

The Pulling Effect of Infrastructure Construction on Economic Growth from the Perspective of Fixed Asset Investment Statistics

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Abstract: Based on the specific perspective of fixed asset investment statistics, combined with data from Shandong Province, this study explores the pulling effect of infrastructure construction on economic growth. The analysis reveals that Shandong's fixed asset investment in infrastructure has maintained a continuous growth trend. By directly stimulating demand in related industries and indirectly optimizing the business environment and regional development conditions, infrastructure investment provides strong support for economic growth. Finally, with the goal of improving infrastructure efficiency and promoting high-quality development, this paper proposes prospects such as optimizing the investment structure, broadening financing channels, and strengthening project management.

Keywords: Fixed Asset Investment; Infrastructure Construction; Economic Growth; Pulling Effect; Shandong

1. From the Perspective of Economic Theory

From the perspective of economic theory, infrastructure investment stimulates economic growth through both direct demand pull and indirect environmental improvements, thereby naturally generating a significant multiplier effect without being intended as an active stimulus. On the one hand, during the construction process, infrastructure drives the development of related industries, expands employment, and increases income, which in turn promotes a virtuous cycle of consumption and investment. On the other hand, the improvement of infrastructure systems enhances the regional business environment and reduces operating costs for enterprises, thereby promoting capital agglomeration and industrial upgrading. Throughout this process, fixed asset investment statistics not only provide an important basis for observing the

scale and development trends of infrastructure construction but also offer solid data support for evaluating its impact mechanisms on economic growth.

2. Current Situation of Fixed Asset Investment in Infrastructure in Shandong

2.1 Overall Investment Scale and Growth Trend

In recent years, Shandong has attached great importance to infrastructure construction, as reflected in the continuous increase in its fixed asset investment. Since 2018, the province's infrastructure investment has steadily risen. In 2023, infrastructure investment grew by 22.9% year-on-year, contributing 4.6 percentage points to the overall investment growth. This significant upward trend highlights the province's emphasis on infrastructure, providing a solid material foundation for upgrading transportation, energy, water conservancy, and other key areas^[1].

2.2 Investment by Sector

Transportation: Transportation infrastructure has long been a key focus of Shandong's investment. In 2023, road transport investment increased by 29.8%, contributing 6.8 percentage points to infrastructure growth. High-speed rail projects, such as the Shandong section of the Jinan-Zhengzhou High-speed Railway, have greatly shortened intercity travel time. By 2024, Shandong's expressway mileage exceeded 8,000 km, achieving "ring roads in every city, dual highways in every county, and full coverage for towns." Meanwhile, inland waterways and port upgrades have enhanced waterway transport efficiency and facilitated regional trade.

Energy: In 2023, investment in electricity and heat production and supply grew by 38.5%. With the rapid development of new energy, Shandong has actively promoted wind power and photovoltaic projects, including large-scale

offshore wind farms such as those in Yantai. At the same time, the power grid has been strengthened through ultra-high-voltage transmission projects, ensuring stable energy supply to meet growing economic demand.

Water Conservancy: Water conservancy investment occupies an important position in Shandong. Major projects such as the second phase of the Yellow River-to-East Water Diversion have optimized water resource allocation and safeguarded regional water security. Efforts in river management and reservoir reinforcement have improved flood control, irrigation capacity, agricultural conditions, rural development, and ecological protection.

3. Mechanisms of Infrastructure Construction Pulling Economic Growth in Shandong

3.1 Direct Demand Pull

Infrastructure construction generates strong demand for upstream industries such as steel, cement, and building materials. For example, each 100 million yuan invested in transportation infrastructure requires about 5,000 tons of steel and 20,000 tons of cement. Similarly, energy projects such as wind and solar power require specialized steel, photovoltaic panels, and electrical equipment. This large-scale demand drives industrial production, capacity expansion, and job creation^[2].

From the perspective of the investment multiplier effect, infrastructure investment produces significant returns. Assuming Shandong's marginal propensity to consume is 0.6, every 100 million yuan of infrastructure investment ultimately drives a 250 million yuan increase in total output (multiplier = $1/(1 - 0.6)$). This effect circulates within the economy, magnifying the role of infrastructure investment in promoting growth^[3].

3.2 Indirect Promotion of Economic Growth

Improved Business Environment: From the perspective of fixed asset investment statistics, the indirect promotion of economic growth by infrastructure construction is first reflected in the optimization of the business environment. Taking transportation infrastructure as an example, Jinan has in recent years continuously improved the layout of expressways, intercity

railways, and urban express road networks, significantly enhancing the efficiency of cargo transportation and personnel movement. According to monitoring data from the Shandong Provincial Transportation Department, with the support of a comprehensive transport network, enterprises in Jinan have reduced logistics costs by an average of about 20%. This not only shortens cargo turnover time but also accelerates nationwide distribution and market coverage. For industries with high time-sensitivity—such as agricultural product processing, equipment manufacturing, and pharmaceuticals—such reductions in cost and improvements in efficiency directly strengthen market competitiveness.

At the same time, a stable supply of energy infrastructure is also key to improving the business environment. The development of electricity and natural gas networks ensures the continuity of industrial production, preventing interruptions or shutdowns caused by insufficient energy supply. For instance, in the chemical industrial parks of Jining and Weifang, local authorities have accelerated the construction of large peak-shaving gas-fired power plants and smart grids, thereby securing continuity in the production chains of energy-intensive enterprises. This not only reduces operational risks but also minimizes unexpected losses. A stable and reliable energy environment has also attracted large numbers of foreign enterprises. Qingdao is a typical case: relying on its port logistics system and stable energy supply, the city has gradually formed an industrial base centered on manufacturing and modern logistics, attracting investment projects from Japan, South Korea, Europe, and the United States. Multinational enterprises favor Qingdao not only because of convenient port transportation but also because they can achieve long-term development in a low-risk, highly efficient business environment.

Promoting Regional Development: The indirect effect of infrastructure construction is also reflected in promoting coordinated regional development and narrowing regional disparities. In underdeveloped areas such as southwestern Shandong, industrial development used to lag behind due to poor transport connections and restricted factor mobility, with insufficient employment opportunities and clear gaps in economic

development compared with developed regions such as Jinan, Qingdao, and Yantai. However, with the gradual improvement of high-speed rail and expressway networks, these areas' locational disadvantages have been significantly reduced. For example, in Heze, southwestern Shandong, the opening of the Jinan–Zhengzhou high-speed railway and the Rizhao–Lankao expressway has enabled the successful transfer of textile, food processing, and light manufacturing industries from both within and outside the province. The entry of these industries has not only brought new tax revenue but also created large numbers of jobs, promoted local employment, and alleviated the pressure of rural labor migration.

Meanwhile, the balanced development of infrastructure helps optimize the allocation of factor resources. After transport improvements, logistics radii in southwestern Shandong have been significantly shortened, allowing agricultural products that once lacked market competitiveness to reach coastal and urban markets more quickly, thereby increasing farmers' incomes. More importantly, the interconnection of infrastructure within the region has promoted urban–rural integration. The paving of rural roads and the spread of information and communication networks have facilitated the rapid growth of rural e-commerce, enabling agricultural products to achieve nationwide sales through digital platforms. For example, in Shanxian and Juye counties, local authorities have relied on logistics parks and cold-chain storage facilities

to establish distribution centers for vegetables and livestock products. These products are now sold to the Beijing–Tianjin–Hebei and Yangtze River Delta regions, forming typical industrial cluster effects.

4. Conclusion

In summary, Shandong's infrastructure construction, supported by continuous fixed asset investment, has significantly promoted economic growth through both direct demand pull and indirect environmental improvements. Looking ahead, Shandong should stabilize traditional infrastructure while expanding investment in new infrastructure, optimize the investment structure, attract more social capital to broaden financing channels, and strengthen project lifecycle management to improve efficiency. Ultimately, these measures will continue to inject momentum into the province's high-quality economic development.

References

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