“Takeover” and “Activation” Effects of National Strategies for Industrial Relocation—Based on the Perspective of Marketisation of Land Elements

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Abstract: National Industrial Relocation Demonstration Zones (NIRDZs) are essential platforms for promoting regional economic restructuring and optimising inter-regional economic relations. Based on panel data of 287 prefecture-level cities in China and over 200,000 industrial land transactions from 2007–2019, this study conducts an empirical test using multi-temporal DID, propensity score matching, and instrumental variable methods to examine the relationship between NIRDZs and the marketisation of industrial land elements. The results show that the establishment of NIRDZs has a significant inhibitory effect on the market allocation of industrial land elements, and the conclusion still holds after a series of robustness tests. Further exploration reveals that the inhibiting effect of NIRDZs on the marketization of industrial land factors is the result of the combined effect of the takeover effect and activation effect of policies. The takeover effect of “promising government” has “low-end industry lock”, which inhibits the development of factor marketisation; the activation effect can stimulate the inner life of “effective market”, which can promote the marketisation of factors market-oriented allocation. The activation effect is to promote the market-based allocation of urban industrial land by activating three aspects: the level of market environment, the level of market operation, and the level of market access in the pilot cities. The analysis of the regulation effect shows that there is a vertical financial asymmetry and a vertical fiscal asymmetry in the inhibiting effect of NIRDZs on the market-oriented allocation of industrial land. Different levels of urban economic development also bring about different policy effects. This study broadens the understanding of heterogeneous development thinking and market-based management structures for industrial land elements in NIRDZs.

Keywords: National Industrial Relocation Demonstration Zones (NIRDZs); the marketisation of industrial land; multi-temporal DID; activation effect; takeover effect

1. Introduction

In recent decades, the prices of production factors such as land, labour, and raw materials in coastal areas have continued to rise, increasing the pressure on industrial development [1]. Because the central and western regions are rich in resources at a low cost, the region urgently requires industrial investment-driven development with increased infrastructural upgrading [2,3]. To address the imbalance in regional growth, the government should actively encourage industrial firms to relocate to underdeveloped regions [4–6]. In order to promote the economic development of the central and western regions and alleviate the problem of unbalanced regional economic development, China has put forward the strategies of Western Development and Central Rise since 1999 [7]. The National Industrial Relocation Demonstration Zones (NIRDZs) attempt to explore a new path to scientifically undertake industrial transfer and balance the spatial structure of the domestic economy [8]. The Wanjiang River City Belt Demonstration Zone, the first national demonstration zone...
for industrial transfer, was authorized and established in 2010. As of July 2019, 11 demonstration zones have been established in China, covering 31 cities (autonomous regions) in 12 provinces (municipalities and autonomous regions).

As a spatial carrier to undertake industrial transfer, industrial land is also an essential element to support and guarantee the coordinated development of the region [9]. This element plays a pivotal role in the adjustment of industrial structure and the development of regional economy [10,11]. However, unlike commercial and residential land, the market for industrial land is characterized by “high volume and low price”, and the value of industrial land resources cannot be fully realized through market prices [12]. According to the data from China Land Market Network, from 2007 to 2019, the area and premium of industrial land concessions in China accounted for 27.01% and 8.66%, respectively, while the area and premium of commercial and residential land concessions accounted for 16.18% and 66.94% respectively. Local governments have been enticing investors by offering industrial land for cheap, zero, or even negative (including infrastructure support subsidies) land prices while leasing commercial and residential land at high prices to collect land value [13–15].

NIRDZs are established to optimise the layout of regional industrial chains, the essence of which is to promote the optimal reallocation of production factors [16–18]. However, the scarcity of land elements cannot serve as a price signal to reasonably regulate the allocation of industrial land elements, leading to an over-reliance on “cheap” industrial land resources for regional development [13,19]. This situation violates the market economy’s laws and tends to cause industrial homogenisation in many cities, leading to generally low industrial land use efficiency [9,19,20]. Therefore, the market should be allowed to play a decisive role in the allocation of industrial land in order to better leverage the role of the government and achieve maximum effectiveness and optimal efficiency in allocating industrial land resources [21]. Promoting the market-oriented allocation of industrial land elements is one of the most urgent issues [22]. We are interested in whether the establishment of NIRDZs can facilitate the market allocation of factors for industrial land. What are the channels and mechanisms that can promote the marketisation of industrial land? Are NIRDZs at different economic levels consistent in terms of the impact of marketisation? Answering this question has practical implications for promoting the optimization of national industrial transfer and coordinated regional development.

The research on industrial transfer has attracted the attention of many scholars, and many theories have been derived, such as the flying geese paradigm [23], the product life cycle [24], and the marginal industrial expansion [25]. This paper scours the pertinent literature for an assessment of the impacts of industrial transfer. More studies have focused on the economic growth effects, energy and environmental effects, and industrial upgrading effects of industrial transfer. Some scholars argue that industrial transfer can promote economic and employment growth [26]; promote industrial upgrading [8]; reduce energy consumption intensity [27]; improve air quality [28], etc. However, according to some academics, industrial transfer will also have gradient trapping and industrial upgrading delaying effects [29], exacerbating regional environmental pollution [30] and lowering the overall factor productivity of the undertaking regions [2].

Regarding the factors affecting the market allocation of industrial land factors, scholars have mainly examined their influence on the market allocation of industrial land factors from the perspective of promotion incentives and the financial pressure of local officials [31,32]. In contrast, the literature has shown that the level of infrastructure construction, population growth, economic development, and land resource endowment has an essential influence on the market allocation of industrial land factors [33–36]. Unlike developed countries’ market-based land distribution systems, China implements the land public ownership system [37]. Local governments monopolise the primary land market and can selectively implement land management policies authorised by the central government and make land transfer decisions based on their interests [38–41]. According to some academics, local governments’ promotion of urbanisation and industrialisation has resulted
in a massive, low-priced industrial land supply [10,42,43]. This conduct violates the laws of the market economy and tends to contribute to industrial homogenisation in many cities, resulting in generally inefficient industrial land use [20,44]. As China’s economy develops, local governments must decide how to use government intervention and market forces to effectively ease fiscal pressures [45].

Due to the short period since the establishment of NIRDZs, the existing literature still lacks a direct policy evaluation of the impact of the establishment of demonstration zones on the market-oriented allocation of industrial land. This paper’s main possible marginal contributions are a more comprehensive investigation of the impact and mechanism of establishing NIRDZs on the marketisation of industrial land factors. For the first time, the “active government” and “efficient market” of a market economy with Chinese characteristics are included in the analysis framework of the impact of NIRDZs on the marketisation of industrial land. Secondly, using micro-transaction plot data from the Urban Land Market Network makes this study more intuitive and precise. As micro-land transaction prices are variables that can be directly incorporated into firms’ cost functions and influence their business decisions, these data can most directly reflect market signals. Thirdly, the potential endogeneity is overcome by using a multi-temporal double-difference method, and thus the policy effects of NIRDZs can be assessed. To a certain extent, it compensates for the lack of research on the policy due to the relatively short period since the establishment of NIRDZs. Fourthly, the policy effects of NIRDZs are decomposed into the takeover and activation effects, and the dominant effect is discussed in detail. Given the activation effect, it is essential to explore the mechanism of the role of demonstration zones and the regional heterogeneity of this role, which will have important implications for the national transformation of the development orientation of NIRDZs and the local adjustment of development thinking.

2. Mechanism Analysis and Research Hypothesis

2.1. Research Framework

In exploring the market-based allocation of industrial land in NIRDZs, the takeover effect and the activation effect may be the main influences [46]. The takeover effect of the promising government and the activation role of the efficient market may be affected by multiple influences simultaneously and may have complex interactions. This highlights the value of decomposing each path of the takeover role and activation role of demonstration zones.

In the process of land resource allocation, local governments should give full play to the role of macro-control, compensate for market failure and improve public service guarantee, and act as a “promising government” [47,48]. In order to attract the target industries to move to the demonstration zones, local governments have formulated supporting preferential policies, such as tax incentives, credit subsidies, flexible land prices, etc., expecting to guarantee and strengthen the policy effects of the demonstration zones through the behaviour of non-market forces [8,49]. This behaviour leads to the existence of immediate effect of the cross-regional flow of production factors of low-end industries [50], thus leading to a “takeover effect”, which keeps the manufacturing structure in the central and western regions in a “low-end locked state” [51].

The local government plays both the role of “athlete” and “referee” [52]. This behaviour ignores the decisive role of the law of value, competition, supply and demand, and other market economic laws on the allocation of industrial land elements, resulting in many problems, such as over-exploitation of industrial land resources and sloppy and inefficient utilization [10,42,53]. Therefore, the establishment of an “effective market” should be the core value orientation of the market-oriented reform of land elements to clarify property rights and promote the integration and build a perfect land element market system [10,54].

In order to achieve the policy goal of undertaking industrial transfer, local governments in central and western regions are gradually improving the hard environment construction, such as infrastructure level, and soft environment construction, such as in-
creasing investment in science and technology \[2,8\]. At the same time, it promotes the flow and reconfiguration of production factors between regions and industries in the region \[55\]. The “activation effect” of NIRDZs further strengthens the concentration of manufacturing industries and industrial upgrading.

Based on the above analysis, we argue that the activation effect and the takeover effect of NIRDZs jointly influence the market-based allocation of industrial land. Figure 1 provides the decomposition framework and shows the influence mechanism of the activation effect.

![General logic diagram](image)

**Figure 1.** General logic diagram.

### 2.2. Research Hypothesis

Compared with other economic factors, such as capital and labour, the immovability of land factors determines that they are more vulnerable to administrative allocation by the government \[56\]. Establishing industrial transfer demonstration zones is an important policy tool to accelerate the free flow of economic factors across regions. In order to promote investment attraction and bridge the development gap in the demonstration zones, local governments in the demonstration zones face more significant incentives for “promotion tournaments” and pressure for performance evaluation, not only to ensure economic growth rate but also to seek higher ranking than their “peers”. Therefore, they are strongly incentivised to seek land financing \[57–59\]. Given the limited financial resources of local governments, establishing industrial transfer demonstration zones will become an important policy tool for the region to promote investment attraction and bridge the development gap. The government will attract investment and achieve industrial scale expansion through preferential policies in industrial land supply. In contrast, industrial enterprises will be attracted by preferential policies on industrial land in the demonstration zones, promoting rapid and sustained regional economic growth \[60\]. Based on the incentive of “promotion tournament” and the pressure of performance assessment, governments at all levels have increased their intervention in the process of industrial land granting, either by granting industrial land at low prices as the primary means of attracting investment or by artificially setting the conditions of granting in the “auction and listing” \[52\]. This inhibits the role of market mechanisms in industrial land transfer. This also inhibits the regular operation of the market mechanism in the market allocation of industrial land elements, which leads to the fact that the price of industrial land cannot truly reflect the actual value of the land, and the competitive influence of the “auction and listing” system on the land price of industrial land does not achieve the expected effect. Therefore, the establishment of industrial transfer demonstration zones will affect the competitiveness of the industrial land market; restrict the development of the industrial land market; cause distortion of the
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market allocation mechanism, market order and other problems; and hinder the market allocation process of industrial land factors. Accordingly, this paper proposes:

**Hypothesis 1.** Establishing industrial transfer demonstration zones will inhibit the market-oriented allocation of urban industrial land elements.

Looking back at the development of land marketisation in China, it is a gradual process driven from top to bottom by the central government [46,61]. Therefore there are significant differences in the degree of implementation of land marketisation requirements by local governments across the country, which provides a rich basis for the differentiated analysis of industrial land marketisation [62]. Spatial variation in land marketisation can be influenced by the degree of openness, local governments’ industrial policies relative to commercial and residential land supply, population density, and city size [63]. Land grants are controlled by local governments rather than the central government, so local governments with large fiscal deficits make up the deficit through central government transfers and land fees, which is the most common way for local governments in China to increase their fiscal revenues [64]. For economically developed regions, such as the southeast coast, where fiscal deficits are small or even fiscal surpluses, governments have less incentive to make up fiscal deficits [65]. Administrative boundaries, administrative barriers, and administrative divisions among Chinese cities also restrict the market allocation of industrial land elements and inhibit the effective division of labour and collaboration among cities. The pattern of market-oriented allocation of industrial land factors shows obvious unevenness, and this variability may primarily affect the policy effect of establishing industrial transfer demonstration zones on the market-oriented allocation of industrial land factors [52]. In addition, the differences in the level of economic development among cities cause the implementation of industrial land policies to differ between cities, further leading to the problems of imperfect collaboration mechanisms and the low market allocation of industrial land elements among cities. Under this circumstance, it is difficult to reflect the real value of industrial land under NIRDZs in the price of industrial land concessions.

**Hypothesis 2.** Compared with cities in non-demonstration zones, NIRDZs have a more effective deterrent effect and reliable influence on the marketisation of industrial land in industrial transfer demonstration area cities in terms of urban transfer payment dependence and economic development level.

The influence of industrial transfer demonstration zones on the market-oriented allocation of industrial land is the result of the combined influence of administrative intervention and marketisation. As an important strategy to optimise the layout of regional industrial chains and drive high-quality economic development in the central and western regions, the demonstration zones are mainly used to undertake the industrial transfer from the eastern region through the administrative intervention of local governments. This strategy not only involves the actions of local governments in the eastern, central, and western regions but also activates the market in the central and western regions, expanding the market scale and gathering demand for industrial land. That is, the demonstration zones have an activating and undertaking effect, which together determine the formation and improvement of “effective markets” and “competent governments” in the demonstration zones. Scholars have argued that the government is the source of distortion of China’s marketisation process [66], and that land development across China has become a profitable business opportunity for local governments [67]. However, the government in place includes the central government, which has macro-governance solid capabilities, and the local governments compete to compensate for market imperfections and stabilise the market order. Establishing national-level demonstration zones for industrial transfer is a regional development strategy to enhance China’s common economic growth, driven by the high centralised power of the central government and the high discretionary power of local governments. To limit rent-seeking opportunities for local governments, China’s central
government has strongly urged local governments to adopt market-led transactions since 2000 [68]. With policy incentives, local governments in industrial transfer demonstration zones use financial and promotional incentives to subsidise industrial land to attract more investment. Such administrative intervention can make the actual price of industrial land much lower than the market value, which is not conducive to the market-based allocation of industrial land and leads to a mismatch of land resources [69]. The following hypothesis was then formulated:

Hypothesis 3a. (Mechanism analysis hypothesis) The national coordinated regional development strategy promotes the market allocation of industrial land in industrial transfer demonstration zones by activating the “effective market”.

Hypothesis 3b. (Mechanism analysis hypothesis) The national coordinated regional development strategy inhibits the role of the “active government” to take over, thus inhibiting the market allocation of industrial land in the industrial transfer demonstration zones.

3. Methodology

3.1. Policy Background and Pilot Cities

Since China’s reform and opening up, the eastern region has been actively undertaking international industrial transfers with the help of many comprehensive favourable factors. With the increasing concentration of factors, the Yangtze River Delta, the Pearl River Delta, and the Bohai Sea region have become growth poles, and their congestion effects have gradually emerged. Especially after the international financial crisis, the prices of production factors, such as land, labour, and raw materials are rising, and the pressure on environmental management and economic development is increasing [2,8]. The eastern region urgently needs to promote the transformation and upgrading of industrial structure and accelerate industrial transfer. At the same time, the central and western regions have relatively low factor costs, more significant market potential, improving infrastructure, and relative increasing competitiveness in industrial development. Based on this, the eastern regions are gradually making large-scale industrial transfers to the central and western regions, with manufacturing as the industrial transfer’s mainstay. At this time, the central government began to pay real attention to regional industrial transfer and the phenomenon underpinning it. It elevated the undertaking of industrial transfer to the level of national development strategy.

In January 2010, the Wanjiang City Belt Demonstration Zone for Undertaking Industrial Transfer was approved for the establishment, becoming the first national demonstration zone for undertaking the industrial transfer. Subsequently, 10 national-level demonstration zones for undertaking industrial transfer involving 31 cities (autonomous regions) in 12 provinces (municipalities and autonomous regions), such as Guidong in Guangxi, Yanjiang in Chongqing, Xiangnan in Hunan, and Jingzhou in Hubei, were approved one after another, with the Xiangnan-Xiangxi demonstration zone approved in November 2018, being built on the basis of the Xiangnan demonstration zone that was established in October 2012. Due to data limitations, 2007–2019 was chosen as the study period in this paper; the city sample is 287 cities (the Tibet Autonomous Region is excluded due to the lack of some critical data), of which 26 cities in the demonstration area are the experimental group and the remaining cities are the control group. The cities included in each NIRDZs and when they were established are as follows (Table 1):
Table 1. Description of NIRDZs and their covered cities.

| Name of NIRDZ                  | Established Time | Included Cities (Districts, Counties)                                                                 |
|--------------------------------|------------------|-----------------------------------------------------------------------------------------------------|
| Wanjiang City Belt             | January 2009     | Hefei, Wuhu, Maanshan, Tongling, Anqing, Chizhou, Chaohu, Chuzhou, Xuancheng, Liuan;                |
| Guidong, Guangxi               | October 2010     | Wuzhou, Guigang, Hezhou, Yulin;                                                                      |
| Chongqing Yanjiang             | January 2011     | Fuling, Banan, Jiulongpo, Bishan, Yongchuan, Shuangqiao, Rongchang;                                  |
| Southern Hunan                 | October 2011     | Hengyang, Chenzhou, Yongzhou;                                                                       |
| Jingzhou Area                  | December 2011    | Jingzhou, Jingmen, Xiantao, Qianjiang, Tianmen;                                                      |
| Yellow River Golden Triangle   | May 2012         | Yuncheng, Linfen, Weinan, Sanmenxia;                                                                 |

3.2. Data
3.2.1. Measurement of Variables

The degree of market allocation of industrial land factors in cities (MAIL\_it) is the explanatory variable in this paper. The most common methods for land marketisation are the direct calculation method and the weighting method [70,71]. The market development of land was measured based on the structure of land transfer methods, i.e., the marketisation level is determined according to the supply area or price composition of different land transfer methods (allocation, agreement, “tender, auction, and listing”) [71]. However, this approach only considers the formal “marketisation” of land resource transactions, which does not truly reflect the degree of realisation of the reasonable value of land. Based on the regionality and scarcity of land resources, the price of industrial land and the cost of industrial land both show large spatial differences. Using the premium rate of industrial land (the ratio of the price of industrial land to the cost price) can eliminate the heterogeneity of regional prices to a certain extent. Therefore, this paper uses the ratio of the actual industrial land transfer price and the minimum transfer price of micro-plots to measure the market-oriented allocation of regional industrial land factors.

\[
MAIL_{iNt} = \frac{P_{iNt}}{P_{C_{iNt}}} / P_{C_{iNt}}
\]  

\[
MAIL_{it} = \frac{15}{\sum_{N=1}^{N}} \frac{A_{iNt}}{A_{it}} \times MAIL_{iNt} \tag{2}
\]

MAIL\_iNt denotes the degree of market allocation of N-class industrial land in city i in year t. MAIL\_it denotes the degree of market allocation in year t for industrial land in city i; P\_iNt and P\_C\_iNt are the amount and cost price of industrial land in year t for industrial land in city i, respectively; A\_iNt is the area of industrial land in year t for industrial land in city i, and A\_it is the total area of industrial land in year t for industrial land in city i at the premium rate. The CPI deflator is required for the minimum land price standard to be explained in the calculation process. In order to ensure that the marketed level of industrial land is in the (0, 100) range, we have normalised the marketed level of industrial land.

3.2.2. Control Variables

After referring to relevant studies by scholars, the following city-level variables have been selected as control variables in this paper [72]. The economic development level (Ln{gdp}), industrial structure level (Ais), government fiscal pressure (Gov), land resource endowment (Pland), infrastructure development effort (Fi), financing environment (Fe), and average employee wage (Psalary). In addition, this study uses covariance tests to prevent multivariate covariance among the control variables. The results show that the
difference inflation factor (VIF) of all control variables is less than 1.5, indicating that the model has no significant cointegration. Variable definitions and descriptive statistics are shown in Table 2.

Table 2. Definitions and descriptive statistics.

Panel A: Definition of Key Variables

| Symbols | Variable Definition |
|---------|---------------------|
| MAIL<sub>t</sub> | Marketability of industrial land | The price premium rate of industrial land after the weighted correction of the disposal method |
| Lnlgdp | Economic development | Natural logarithm of GDP per land |
| Ais | Industrial structure | Tertiary sector output/Secondary sector output |
| Gov | Financial pressures | Budgeted fiscal expenditure/regional GDP |
| Pland | Land resource endowment | Built up area per capita (km²) |
| Fi | Infrastructure | Road area per capita (km²) |
| Fe | Financing environment | Balance of all loans to financial institutions/Regional GDP |
| Psalary | Average wage of employees | Average wage per employee (million) |

Panel B: Descriptive Statistics

| Symbols | N | Mean | SD | Min | Max |
|---------|---|------|----|-----|-----|
| MAIL<sub>t</sub> | 3752 | 2.09 | 0.215 | 0 | 3.402 |
| Lnlgdp | 3752 | 10.58 | 1.173 | 9.185 | 12.576 |
| Ais | 3752 | 48.621 | 0.200 | 24.4 | 74.45 |
| Gov | 3752 | 0.178 | 0.066 | 0.064 | 0.402 |
| Pland | 3752 | 0.332 | 1.171 | 0.056 | 1.448 |
| Fi | 3752 | 0.278 | 0.390 | 0.009 | 1.963 |
| Fe | 3752 | 0.879 | 0.141 | 0.307 | 2.576 |
| Psalary | 3752 | 4.593 | 0.145 | 1.73 | 10.33 |

3.2.3. Data Sources and Descriptive Statistics

The data required to measure the level of marketisation of industrial land and the data on local government interventions in the market for industrial land offers are taken from the “Results Announcement” section of the China Land Market website hosted by the Ministry of Land and Resources. Since 1 August 2006, the central government has required local governments to publish all cases of state-owned land supply on the Land and Resources website. We can obtain detailed information on industrial land supply at the municipal level in China, including project location, area, land use, land supply method, transaction price, and contract signing date. After data cleaning, we collected 27,615 industrial land supply cases between 2007 and 2018. Based on the 2007 jurisdictional codes, the data collated by the Land Market Network was combined and aggregated with data from various cities in this paper.

The cost price of industrial land by grade in each region was obtained from the document “National Minimum Price Standard for the Sale of Industrial Land” by the Ministry of Land and Resources. Data for other variables are obtained from the China Urban Statistical Yearbook, the China Statistical Yearbook of Land and Resources, and statistical yearbooks or press releases from various provinces and cities in China. Some missing values were filled in using the average values of the two years before and after. To eliminate the effect of price changes, the variables of GDP, budgetary fiscal expenditure, and the balance of various loans from financial institutions were deflated using the consumer price index for each province as the base period in 2007.

3.3. Model Construction

In order to investigate how the establishment of NIRDZs affects the market allocation of industrial land factors, this paper compares whether differences in the marketisation of industrial land factors occur between the experimental and control groups before and after the establishment of demonstration zones by constructing a double difference model. Since
the demonstration zones were established in batches and the timing of their establishment was not consistent, and the standard double difference method requires the policy shocks to be at the same time. This paper will adopt the asymptotic double-difference method. In this paper, the observations set up as demonstration zones are used as the experimental group and those not set up as demonstration zones are used as the control group, and the regression model is constructed as follows:

\[ MAIL_{it} = \beta_0 + \beta TREAT_i \times POST_{it} + \rho X_{it} + \gamma_t + \mu_i + \epsilon_{it} \]  

(3)

The explanatory variable \( MAIL_{it} \) indicates the level of marketisation of industrial land elements in city \( i \) in year \( t \). \( TREAT_i \times POST_{it} \) is the core explanatory variable and its regression coefficient \( \beta \) is the net effect of the industrial transfer demonstration zone policy, indicating the effect of the policy on the level of marketisation of industrial land factors in the city. \( X_{it} \) denotes the control variable selected to control for the effects of other factors on the marketisation of industrial land. \( \gamma_t, \mu_i \) denote time fixed effects and regional fixed effects, respectively, to capture the effects of unobserved heterogeneity and common shocks. \( \epsilon_{it} \) denotes the random error term, using city-level clustering to adjust for standard errors.

The explanatory variable \( TREAT_i \times POST_{it} \) is the core explanatory variable. The implementation period of the industrial transfer demonstration zones began at the end of 2010, within the study period of this paper, so all prefecture-level cities are assigned values based on the year of establishment. City \( I \) is assigned a value of 1 if it was established as a demonstration zone in year \( T \); otherwise, it is assigned a value of 0.

4. Empirical Analysis

4.1. Basic Regression Analysis

This paper explores the real-world impacts of NIRDZs on the marketisation of urban industrial land. The impact estimates without and with the inclusion of control variables are presented in columns (1) and (2) of Table 3 without controlling for city and time fixed effects. Columns (3) and (4) of Table 3 show the impact estimates after controlling for city and time-fixed effects. The coefficients of the NIRDZs are significantly negative and significant at the 1% level regardless of the inclusion of control variables, suggesting that the implementation of NIRDZs can significantly reduce the marketability of industrial land in the city, testing Hypothesis 1. The possible reason for this is that local governments tend to supply industrial land at low prices and high scales to attract corporate projects and undertake industrial relocation.

This is because local governments tend to supply industrial land at low prices and high scales to attract projects. The increased intervention of the local government in the market for industrial land supply has led to a limited degree of market-determined allocation of industrial land factors.

The estimation results of the control variables based on column (4) found that the estimated coefficients of the level of economic development, industrial structure, fiscal pressure, and the financing environment were all significantly positive. This shows that the higher the level of economic development, the faster the transformation and upgrading of the industrial structure, the greater the financial pressure on the government. The better the financing environment, the more favourable the role of market mechanisms in the market allocation of industrial land factors and the higher the degree of industrial land factors market allocation.

The estimated coefficients of infrastructure construction strength, land resource endowment, and employee salary level are all negative, indicating that they have a certain inhibitory effect on the market-oriented allocation of industrial land factors. The reason for the above may be that the government does not hesitate to borrow money to build infrastructure for the construction of demonstration zones; the increase in the scale of debt will stimulate local governments to increase their intervention in the industrial land transfer market, which will limit the extent to which the market determines the allocation of industrial land elements. However, the estimated coefficient of land resource endowment
failed to pass the significance test, indicating that this negative effect was weak during the study period.

Table 3. Baseline regression results.

| Variable          | MAIL_{it}   | MAIL_{it}   | MAIL_{it}   | MAIL_{it}   |
|-------------------|-------------|-------------|-------------|-------------|
| \( TREAT \times POST \) | -0.5067 *** | -0.3924 *** | -0.5933 *** | -0.4157 *** |
| (TREAT)           | (0.1032)    | (0.0903)    | (0.1032)    | (0.0657)    |
| Lnlgdp_{1}        | 0.1194 *    | 0.1268 *    |             |             |
|                   | (0.0718)    | (0.0657)    |             |             |
| Ais               | 0.0097 ***  | 0.0100 ***  |             |             |
|                   | (0.0046)    | (0.0021)    |             |             |
| Gov               | 1.9145 ***  | 1.9428 *    |             |             |
|                   | (0.7710)    | (1.0007)    |             |             |
| Pland             | -0.7934 *** | -0.5412     |             |             |
|                   | (0.3346)    | (0.3854)    |             |             |
| Fi                | -0.7330 *** | -0.6689 *** |             |             |
|                   | (0.2956)    | (0.2869)    |             |             |
| Fe                | 0.1934      | 0.1698 *    |             |             |
|                   | (0.1238)    | (0.0934)    |             |             |
| Psalary           | -1.0860***  | -0.9752 *** |             |             |
|                   | (0.4084)    | (0.4084)    |             |             |
| Constant          | 0.9098 ***  | -1.8338 *   | 1.2861 ***  | -2.6891 **  |
| (0.0072)          | (1.0444)    | (1.1808)    | (1.3333)    |             |
| Observations      | 3640        | 3640        | 3640        | 3640        |
| A-R^2             | 0.0131      | 0.0350      | 0.0344      | 0.0587      |
| City FE           | NO          | NO          | YES         | YES         |
| Year FE           | NO          | NO          | YES         | YES         |

Notes: Robust standard errors in parentheses. *** \( p < 0.01 \), ** \( p < 0.05 \), * \( p < 0.1 \). Same as later tables.

4.2. Identification Condition Test

The main purpose of using the double difference method for policy evaluation is to remove the interference of factors other than the establishment of demonstration zones and to better address the endogeneity problem in policy evaluation. However, this must be based on two key assumptions. One is to confirm that there is no direct correlation between demonstration zones and regional industrial land market allocation, i.e., the “exogeneity test”. That is, if the degree of marketisation of industrial land in a certain region is an important consideration for the State Council or the National Development and Reform Commission to approve the establishment of demonstration zones in that region, then the non-demonstration areas cannot be a control group for the establishment of demonstration zones. Second, it is confirmed that there is no time trend difference in the degree of market allocation of industrial land factors between the control group and the treatment group before the establishment of the industrial transfer demonstration zone. The article wants to ensure that the two groups of samples are comparable before the establishment of the demonstration zone, i.e., “parallel trend test”. This paper discusses these two hypotheses separately.

4.2.1. Exogeneity Test

If the original degree of marketisation of industrial land in the city will affect the construction of NIRDZs, then this paper will face a serious endogenous problem. From the approval of the National Development and Reform Commission, the approval of the central government for the establishment of the demonstration zone is based on a comprehensive consideration of a series of factors, such as the endowment of resource factors and the complementary industries and transportation location advantages of the area to be achieved. Additionally, the degree of market-based allocation of industrial land elements is not the main consideration in the national selection of construction demonstration zones, thus
initially satisfying the exogeneity test. Given the phased establishment of NIRDZs, this paper uses a logit model to empirically test the criteria for establishing NIRDZs [73].

The different regions of NIRDZs were established in 2010, 2011, 2012, and 2013, respectively. In this paper, the regions that were not established as demonstration zones in 2011 and later were used as a control group for the regions established as demonstration zones in 2010 to test the criteria for the establishment of demonstration zones in 2010, and so on. Specifically, this paper uses whether or not a demonstration zone was established as the explanatory variable and the one-period lagged regional economic characteristics variable as the control variable to examine whether the degree of marketisation of regional industrial land influenced the establishment of a demonstration zone. The estimated results of the logit model are shown in Table 4.

Table 4. Exogeneity test.

| Variable | 2010 Year | 2011 Year | 2012 Year | 2013 Year |
|----------|-----------|-----------|-----------|-----------|
| MAIL      | −0.5139   | −1.1016   | −2.2397   | −2.1163   |
|           | (−0.8099) | (−3.5635) | (−2.9205) | (−2.9492) |
| Lnlgdp_1  | −2.4174 ***| −3.8405   | −3.9244 ***| −1.0312   |
|           | (−0.8175) | (−4.1684) | (−1.3518) | (−2.3157) |
| Ais_1     | 0.0340    | −0.1865   | −0.0521   | 0.25177 * |
|           | (−0.0346) | (−0.1790) | (−0.1161) | (−0.1496) |
| Gov_1     | −5.4489   | 5.8165    | −6.2376*  | 2.8797    |
|           | (−5.1824) | (−5.3448) | (−3.5735) | (−1.6405) |
| Pland_1   | 2.0297    | 2.9054 ***| 3.9329 ***| 4.6176 ***|
|           | (−1.2150) | (−1.0682) | (−1.5692) | (−1.2897) |
| Fi_1      | −1.0135   | −1.8544 ***| −3.7310 ***| −2.0362 ***|
|           | (−0.8713) | (−0.9209) | (−1.2179) | (−0.8551) |
| Fe_1      | 2.2977 ***| 1.9005    | 2.0095    | 2.9698 ** |
|           | (−0.8027) | (−1.21250)| (−1.9559) | (−1.4707) |
| Psalary_1 | 0.0001    | 0.0004    | 0.0004 ** | 0.0001    |
|           | (−4 × 10⁻⁵)| (−0.0005) | (−0.0002) | (−0.0001) |
| Observations | 1626.0000 | 1356.0000 | 1085.0000 | 1013.0000 |

Table 4 shows that the degree of regional industrial land marketisation is not the main influencing factor for the establishment of NIRDZs, so we can tentatively judge that the establishment of NIRDZs is random in relation to the regional industrial land marketisation. Moreover, from other influencing factors, the establishment of NIRDZs is significantly correlated with the level of regional economic development, the strength of infrastructure development, resource endowment, and the financing environment. Cities with lower levels of economic development, poorer infrastructure development efforts, and higher resource endowments are more likely to build NIRDZs.

4.2.2. Parallel Trend Test

Another important prerequisite for the use of double difference models is the parallel trend assumption, which requires that the dependent variables in the experimental and control groups do not differ systematically before the NIRDZs are set up, or if they do, the variability should be fixed and follow the same trend. Referring to the studies of related scholars, the interaction term \((Pre)\) between the dummy variable for the year \(k\) (where, \(k = 3, 2, 1\)) prior to the establishment of NIRDZs and the dummy variable for the establishment of NIRDZs is constructed and included in the benchmark model for testing [74,75]. If the coefficient on the time dummy variable for each year prior to the onset of the policy is not significant with the experimental group control group cross product term, then the common trend is satisfied. The baseline regression results report the average policy effects of the establishment of NIRDZs on the market-based allocation of industrial land factors. The establishment of NIRDZs is a systematic project, and there is a time lag in the effect of policy implementation, so further dynamic evaluation of the policy effect is needed. In this
paper, after constructing the interaction term ($TP_{year}$) between the dummy variable and the dummy variable for the year after the introduction of the industrial transfer demonstration zone policy, the following model is set for estimation [75].

\[ MAI_{it} = \beta_0 + \beta_1 TREAT_i \times POST_{it} \times year + \rho X_{it} + \gamma_{it} + \mu_i + \epsilon_{it} \]  

The regression results in column (1) of Table 5 show that the inhibitory effect of the establishment of NIRDZs on the market-based allocation of industrial land factors still exists significantly after the establishment of NIRDZs, while the year effects before the establishment of NIRDZs are insignificant, indicating that the sample satisfies the parallel trend hypothesis and further verifies the inhibitory effect of the establishment of NIRDZs on the market-based allocation of industrial land factors.

### Table 5. Parallel trends and dynamic tests.

| Variable                  | Parallel Trends | Dynamic Tests |
|---------------------------|-----------------|---------------|
| $Pre_{3}$                 | -0.3761         |               |
|                           | (0.4134)        |               |
| $Pre_{2}$                 | -0.3163         |               |
|                           | (0.3787)        |               |
| $Pre_{1}$                 | -0.2973         |               |
|                           | (0.3063)        |               |
| $TREAT \times POST$       | -0.4267 **      |               |
|                           | (0.1058)        |               |
| $TP_{year2018}$           |                 | -0.4240 **    |
|                           |                 | (0.1807)      |
| $TP_{year2017}$           |                 | -0.4962 **    |
|                           |                 | (0.2484)      |
| $TP_{year2016}$           |                 | -0.3581 ***   |
|                           |                 | (0.1237)      |
| $TP_{year2015}$           |                 | -0.2492 *     |
|                           |                 | (0.1322)      |
| $TP_{year2014}$           |                 | -0.1761 **    |
|                           |                 | (0.0882)      |
| $TP_{year2013}$           |                 | -0.1782 *     |
|                           |                 | (0.0913)      |
| $TP_{year2012}$           |                 | -0.1612 *     |
|                           |                 | (0.0866)      |
| $TP_{year2011}$           |                 | 0.1418        |
|                           |                 | (0.2696)      |
| $TP_{year2010}$           |                 | 0.3317        |
|                           |                 | (0.2095)      |
| Controls                  | YES             | YES           |
| City FE                   | YES             | YES           |
| Year FE                   | YES             | YES           |
| $A-R^2$                   | 0.344           | 0.587         |

As shown in column (2) of Table 5, the estimated coefficients of the interaction terms did not pass the negative significance test in 2011 and before, indicating that the initial effect of the policy on the market allocation of industrial land factors was not significant due to various objective constraints in the early stage of the establishment of the NIRDZs. The reason for this is that the policy of the NIRDZs has been a major factor in the development of industrial land. The reason for this is that the policy effect of the industrial transfer NIRDZs has gradually fermented and the impact on the market allocation of industrial land factors has gradually strengthened. In recent years, as the downward pressure on the economy continues to intensify and the competition among regions receiving industrial transfer becomes increasingly fierce, local governments tend to intervene more in the market for industrial land factors to attract enterprises to move in, resulting in the weakening of the role of market mechanisms in the process of resource allocation.
4.2.3. Robustness Tests

To further verify the credibility of the regression results of the previous Model (1), robustness tests were conducted in the following manner.

Estimation based on PSM-DID method: logit regressions were conducted on the control variables using city-level control variables as covariates and NIRDZs as dummy variables, using nearest neighbour one-to-one matching and double differencing after PSM using samples within the common support range. The estimation results are presented in column (1) of Table 6, and the final coefficients and signs obtained did not change significantly, indicating that the findings remain robust.

Table 6. Further robustness checks of the underlying regression results.

| Variable | PSM-DID | Clustering | Province Year |
|----------|---------|------------|---------------|
|          | (1) MAIL\(_{it}\) | (2) MAIL\(_{it}\) | (3) MAIL\(_{it}\) |
| TREAT × POST | −0.2772 * | −0.4157 *** | −0.3473 *** |
| Observations | −2.9442 *** | 1.7207 *** | −2.9758 * |
| City FE | YES | YES | YES |
| Year FE | YES | YES | YES |
| Province | NO | YES | NO |
| Province × Year | NO | NO | YES |
| A-R\(^2\) | 0.1494 | 0.0587 | 0.2363 |

| Variable | (4) MAIL\(_{it}\) | (5) MAIL\(_{it}\) | (6) MAIL\(_{it}\) |
|----------|---------|------------|---------------|
| TREAT × POST | −0.4197 *** | −0.4277 *** | −0.2454 *** |
| Observations | −1.1430 * | −2.5318 * | −1.5159 *** |
| City FE | YES | YES | YES |
| Year FE | YES | YES | YES |
| Province | NO | NO | NO |
| Province × Year | NO | NO | YES |
| A-R\(^2\) | 0.2393 | 0.0584 | 0.1050 |

Different city levels and sectors: considering that the degree of urbanisation increases the level of industrial allocation of factors; there are differences in the implementation of government strategies and differences in the effects of pilot policies, and the degree of impact on local market allocation of factors. In summary, the results of the double-difference estimation of the clustering of cities to the province level, the fixed effects of fixed provinces over time and the exclusion of municipalities directly under the central government and sub-provincial cities in three cases are shown in columns (2)–(4) of Table 6, respectively, and the results indicate that the conclusion that the industrial transfer city pilot is still robust to the suppression of urban industrial land use.

Other results: (i) balanced panel data were selected and (ii) the continuous variables were separately scaled up and down by 1%. The results are presented in columns (5)–(6) of Table 6, respectively, and the conclusions remain the same.

4.2.4. Excluding the Impact of Other Policies

This paper examines the impact of the establishment of NIRDZs on the marketisation of industrial land, but the estimates may be biased if the marketisation of industrial land is disturbed by other policies during the same period. Of these, the One Belt and One Road (OBOR) initiative [76], the Low Carbon City Pilot (LCC) policy [77], the Carbon Emission Trading (CET) policy [78], and the Smart City (SC) policy [79] were proposed and implemented, which also have an impact on the allocation of land factors. Therefore,
this paper constructs these four policies. Table 7 shows that the estimated coefficients of $TREAT \times POST$ still pass the negative significance test at the 1% level after re-estimation by adding the four-policy time dummy variables mentioned above. These results indicate that these four concurrent events did not affect our baseline estimates. The establishment of NIRDZs did have a dampening effect on the market allocation of industrial land elements.

Table 7. Test for exclusion of other policies.

| Variable          | Excluding OBOR | Excluding LCC | Excluding CET | Excluding SC |
|-------------------|----------------|---------------|---------------|--------------|
| $TREAT \times POST$ | $-0.4572^{***}$ | $-0.4680^{***}$ | $-0.3772^{***}$ | $-0.3521^{***}$ |
| OBOR              | $0.1455^{***}$  | (0.2237)      | (0.1871)      | (0.1257)     |
| LCC               |               | 0.0476        | (0.0321)      |              |
| CET               |               | 0.0723        | 0.0361        | 0.0782**     |
| SC                |               |               | 0.0361        | 0.0782**     |
| Observations      | 2708           | 2708          | 2708          | 2708         |
| Controls          | YES            | YES           | YES           | YES          |
| City FE           | YES            | YES           | YES           | YES          |
| Year FE           | YES            | YES           | YES           | YES          |
| $A-R^2$           | 0.3221         | 0.3221        | 0.3221        | 0.3321       |

5. Further Research: Mechanisms of Influence and Heterogeneity

As explained in the previous section of the theoretical analysis, the establishment of a demonstration zone brings about a takeover effect and an activation effect. These two effects together determine the disincentive effect of the establishment of demonstration zones on the market-based allocation of industrial land elements. In order to clearly illustrate the policy effects of the demonstration zones, this paper will further examine the policy effects and mechanisms of the demonstration zones at the micro level.

5.1. Analysis of the Mechanism of Action

5.1.1. Policy Effects of NIRDZs

In order to examine the takeover and activation effects of the establishment of NIRDZs on the market-based allocation of industrial land, this study decomposes the changes in the degree of market-based allocation of industrial land by applying a first-order difference to Equation (3) as follows [80]:

\[
\Delta MAIl_{it} = \Delta \left( \sum_{N=1}^{15} \frac{A_{iNt}}{A_t} \times MAIl_{(NI)} \right) \\
= \Delta \left( \sum_{N=1}^{15} \frac{P_{NI}}{A_t \times P_{NI}} \right) - \frac{P_{NI-1}}{A_t \times P_{NI-1}} \\
+ \sum_{N=entry} \frac{P_{NI}}{A_t \times P_{NI}} - \sum_{N=exit} \frac{P_{NI-1}}{A_t \times P_{NI-1}} \\
= \sum_{N=entry} \frac{P_{NI}}{A_{i1-1} \times P_{NI}} - \sum_{N=exit} \frac{P_{NI-1}}{A_{i1-1} \times P_{NI-1}}.
\]
After the reasoning of the above formula, the change in the degree of market-based allocation of industrial land in the region can finally be decomposed into a takeover effect and an activation effect. NIRDZs have been reallocated since the establishment of the Model Area. The establishment of the Model Area has included a reallocation of the ongoing market-based allocation of industrial land and a reallocation of new build demise in the allocation of industrial land. According to the final decomposition results, the two components obtained from the decomposition were regressed separately in place of the explanatory variables, and the estimation results are shown in Table 8.

Table 8. The policy effect of the establishment of the demonstration zone.

| Variable     | Takeover Effect | Activation Effect |
|--------------|-----------------|-------------------|
| TREAT × POST | 0.7054 ***      | 0.4680 ***        |
|              | (0.2237)        | (0.1871)          |
| Constant     | 0.6347 ***      | 1.3175 ***        |
|              | (0.1732)        | (0.2691)          |
| Observations | 2708            | 2708              |
| Controls     | YES             | YES               |
| City FE      | YES             | YES               |
| Year FE      | YES             | YES               |
| A-R²         | 0.3526          | 0.3248            |

Note: First-order differencing eliminates area fixed effects.

As shown in column (1) of Table 8, the regression coefficient of the takeover effect for NIRDZs is −0.7054 and significant at the 1% level, indicating that the takeover effect is the main source leading to the establishment of NIRDZs inhibiting the market allocation of industrial land in the region. The reason for this is that most of the industries taken over by NIRDZs are labour-intensive and low-tech capital-intensive industries, which are not conducive to industrial upgrading and high-quality economic development in the region, and therefore the government of NIRDZs will intervene in the price and method of industrial land concessions in order to narrow the economic development gap between regions and develop the regional economy, in order to “attract investment with land”. The establishment of NIRDZs will lead to a strong policy bias in the industrial land disposal market, with more intervention in the “auction” process, which will, to a certain extent, inhibit the formation and integrity of market mechanisms in the allocation of industrial land elements.

According to column (2) of Table 8, the regression coefficient of the activation effect of NIRDZs is significantly positive at the 1% level with a value of 0.4680, indicating that the activation effect of NIRDZs will promote the market allocation of urban industrial land, probably because the local government of NIRDZs improves the hard and soft environment, creates a good investment environment, and can enhance the investment value of the city. On the one hand, the creation of NIRDZs leads to a rapid increase in the visibility and influence of cities and a more pronounced competitive advantage; on the other hand, the market will increase its expectations for the economic development of cities in NIRDZs and therefore its willingness to invest in them, so the creation of NIRDZs activates the “efficient market” of cities. The combined effect of the take-up and activation effects is the main reason why the creation of NIRDZs significantly inhibits the market allocation of industrial land factors in cities.

5.1.2. Mechanism of Action

The analysis of policy effects confirms that the activation effect of NIRDZs can significantly promote the market-based allocation of urban industrial land. As the takeover effect of NIRDZs is mainly determined by government actions and enterprises in the areas where industries are transferred, the actions of local governments in NIRDZs play a minimal role in it. Therefore, this section will explore the channels through which the activation effect
of NIRDZs promotes the market-oriented allocation of industrial land factors in terms of the aspects controllable by the government of NIRDZs. The establishment of NIRDZs policy as a comprehensive regional development instrument implies that multiple types of policy instruments synergistically promote the market-oriented development of cities. Understanding the mechanism of the role of NIRDZs establishment in influencing the market-oriented allocation of industrial land factors can provide reference for improving the market-oriented allocation of industrial land factors and scientifically tailoring the policies related to industrial transfer demonstration zones.

$$ACT_{it} = \beta_0 + \beta_1 TREAT_{i} \times POST_{it} + \rho X_{it} + \gamma_t + \mu_i + \epsilon_{it}$$ (6)

$$MED_{it} = \alpha_0 + \alpha_1 TREAT_{i} \times POST_{it} + \rho X_{it} + \gamma_t + \mu_i + \epsilon_{it}$$ (7)

where $ACT_{it}$ represents the activation effect of the NIRDZs, $MED_{it}$ represents the mediating variables of the NIRDZs to activate the effective market for industrial land, $TREAT_{i} \times POST_{it}$ is the core explanatory variable, and $X_{it}$ is the control variable, all of which are consistent with the previous section. In order to analyse the mechanism of activation of the “effective market” for industrial land in the NIRDZs, this paper selects mediating variables in terms of the level of environment, operation, and access to the “effective market”, which are described as follows:

(1) The level of market-oriented environment $MARE$: In order to fully optimise the business environment in the NIRDZs, local governments are more than happy to carry out special rectification activities for the business environment in the field of bidding and continuously strengthen the rule of law as well as continuously strengthen fair and impartial supervision. Improving the market-oriented environment for factors is a source of motivation to promote the market-oriented allocation of factors. The higher the level of market-oriented environment in a region, the faster the flow of factors for industrial land, the lower the dependence on land finance, and the greater the impact on the marketisation of industrial land, so this paper measures the level of its market-oriented environment by measuring the inverse of the dependence on land finance. Drawing on the literature, land premiums are used to measure land finance dependency \[81,82\]. The calculation formula is as follows: here, $lfd$ stands for land finance dependency, $ltf$ for land premiums, and $gbr$ for local government budget revenues.

$$lfd = \frac{ltf}{ltf + gbr}$$ (8)

$$MARE = \frac{1}{lfd} = \frac{ltf + gbr}{ltf}$$ (9)

(2) Market-oriented operation level $OPER$: In order to fully stimulate the vitality of market players in the demonstration area and enhance the resilience of market development, local governments will take the initiative to focus on the openness and transparency of market rules. The government deepens the reform of “management and service”, strengthens the attention to infrastructure construction and equalization of public services, and tries to implement the system of “standard land” for industrial projects, which enhances the market-oriented standardized operation of the demonstration area. The higher the level of market operation and the larger the market size, the more attractive it is for industrial enterprises to invest in the area, thus affecting the degree of market allocation of local industrial land factors. Specifically, based on the theory of “promotion tournament”, the disparity of economic development between cities significantly affects the behaviour of local governments in economic activities, such as factor allocation, which can reflect the market size of cities \[83\]. Therefore, this paper uses the ratio of urban GDP per capita to national GDP per capita to characterize the market size.

(3) Market access level $ACCE$: The establishment of NIRDZs has had an impact on the elimination of local inequalities that hinder fair competition, such as ownership
discrimination and local protection, and the streamlining of approvals and materials for SMEs in the process of market entry, production, and even market exit. Activating “efficient markets” in NIRDZs means expanding market access and promoting fair competition in markets. This paper measures the level of market access in terms of the extent to which it attracts external investment.

The regression results of models (6) and (7) are presented in Table 9. The results in column (2) show that the establishment of the NIRDZs improves the market-oriented environment of the city, but the results are not significant, while the results in columns (4) and (6) indicate that the establishment of the NIRDZs significantly contributes to the level of market-oriented operation and access of the cities. The results in columns (5) and (7) show that the activation effect is significantly positive due to the increase in the level of market operation and access in the cities of the NIRDZs, indicating that the activation effect is due to the gradual standardisation of market operation and the gradual relaxation of market access barriers in the NIRDZs. This suggests that there are two institutional channels for the activation effect of the establishment of the NIRDZs, namely the increase in the level of market operation and the relaxation of the level of market access.

Table 9. Mechanism of action of the activation effect.

| Variable  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|-----------|-----|-----|-----|-----|-----|-----|-----|
| TREAT × POST | 0.4680 ** (0.1871) | 0.0002 | 0.4307 *** (0.1022) | 0.1145 *** (0.0216) | 0.4371 *** (0.1076) | 0.0747 *** (0.0110) | 0.4506 *** (0.1106) |
| MARE      | 0.1268 * (0.0066) |
| OPER      | 0.1086 * (0.0615) |
| ACCE      | 0.0095 * (0.0051) |
| Controls  | YES | YES | YES | YES | YES | YES | YES |
| City FE   | YES | YES | YES | YES | YES | YES | YES |
| Year FE   | YES | YES | YES | YES | YES | YES | YES |
| Observations | 2708 | 2693 | 2689 | 2672 | 2668 | 2712 | 2708 |
| A-R²      | 0.0587 | 0.5156 | 0.0592 | 0.9010 | 0.0592 | 0.9544 | 0.0596 |

5.2. Heterogeneity Analysis

The differences between cities in terms of fiscal revenues and expenditures as well as economic development levels will have a greater impact on the process of the market-based allocation of industrial land in cities. Therefore, this section will examine the heterogeneity of the policy effects of the establishment of NIRDZs by grouping different regions in terms of three aspects: the degree of regional vertical financial symmetry, the level of regional fiscal revenue, and the level of regional economic development, respectively [84]. First, vertical financial asymmetry (vfa) may alter the impact of industrial transfer demonstration zones on the market-based allocation of industrial land. vfa measures the degree of asymmetry between the decentralisation of fiscal revenue and fiscal expenditure, reflecting the extent to which local governments’ fiscal expenditure obligations exceed their revenues [85]. If a local government’s expenditure obligations significantly exceed its revenues, it is likely to become more dependent on transfers from the central government, which will have important implications for its behaviour. This paper describes the extent of vfa in terms of the difference between fiscal expenditure decentralisation (fex) and fiscal revenue decentralisation (fre) [86]. The per capita amounts involved in the calculation of fiscal expenditure decentralisation and fiscal revenue decentralisation are derived as a ratio of
fiscal revenues and expenditures to the total population of each region. The formula for calculating \( vfa \) is as follows:

\[
fre = \frac{\text{Local budget per capita income}}{\text{Local budget per capita income} + \text{Central budget income per capita}}
\]

(10)

\[
fx = \frac{\text{Local budget expenditure per capita}}{\text{Local budget expenditure per capita} + \text{Central budget expenditure per capita}}
\]

(11)

\[
vfa = fx - fre
\]

(12)

Column (1) of Table 10 shows that at a high \( vfa \), the industrial transfer demonstration zone can significantly inhibit the market allocation of industrial land and promote quality economic development. The coefficient of impact of the interaction term between vertical financial asymmetry and industrial transfer demonstration zones (\( vfa \times TREAT \times POST \)) is 0.8223, which is significant at the 5% level. As the gap between local government expenditure obligations and revenues gradually widens, the importance of the corrective role of transfer payments will increase and local economic development will become increasingly dependent on central transfer payments. In pursuit of greater financial autonomy, eliminating dependence on central transfers, ensuring that they can successfully perform their duties, and enhancing their autonomy in economic development, local governments often increase the supply of land, especially industrial land, in an illegal manner to increase local fiscal revenue. In this context, the Industrial Transfer Demonstration Zone will greatly inhibit land market supply behaviour and reduce the market allocation of industrial land.

Table 10. Heterogeneity regression results.

| Variable                | (1)       | (2)       | (3)       |
|-------------------------|-----------|-----------|-----------|
| \( vfa \times TREAT \times POST \) | 0.8223 *** (0.3081) | 0.4254 *** (0.1242) | 0.3465 ** (0.1762) |
| \( fre \times TREAT \times POST \) |          | -0.4254 *** (0.1242) |          |
| \( \lnPGDP \times TREAT \times POST \) |          |          | -0.3465 ** (0.1762) |
| Controls                | YES       | YES       | YES       |
| City FE                 | YES       | YES       | YES       |
| Year FE                 | YES       | YES       | YES       |
| A-R\(^2\)               | 0.2554    | 0.2672    | 0.3603    |

According to column (2) of Table 10, the more decentralised the fiscal revenue, the stronger the disincentive effect of the industrial transfer demonstration zone on the market allocation of industrial land. The coefficient of impact of the interaction term (\( fre \times TREAT \times POST \)) between fiscal revenue decentralisation and the industrial transfer demonstration zone policy is \(-0.4254\), which is significant at the 1% level. This indicates that the negative impact of the model industrial transfer zones is greater in cities with a higher degree of fiscal revenue decentralisation. As fiscal decentralisation increases competition among local governments, the greater the fiscal autonomy and independence of local governments, the more likely they are to behave in a distorted manner and breed more illegal land use [87,88].

In addition, the role of industrial transfer demonstration zones in the market-based allocation of industrial land may be influenced by the level of economic development of the city. Column (3) of Table 10 shows that the inhibitory effect of industrial transfer demonstration zones on the market-based allocation of industrial land is stronger when the level of economic development is higher. The coefficient of influence of the interaction term (\( \lnPGDP \times TREAT \times POST \)) between GDP per capita and the demonstration zone policy is \(-0.3465\), which is significant at the 5% level. Land demand is higher in cities with a higher GDP per capita [89]. However, restrictions in the land supply index may lead local governments to increase the supply of construction land through other illegal means.
This could easily lead to collusion between local governments and firms, resulting in more illegal land use to increase production and improve competitive advantage.

6. Discussion of Results and Policy Recommendations

As an important basic element for NIRDZs to undertake industrial transfer, optimize regional productivity layout, and promote coordinated regional development, industrial land is characterized by immovability and its high reconfiguration cost. Therefore, examining the degree of marketisation of industrial land in demonstration zones is an important element in assessing the policy effects of NIRDZs. Based on a quasi-natural experiment of establishing NIRDZs, this paper constructs a multi-period DID model to accurately and efficiently estimate the causal impact of establishing NIRDZs on the marketisation of urban industrial land. The establishment of NIRDZs has a significant inhibitory effect on the marketized allocation of industrial land elements. The reason may be that in order to build NIRDZs, local governments tend to raise debt to build infrastructure, and the increase in debt size will stimulate local governments to increase their intervention in the market for industrial land concessions, resulting in a limited degree of market-determined allocation of industrial land factors [2,60]. Moreover, the higher the degree of the vertical fiscal asymmetry of cities, the more fragmented the fiscal revenues, and the higher the level of economic development of cities, the stronger the inhibitory effect of NIRDZs on the marketisation of urban industrial land.

The effect of NIRDZs on the marketisation of industrial land is the result of the combined effect of the acceptance effect and the activation effect [51]. Some demonstration zones do not hesitate to lower industry acceptance standards in order to accelerate local economic development, leading to low-end takeover industries that interfere with normal market signals [2]. Excessive government intervention leads to distorted factor prices and ineffective resource allocation, which negatively affects energy efficiency. At the same time, NIRDZs also activate the “efficient market” in cities to promote market-based allocation of industrial land factors, probably because local governments in NIRDZs improve the hard and soft environments, creating a favourable investment climate and enhancing the investment value of cities [90]. The “Activation effect” promotes the market-based allocation of urban industrial land by activating three aspects: market environment, level of market operation, and level of market access [85]. This provides reliable evidence for a deep understanding of the relationship between the establishment of industrial transfer demonstration zones and the market-based allocation of industrial land elements and the promotion of market-based reforms in the allocation of industrial land elements [91].

This paper has several limitations that require more work for future research. First, although the establishment of demonstration zones in the observation interval has an obvious inhibiting effect on the market-oriented allocation of industrial land factors. However, with the gradual completion of the investment and construction cycle in the demonstration zones, the investment in various factors has returned to normal and the market mechanism has been gradually improved, it is possible that the degree of marketisation of industrial land will gradually mature and improve in the future; therefore, analysing the long-term trend of marketisation of industrial land factors in these regions becomes an element of further research. Second, the marketisation of industrial land elements is the result of various factors. This paper only investigates the mechanism of action on industrial land promotion under the activation effect of NIRDZ. Further studies should examine the interactions of multiple factors more comprehensively.

In order to give full play to the national industrial transfer strategy, regulate the development of industrial land market and promote high-quality economic development, the following suggestions are made: (1) Local governments in the areas undertaking industrial transfer should follow market laws, give full play to the decisive role of the market in allocating factors, avoid blind investment and vicious competition, and prevent low-level repetitive construction. NIRDZs cities should improve industrial land grant procedures, strengthen supervision of the use of land grant funds, clarify the scope of expenditure, and
reduce local governments’ over-reliance on land finance. (2) Demonstration zones should build industrial clusters with clear division of labour and positive interaction to provide a solid environmental foundation for involved industries. It is also necessary to further improve the level of rule of law and strengthen the hard and soft environments of local governments. Efforts should be made to improve the level of public services, innovate government management tools and management systems, and reduce administrative intervention. (3) The economic and social development of each region in China varies greatly, and efforts should be made to realize a differentiated path for the construction of demonstration zones in each region, taking into account the characteristics of different regions. Industries should be encouraged and guided to the central and western regions and settled areas with appropriate inclination to guide the construction of market environment in these regions. The fierce competitive environment has prompted local governments to better respect the market laws in the industrial land market and seriously implement relevant policies in the industrial land market, which is more conducive to the decisive role of the market-based price mechanism in the allocation of industrial land elements, and promote the market-based allocation of industrial land elements.

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