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The Impact of Development Zones on Economic Growth in Less Developed Regions: Evidence from Guangxi, China

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Abstract: The development zone is an important institutional form of industrial spatial organization in China's economic transformation and is an essential growth pole of urban economic development. Based on the county-level panel data of Guangxi from 2005 to 2017, this study contributes to the discussion by exploring the effects of development zones on economic development in developed regions. Additionally, this study further attempts to illustrate the character of the agglomeration effect built on development zones and try to reveal the significant influence factors of the effect of development zones on the economy. Through the progressive difference-in-difference (DID) model approach, empirical results reveal that the development zone has a negative effect on the local economy within three years after its establishment, and the "development zone fever" significantly reduces the potential for regional economic growth. With the decrease in the established frequency of development zones, the effect of the development zone on economic growth becomes positive. However, this promoting effect is unsustainable because the agglomeration effect of development zones is mainly caused by the "clusters of enterprises". Certain industrial agglomeration and technological capabilities are essential prerequisites for development zones to promote economic growth, while the negative impact appears in a highly competitive environment caused by excessive government intervention. Therefore, the key to maintaining the sustainability of development zones' competition is to strengthen the assessment standard of survival of the fittest for enterprises, and promote the agglomeration of high-end industries by improving the selection effect of development zones. These findings have great potential in policy making and can be used as a resource by policymakers to promote the sustainable development of less developed regions.

Keywords: development zones; economic growth; urban growth pole; sustainable development; less developed regions; China

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1. Introduction

The rapid development of urban agglomeration, development zones and industrial clusters has become a dynamic economic phenomenon in China's regional economy. As an important link between cities and industries, development zones are expanding in practice in China. Since the first development zone was established in Dalian by the Chinese state in 1984, China has succeeded in leveraging development zones to achieve far-reaching economic transformations. After the initial successes, the development zones boomed in China and were gradually rolled out from developed regions and coastal cities to inland and less developed areas. According to the China Development Zone Audit Bulletin Directory (CDZABD 2006, CDZABD 2018) [1,2], there were already 2541 development zones in China by 2017, including 550 national-level development zones and 1991 provincial-level development zones. The total number of development zones in 2017 increased by 62% compared to 2006.

Development zones are usually considered special, being different from other business locations, because of many policy-induced advantages offered only to entities operating

within the boundaries of the designated area. In general, development zones usually bring benefits of employment generation, export growth, government revenues, skills upgrading, technological innovation, etc. [3]. The central government granted these development zones various preference policies covering institutions, industries, and land [4], to attract foreign direct investment (FDI) and boost local economic growth [5]. With the deepening of the reform and opening up, development zones have become a useful tool in the process of economic modernization [6–8]. However, many scholars proposed that the success of development zones is confined to specific conditions over a limited time horizon [9] and some even have concerns that development zones may become enclaves [10].

As China's essential representative of place-based industrial policies, some development zones have experienced miraculous economic success [11–13]. The contribution of development zones to economic development comes from the effects of agglomeration and selection [14]. Development zones have played an important role in optimizing industrial structure [15], which formed agglomeration effects. Furthermore, the spillover effect generated by agglomeration improves technology and production efficiency, thereby stimulating local economic growth [16–18]. There are two significant types of agglomeration, one of which is known as "clusters of enterprises". The local government offers incentives such as low-price resources and tax exemptions to enterprises to attract them to settle in development zones, which may lead to rent-seeking. Although enterprise clustering will bring a scale economy, its low technical efficiency and feeble spillover effects mean that their contributions to the economy can only last for a few years [19]. Another type of agglomeration is "industrial agglomeration", which is usually the result of local industry blooming caused by efficient enterprises. Industrial agglomeration can promote the steady and sustainable development to the economy. With an improvement in development zone policies, the survival of the fittest will causes a selection effect, where highly efficient enterprises continue to survive whereas inefficient enterprises are eliminated [20]. The "clusters of enterprises" can be transformed to the industrial agglomeration through the selection effect.

Meanwhile, the outcome of development zone policies in some regions has strayed from expectations [21]. The rapid growth of development zones often occurred at the expense of the loss of public benefits [22,23]. To absorb investment within the fierce regional competition, local governments, especially those at or below the provincial level [24], subsidize enterprises in development zones with unreasonably low-price land use [25]. However, the resource allocation directed by the local government usually leads to misallocation (i.e., land, energy, financial funds, etc.) and causes the crowding-out effect between enterprises within the development zones and others outside the zones. Moreover, local governments often waive or reduce taxes for enterprises in development zones, and the tax exemptions can undermine the ability of authorities, particularly in poorer regions [26]. The establishment of development zones is a long-term orientated [27] and expensive process [28]. A vast fiscal burden and crowding-out effect will impede the potential economic growth.

All such debates about development zones in China pose a puzzling question: why did local governments decide to establish so many development zones, even though only some would succeed in securing investments, especially in less developed regions? Some studies suggest that the incentive model for the performance of local government officials is the main reason [29,30]. After fiscal decentralization, local governments could keep all (or almost all) extra revenue beyond their regulated responsibilities for the upper-level government. More autonomy has been given to local governments in approving investments, allocating resources, and developing local economies in their jurisdictions. Under this institution, local governments and their officials have benefited greatly from local economic prosperity, thus incentivizing them to pursue economic growth. The contribution of development zones to local economic growth in some regions has stimulated a "development zone fever" in China. It has aroused fierce competition between local governments to attract capital to their region by establishing development zones. Some attribute China's rapid economic growth to fierce competition in the past three decades [31–33]. However,

the positive accounts of regional competition have been challenged from the perspective of a low compensation rate for factor use [34].

Previous studies have not reached a consensus regarding the contribution of development zones to the economy [35], despite Chinese development zones performing well in attracting foreign investment and promoting international trade [36]. Some studies focused on the ability of development zones to contribute to the local economy suggested that development zones can trigger a wider industrial development process in regions with high technological capabilities [25], and can succeed in fostering economic development, provided that the local industrial base has been formed and has acquired some basic level of production expertise [37]. Nevertheless, some research has raised doubts about the impact of development zones as "a policy trap or a growth drive" [38]. The "development zone fever" will inevitably lead to massive deficits and hinder local economic growth. Moreover, some analysis also suggests the heterogeneous effects of development zones across different territories, such as developed and less developed regions [39,40].

Relevant research provides a substantial theoretical basis for understanding the influencing mechanism of development zones on local economic growth. Nonetheless, many issues that need to be further discussed have arisen as research has continued to progress. Previous studies have focused on the average effect of development zones on the whole but have failed to investigate their dynamic effects across time and countries. These studies have concentrated on the development zones in eastern China or the few large cities in the central and western regions, with fewer studies focused on the less developed regions. Despite studies on development zones across the country, the differences in regional background and development level lead to certain limitations in the application of the research findings.

This study contributes to the following aspects: firstly, focusing on the characteristics of less developed regions, this paper analyzes the impact of development zones on local economic growth based a progressive difference-in-differences (DID) model. The robustness of the TWFE estimator is supported by some empirical tests, such as the decomposition of heterogeneous treatment effects and "Interaction-Weighted" (IW) estimation. Secondly, different from the relevant literature, this study analyzes the dynamic effects of development zones on local economic growth across time, simultaneously considering both the positive and negative effects. Thirdly, this study further analyzes the influence mechanism of development zones on local economic growth. The conclusions of this study may provide some theoretical and practical references for the sustainable development of less developed regions.

2. Theories and Hypotheses

There is an apparent disparity between less developed and developed areas due to the uneven distribution of resources and economic development across regions in China. Based on the theory of unbalanced growth proposed by German economist Albert Otto Hirschman in 1958, it is hardly impossible to achieve absolute balanced growth among regions. The investment must be concentrated in a few regions or sectors (of a country, province, or city), while other regions or sectors can be developed gradually by utilizing the spillover effects generated by the former. That is to say, different development strategies should be adopted for regions with different resources and industrial bases.

The formation of industrial agglomeration requires a certain industrial base and supporting facilities. For less developed regions with weak industrial bases and sluggish construction of supporting facilities, the rapid establishment of development zones only brings clusters of enterprises in the short term. Still, it is hard to achieve industrial agglomeration in the general meaning. The feeble spillover effects cannot make up for the negative impact of the huge fiscal expenditure and crowding-out effect. The economic benefits are too small to empirically justify significant and sustained efforts toward clusters [41]. Based on the above analysis, we propose the following hypothesis:

Hypothesis 1 (H1). The development zones have a negative effect on local economic growth.

According to the theory of growth poles, which was first put forward by the French economist François Perroux, economic growth is not uniform in the region but emanates at specific points or poles with variable intensities and then spreads throughout the region. Thus, development must focus on more advantageous areas or sectors to achieve the rational allocation of resources. The explosive boom of development zones leads to misallocation of the resource market, which impair the original advantages relating to economic development [42]. Especially in a low-income region, the governance shortcoming of land grabbing for industrial production could negatively affect market prices when multiple development zones are established in a short time [43]. Meanwhile, the frequent establishment of development zones imposes an unbearable fiscal burden on local governments. Hence, the following hypothesis can be proposed:

Hypothesis 2 (H2). The development zones have a negative impact on local economic growth in periods with high established frequency.

The positive effect of development zones on economic growth comes from the industrial agglomeration effect, but the effect of enterprise clusters on economic growth is unsustainable. In order to absorb investment and attract more enterprises to locate in the development zones, local governments subsidize enterprises with preference policies [44], which may attract firms with lower productivity [45]. As a result, some enterprises locate in for policy benefits but contribute less to the local economy. Government intervention in factor allocation increases competition across regions, ultimately leading to a decline in total factor productivity (TFP) [46]. At the same time, the loss of public benefits rises in the process of competition. Therefore, we propose the following hypothesis:

Hypothesis 3 (H3). The positive effect occurs in counties with a greater level of industrial agglomeration, whereas the negative effect occurs in counties with a greater tendency toward competition.

3. Study Area, Materials and Methods

3.1. Study Area

As a typical less developed region with considerable national strategic significance, the development of the Guangxi Zhuang autonomous region (hereinafter referred to as "Guangxi") has a special significance in China. Guangxi is one of the five ethnic minority autonomous regions in China (another four ethnic minority autonomous regions: Inner Mongolia, Xinjiang, Ningxia, and Tibet). Beihai city in Guangxi is one of the first batches of coastal cities to have been opened to the outside world, authorized by the central government in 1984. In addition, Guangxi borders Vietnam to the southwest, making it a significant gateway to foreign exchanges in southwest China and a key hub in China's Belt and Road Initiative. Given its geographical advantages, Guangxi has become the main region for industry transfer from Guangdong province. However, Guangxi has always been a less developed region in China. It is critical to analyze whether Guangxi could benefit economically from establishing development zones.

The "development zone fever" phenomenon seems more evident in Guangxi. Guangxi had 65 development zones in 2017, including 15 national-level development zones and 50 provincial-level development zones. As shown in Figure 1, development zones boomed in 1992 and the period of 2007–2009 in Guangxi. In terms of established frequency from 2006 to 2017, the average number of establishments for all provinces was 2.62 per year, and it was 3.67 in Guangxi. However, the GDP of Guangxi has always been lower than the national average level, and the gap between those two tends to widen further (as shown in Figure A1).

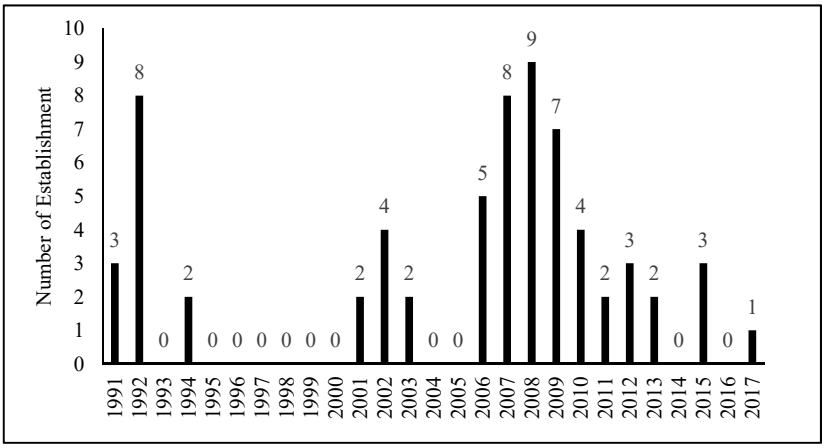

Figure 1. The establishment of development zones in Guangxi from 1991 to 2017.

According to the economic growth and distribution of development zones for counties in Guangxi, counties with more significant economic growth do not tend to set up more development zones (Figure 2). As shown in Figure 2, counties with rapid economic growth in Guangxi are primarily distributed near the administrative boundary, while the distribution of development zones is mainly concentrated in counties within the province. It is worth noting that, for the five counties with the fastest GDP growth rate, each has only one or no development zones.

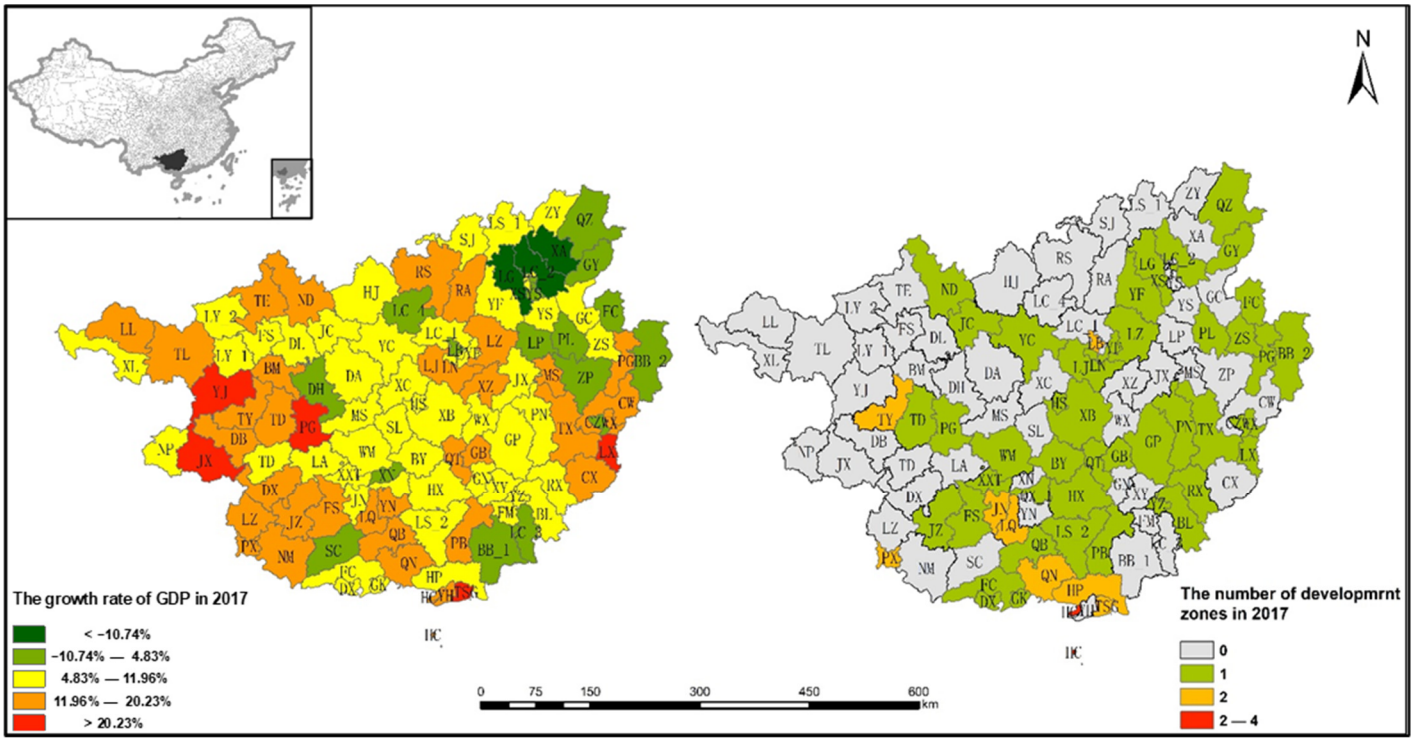

Figure 2. Study area: the growth rate of GDP and the number of development zones in Guangxi. Detailed information is listed in Table A1. Map source data were obtained from Natural Earth (http://www.naturalearthdata.com/, accessed on 21 April 2021).

3.2. Methodology

We assess the impact of development zones on local economic growth with a counterfactual approach [47], and a difference-in-difference (DID) model was adopted for the analysis. The DID model aims to construct a counterfactual experiment using a treatment

group with policy intervention and a control group without policy intervention. The differences in economic growth between the treatment group and the control group are compared before and after the policy intervention to evaluate the policy's effect. We use the establishment of development zones as the policy intervention in the DID model. Therefore, we have counties with established development zones as the treatment group and counties without established development zones as the control group.

In some cases, policy intervention happens at different times, meaning that the treatment group and control group samples are not completely fixed. During the research period in Guangxi, development zones in Guangxi were established at different times in different counties. Therefore, for counties that have established development zones during the sample period, we identify them as the control group in the years preceding the established year, while after the established year are identified as the treatment group. Thus, the progressive DID model was adopted [48]:

$$Y_{it} = \alpha + \beta D_{it} + \delta X_{it} + A_i + B_t + \varepsilon_{it} \quad (1)$$

where Y_{it} represents the local economic growth of subject i in year t. D_{it} is the dummy variable for the establishment of development zones; if county i established or has already established development zones in year t, then D_{it} takes the value 1; otherwise, it is 0. X_{it} is the variable of subject i that changes over time, which is the control variable. A_i and B_t are the regional dummy variable and the time dummy variable, respectively. ε_{it} is the error term. β is the estimator of interest in the study, which represents the average effect of the development zones on economic growth. Since too many data were lost for Xiufeng county, we deleted it from the sample. Finally, we have data for 110 counties in total, over 13 years, so the 1430 county-year observations serve as the basis for our analysis.

3.3. Data

The sample data from 2005 to 2017 in Guangxi were selected for analysis, and the specific data were derived from the Guangxi Statistical Yearbook (2006–2018) [49]. The variables in the regression are as follows:

Local economic growth. The GDP growth rate (gdpg) and per capita GDP growth rate (pgdpg) were the dependent variables to measure local economic growth. The data were processed as follows: (1) the year 2004 was taken as the base year, and we used the CPI index to deflate the index of GDP and per capita GDP; (2) sample data below the 1st percentile and above the 99th percentile were excluded. Moreover, the descriptive statistics of the economic performance indicators are shown in Table 1. We list three types of standard deviation for each indicator: cross-county standard deviation, time-series standard deviation, and cross-county-time-series standard deviation. The cross-county standard deviation was obtained after controlling for the regional fixed effects, the time-series standard deviation was obtained after controlling for the time fixed effects, and the cross-county time-series standard deviation was obtained after controlling for the regional and the time fixed effects. Standard deviations obtained from the two-way fixed effects help to explain the economic significance of the regression coefficients of key variables [50]. In terms of skewness, variables of lngdp and lnpgdp were left-skewed and the other two were right-skewed. The kurtosis values for variables were all above 3, hence their distributions were leptokurtic. The Jarque-Bera test indicated that except for lnpgdp with a normal distribution, the other three were all non-normal distributions. The non-normal distributions do not pose a problem for the subsequent analyses, since the study is based on a large number of indicators and data from over thirteen years.

Table 1. Descriptive statistics of the economic performance indicators.

	gdpg	pgdpg	lngdp	lnpgdp
Mean	0.1193	0.1575	13.1317	9.4932
Minimum	−0.7901	−0.7862	10.7621	7.7777
Maximum	2.4581	2.5217	15.6705	12.0284
Cross-county Std. Dev.	0.0855	0.1133	0.3751	0.4019
Time-series Std. Dev.	0.0774	0.0938	0.6965	0.4563
Cross-county-time-series Std. Dev.	0.072	0.0897	0.1771	0.1788
Skewness	5.2079	3.8128	−1.4045	−0.9928
Kurtosis	86.0226	49.4687	9.4431	5.5146
Jarque–Bera test	351,520.71 ***	111,983.26 ***	2278.992 ***	485.0725
Observations	1205	1212	1229	1236

Note: *** represents a significance level of 1%.

The establishment of development zones. The dummy variable (dz) for establishing development zones is the key variable. The information on development zones comes from the China Development Zone Audit Bulletin Directory (CDZABD 2006, CDZABD 2018) [1,2] and includes the level, name, year of approval, and approved area of the development zone. The 2018 version of the report only covers the whole year until 2017, thus 2017 is the most recent source of data we can use. As of 2017, there existed 55 counties with development zones in Guangxi, with some counties having more than one development zone, and others not. Additionally, there is one development zone located on the county border of Lingui and Yongfu; therefore, we identified both counties as the treatment group. When defining this variable, only the time when the first development zone was established in the county was included.

Control variables. To control for other factors that influence local economic growth, in this paper (1) the proportion of middle school students in the total population of the region (student) was used to reflect the level of human capital investment; (2) the ratio of the employed population in industrial enterprises above the designated size to the total population (emp) was used to reflect urban employment situation, because the county data lacked the data on the total employed population in the whole population; (3) the ratio of the general government expenditures to GDP (gov) was used to reflect the degree of local government intervention in the economy; and (4) the logarithm of fixed asset investment (lninvest) was used to reflect the impact of controlled investment on economic growth [51]. The DID model provides a solution to omitted influencing factors. The omitted variables that changed with time were controlled by the time dummy variable B_t in Model (1), so that subjects showed their respective linear growth trend. Regional characteristics that did not vary with time but were specific to regions were controlled by the regional dummy variable A_i, which to a certain extent can mitigate the endogeneity caused by omitted variables.

Table 2 represents the descriptive statistics for all the independent variables. All the independent variables were right-skewed and had a leptokurtic distribution, except for dz with a platykurtic distribution. The Jarque-Bera test showed that all the independent variables had non-normal distributions, but that did not pose a problem for the empirical analyses.

Table 2. Descriptive statistics of independent variables.

Variable	Mean	Minimum	Maximum	Std. Dev.	Skewness	Kurtosis	Jarque–Bera Test	Observations
dz	0.3846	0	1	0.4867	0.4743	1.225	241.3 ***	1430
student	4.8384	0.1412	12.8889	1.4987	0.259	5.5371	343.9205 ***	1231
emp	0.0225	0.0005	0.4844	0.0256	6.7128	95.4497	449450.4 ***	1236
gov	0.2182	0.0161	0.9719	0.1607	1.9031	7.0785	1592.3274 ***	1228
lninvest	12.8832	10.5443	14.9564	0.9613	2.1528	11.0962	4365.5054 ***	1246

Note: *** represents a significance level of 1%.

Correlation analyses should be adopted to precede the econometric analysis, because they can signal potential multicollinearity problems between independent variables [52]. The econometric estimation results will be biased and invalid if the correlations exceed a value of 0.9. Therefore, pairwise Pearson correlations were conducted for the overall sample, as is customary in the literature [53]. As in Table 3, there is a significant correlation between dependent variables and independent variables, indicating that the selected indicators are reasonable. Since the largest correlation between independent variables is −0.5351, it can be concluded that multicollinearity does not pose any problem for the estimated econometric results.

Table 3. Correlation matrix of the variables.

	gdpg	pgdpg	lngdp	lnpgdp	dz	tudent	emp	gov	lninvest
gdpg	1								
pgdpg	0.8524 ***	1							
lngdp	0.7169 ***	0.6330 ***	1						
lnpgdp	0.6261 ***	0.7782 ***	0.8115 ***	1					
dz	−0.0818 ***	−0.0984 ***	−0.0431	−0.0693 **	1				
student	0.1482 ***	0.1271 ***	0.0960 ***	0.0927 ***	−0.1097 ***	1			
emp	−0.023	−0.0536 *	−0.0356	−0.0787 ***	0.2262 ***	−0.1617 ***	1		
gov	−0.1901 ***	−0.1795 ***	−0.2079 ***	−0.1988 ***	−0.3199 ***	0.1420 ***	−0.3175 ***	1	
lninvest	0.1370 ***	0.0783 ***	0.1107 ***	0.051 *	0.2579 ***	−0.2298 ***	0.3974 ***	−0.5351 ***	1

Note: *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively.

4. Results and Discussion

4.1. Timing of Establishment and Economic Performance

Our empirical analysis rests on the assumption that the establishment time of development zones is unaffected by local economic growth. As shown in Figure A2, the local economic growth before the establishment of development zones cannot explain their timing. Additionally, Figure A3 shows that the economic growth trend of the treatment group and the control group basically satisfies the homogeneity hypothesis. Furthermore, the Weibull hazard model [54] was used to examine the relationship between the establishment time of development zones and economic growth. The period from the first year of the sample to the year when the development zone was established was regarded as the preparatory period before the establishment of the development zone, that is, the time required for the establishment of the development zone, T.

$$Ln(T) = x'b^* + e \quad (2)$$

In Formula (2), T is the expected time taken for the establishment of development zones; x' is the standard deviation of the explanatory variable x; e is the error term; and b^* measures the percent change in the length of the preparatory period due to a unit change in covariates. When b^* is significantly positive, that means the increase in the covariate will delay the expected establishment of development zones, and vice versa. If b^* is not significant, it indicates that the covariates fail to explain the time of establishment of the development zone. The regression results are as follows.

Table 4 indicates that the timing of the establishment does not vary with the change in local economic growth. Column (1) reports the results of regression with only the GDP growth rate (gdpg), while Columns (2) to (4) provide the regression results controlling for some county-level control variables. As shown, the regression coefficient of GDP growth rate is insignificant in any case. Therefore, the change in economic growth before the establishment of development zones fails to explain the timing of the establishment, which means the establishment time of development zones over the sample period was not affected by local economic growth.

Table 4. Relationship between establishment time and economic growth before establishment.

	(1)	(2)	(3)	(4)
gdpg	3.4398 (3.3662)	3.5261 (3.3192)	2.7319 (2.0850)	2.4853 (1.7400)
Political–economy factors		Control		Control
Regional indicators			Control	Control
Observations	924	911	907	895

Note: The political–economy factors include gov and lninvest; the regional indicators include student and emp.

4.2. Impact of Development Zones on Economic Growth

4.2.1. Preliminary Result

In Table 5, we assess the impact of development zones on economic growth using two indicators of economic growth: the GDP growth rate and the per capita GDP growth rate. The sample comprises 110 counties with a sample period from 2005 to 2017. All models control for county and year fixed effects (FE). As shown in Table 5, columns (1) and (2) report the preliminary regression results. In addition, columns (3) and (4) report robustness test I for adjusting the economic performance indicators into logarithmic form, and columns (5) and (6) report robustness test II base on the research sample that excluding samples with 5 or more years of missing data on the dependent variable. The robust-cluster regression was performed with counties as the basis for grouping.

Table 5. Impact of development zones on economic growth: preliminary regression and robustness tests.

	Preliminary Regression		**Robustness Test I**		**Robustness Test II**	
	gdpg (1)	**pgdpg (2)**	**lngdp (3)**	**lnpgdp (4)**	**gdpg (5)**	**lngdp (6)**
dz	−0.0293 ** (−2.00)	−0.0315 * (−1.81)	−0.1333 *** (−3.71)	−0.1228 *** (−3.42)	−0.0277 * (−1.87)	−0.1332 *** (−3.71)
student	0.0082 *** (2.91)	0.586 (1.49)	3.3004 *** (2.87)	3.4296 *** (2.91)	0.8585 *** (3.03)	3.3287 *** (2.84)
emp	−0.2028 *** (−2.61)	−0.2382 ** (−2.06)	0.3639 (1.59)	0.7361 *** (4.14)	−0.1723 ** (−2.20)	0.347 (1.45)
gov	−0.0252 (−0.64)	−0.0570 (−1.29)	−1.1950 *** (−4.87)	−0.8692 *** (−4.24)	−0.0239 (−0.59)	−1.1834 *** (−4.77)
lninvest	0.0495 *** (6.77)	0.0456 *** (4.95)	0.1669 *** (4.70)	0.1655 ** (6.49)	0.0515 *** (6.97)	0.1727 *** (4.69)
R^2	0.3366	0.4215	0.9241	0.9341	0.3406	0.9249
N	1149	1148	1085	1084	1109	1131

Note: *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively. The value in parentheses is the t value calculated with robust-cluster standard errors. Unless otherwise specified, the following tables are the same.

Table 5 shows that development zones have a significantly negative effect on local economic growth in Guangxi. In columns (1) and (2), the establishment of development zones caused an average drop of 0.0293 and 0.0315 in gdpg and pgdpg, respectively. These effects are economically large. To gauge the economic effects of these results, we compare the coefficient estimate with the standard deviation of the gdpg and pgdpg after accounting for county and year fixed effects. The standard deviation is 0.072 and 0.0897 for gdpg and pgdpg, respectively, as shown in Table 1. This suggests that the establishment of development zones explains approximately 40.69% and 35.12% of the variation in the GDP growth rate and per average GDP growth rate, respectively, after controlling for fluctuations in the economy accounted for by county and year effects. That is to say, the county and year fixed effects explain much more of the total variation in economic growth than development zones. The negative effect of development zones on economic growth is

verified in both robustness tests I and robustness tests II (H1 is verified). Moreover, human capital and fixed investment significantly promote local economic growth, whereas higher government intervention is associated with lower economic growth.

4.2.2. Heterogeneous Treatment Effects

Goodman-Bacon (2021) [55], de Chaisemartin and D' Haultfoeuille (2020) [56] propose that the estimation of the traditional two-way fixed effects (TWFE) model may be not robust to heterogeneous treatment effects across group and over time. According to them, the two-way fixed effects DD estimator (TWFEDD) is a weighted average of all possible 2 × 2 DD estimators. Therefore, we analyze the heterogeneous treatment effects of development zones on local economic growth by using a Goodman-Bacon decomposition.

In Table 6, the estimators of all comparison groups are negative. Decompositions further show that the negative effect of development zones on local economic growth is driven by the "Never T vs Timing C" effects. These decompositions are shown in Figure A4. Moreover, the effect of "Timing groups" and "Always T vs. Timing C" only accounted for 27.84% of the TWFE treatment effect, which means it will bring minor bias in parameter estimation, but it will not affect the robustness of the TWFE estimation.

Table 6. Goodman-Bacon decomposition.

DD Comparison	Average DD Estimation	Weight
Timing groups	−0.04951	0.09825
Always T vs. Timing C	−0.02346	0.18012
Never T vs. Timing C	−0.02723	0.69240
Always T vs. Never C	−0.23362	0.00249
Within	−0.08328	0.02674

Note: We identify the sample into four groups based on the treatment timing: (1) early group: counties with development zones established in the early period; (2) late group: counties that development zones established during the study period; (3) never group: counties without development zone; (4) always group: counties that have always had development zones. C means control group while T means treatment group. Timing groups contain comparison groups of Early T vs. Late C (compares early group to late group during the late timing group's pre-period) and Late T vs. Early C (compares late group to early group during the early timing group's post-period).

In settings with a variation in establishment timing across counties, the coefficient on a given lead or lag can be contaminated by effects from other periods. The TWFE estimations will be influenced by the treatment effects heterogeneity. Sun and Abraham (2021) [57] proposed "Interaction-Weighted" (IW) estimators to capture the treatment effect, and these estimators are robust to heterogeneous treatment effects. As seen in Figure A5, there is a significant negative effect of development zones on the growth rate of GDP.

In summary, all the test shows that results in Table 5 are robust, and will not biased due to the timing of establishment varies across county and year.

4.3. Impact of the Established Frequency on Economic Growth

Since most counties in Guangxi have only one development zone, there will be too many zero-value data points. The regression results will be biased if we value the established frequency using county-level data. Hence, we constructed the analytical framework from the perspective of the provincial level to assess the impact of established frequency on local economic growth.

From 1991 to 2017, the average level of the established frequency was 2.4 per year, and there were 2.7 and 1.57 before and after 2010, respectively. Compared with the average level on the whole, the established frequency before 2010 was excessively frequent. Hence, the sample data were chronologically divided into four small samples (2005–2007, 2008–2010, 2011–2013, and 2014–2017). Considering that most of the development zones were established before 2010 and fewer were established after 2014 (Figure 1), the time span of the first three periods was set to be three years and the fourth period to be four years. The results are reported below.

The results in Table 7 show a significant heterogeneous effect of development zones on the local economic growth at different periods. Specifically, in 2005–2007 and 2008–2010, the establishment of development zones significantly negatively impacted the economic growth, with the established frequency of 4.33 and 6.67 per year, respectively. In the periods of 2011–2013 and 2014–2017, with an established frequency of 1.67 and 1 per year, respectively, the establishment had a significantly positive effect on the economic growth, and the positive effect was greater in 2014–2017. The effect of development zones on economic growth changes from inhibition to promotion in different periods; the different established frequencies would be the main reason. In other words, in periods with low established frequency, the development zone has a positive impact on local economic growth, while in periods with high established frequency, it is often accompanied by a negative effect on local economic growth, which verifies H2.

Table 7. Impact of the established frequency of development zones on economic performance.

	2005–2007	**2008–2010**	**2011–2013**	**2014–2017**
dz	−0.1233 **	−0.0746 ***	0.0425 *	0.2404 ***
	(−2.29)	(−2.65)	(1.86)	(4.69)
student	−0.0082	−0.0260	0.0092	0.0061
	(−0.60)	(−1.08)	(1.27)	(1.36)
emp	−0.2533	0.5854	−0.4651	−0.3623
	(−1.42)	(0.54)	(−0.46)	(−0.49)
gov	−0.2695	−0.6306 **	0.0491	−0.5856 ***
	(−0.55)	(−2.18)	(0.37)	(−2.66)
lninvest	0.1023 ***	0.1449 ***	0.0767 *	0.0187
	(2.66)	(3.79)	(1.83)	(0.45)
R^2	0.1556	0.3243	0.3740	0.5056
N	247	258	266	382

Note: *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively. The value in parentheses is the t value calculated with robust-cluster standard errors.

4.4. Dynamic Effects of the Establishment on Economic Performance

To further verify the above conclusions and assess the dynamic effects of development zones in Guangxi, we next examine the dynamics of the relationship between the development zones and economic growth. By including a series of dummy variables in the standard regression, we can trace out the year-by-year effects of the establishment on the growth rate of GDP. The model is as follows:

$$GDPG_{it} = \alpha + \beta_1 D_{it}^{-5} + \beta_2 D_{it}^{-4} + \cdots + \beta_{18} D_{it}^{+14} + \beta_{19} D_{it}^{+15} + A_i + B_t + \varepsilon_{it} \quad (3)$$

where D_{it} is a set of dummy variables. When year t is the jth year before the development zone was established in county i, then D_{it}^{-j} takes the value 1, otherwise it is 0; when year t is the jth year after the development zone was established in county i, then D_{it}^{+j} takes the value 1, otherwise it is 0. In the year when the development zone was established, $j = 0$. The case of $j = 0$ was excluded, and the year-by-year impact of the establishment of the development zone on economic performance can be examined. The vectors A_i and B_t are vectors of county and year dummy variables, respectively; ε_{it} is the error term. At the end points, D_{it}^{-5} takes the value 1 for all years that are 5 or more years before the development zone was established, while D_{it}^{+15} takes the value 1 for all years that are 15 or more years after the development zone was established. The estimated variance in the endpoint value may be larger than the other points, and the estimation accuracy may be lower than that of the other points. The results are shown in Figure 3:

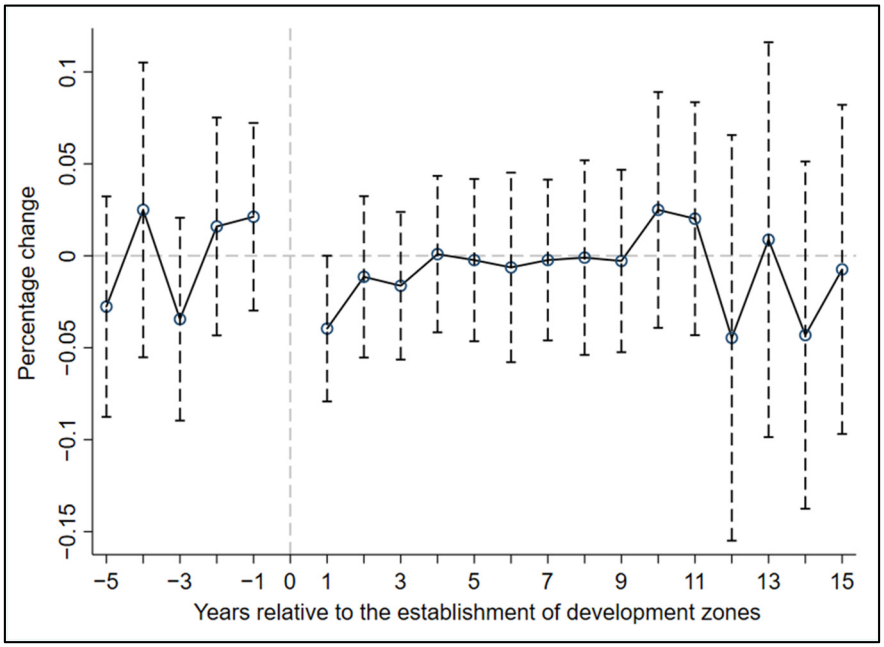

Figure 3. Dynamic impact of the establishment on the percentage change in the growth rate of GDP.

Figure 3 plots the dynamic impact of development zones on the growth rate of GDP. The dashed lines represent 95% confidence intervals, adjusted for county-level clustering. Figure 3 illustrates two key points: (1) first, there is no fixed trend of local economic growth prior to the establishment of development zones, and the negative impact of establishment on economic growth materializes very quickly. According to the trend suggested by the broken line, economic growth falls immediately after the establishment of development zones. The impact of a development zone on economic growth lasts for approximately three years after establishment, and then the effect levels off. (2) Second, approximately nine years after the establishment of the development zone, its promoting effect on economic growth significantly manifested but only lasted for a short while. This fluctuation was attributed to the influence of the economic cycle, and the trend was similar to that before the establishment of the development zone, indicating that the establishment of development zones had an unsustainable promoting effect on the economic growth rate. To summarize, the establishment of development zones had an immediate negative effect on economic growth. As time went on, the promoting effect on local economic growth started to appear, however, this was probably a result of the clustering of enterprises.

4.5. Mechanism: Impact of the Establishment on Economy

Present studies provide three main influence factors for the impact of development zones on local economic growth: industrial agglomeration, technological innovation, and regional competition. Firstly, industrial agglomeration usually improves the local industrial base and brings advanced expertise to optimize the production structure. Therefore, the index of "value-added of secondary industry/GDP" (agglomeration) was used to measure the degree of the local industrial base. Secondly, the number of certified patents (technology) was used to measure regional technological innovation and the data from the Guangxi Intellectual Property Office. Thirdly, local governments with greater fiscal autonomy have a stronger tendency to compete. Thus, the degree of budgetary autonomy (competition) was used to measure the local government's tendency to compete, and the data were calculated by budgetary revenue/total budgetary expenditure. All of the time-series data were deflated by the consumer product index (CPI), as 2004 is the base year. The following model was used for regression:

$$GDPG_{it} = \alpha + \beta D_{it} + \alpha_1 Z_{it} + \alpha_2 D_{it} Z_{it} + A_i + B_t + \varepsilon_{it} \quad (4)$$

where $GDPG_{it}$ is the growth rate of GDP; D_{it} is the dummy variable for the establishment of development zones, taking the value 1 if county i established or has already established development zones in year t, otherwise it is 0; Z_{it} is the variable representing the three influence factors industrial agglomeration, technological innovation, and regional competition; α_2 is the coefficient of variation in interest in the regression, which represents the difference between the impacts of an established development zone on the economic performance with and without the characters; A_i and B_t are the county dummy variable and the year dummy variable, respectively; and ε_{it} is the error term.

As shown in Table 8, development zones will improve the local economic growth in counties with a higher degree of industrial agglomeration and technological capabilities. Meanwhile, the development zone will negatively affect local economic growth in counties with a higher degree of competition, which verifies H3. As shown in column (2), the effect of technology on the GDP growth rate is weak and is not significant in column (4), which could be because some counties failed to report data, resulting in a large number of missing data. In the statistics published by the Guangxi Intellectual Property Office, the data of municipal districts were not listed individually. Therefore, the data of these areas are shown as missing data in the sample.

Table 8. Mechanism of the impact of the establishment on economic growth.

	(1)	(2)	(3)	(4)
dz	−0.1534 *** (−3.14)	−0.0214 (−0.92)	0.0227 (0.83)	−0.0739 (−1.49)
dz×(agglomeration)	0.3255 *** (2.69)			0.2569 ** (2.15)
dz×(technology)		0.0002 * (1.67)		0.0001 (0.61)
dz×(competition)			−0.1462 ** (−1.87)	−0.2061 *** (−3.35)
R^2	0.2110	0.2470	0.2068	0.2599
N	1205	1023	1204	1023

Note: *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively. The value in parentheses is the t value calculated with robust-cluster standard errors.

5. Discussion

In the history of regional policy making, the designation of selected local areas as "development zones" with the purpose of stimulating industrial development is not a novel idea. The review of the previous literature shows that certain valuable conclusions have been reached regarding the impact of development zones on local economic growth. However, previous studies mainly focused on the positive effects of development zones on local economic growth, while there were few studies on their negative effects, especially in less developed regions. This paper analyzes the impact of development zones on local economic growth from theoretical and empirical perspectives based on county-level data in Guangxi. Compared with other studies, we focus on the positive and negative effects simultaneously, contributing to a comprehensive picture of the development zone and providing a new perspective and approach for the sustainable development of less developed regions.

The empirical results show that development zones have a negative effect on local economic growth in Guangxi. Based on the background that "development zone fever" is more evident in Guangxi, the main reason for these results is because the rapid establishment of development zones leads to huge fiscal expenditure and a crowding-out effect. We further test the impact of development zones on economic growth in different periods and find that periods with high established frequency will have a negative effect, while periods with low established frequency will lead to a positive effect. This is consistent with

our theoretical analysis, suggesting that development zones will have both positive and negative effects on economic growth. Under the phenomenon of "development zone fever", the impact of development zones on the economy deviates from the original intention of their establishment. To explain this, we analyze the dynamic effect of the development zone on the percentage change in the GDP growth rate. The results show that establishing development zones cannot produce economic contribution immediately. The huge financial burden the establishment brings will negatively affect local economic growth, which may last for several years. Generally speaking, the development zone will have a sustainable positive effect after the industry agglomeration is formed. Unfortunately, the highly established frequency of development zones often leads to rent-seeking by enterprises, which can only result in an unsustainable positive effect. Moreover, the impact of development zones in counties with various regional characteristics displayed significant differences in the study area. In counties with a higher degree of industrial agglomeration and more technological capabilities, the impact of development zones was positive, while it was negative in counties with a higher degree of competition.

These results provide some implications for development zones. First, the effects of development zones on local economic growth are context-specific and may vary considerably according to the specific local characteristics of regions, which requires the local governments to achieve sustainable development, utilizing their advantages effectively [58]. In policy operations, counties with higher industrial advantages should establish development zones to exert a spillover effect. Second, local governments should set higher thresholds and establish comprehensive assessment criteria for enterprises. Backward and eliminated enterprises should be withdrawn from development zones to reduce the crowding-out effect of regional resources. Third, the establishment of development zones must conform to the overall strategic planning of the region to avoid excessive competition.

Nevertheless, some limitations still exist in this study. First, as some data from the years or counties to be studied may be missing, the method may suffer from data acquisition problems since it is based on a large number of indicators and much data over thirteen years. However, this does not affect the main conclusions of this paper, because we have completed substantial preliminary work toward data collection. Additionally, the results are robust even when sample data are adjusted to exclude subjects with five or more years of missing data with regard to the dependent variable. Second, this study only noted the impact of development zones on local economic growth and explained the mechanism, without comparing it with other industrial policies. Our future work will focus on comparing the effect of development zones with similar industrial policies in this regard.

6. Conclusions

This study investigates whether development zones significantly contribute to the local economic growth in less developed regions and assesses some key factors that influence the economic effect of development zones. The analysis was based on the sample of Guangxi, a typical less developed region in China. The empirical results of this study shows that there is a negative effect of development zones on local economic growth in Guangxi Zhuang autonomous region. The Goodman-Bacon decomposition of the heterogeneous treatment effects shows the robustness of the TWFE estimation. The "Interaction-Weighted" (IW) estimation results indicate a negative effect of development zones on the GDP growth rate at 5% significant level. The negative effect on local economic growth will last for several years after development zones established. Nine years after the establishment of a development zone, it presents a temporary promoting effect on economic growth, which means enterprises located in the development zones have not formed the industry agglomeration. Moreover, the established frequency is the important explanation for the heterogeneous impact of development zones on economic growth in different periods. In periods with low established frequency, the development zone has a positive impact on local economic growth, while in periods with high established frequency, it is often

accompanied by a negative effect on local economic growth. Furthermore, the impact of development zones on economic growth varies in a theoretically predictable manner across counties with distinct industry, technology, and competition characteristics. Our findings support the view that certain industrial agglomeration and technological capabilities are an important prerequisite for development zones to promote economic growth, while fierce competition will aggravate the degree of misallocation, which is not conducive to economic growth.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

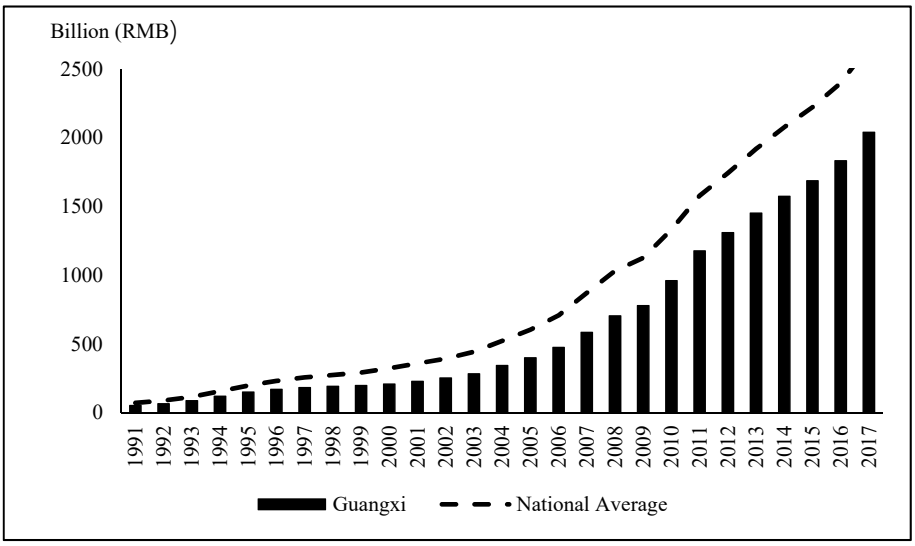

Figure A1. The development of GDP: Guangxi and the national average.

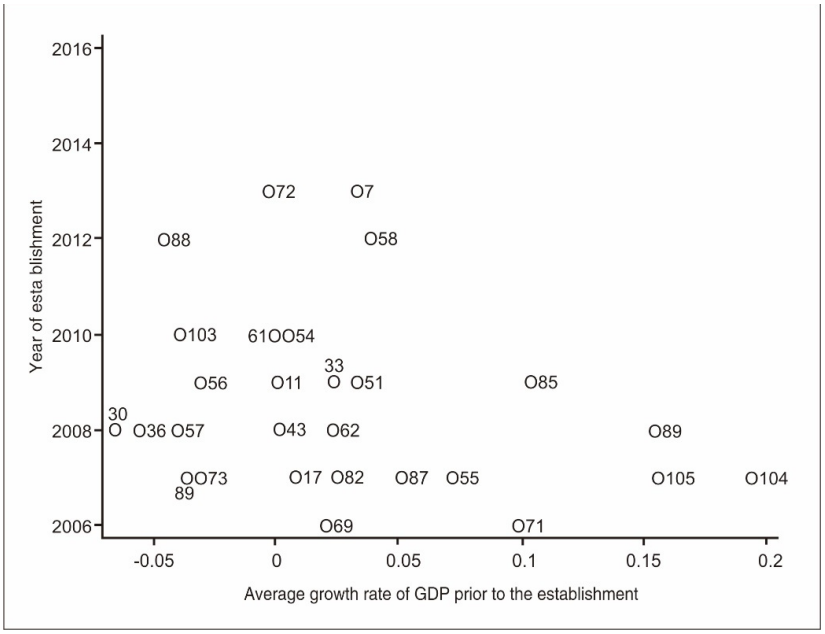

Figure A2. Timing of the establishment of development zones and the level of economic growth prior to the establishment.

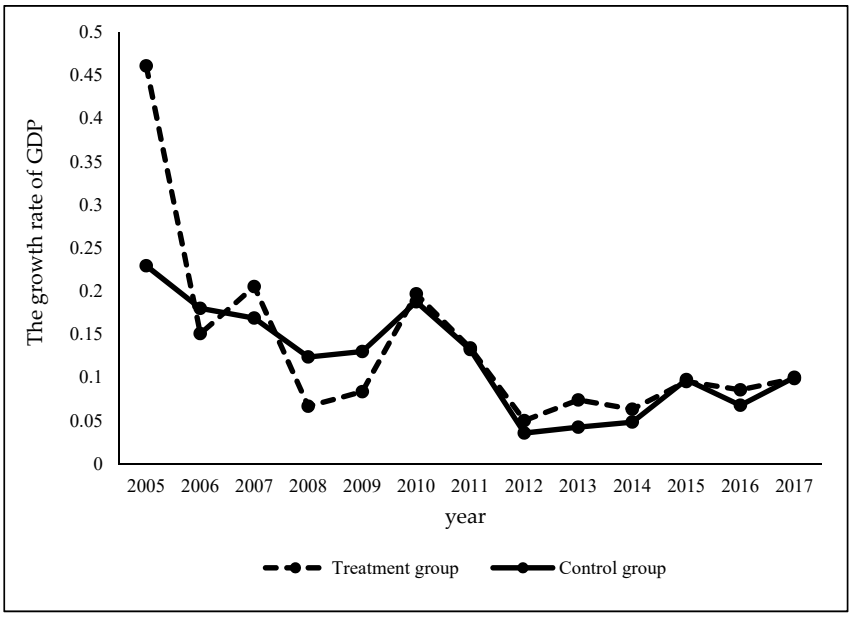

Figure A3. The homogeneity hypothesis of economic growth between the treatment group and control group. The establishment of development zones in Guangxi was divided into four time periods in view of the time differences in this process: before 2005, 2006–2009, 2010–2013, and 2014–2017. Accordingly, the sample data were grouped into four time periods: 2005–2007, 2008–2010, 2011–2013, and 2014–2017 [59]. From 2005 to 2007, counties with development zones established before 2005 served as the treatment group, and the others as the control group; from 2008 to 2010, counties with development zones established before 2005 and from 2006 to 2009 served as the treatment group, and the others as the control group; from 2011 to 2013, counties with development zones established before 2005, from 2006 to 2009, and from 2010 to 2013 served as the treatment group, and the others as the control group; and from 2014 to 2017, all counties with development zones served as the treatment group, and counties that had never established development zones served as the control group. The differences in economic growth between the treatment group and the control group were compared.

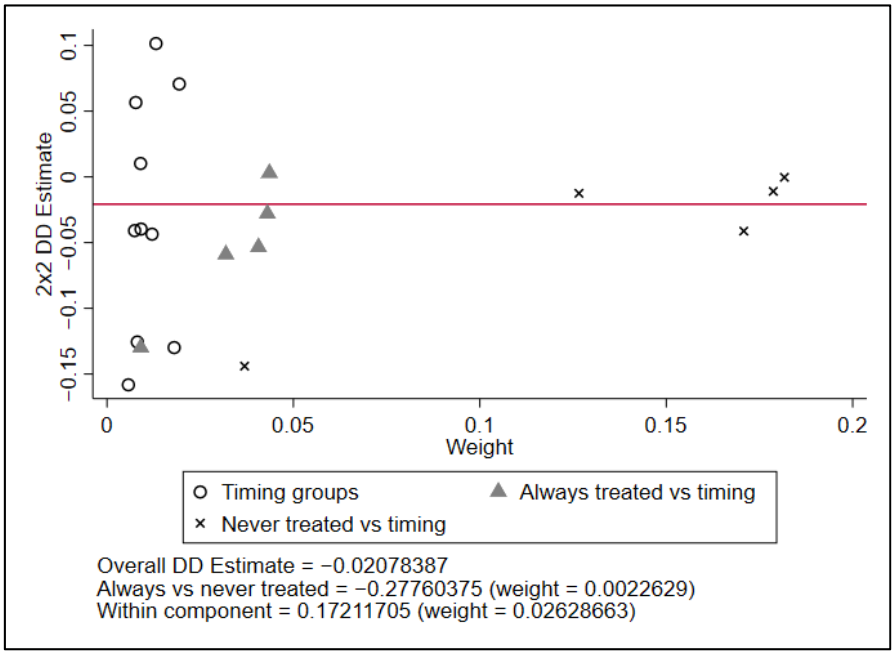

Figure A4. Goodman-Bacon Decomposition: the growth rate of GDP. This figure plots weights and point estimates for each 2 × 2 DD comparison. Estimates are from regressing the growth rate of GDP on the dz indicator with county and year FE. As seen, the negative effect of development zones is driven by the "Never vs Timing" effect, which is consistent with Table 6.

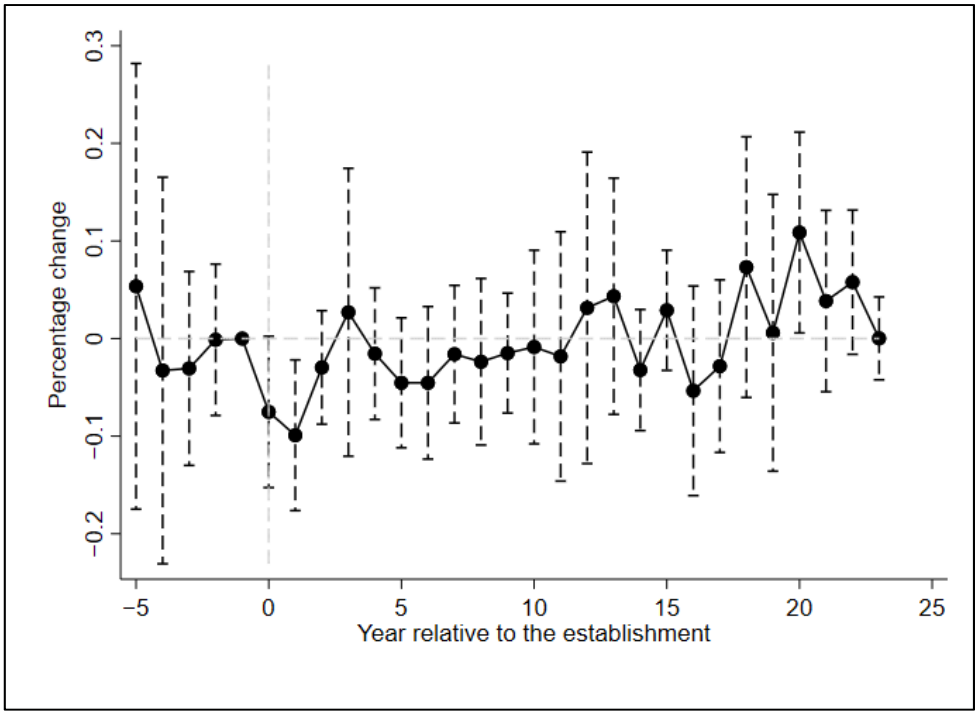

Figure A5. The impact of development zones on local economic growth (gdpg) based on the Interaction-Weighted (IW) estimations. The figure shows a significant negative effect of development zones on local economic growth at 5% significant level.

Appendix B

Table A1. The growth rate of GDP and the number of development zones for every county in 2017.

County	Code	The Growth Rate of GDP	Number of DZs	County	Code	The Growth Rate of GDP	Number of DZs
Tieshangang	TSG	0.425076	2	Gangnan	GN	0.098121	
Jingxi	JX	0.337332		Gangkou	GK	0.09755	1
Longxu	LX	0.270238	1	Jiangnan	JN	0.095381	2
Youjiang	YJ	0.252411		Zhongshan	ZS	0.093141	1
Pingguo	PG	0.240019	1	Ziyuan	ZY	0.090344	
Fusui	FS	0.202294	1	Guiping	GP	0.090013	1
Debao	DB	0.201307		Jincheng	JC	0.087351	1
Mengshan	MS	0.198981		Lingyun	LY_1	0.087171	
Jiangzhou	JZ	0.19347	1	Tiandeng	TD	0.085527	
Qintan	QT	0.192734	1	Lingshan	LS_2	0.085347	1
Tianyang	TY	0.18784	2	Xixiangtang	XXT	0.084854	1
Tiane	TE	0.181331		Diecai	DC	0.084126	
Yongning	YN	0.176484		Yongfu	YF	0.083107	1
Tianlin	TL	0.165682		Sanjiang	SJ	0.082886	
Rongshui	RS	0.165097		Wuming	WM	0.081555	1
Pubei	PB	0.163572	1	Yizhou	YC	0.080836	1
Ningming	NM	0.162273		Longsheng	LS_1	0.080776	
Daxin	DX	0.158333		Yangshuo	YS	0.079895	
Luzhai	LZ	0.156996	1	Duan	DA	0.079419	
Longzhou	LZ	0.151938		Qingxiu	QX_1	0.079357	1
Longlin	LL	0.147368		Binyang	BY	0.077135	1
Yinhai	YH	0.145878		Mashan	MS	0.075996	
Pingxiang	PX	0.144396	2	Xincheng	XC	0.075295	
Wanxiu	WX	0.144315	1	Donglan	DL	0.074014	
Haicheng	HC	0.14341	4	Chengzhognqu	CZQ	0.071381	
Pinggui	PG	0.142436	1	Xiangshan	XS	0.06956	
Tengxian	TX	0.140462	1	Beiliu	BL	0.06815	1
Qinnan	QN	0.140325	2	Napo	NP	0.067786	
Qinbei	QB	0.139114	1	Heshan	HS	0.067376	1
Cenxi	CX	0.137748		Fangcheng	FC	0.066509	1
Liujiang	LJ	0.137253	1	Xingye	XY	0.065321	
Bama	BM	0.136572		Shanglin	SL	0.063656	
Liangqing	LQ	0.135349	2	Xilin	XL	0.059808	
Xiangzhou	XZ	0.134297		Fengshan	FS	0.059521	
Nandan	ND	0.131117	1	Fumian	FM	0.052354	
Rongan	RA	0.13054		Luchuan	LC_3	0.048278	
Cangwu	CW	0.128468		Luocheng	LC_4	0.047085	
Gangbei	GB	0.124358	1	Xingning	XN	0.046896	
Tiandong	TD	0.124146	1	Zhaoping	ZP	0.040205	
Huanjiang	HJ	0.119645		Liubei	LB	0.031394	2
Yuzhou	YZ	0.115749	1	Fuchuan	FC	0.030603	1
Liucheng	LC_1	0.114529		Shangsi	SC	0.024983	
Rongxian	RX	0.112115	1	Guangyang	GY	0.024807	1
Wuxuan	WX	0.111346		Lipu	LP	0.021119	
Pingnan	PN	0.110353	1	Bobai	BB_1	0.018686	
Xingbin	XB	0.109935	1	Qixing	QX_2	0.008934	1
Hengxian	HX	0.109343	1	Pingle	PL	0.007715	1
Liunan	LN	0.108103	1	Dahua	DH	0.005266	
Leye	LY_2	0.106996		Yanshan	YS	−0.0062	
Longan	LA	0.106768		Changzhou	CZ	−0.02763	1
Yufeng	YF	0.104716	1	Quanzhou	QZ	−0.03843	1
Jinxiu	JX	0.103306		Babu	BB_2	−0.04505	1
Gongcheng	GC	0.101428		Xingan	XA	−0.10745	
Hepu	HP	0.10115	2	Lingchuan	LC_2	−0.12568	1
Dongxing	DX	0.100418	1	Lingui	LG	−0.31521	1

Note: We listed all counties in descending order of the growth rate of GDP.

References

1. China Development Zone Audit Bulletin Directory, 2006 (CDZABD, 2006). China Development and Reform Commission Website, Beijing; 2006. Available online: http://www.gov.cn/zwgk/2007-04/06/content_574049.htm (accessed on 1 August 2022).
2. China Development Zone Audit Bulletin Directory, 2018 (CDZABD, 2018). China Development and Reform Commission Website, Beijing; 2018. Available online: http://www.gov.cn/zhengce/zhengceku/2018-12/31/content_5434045.htm (accessed on 1 August 2022).
3. Zeng, D.Z. *Building Engines for Growth and Competitiveness in China: Experience with Special Economic Zones and Industrial Clusters*; World Bank Publications: Washington, DC, USA, 2010.
4. Yang, L.; Luo, X.; Ding, Z.; Liu, X.; Gu, Z. Restructuring for Growth in Development Zones, China: A Systematic Literature and Policy Review (1984–2022). *Land* **2022**, *11*, 972. [CrossRef]
5. Romyen, A.; Liu, J.; Sriboonchitta, S.; Cherdchom, P.; Prommee, P. Assessing regional economic performance in the southern Thailand special economic zone using a Vine-COPAR model. *Economies* **2019**, *7*, 30. [CrossRef]
6. Ge, W. Special economic zones and the opening of the Chinese economy: Some lessons for economic liberalization. *World Dev.* **1999**, *27*, 1267–1285. [CrossRef]
7. Zhang, J. From Hong Kong's capitalist fundamentals to Singapore's authoritarian governance: The policy mobility of neo-liberalising Shenzhen, China. *Urban Stud.* **2012**, *49*, 2853–2871. [CrossRef]
8. Berdina, M.; Berdin, A. SEZ in Africa: Causes of the crisis and development potential. In Proceedings of the VIII International Scientific and Practical Conference "Current Problems of Social and Labour Relations" (ISPC-CPSLR 2020), Makhachkala, Russia, 17–18 December 2020; Atlantis Press: Paris, France, 2020; pp. 112–117. [CrossRef]
9. Madani, D. *A Review of the Role and Impact of Export Processing Zones*; World Bank Policy Research Working Paper: Washington, DC, USA, 2003; p. 2239.
10. Kaplinsky, R. Export processing zones in the Dominican Republic: Transforming manufactures into commodities. *World Dev.* **1993**, *21*, 1851–1865. [CrossRef]
11. Alder, S.; Shao, L.; Zilibotti, F. Economic reforms and industrial policy in a panel of Chinese cities. *J. Econ. Growth* **2016**, *21*, 305–349. [CrossRef]
12. Mwansa, S.; Shaikh, J.; Mubanga, P. Special economic zones: An evaluation of Lusaka south-multi facility economic zone. *J. Soc. Polit. Sci.* **2020**, *3*, 523–539. [CrossRef]
13. Liu, W.; Shi, H.-B.; Zhang, Z.; Tsai, S.-B.; Zhai, Y.; Chen, Q.; Wang, J. The Development Evaluation of Economic Zones in China. *Int. J. Environ. Res. Public Health* **2018**, *15*, 56. [CrossRef]
14. Wang, Y.J.; Zhang, G.F. Sources of productivity advantages of special economic zones: Agglomeration effect or selection effect? *Econ. Res. J.* **2016**, *51*, 58–71.
15. Zeng, D.Z. *Global Experiences with Special Economic Zones: Focus on China and Africa*; World Bank Policy Research Working Paper: Washington, DC, USA, 2015; Volume 4, p. 7240. Available online: https://ssrn.com/abstract=2594576 (accessed on 3 June 2021).
16. López-Bazo, E.; Vayá, E.; Artís, M. Regional externalities and growth: Evidence from European regions. *J. Reg. Sci.* **2004**, *44*, 43–73. [CrossRef]
17. Lu, Y.; Wang, J.; Zhu, L. Place-based policies, creation, and agglomeration economies: Evidence from China's economic zone program. *Am. Econ. J.-Econ. Policy* **2019**, *11*, 325–360. [CrossRef]
18. Bai, X.J.; Yan, W.K.; Chiu, Y.H. Performance evaluation of China's Hi-tech zones in the post financial crisis era—Analysis based on the dynamic network SBM model. *China Econ. Rev.* **2015**, *34*, 122–134. [CrossRef]
19. Zheng, J.H.; Gao, Y.Y.; Hu, X.W. Firm concentration, technology promotion and economic performance: An empirical study on the cluster effects in China. *Econ. Res. J.* **2008**, *5*, 33–46. Available online: https://mpra.ub.uni-muenchen.de/8917/ (accessed on 17 June 2021).
20. Melitz, M.J.; Ottaviano, G.I. Market size, trade, and productivity. *Rev. Econ. Stud.* **2008**, *75*, 295–316. [CrossRef]
21. Parwez, S. Enterprising SEZ enclaves and economic development in India. *J. Int. Bus. Econ.* **2018**, *19*, 1–33. [CrossRef]
22. Dutta, M. Nokia SEZ: Public price of success. *Econ. Polit. Wkly.* **2009**, *44*, 23–25. Available online: http://www.jstor.org/stable/25663651 (accessed on 26 March 2022).
23. Zheng, G.; Zhang, Y.J. The transition of national-level development zones in view of factor succession. *Econ. Geogr.* **2014**, *34*, 114–118. [CrossRef]
24. Xiang, K.H.; Lu, M. Speed versus quality: Why regional dispersion tendency of development zone policy is not sustainable? *J. Financ. Econ.* **2015**, *41*, 4–17. [CrossRef]
25. Zheng, G.; Barbieri, E.; Di Tommaso, M.R.; Zhang, L. Development zones and local economic growth: Zooming in on the Chinese case. *China Econ. Rev.* **2016**, *4*, 238–249. [CrossRef]
26. Cotula, L.; Mouan, L. *Special Economic Zones: Development Engines or Sites of Exploitation?* Briefing note (IIED Briefing Papers); International Institute for Environment and Development: London, UK, 2018; 4p.
27. Giannecchini, P.; Taylor, I. The eastern industrial zone in Ethiopia: Catalyst for development? *Geoforum* **2018**, *88*, 28–35. [CrossRef]
28. Ahmed, W.; Tan, Q.; Solangi, Y.A.; Ali, S. Sustainable and special economic zone selection under fuzzy environment: A case of Pakistan. *Symmetry* **2020**, *12*, 242. [CrossRef]
29. Pinto, P.M.; Zhu, B.L. Fortune or evil? The effect of inward foreign direct investment on corruption. *Int. Stud. Q.* **2016**, *60*, 693–705. [CrossRef]

30. Alkon, M. Do special economic zones induce developmental spillovers? Evidence from India's states. *World Dev.* **2018**, *107*, 396–409. [CrossRef]
31. Oi, J.C. Fiscal reform and the economic foundations of local state corporatism in China. *World Polit.* **1992**, *45*, 99–126. [CrossRef]
32. Naughton, B. *Growing Out of the Plan: Chinese Economic Reform, 1978–1993*; Cambridge University Press: New York, NY, USA, 1996.
33. Cheung, S.N.S. The economic system of China. *Man Econ.* **2014**, *1*, 1–49. [CrossRef]
34. Gopalakrishnan, S. Negative aspects of special economic zones in China. *Econ. Polit. Wkly.* **2007**, *42*, 1492–1494. Available online: http://www.jstor.org/stable/4419511 (accessed on 17 June 2021).
35. Cheng, L.K.; Kwan, Y.K. What are the determinants of the location of foreign direct investment? The Chinese experience. *J. Inter. Econ.* **2000**, *51*, 379–400. [CrossRef]
36. Hu, Y.; Han, Y. Identification of Urban Functional Areas Based on POI Data: A Case Study of the Guangzhou Economic and Technological Development Zone. *Sustainability* **2019**, *11*, 1385. [CrossRef]
37. Fagerberg, J.; Srholec, M.; Verspagen, B. The role of innovation in development. *Rev. Econ. Inst.* **2010**, *1*, 2–29. [CrossRef]
38. Lu, X.H.; Chen, D.L.; Kuang, B.; Zhang, C.Z.; Cheng, C. Is high-tech zone a policy trap or a growth drive? Insights from the perspective of urban land use efficiency. *Land Use Policy* **2020**, *6*, 104583. [CrossRef]
39. Crane, B.; Albrecht, C.; Duffin, M.K.; Albrecht, C. China's special economic zones: An analysis of policy to reduce regional disparities. *Reg. Stud. Reg. Sci.* **2018**, *5*, 98–107. [CrossRef]
40. Zhang, Q.; Zou, H.F. Regional inequality in contemporary China. *Ann. Econ. Financ.* **2012**, *13*, 113–137. Available online: https://www.proquest.com/scholarly-journals/regional-inequality-contemporary-china/docview/2226745947/se-2 (accessed on 5 June 2021).
41. Duranton, G. California dreamin': The feeble case for cluster policies. *Rev. Econ. Anal.* **2011**, *3*, 3–45. Available online: https://repository.upenn.edu/real-estate_papers/2 (accessed on 23 June 2021).
42. Dai, X.Y.; Cheng, L.W. Market distortions and aggregate productivity: Evidence from Chinese energy enterprises. *Energy Policy* **2016**, *95*, 304–313. [CrossRef]
43. Brussevich, M. *The Socio-Economic Impact of Special Economic Zones: Evidence from Cambodia*; IMF Working Paper No. 20/170; IMF: Washington, DC, USA, 2020; Available online: https://ssrn.com/abstract=3721194 (accessed on 5 June 2021).
44. Bräutigam, D.; Tang, X.Y. China's investment in special economic zones in Africa. In *Special Economic Zones: Progress, Emerging Challenges, and Future Directions*; Farole, T., Akinci, G., Eds.; The International Bank for Reconstruction and Development, The World Bank: Washington, DC, USA, 2011; pp. 69–100.
45. Chen, J.J.; Feng, H.; Zhou, H. Local industrial policy and productivity: Evidence from China. *Contemp. Econ. Policy* **2022**, *40*, 138–161. [CrossRef]
46. Li, M.N.; Pan, X.F.; Yuan, S. Do the national industrial relocation demonstration zones have higher regional energy efficiency? *Appl. Energy* **2022**, *306*, 117914. [CrossRef]
47. Huang, D.C.; Van, V.T.; Hossain, M.E.; He, Z.Q. Shanghai pilot free trade zone and its effect on economic growth: A counter-factual approach. *Open J. Soc. Sci.* **2017**, *5*, 73–91. [CrossRef]
48. Wang, J. The economic impact of special economic zones: Evidence from Chinese municipalities. *J. Dev. Econ.* **2013**, *101*, 133–147. [CrossRef]
49. The Guangxi Statistical Yearbook (GSY) (2007–2018). China Statistic Press: Beijing, China, 2006–2018. Available online: https://navi.cnki.net/knavi/yearbooks/YLOEM/detail?uniplatform=NZKPT (accessed on 7 August 2022).
50. Beck, T.; Levine, R.; Levkov, A. Big Bad Banks? The winners and losers from bank deregulation in the United States. *J. Financ.* **2010**, *65*, 1637–1667. [CrossRef]
51. Mankiw, N.G.; Romer, D.; Weil, D.N. A contribution to the empirics of economic growth. *Q. J. Econ.* **1992**, *107*, 407–437. [CrossRef]
52. Batrancea, L.M. An Econometric Approach on Performance, Assets, and Liabilities in a Sample of Banks from Europe, Israel, United States of America, and Canada. *Mathematics* **2021**, *9*, 3178. [CrossRef]
53. Batrancea, L. The Influence of Liquidity and Solvency on Performance within the Healthcare Industry: Evidence from Publicly Listed Companies. *Mathematics* **2021**, *9*, 2231. [CrossRef]
54. Kroszner, R.S.; Strahan, P.E. What drives deregulation? economics and politics of the relaxation of bank branching restriction. *Q. J. Econ.* **1999**, *114*, 1437–1467. [CrossRef]
55. Goodman-Bacon, A. Difference-in-differences with variation in treatment timing. *J. Econom.* **2021**, *225*, 254–277. [CrossRef]
56. De Chaisemartin, C.; d'Haultfoeuille, X. Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects. *Am. Econ. Rev.* **2020**, *110*, 2964–2996. [CrossRef]
57. Sun, L.Y.; Sarah, A. Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *J. Econom.* **2021**, *225*, 175–199. [CrossRef]
58. Guo, Y.Y.; Xi, S.J.; Zhang, M.D. Provincial division of economic zones based on the improved urban gravity model: A case study of Hunan Province, China. *PLoS ONE* **2021**, *16*, e0261205. [CrossRef]
59. Guo, F.; Xiong, R.X. Local financial institutions and regional economic growth: A Quasi-natural experiment of city commercial banks in China. *Q. J. Econ.* **2018**, *16*, 221–246. [CrossRef]