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Industrial Relocation and Industrial Chain Resilience : Evidence from National Industrial Relocation Demonstration Zones in China

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Abstract

Industrial relocation reshapes regional economic structures and the spatial organization of production. This study examines its implications for industrial chain resilience using panel data for 290 Chinese cities from 2003 to 2022. The staggered establishment of National Industrial Relocation Demonstration Zones provides a quasi-natural experiment, evaluated using a difference-in-differences model. The results indicate that designation as a demonstration zone significantly improves industrial chain resilience, and the finding remains stable across a series of robustness checks. The mechanism regressions show that the policy promotes industrial restructuring and increases public expenditure on science and technology, consistent with the proposed transmission channels. The estimated effect is positive and statistically significant in central China but does not reach statistical significance in western China. These findings extend research on industrial chain resilience by examining the spatial reorganization of production and provide evidence to inform the design of industrial relocation and regional support policies.

Keywords

Industrial Chain Resilience; National Industrial Relocation Demonstration Zones; Difference-In-Differences

1. Introduction

The COVID-19 pandemic, geopolitical conflicts, extreme weather events, and trade policy uncertainty have made industrial chain resilience central to the stability of production systems and the balance between economic efficiency and security. The division of production across regions and the spatial allocation of resources generate gains from specialization, economies of scale, and market expansion. Yet closely connected input-output networks can also transmit disruptions: an interruption at one production stage may spread to directly and indirectly connected firms and ultimately affect aggregate economic activity (Carvalho et al., 2021). A key question is therefore how production networks can withstand shocks,

adapt, and recover while retaining the benefits of specialization and cooperation (Baldwin and Freeman, 2022). By relocating production and reorganizing interregional industrial relationships, industrial relocation changes both resource allocation and exposure to production risks. Examining its effects on industrial chain resilience helps establish whether the gains from spatial reallocation also improve the stability of production systems.

Since 2010, China has established successive National Industrial Relocation Demonstration Zones (NIRDZs) to improve the spatial distribution of productive activity and promote regional specialization and coordinated development. These zones seek to strengthen recipient regions' capacity to accommodate industry through infrastructure and public services, the clustering of related activities, technological innovation, and interregional cooperation. The State Council's Guiding Opinions on Undertaking Industrial Relocation in the Central and Western Regions encourage the coordinated relocation of entire industrial chains and related industries to strengthen local industrial linkages (State Council, 2010). The Measures for the Administration of Industrial Relocation Demonstration Zones, issued in 2023, place further emphasis on industrial and supply chain development and security (National Development and Reform Commission, 2023). The policy thus concerns the reliability of production networks as well as industrial development and regional growth. Its effect on resilience is nevertheless an empirical question. Industrial relocation may strengthen upstream-downstream linkages and resource mobility, but inadequate local support and difficulties in technological integration may create new vulnerabilities. Identifying the policy's effects, transmission channels, and regional variation is therefore relevant to the design of industrial relocation and complementary public support.

Two strands of research are particularly relevant. The first examines the meaning and determinants of industrial and supply chain resilience. Early studies define resilience in terms of preparedness, response, recovery, and adaptation, emphasizing risk identification and organizational coordination (Ponomarov and Holcomb, 2009). Work drawing on dynamic capabilities and evolutionary economic geography highlights the roles of resource recombination, accumulated capabilities, and industrial restructuring (Boschma, 2015). Empirical studies likewise identify innovation, resource allocation efficiency, and structural upgrading as channels through which industrial chain resilience can improve (Li et al., 2026). Howell (2017) shows that research and development (R&D) grants support technology development and patenting, providing microeconomic evidence on how public support can contribute to innovative capabilities. Together, these studies motivate an analysis that considers structural adjustment alongside public support for innovation.

The second strand concerns the spatial allocation of industry and the effects of relocation policies. Research on economic geography and industrial location

emphasizes how market demand, transport costs, and agglomeration economies shape industrial location and regional specialization (Wen, 2004). Policy evaluations identify effects across several dimensions. Demonstration zones can improve urban innovation efficiency, but they may also reduce energy efficiency in recipient regions, suggesting that innovation gains can coexist with pressure on resource use (Liu et al., 2023). Research on local government behavior further shows how fiscal conditions, returns to cooperation, and environmental regulation affect intergovernmental competition and firms' relocation choices (Hu et al., 2024; Hu et al., 2025). These findings suggest that relocation outcomes depend on the match between industrial characteristics, recipient conditions, and policy incentives. Industrial expansion alone does not establish an improvement in resilience.

Evidence remains limited on how industrial relocation affects resilience through structural adjustment and public innovation support, and how these effects vary across regions. Using panel data for 290 Chinese cities over 2003–2022, this study treats the establishment of NIRDZs as a quasi-natural experiment and applies a difference-in-differences (DID) model. It extends relocation policy evaluation to city-level industrial chain resilience, examines industrial restructuring and public expenditure on science and technology as potential transmission channels, and compares estimates for central and western China to inform regionally differentiated relocation and support policies..

2. Theoretical Analysis and Hypotheses

2.1. Industrial Relocation and Industrial Chain Resilience

Industrial chains consist of interdependent production stages. Local shocks can propagate through input-output relationships, and the failure of a critical node may cause losses across several stages. Resilience therefore depends on the continuity of critical activities and the capacity of the wider production system to adjust after a shock (Carvalho et al., 2021). Industrial relocation can strengthen resilience by redistributing risk, improving industrial linkages, and expanding the scope for production adjustment. When relocation creates production capacity that can substitute across regions, and regional shocks are not perfectly correlated, a wider geographical distribution reduces dependence on a single location. Capacity in unaffected regions can then partly compensate for disrupted production elsewhere (Baldwin and Freeman, 2022). Links between incoming and existing industries can fill missing production stages and strengthen specialized support. Shared labor markets and knowledge exchange also expand the skills and technologies available for resource recombination, process adjustment, and adaptation (Boschma, 2015). These advantages are especially relevant when new production nodes possess compatible technologies, usable capacity, and reliable relationships. Under such conditions, they can provide effective alternatives at critical stages and ease the adjustment constraints associated with input specificity (Elliott et al., 2022).

Establishing and maintaining production relationships is itself costly. By improving the conditions for such relationships, industrial relocation can support network continuity and adjustment after a disruption (Acemoglu and Tahbaz-Salehi, 2025). This reasoning leads to the following hypothesis.

H1. The establishment of National Industrial Relocation Demonstration Zones improves industrial chain resilience.

2.2. Potential Transmission Channels

2.2.1. Industrial Restructuring

Industrial relocation can promote structural adjustment in recipient regions by reallocating production factors and reorganizing interregional specialization. A closer match between incoming industries and local factor endowments, technological foundations, and productive capabilities can direct capital and labor toward activities with a comparative advantage and support the development of related industries (Chen et al., 2025). Research on industrial relatedness shows that entry into new activities depends on a region's existing knowledge and capabilities; technologically related entrants are better placed to extend these capabilities and contribute to structural change (Neffke et al., 2011). Through industrial selection, the allocation of resources, and supporting investment, NIRDZs can improve links between incoming and local industries and the allocation of resources across sectors. Policy evaluations provide evidence that the zones promote industrial structure rationalization (Ge et al., 2022). Structural adjustment can, in turn, strengthen resilience by improving the composition of local industry and its capacity to redeploy resources. Knowledge exchange among related industries supports technological adaptation and production adjustment, while differences in sectoral exposure can help distribute the effects of industry-specific shocks (Frenken et al., 2007). Where existing capabilities can be applied to new activities, regions have greater scope to reallocate resources, reorganize production, and develop alternative growth paths after a shock (Boschma, 2015). The second hypothesis is therefore as follows.

H2. National Industrial Relocation Demonstration Zones improve industrial chain resilience by promoting industrial restructuring.

2.2.2. Public Expenditure on Science and Technology

Industrial relocation creates demand for technological integration, process adaptation, and coordination among industries. Recipient regions consequently require public research facilities, technical services, and research collaboration. Local governments have an incentive to expand public support where private investment does not meet these needs and where better technical conditions would help incoming activities integrate with the local production system (Howell, 2024).

The NIRDZ policy combines these additional demands with arrangements for public support. For example, measures for the Wanjiang demonstration zone explicitly call for increased government expenditure on science and technology. Existing research also finds that science and technology expenditure accounts for a relatively larger share of fiscal spending in demonstration-zone regions (He et al., 2019). Additional public funding can share the costs of R&D, ease financing constraints, and make technology development more feasible, supporting continued research and the development of usable technologies (Howell, 2017). The resulting knowledge and capabilities can improve firms' ability to absorb and apply external technologies. They also provide a basis for process adjustment, technological substitution, and production reorganization when critical stages are disrupted, thereby supporting the response and recovery of the industrial chain (Cohen and Levinthal, 1990). This leads to the third hypothesis.

H3. National Industrial Relocation Demonstration Zones improve industrial chain resilience by increasing public expenditure on science and technology.

3. Research Design

3.1. Sample and Data

The analysis uses panel data for 290 Chinese cities from 2003 to 2022, drawn primarily from successive editions of the China City Statistical Yearbook and municipal statistical yearbooks. Some missing observations are filled by linear interpolation. Cities affected by administrative boundary changes, including Chaohu, and cities with substantial missing data are excluded. Cities covered by NIRDZ designations form the treated group; other sample cities form the comparison group. The policy indicator equals one for treated cities in the year of designation and thereafter, and zero otherwise. **Table 1** lists the designation cohorts and geographical coverage reported in the source dataset.

Table 1. National Industrial Relocation Demonstration Zones

Demonstration zone	Designation	Geographical coverage
Wanjiang City Belt, Anhui	Jan. 2010	Hefei, Lu'an, Wuhu, Ma'anshan, Tongling, Chizhou, Chuzhou, Xuancheng, Anqing, and Chaohu
Eastern Guangxi	Oct. 2010	Hezhou, Guigang, Yulin, and Wuzhou
Chongqing along the Yangtze River	Jan. 2011	Chongqing
Southern Hunan	Oct. 2011	Hengyang, Yongzhou, and Chenzhou
Jingzhou, Hubei	Dec. 2011	Jingzhou, Jingmen, Xiantao, Qianjiang, and Tianmen
Yellow River Golden Triangle, Shanxi–Shaanxi–Henan	May 2012	Linfen, Weinan, Sanmenxia, and Yuncheng
Yinchuan–Shizuishan, Ningxia	Jan. 2013	Yinchuan and Shizuishan
Guang'an, Sichuan	Mar. 2013	Guang'an

Lanzhou–Baiyin, Gansu	Mar. 2013	Lanzhou and Baiyin
Southern Jiangxi	Jun. 2013	Ganzhou
Southern and Western Hunan	Nov. 2018	Hengyang, Yongzhou, Chenzhou, Xiangxi Tujia and Miao Autonomous Prefecture, Huaihua, and Shaoyang
Northwestern Liaoning	Dec. 2020	Fuxin and Chaoyang

3.2. Variables

3.2.1. Dependent Variable

Industrial chain resilience (cc) is measured along two dimensions: resistance and recovery, and transformation and renewal, following Sun and Zhu (2023). Resistance and recovery are represented by industrial diversity (Indiv), calculated as the inverse of the Herfindahl-Hirschman index (HHI). A lower HHI indicates less industrial concentration and greater diversity, which is taken to represent a stronger capacity to withstand external shocks and maintain production. Transformation and renewal (Renew) are measured by the number of invention patents granted in a city. A higher value represents a greater capacity to develop or modify products and adjust future development paths.

Industrial diversity is calculated as follows:

$$Indiv = \frac{1}{\sum_{k=1}^{3} S_k^2} \tag{1}$$

where S_k is the share of industry k in a city's gross domestic product (GDP). After the resistance-recovery and transformation-renewal measures are calculated, they are combined using mean-based proportional weights to obtain the composite resilience index. Higher values indicate greater industrial chain resilience.

3.2.2. Explanatory Variable

The policy indicator is defined as $DID_{it} = Treat_i \times Post_{it}$. $Treat_i$ equals one for cities designated as NIRDZs and zero for comparison cities. $Post_{it}$ equals one in the designation year and subsequent years for the relevant treated city, and zero before designation. DID_{it} therefore identifies city-year observations exposed to the industrial relocation policy.

3.2.3. Control Variables

The regressions include the following city-level controls: industrial development (gyqy), measured by the number of industrial enterprises above the designated size; economic development (lngdp), measured by the natural logarithm of city GDP; fiscal expenditure (yszc), measured by the natural logarithm of local general budget expenditure; employment (zgzg), measured by the average number of on-post employees; foreign investment (wstz), measured by the number of foreign-invested enterprises; education (stu), measured by the natural logarithm of the number of

full-time faculty members in regular higher education institutions; and income (srsp), measured by the natural logarithm of average employee wages.

3.3. Empirical Model

The staggered establishment of NIRDZs is treated as a quasi-natural experiment. The following DID model evaluates its effect on industrial chain resilience:

$$cc_{it} = \alpha + \beta DID_{it} + \gamma' X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2)$$

where i and t index cities and years, respectively. X_{it} is the vector of control variables, μ_i and λ_t denote city and year fixed effects, and ε_{it} is the error term. The coefficient β captures the policy-associated change in industrial chain resilience after controlling for these factors.

4. Empirical Results

4.1. Baseline Estimates

Table 2 reports the baseline DID estimates. Without control variables, the coefficient on DID is 0.538 and is statistically significant at the 1% level. With the controls included, the coefficient is 0.442 and remains significant at the 1% level. The results indicate that designation as a demonstration zone improves city-level industrial chain resilience, supporting H1.

Table 2. Baseline Regression Results

Variable	(1) cc	(2) cc
DID	0.538*** (3.97)	0.442*** (3.44)
gyqy		0.015*** (2.98)
lngdp		0.077 (0.48)
yszc		0.541*** (3.91)
zgzg		0.003*** (3.20)
wstz		0.004* (1.72)
stu		0.034 (0.59)
srsp		-0.252** (-2.19)
N	5745	5371
R^2	0.887	0.899
City fixed effects	Yes	Yes
Year fixed effects	Yes	Yes

Notes: t-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

4.2. Parallel Trends and Dynamic Effects

The DID design requires treated and comparison cities to have followed similar trends in the absence of the policy. An event-study specification is used to assess this assumption. Event time is measured relative to the designation year, and observations four or more years before designation are pooled into event period −4. **Figure 1** reports the estimates. The pre-policy coefficients show no statistically significant departures from the reference period, providing evidence consistent with the parallel-trends assumption.

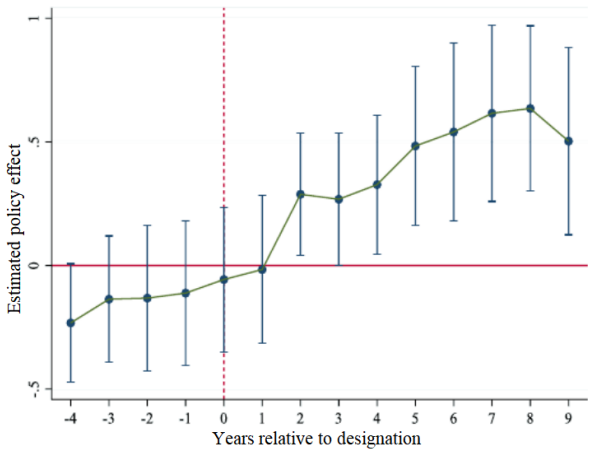


Figure 1. Parallel Trends and Dynamic Policy Effects

4.3. Placebo Test

A placebo test examines whether random treatment assignments could produce estimates similar to the baseline result. In each replication, 50 cities are randomly selected as a pseudo-treated group, with the remaining cities assigned to a pseudo-comparison group. A placebo policy indicator is constructed and the model is re-estimated. The procedure is repeated 500 times. As **Figure 2** shows, the placebo estimates cluster around zero and are clearly separated from the baseline estimate of 0.442. Random assignment therefore does not reproduce the estimated policy effect, lending further support to the baseline finding.

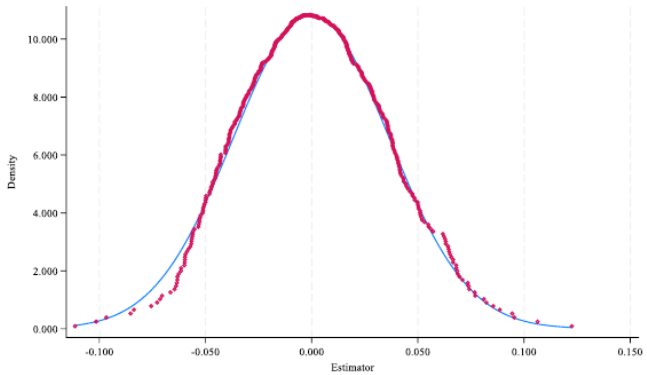


Figure 2. Distribution of Placebo Policy Estimates

4.4. Robustness Checks

Robustness is assessed by winsorizing continuous variables at the 1st and 99th percentiles and, separately, at the 5th and 95th percentiles; excluding treated cities' designation-year observations to allow for implementation and investment response lags; and excluding Beijing, Tianjin, Shanghai, and Chongqing given their distinctive administrative status, resource endowments, and economic conditions. **Table 3** shows that the DID coefficient remains positive and statistically significant across all specifications, supporting the robustness of the baseline finding..

Table 3. Robustness Checks

Variable	5% winsorization	1% winsorization	Excluding designation year	Excluding municipalities
DID	0.337*** (3.89)	0.442*** (3.66)	0.515*** (3.82)	0.499*** (4.05)
Controls	Yes	Yes	Yes	Yes
N	5371	5371	5338	5295
R^2	0.896	0.901	0.900	0.897
City fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Notes: t-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

4.5. Potential Transmission Channels

The theoretical analysis identifies public expenditure on science and technology and industrial restructuring as potential channels linking industrial relocation to resilience. Their responses to the policy are examined using the following model:

$$K_{it} = \alpha + \beta DID_{it} + \gamma' X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (3)$$

where K_{it} denotes either public expenditure on science and technology or industrial restructuring. The remaining variables are defined as in the baseline model.

Table 4. Policy Effects on Potential Mechanism Variables

Variable	(1) Science and technology	(2) Science and technology	(3) Industrial restructuring	(4) Industrial restructuring
DID	0.674*** (4.99)	0.485*** (4.75)	0.044* (1.95)	0.020** (2.04)
Controls	Yes	Yes	Yes	Yes
N	5745	5371	5800	5373
R^2	0.925	0.947	0.683	0.879
City fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Notes: t-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 4 indicates that designation increases public science and technology expenditure, with DID coefficients of 0.674 without controls and 0.485 with controls, both significant at the 1% level (columns (1)–(2)). Industrial restructuring also improves, with corresponding coefficients of 0.044 and 0.020, significant at the 10% and 5% levels, respectively (columns (3)–(4)). These findings are consistent with the transmission channels proposed in H3 and H2, respectively.

4.6. Regional Heterogeneity

Differences in industrial foundations, factor endowments, and supporting policies may influence the resilience gains from relocation. Two regional indicators are constructed: Middle equals one for cities in central China and zero otherwise, while West equals one for cities in western China and zero otherwise. The policy indicator is interacted with each regional indicator to examine region-specific policy effects. **Table 5** reports these interaction specifications. No separate estimate is reported for the remaining late-adopting demonstration-zone cities, for which the treated cohort and post-designation observation window are limited.

Table 5. Regional Policy Effects

Variable	(1) cc	(2) cc	(3) cc	(4) cc
DID × Middle	0.809*** (4.60)	0.699*** (4.54)		
DID × West			0.265 (1.54)	0.118 (0.63)
Controls	Yes	Yes	Yes	Yes
N	5745	5371	5745	5371
R^2	0.888	0.900	0.885	0.898
City fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Notes: t-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

In **Table 5**, the DID × Middle coefficients are positive and significant at the 1% level with and without controls (columns (1) – (2)), whereas the DID × West

coefficients are positive but insignificant (columns (3) – (4)). These estimates support resilience gains in central China but provide no statistically significant evidence of gains in western China during the sample period. Industrial linkages, transport connections, and factor markets may facilitate integration in central China, while inadequate industrial support, limited technological absorptive capacity, and higher coordination costs may constrain gains in some western cities. Differences in significance alone do not establish a statistically significant difference between the regional coefficients.

5. Conclusions and Policy Implications

5.1. Conclusions

Using panel data for 290 Chinese cities from 2003 to 2022, this study examines the relationship between industrial relocation policy and industrial chain resilience through the staggered establishment of NIRDZs. Designation has a positive and statistically significant effect on resilience. The baseline estimates are supported by the event-study evidence, placebo test, and robustness checks. The mechanism regressions show that the policy increases public expenditure on science and technology and promotes industrial restructuring, consistent with these variables serving as transmission channels. The estimated policy effect is statistically significant in central China but not in western China during the sample period.

5.2. Policy Implications

Industrial relocation policy should align project selection with local industrial capabilities and factor endowments while strengthening upstream–downstream linkages and interregional coordination. Infrastructure and public services should facilitate the integration of relocated firms into local production systems, supported by continued cooperation between R&D, design, and production across regions. Public expenditure on science and technology should support process upgrading, shared technical services, and collaborative R&D, with funding matched to firms' technological adaptation needs and performance assessed against improvements in technological capability and production continuity. Regional support should reflect differences in recipient capacity: central China can deepen cooperation within existing industrial networks, while western China should address project-specific constraints in transport, skilled labor, and technological absorption. Regular assessments of recipient conditions and policy outcomes should guide policy adjustments to strengthen industrial chain resilience.

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References

[1] Carvalho, V.M., Nirei, M., Saito, Y.U. and Tahbaz-Salehi, A. (2021) Supply Chain Disruptions: Evidence from the Great East Japan Earthquake. The Quarterly Journal of Economics, 136(2), 1255–1321. https://doi.org/10.1093/qje/qjaa044

[2] Baldwin, R. and Freeman, R. (2022) Risks and Global Supply Chains: What We Know and What We Need to Know. Annual Review of Economics, 14, 153–180. https://doi.org/10.1146/annurev-economics-051420-113737

[3] State Council (2010) Guiding Opinions on Undertaking Industrial Relocation in the Central and Western Regions. State Council Document No. 28 [2010]. (In Chinese). https://www.gov.cn/xxgk/pub/govpublic/mrlm/201009/t20100906_56764.html

[4] National Development and Reform Commission (2023) Measures for the Administration of Industrial Relocation Demonstration Zones. (In Chinese). https://www.ndrc.gov.cn/xxgk/jd/jd/202307/t20230711_1358307_ext.html

[5] Ponomarov, S.Y. and Holcomb, M.C. (2009) Understanding the Concept of Supply Chain Resilience. The International Journal of Logistics Management, 20(1), 124–143. https://doi.org/10.1108/09574090910954873

[6] Boschma, R. (2015) Towards an Evolutionary Perspective on Regional Resilience. Regional Studies, 49(5), 733–751. https://doi.org/10.1080/00343404.2014.959481

[7] Li, H., Yang, D., Sun, N. and Zhang, Z. (2026) Can Digital Infrastructure Construction Enhance Industrial Chain Resilience? Evidence from China. Economic Analysis and Policy, 90, 614–631. https://doi.org/10.1016/j.eap.2026.01.045

[8] Howell, S.T. (2017) Financing Innovation: Evidence from R&D Grants. American Economic Review, 107(4), 1136–1164. https://doi.org/10.1257/aer.20150808

[9] Wen, M. (2004) Relocation and Agglomeration of Chinese Industry. Journal of Development Economics, 73(1), 329–347. https://doi.org/10.1016/j.jdeveco.2003.04.001

[10] Liu, H., Zhang, A. and Wu, J. (2023) Can Industrial Transfer Improve Urban Innovation Efficiency? Socio-Economic Planning Sciences, 90, 101750. https://doi.org/10.1016/j.seps.2023.101750

[11] Hu, L., Wang, H. and Zhao, R. (2024) An Evolutionary Game Analysis of Heterogeneous Local Government Land Supply Behavior and Industrial Transfer Competition. Systems, 12(6), 189. https://doi.org/10.3390/systems12060189

[12] Hu, L., Wang, H. and Cai, X. (2025) The Transfer of China's Energy-Intensive Industries under Environmental Regulation: An Evolutionary Game Theory Approach Based on Sustainable Development. SAGE Open, 15(1), 21582440251328118. https://doi.org/10.1177/21582440251328118

[13] Elliott, M., Golub, B. and Leduc, M.V. (2022) Supply Network Formation and Fragility. American Economic Review, 112(8), 2701–2747. https://doi.org/10.1257/aer.20210220

[14] Acemoglu, D. and Tahbaz-Salehi, A. (2025) The Macroeconomics of Supply Chain Disruptions. The Review of Economic Studies, 92(2), 656–695. https://doi.org/10.1093/restud/rdae038

[15] Chen, D., Gu, Y. and Yang, Z. (2025) Multi-Period Port Cluster Investment along the Maritime Silk Road Considering the Matching of Relocated Industries and Recipient Countries. Ocean & Coastal Management, 266, 107665. https://doi.org/10.1016/j.ocecoaman.2025.107665

[16] Neffke, F., Henning, M. and Boschma, R. (2011) How Do Regions Diversify over Time? Industry Relatedness and the Development of New Growth Paths in Regions. Economic Geography, 87(3), 237–265. https://doi.org/10.1111/j.1944-8287.2011.01121.x

[17] Ge, T., Lv, X., Ma, L. and Shen, X. (2022) Can Industrial Relocation Reduce Air Pollution?

Evidence from a Quasi-Natural Experiment in China. Frontiers in Environmental Science, 10, 910668. https://doi.org/10.3389/fenvs.2022.910668

[18] Frenken, K., Van Oort, F. and Verburg, T. (2007) Related Variety, Unrelated Variety and Regional Economic Growth. Regional Studies, 41(5), 685–697. https://doi.org/10.1080/00343400601120296

[19] Howell, S.T. (2024) Government Intervention in Innovation. Annual Review of Financial Economics, 16, 367–390. https://doi.org/10.1146/annurev-financial-082123-105722

[20] He, S., Liu, Y. and Duan, C. (2019) Do National Industrial Relocation Demonstration Zones Have Higher Total Factor Productivity? Journal of Finance and Economics, 45(3), 127–140. (In Chinese). https://doi.org/10.16538/j.cnki.jfe.2019.03.010

[21] Cohen, W.M. and Levinthal, D.A. (1990) Absorptive Capacity: A New Perspective on Learning and Innovation. Administrative Science Quarterly, 35(1), 128–152. https://doi.org/10.2307/2393553

[22] Sun, H.X. and Zhu, J.H. (2023) Can the Establishment of Pilot Free Trade Zones Enhance Industrial Chain Resilience in China? Testing the Mediating Role of the Agglomeration of Multiple Innovation Factors. Modern Economic Research, No. 11, 72–84. (In Chinese). https://doi.org/10.13891/j.cnki.mer.2023.11.002