most model specifications, except in column (4), which only controls for year and fixed effects. This indicates that the regional poverty alleviation policy did not produce significant spatial spillover effects in paired-assistance regions.

Table 5: Spatial Spillover Effects in Paired-Assistance Regions

	Total GDP			Per Capita GDP		
	(1)	(2)	(3)	(4)	(5)	(6)
$Post_t \times help_c$	-0.032 (0.021)	-0.002 (0.020)	0.003 (0.017)	-0.057** (0.023)	-0.021 (0.021)	-0.016 (0.018)
Control variables	No	No	Yes	No	No	Yes
Province-year fixed effects	No	Yes	Yes	No	Yes	Yes

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Table 5 Continued

	Total GDP			Per Capita GDP		
	(1)	(2)	(3)	(4)	(5)	(6)
Year fixed effects	Yes	No	No	Yes	No	No
County/district fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7888	7888	7888	7888	7888	7888
R^2	0.978	0.987	0.989	0.960	0.972	0.975

5. Mechanism Analysis

The previous analysis has shown that China's regional poverty alleviation policies significantly promoted economic growth in its poor areas. But through what channels was this growth achieved? What underlying mechanisms were at work? A substantial body of literature points to a close relationship between regional development and industrial structure. In fact, China's economic rise since the reform and opening-up era has largely been driven by accelerated industrialization (Jin, 2014). Following this logic, could structural transformation of industry be a key channel through which regional poverty alleviation policies stimulate growth in underdeveloped areas?

To test this hypothesis, we use sectoral output values to measure the absolute size of each industry and the proportion of each sector's output relative to total output to measure the relative size. This allows us to assess how the policy influenced the industrial structure of poor counties.

Table 6 reports the regression results. Panel A includes year and county fixed effects only, while Panel B adds province-year fixed effects and additional control variables. Columns (1) through (3) show that the estimated coefficients of the regional poverty alleviation policy are consistently positive and statistically significant across all three industrial sectors, suggesting a broad-based stimulative effect. Among the three, the secondary industry experienced the strongest growth, with output increasing by 6.9%.

Table 6: Regional Poverty Alleviation Policies and Industrial Development

	Absolute scale			Relative scale		
	Primary industry	Secondary industry	Tertiary industry	Primary industry	Secondary industry	Tertiary industry
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Incorporation of Year Fixed Effects and County/District Fixed Effects						
$Post_t \times Treat_c$	0.102*** (0.016)	0.101*** (0.022)	0.044*** (0.015)	-0.158 (0.319)	0.985** (0.495)	-0.843** (0.383)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
County/district fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6808	6808	6808	6808	6808	6808
R^2	0.985	0.963	0.973	0.952	0.919	0.876
Panel B: Incorporation of Province-Year Fixed Effects and Control Variables						
$Post_t \times Treat_c$	0.063*** (0.014)	0.069*** (0.021)	0.026** (0.012)	-0.250 (0.321)	0.936** (0.473)	-0.713** (0.342)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Province-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
County/district fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6808	6808	6808	6808	6808	6808
R^2	0.990	0.972	0.979	0.960	0.934	0.899

Columns (4) to (6) report the policy's impact on the relative industrial structure. The results indicate that, compared with the control group, the share of the secondary industry in poor counties increased by

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0.9 percentage points, confirming that the policy not only expanded industrial output but also promoted structural upgrading toward industrialization.

Panels A and B of Figure 3 present the dynamic estimation results based on regression equation (2), using the absolute and relative scales of industrial sectors as the dependent variables, respectively. The findings yield three key insights:

First, prior to the implementation of the regional poverty alleviation policy, both the absolute and relative scales of the primary, secondary, and tertiary industries in the treatment and control groups followed nearly identical, parallel trends, indicating no systematic differences—thus supporting the parallel trends assumption.

Second, regarding absolute scale, the estimated post-policy coefficients are significantly different from zero and increase over time, suggesting that the policy consistently stimulated industrial development across all three sectors in poor regions.

Third, from the perspective of relative scale, the share of the secondary industry in these regions steadily increased following the policy's introduction, while the shares of the primary and tertiary industries declined accordingly.

Taken together with the findings in Table 6, Figure 3 clearly demonstrates that the economic growth effects of regional poverty alleviation policies were primarily driven by the expansion of the secondary industry, accelerating the industrial transformation of the economic structure in poor areas.

To further verify this conclusion, we decomposed the overall economic growth effect of the policy using the 2011 industrial output values in poor counties as a baseline. This decomposition assesses the relative contributions of each sector. The results show that the secondary industry contributed 52.9% to the total policy-induced economic growth, while the primary and tertiary industries accounted for only 32.0% and 15.1%, respectively.

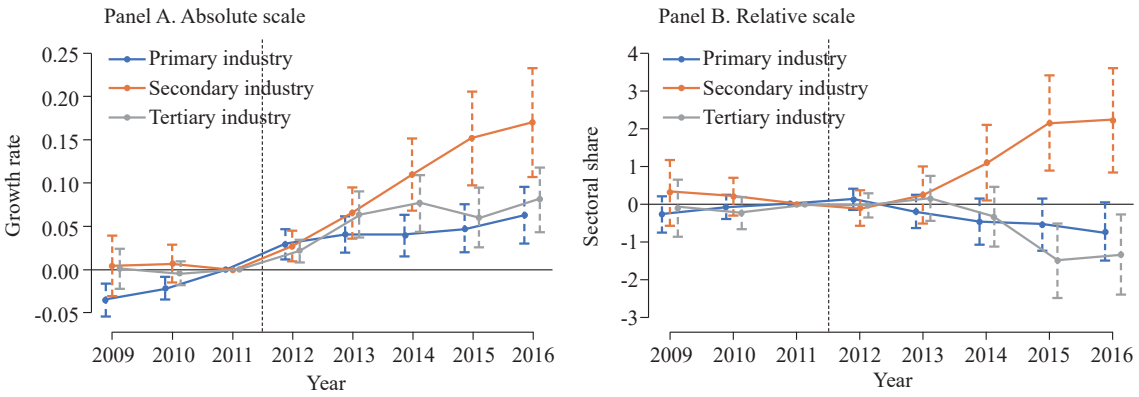

Figure 3: Dynamic Effects of Regional Poverty Alleviation Policies

To fully understand the economic growth effects of regional poverty alleviation policies, it is essential to examine how these policies promoted industrialization in poor areas. Theoretically, two distinct mechanisms may explain this process. The first is exogenous development through scale expansion, where poor regions, supported by preferential policies, attract new enterprises via investment promotion or encourage existing firms to scale up production by increasing input use and expanding capacity. The second is intensive development through efficiency improvement, in which regions enhance infrastructure, improve the business environment, or foster industrial clusters to increase the productivity of incumbent firms, enabling them to produce more with the same level of inputs. Which of these mechanisms played the dominant role in practice? We explore this question through empirical analysis.

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5.1 Exogenous Development through Scale Expansion

We begin by examining how regional poverty alleviation policies contributed to extensive growth, focusing on increases in enterprise numbers and investment levels. Table 7 presents the estimated impact of the policy on the number of newly established industrial enterprises and fixed asset investment[2]. Using Panel B—which incorporates province-year fixed effects and a full set of control variables—as the benchmark, columns (1) and (2) show that, after the policy was introduced, the number of industrial enterprises in poor counties increased by 12.0%, and fixed asset investment rose by 6.0%. These results provide strong evidence that the industrial transformation of poor areas has relied heavily on exogenous development, driven by a rise in enterprise numbers and the expansion of production scale.

Table 7: Regional Poverty Alleviation Policies and Exogenous Development

	New industrial enterprises	Fixed asset investment	Land transfer area		Number of transferred land plots	
			Industrial land	Total land use	Industrial land	Total land use
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Incorporation of Year Fixed Effects and County/District Fixed Effects						
$Post_t \times Treat_c$	0.287*** (0.053)	0.167*** (0.041)	0.308*** (0.087)	0.255*** (0.081)	0.169* (0.089)	0.201*** (0.062)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
County/district fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6808	6808	6016	6016	6016	6016
R^2	0.736	0.892	0.318	0.430	0.361	0.623
Panel B: Incorporation of Province-Year Fixed Effects and Control Variables						
$Post_t \times Treat_c$	0.120** (0.057)	0.060* (0.035)	0.189** (0.094)	0.140* (0.081)	0.166* (0.094)	0.190*** (0.065)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
County/district fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6808	6808	6016	6016	6016	6016
R^2	0.829	0.915	0.344	0.469	0.378	0.649

What explains the scale-driven growth in poor counties? The key may lie in targeted land-use and fiscal concessions granted by higher levels of government. As previously noted, to increase the likelihood of enterprise entry and investment in poor counties, upper-level authorities often offer a wide range of policy incentives, including tax relief, favorable land-use terms, and preferential access to loans. This study focuses on industrial land policies to explore how such preferential treatment facilitates extensive development. Previous literature has highlighted that land—especially industrial land—is a crucial input for production and a key factor influencing firms' location decisions and scale of operations (Xi & Mei, 2019). Furthermore, local governments, as monopolistic suppliers of land, often treat land as a strategic tool to attract investment. Given that local governments receive annual land quotas from the central government via top-down administrative planning, these quotas are often insufficient to meet the land demands of local economic development (Tao & Wang, 2010). Consequently, the extensive industrial development seen in poor regions requires additional construction land quotas for support. Based on this reasoning, we propose the following hypothesis: preferential allocation of land quotas relaxes land-use constraints in poor counties and serves as a key mechanism promoting extensive industrial development.

[2] The variable for newly registered industrial enterprises is aggregated at the county-year level using business registration data and includes firms in mining, manufacturing, electricity, heat, gas, and water supply, as well as construction.

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To test this hypothesis, we use county-level data on total land supply and industrial land concessions to assess how regional poverty alleviation policies affect land transactions in poor areas. Columns (3) to (6) of Table 7 report the estimation results. Across different regression specifications, the estimated coefficients are significantly positive. Specifically, the policy increased industrial land concession area by 18.9% and the number of concession parcels by 16.6%. These results suggest that, under the influence of preferential land policies, the industrial land supply in poor areas expanded rapidly and became a major driver of scale-driven development.

5.2 Intensive Development through Efficiency Improvement

As industrial firms in poor areas expand in scale, an important question is whether their productivity has also improved. In other words, do regional poverty alleviation policies facilitate "intensive development" through efficiency gains? This study uses total factor productivity (TFP) growth to capture intensive development and investigates the policy's effect on TFP using the following regression equation:

$$TFP_{fcpit}=\alpha+\beta Post_t\times Treat_c+(X_c\cdot f_t)'\theta+\lambda Z_{ft}+\mu_f+\mu_{it}+\mu_{pt}+\varepsilon_{fct} \quad (5)$$

where subscripts *f,c,p,i,t* denote firm, county/district, province, industry, and year, respectively, and TFP_{fcut} represents total factor productivity. To ensure robustness, we compute productivity using three commonly used methods: the Levinsohn & Petrin (2003) approach (LP), the Ackerberg et al. (2015) method (ACF), and the Olley & Pakes (1996) method (OP). The coefficient β measures the causal effect of the policy. The variable $Treat_c$ is a dummy that equals 1 if firm f is located in county c within the treatment group, and 0 otherwise. Control variables $X_c\times f_t$ and Z_{ft} capture factors at the county and firm levels. In addition, we include a set of fixed effects: firm fixed effects μ_f, industry-year fixed effects μ_{it}, and province-year fixed effects μ_{pt}.

Columns (1) to (4) of Table 8 report the regression results. Across all specifications, the coefficient β is positive and statistically significant, indicating that the policy substantially improved firm-level productivity. This provides strong evidence that China's regional poverty alleviation policies promoted intensive development in recipient counties by enhancing production efficiency in poor regions.

A deeper question then emerges: how does the policy affect firm productivity in poor areas? This study argues that *infrastructure development* may be a key mechanism. On the one hand, the positive role of public infrastructure in improving productivity is widely recognized in academic literature. As Jeffery Sachs (2006) noted, "With infrastructure in place, markets become a powerful engine for development. Without it, markets cruelly bypass poor areas, leaving their populations trapped in endless poverty and suffering". On the other hand, China's rapid economic growth and substantial productivity gains since the reform era have also been closely linked to large-scale infrastructure investment (Zhang, 2013; Jia, 2017).

Among the many types of infrastructure, this study focuses on transportation infrastructure for two reasons. First, transportation has long been a central pillar of infrastructure construction. Between 2009 and 2021, China's spending on transportation infrastructure consistently accounted for more than 20% of all fiscal investment expenditures and about 6% of total fiscal spending. Moreover, the targeted regions of regional poverty alleviation policies are typically mountainous areas with underdeveloped transportation networks. High transport costs severely constrain local firms' ability to participate in market competition, creating a bottleneck for economic development. Thus, transportation infrastructure has naturally become a priority in the policy's implementation. Second, from a theoretical standpoint, transportation infrastructure is both a precondition for economic growth (Donaldson, 2018; Banerjee et al., 2020) and a key factor influencing firm productivity (Fernald, 1999; Ghani et al., 2016). Based on this reasoning, we propose the hypothesis that improvements in transportation infrastructure are a potential mechanism through which regional poverty alleviation policies enhance firm productivity.

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Table 8: Regional Poverty Alleviation Policies and Intensive Development

	Productivity: LP		Productivity: ACF		Productivity: OP	
	(1)	(2)	(3)	(4)	(5)	(6)
$Post_t \times Treat_c$	0.007*	0.008**	0.011**	0.011**	0.009**	0.008*
	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)
Control variables	No	Yes	No	Yes	No	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Sector-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Province-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	174140	174140	174140	174140	58068	58068
R^2	0.958	0.958	0.910	0.910	0.801	0.801

Note: (1) The sample is limited to enterprises established before the introduction of the policy (i. e., before 2012). Observations with key variables such as operating revenue, fixed assets, employee wages, and raw materials less than or equal to zero, as well as those with fewer than eight employees, are excluded. (2) Control variables cover both county-level and enterprise-level factors. County-level controls are consistent with the baseline analysis, while enterprise-level controls include firm age, net assets, number of employees, and a dummy variable indicating whether the firm engages in exports. (3) The OP estimation method requires positive investment, which leads to the exclusion of many firms without investment data.

To test this hypothesis, we collected county-level road mileage data from six provinces—Sichuan, Hebei, Guangxi, Heilongjiang, Inner Mongolia, and Qinghai—to examine the policy's impact on transport infrastructure. Columns (1) to (3) of Table 9 report the regression results. The coefficients remain significantly positive across various identification strategies, indicating that the policy significantly improved transportation infrastructure in poor areas. For example, the estimate in column (3) suggests that the policy increased road mileage in target counties by an average of 8.6%.

This study analyzes road mileage data from counties in six provinces—Sichuan, Hebei, Guangxi, Heilongjiang, Inner Mongolia, and Qinghai—to examine the impact of regional poverty alleviation policies on transportation infrastructure. Table 9, columns (1) to (3), report the regression results. The estimated coefficients remain consistently significant across different identification strategies, indicating that the policy significantly improved transportation infrastructure in poor areas. For instance, column (3) shows that the targeted regions experienced an average 8.6% increase in road mileage as a result of the policy.

To address concerns about sample selection bias, this study further conducts a robustness check using prefecture-level data. We collected panel data from 262 prefecture-level cities across China spanning 2009 to 2016. Cities that include counties identified as part of the treatment group in our baseline analysis were assigned to the treatment group, while all other cities served as the control group.

The regression results, shown in columns (4) to (6) of Table 9, indicate that following the introduction of the regional poverty alleviation policy, prefecture-level cities with policy-affected counties experienced an 8.2 percentage point increase in per capita road space compared to those without. These findings reinforce the conclusion that improvements in transportation infrastructure were a key mechanism through which the policy enhanced enterprise productivity and promoted intensive development in poor regions.

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Table 9: Regional Poverty Alleviation Policies and Transportation Infrastructure Development

	Road mileage			Per capita road space		
	(1)	(2)	(3)	(4)	(5)	(6)
$Post_t \times Treat_c$	0.085**	0.088**	0.086*	0.093***	0.086**	0.082**
	(0.043)	(0.042)	(0.044)	(0.033)	(0.035)	(0.036)
Control variables	No	No	Yes	No	No	Yes
Province-year fixed effects	No	Yes	Yes	No	Yes	Yes
Year fixed effects	Yes	No	No	Yes	No	No
County/district (city) fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2736	2736	2736	2096	2096	2096
R^2	0.924	0.926	0.926	0.902	0.910	0.910

In summary, our analysis shows that China's regional poverty alleviation policies primarily stimulated economic growth in poor areas by promoting industrialization. This occurred through two main channels: exogenous development, driven by the expansion of production capacity under preferential policy support; and intensive development, resulting from efficiency gains due to infrastructure improvements.

6. Cost-Benefit Analysis and Fiscal Sustainability

6.1 Cost-Benefit Analysis

While the earlier analysis demonstrates that regional poverty alleviation policies significantly promoted economic growth in poor areas, it is also important to recognize the substantial public expenditures required to implement them. While China's poverty alleviation efforts, designed to build a "moderately prosperous society in all respects", is not framed around the cost-benefit calculus typical of Western countries, evaluating the cost-benefit structure is crucial. It helps assess the capacity for self-sustained development in poor areas and the establishment of effective poverty exit mechanisms, which are vital for consolidating the gains from poverty reduction. Hence, this section conducts a cost-benefit analysis of the regional poverty alleviation policy.

We treat the GDP growth induced in poor areas as the policy's benefit. Following the method used by Lu et al. (2019), we estimate these benefits based on the dynamic policy effect coefficients shown in Figure 3. Columns (1) to (3) of Panel A in Table 10 present the estimation results. The annual policy benefits increased from 76.8 billion yuan in 2012 to 412.1 billion yuan in 2016, with the total cumulative benefit over five years reaching 1,245.1 billion yuan.

A comprehensive cost-benefit analysis of the poverty alleviation policy requires information on policy expenditures. We obtained data on total poverty alleviation investments in poor regions from 2014 to 2016, as reported in the *China Rural Poverty Monitoring Report*. This dataset includes central government special poverty alleviation funds, subsidized loans, provincial government allocations, and various fiscal subsidies—the broadest measure of fiscal inputs available for this policy[3]. Based on this, we estimate that the total accounting cost of regional poverty alleviation policies from 2012 to 2016 was 912.5 billion yuan. Combining this with the previously estimated policy benefits, we calculate the accounting net benefit, as reported in column (5) of Panel A in Table 10. The results show that over the

[3] Note: Due to the unavailability of expenditure data for 2012 and 2013, we use 2014 figures as a proxy. This is justified because poverty alleviation spending increased over time, making 2014 a reasonable upper-bound estimate for earlier years. As a result, our estimated economic benefits are likely conservative.

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five-year period, the net benefit totaled 332.6 billion yuan. This implies that for every 1 yuan spent, the policy generated 1.3 yuan in return.

Table 10: Cost-Benefit Analysis

Panel A. Analysis of Accounting Benefit					
Year	Real GDP	Counterfactual GDP	Policy benefit	Accounting cost of policy	Accounting benefit
	(1)	(2)	(3)	(4)	(5)
2012	42491	41723	768	1421	-653
2013	47773	46106	1667	1421	246
2014	52357	49709	2648	1421	1227
2015	55607	52360	3247	1903	1344
2016	60214	56093	4121	2959	1162
Total	258442	245991	12451	9125	3326
Panel B. Analysis of Economic Benefit					
Year	Accounting cost of policy	Fiscal multiplier	Policy benefit	Economic cost of policy	Economic benefit
	(1)	(2)	(3)	(4)	(5)
2012	1421	1.14	768	1620	-852
2013	1421	1.15	1667	1634	33
2014	1421	1.16	2648	1648	1000
2015	1903	1.15	3247	2188	1059
2016	2959	1.18	4121	3492	629
Total	9125	1.16	12451	10582	1869

However, this direct comparison between benefits and costs does not account for opportunity costs—that is, whether alternative uses of the same funds might have produced greater returns. To assess this, we conduct an economic cost-benefit analysis using the concept of the fiscal multiplier, which measures the increase in output generated by each unit of government spending. Given that poverty alleviation expenditures are primarily borne by the government, the fiscal multiplier serves as a proxy for estimating opportunity costs. Drawing on estimates from Li & Tian (2021), we use the multiplier to recalculate the economic costs and benefits of the policy. The results, reported in columns (2) to (5) of Panel B in Table 10, indicate that the economic benefit of the poverty alleviation policy between 2012 and 2016 was 186.9 billion yuan. Even under this more stringent assessment, the regional poverty alleviation policy remains cost-effective.

6.2 Fiscal Sustainability

An important concern surrounding China's regional poverty alleviation policies is fiscal sustainability. Although these policies have effectively reduced widespread poverty in targeted areas, their long-term viability may be threatened if poor regions remain heavily dependent on fiscal transfers and fail to develop self-sustaining economic cycles[4]. To explore this issue, we analyze the fiscal sustainability of the policy from the perspective of fiscal balance.

[4] For instance, a *New York Times* article published on December 31, 2020—"Jobs, Houses and Cows: China's Costly Drive to Erase Extreme Poverty"—raised such concerns.

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The results are presented in Figure 4. Panel A shows that, following policy implementation, both general public budget revenue and expenditure in poor regions increased steadily, with growth rates accelerating over time. Notably, revenue growth outpaced expenditure growth. Using 2011 as the baseline, public budget revenue in 2016 was approximately 10% higher, exceeding the expenditure growth rate by about four percentage points. This rise in revenue, which became more significant three years after policy implementation, likely reflects two factors: (1) New enterprises, having completed their construction and ramp-up phases, began full-scale operations, resulting in increased tax contributions; (2) The expiration of the "three-year tax exemption followed by a three-year 50% tax reduction" tax incentive policy, which phased out after three years, led to a rebound in tax revenue beginning in year four. Panel B indicates that although the fiscal deficit ratio in poor areas rose rapidly between 2011 and 2014, the surge in revenue from 2015 onward helped reverse this trend. By the end of the study period, the fiscal gap had narrowed and returned to pre-policy levels.

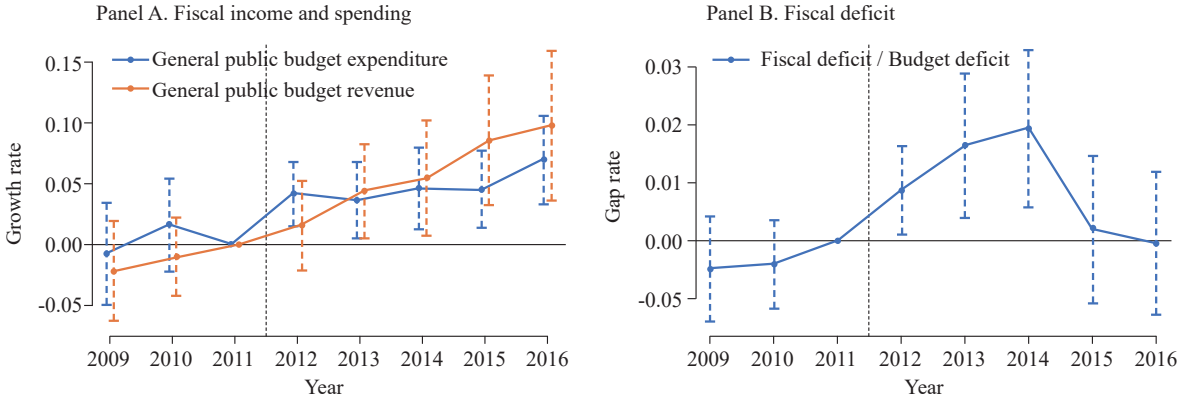

Figure 4: Dynamics of Fiscal Revenue and Expenditure

The results above indicate that at the initial stage of China's regional poverty alleviation policy, the target poor areas suffered from severe fiscal constraints. Local governments had limited own-source revenue and relied heavily on upper-level fiscal transfers, which led to a continuous widening of the fiscal deficit ratio. However, over time, as the policy stimulated economic activity, the scale of the local economy and the associated tax base expanded. This, in turn, led to a rapid increase in local tax revenues. Since the growth rate of revenue outpaced that of expenditure, the fiscal deficit began to narrow. Therefore, the widely held view that China's regional poverty alleviation policy is fiscally unsustainable is not supported by empirical evidence. As the local economies grow and tax revenues continue to rise, the policy appears fiscally sustainable from the perspective of budgetary balance.

7. Concluding Remarks

This paper takes China's national regional poverty alleviation plan since 2011 as a policy entry point and applies a DID estimation strategy to address several important questions: to what extent did the policy promote economic growth in China's poor areas; whether the policy generated spatial spillover effects; what the underlying drivers of local development were; and whether the policy is cost-effective and fiscally sustainable. The analysis finds, first, that China's regional poverty alleviation policy had a significant positive impact on economic growth in targeted areas. It increased both total GDP and per capita GDP by 5.1 and 4.6 percentage points respectively, without causing adverse spatial spillover effects on neighboring counties or regions receiving paired assistance. Second, the growth experienced in these regions was mainly driven by industrialization, which included both extensive

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development through expansion of production scale and intensive development through improvements in productivity. These findings suggest that the policy achieved its dual goals of economic expansion and quality enhancement, with preferential policy support and infrastructure investment serving as critical mechanisms. Third, the policy proves to be cost-effective. Even when measured purely in monetary terms, the benefits far outweigh the costs. The policy yielded an accounting benefit of 332.6 billion yuan and an economic benefit of 186.9 billion yuan, which accounts for opportunity costs, during 2012-2016. Fourth, economic growth spurred by the policy led to a substantial increase in local tax revenues. While fiscal deficits in poor areas initially widened, they gradually narrowed as revenue growth began to outpace expenditure, providing evidence of the policy's long-term fiscal sustainability.

This study offers meaningful insights for further advancing China's regional poverty alleviation reforms and narrowing development gaps between regions. The findings show that the 2011 national poverty alleviation plan was generally effective, enabling poor areas to seize the opportunities presented by favorable policies and achieve rapid development. However, major economic indicators in these areas still fall well below national averages, suggesting that regional inequality remains a pressing issue. In the current stage, it is crucial to consolidate the achievements of poverty alleviation and continue to focus support on key designated counties and contiguous areas of extreme poverty, ensuring that concentrated resources are directed to where they are most needed.

In addition, the study provides strong evidence that industrial development was the main engine of economic growth in these areas. As emphasized by President Xi Jinping at the National Conference to Review the Fight Against Poverty and Commend Outstanding Individuals and Groups, targeted poverty alleviation and development-oriented strategies are core elements of China's distinctive path to poverty reduction. A thriving industrial base supports both economic prosperity and public welfare. In this context, industrial development serves as an essential link between targeted support and development-oriented poverty alleviation, and it remains a fundamental strategy for enhancing the endogenous development capacity of poor areas.

Finally, preferential policies and infrastructure development are confirmed to be essential mechanisms for driving both economic growth and improvements in development quality. In the context of consolidating the gains of poverty alleviation and promoting rural revitalization, strengthening infrastructure in underdeveloped regions remains critical for building long-term mechanisms that sustain economic growth.

Nonetheless, this study has several limitations that merit further research. One limitation is the use of a reduced-form estimation of policy effects to construct counterfactual outcomes. This approach does not capture general equilibrium effects. Future studies could adopt a quantitative spatial equilibrium framework to address this issue. Another limitation is the inability to provide definitive evidence regarding the long-term effects of the policy. Since 2016, many counties have officially exited poverty, but to consolidate these achievements, the central government has issued the policy of "four no-withdrawals", i. e., no withdrawals of core responsibilities, policies, support, and oversight during a designated transition period. This continuation of policy support makes it difficult to observe what might happen to long-term economic development in the absence of such policies. Investigating the long-term impact of regional poverty alleviation policies remains a crucial direction for future research.

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