



China–ASEAN Trade under the Western Land–Sea Corridor: Empirical Evidence from a DID Panel Analysis

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Abstract. Western Land-Sea New Corridor has emerged to be among the strategic infrastructure initiatives, which concentrates on enhancing connectivity between inland China and the ASEAN economies. The paper explores the impact of province country panel data of 2012–2024 on bilateral trade. The changes in the scale of trade, the balance of trade, the market share and the intensity of trade are estimated using a difference-in-differences (DID) model. Empirical evidence indicates that the corridor is a significant stimulus to the degree of trade and economic interconnections. Trade balance however shows statistically significant fall to represent additional integration of imports and structural change of trade patterns. The robustness tests, including placebo tests, propensity score matching DID, and the absence of the COVID-19 era, support the validity of the results. Findings show that infrastructure is relevant in reducing the cost of trade, enhancing logistics productivity, and redefining regional patterns of trade.

Keywords: China–ASEAN trade, DID model, infrastructure corridor, trade intensity, panel data

1 Introduction

Infrastructure development is a key element in characterizing international trade by reducing the cost of the transaction and increasing connectivity. The dynamic expansion of global value chains in the recent decades has added importance to efficient transport networks in trade at both domestic and international levels.^[1] Western Land-Sea New Corridor of China is a big policy project targeted at implementing connectivity of both inland China provinces and ASEAN economies.^[2] The corridor has also included rail, road, and sea transport systems so as to provide an alternative channel of trade that could exclude the use of the traditional sea routes.

The significance of the corridor is not restricted by the logistics efficiency. It has the potential to change the trends of trade by altering the comparative advantages, improving accessibility, and integrating the region economy.^[2] Despite previous studies having come up with a strong interdependence between infrastructural developments and trade growth, little has been done so far to examine how a specific corridor policy can affect disaggregated bilateral trade.

The paper will attempt to address this gap by analyzing the impact of the Western land-sea corridor on Chinese-ASEAN trade through a panel data study. Unlike the available researches which simply examine aggregate trade flows, this study examines different aspects of trade including scale, balance, market share, and trade intensity. This research has three-fold contributions. First, it provides empirical evidence on the impact of a major infrastructure corridor on bilateral trade. Second, it broadens the literature because it examines the structural alterations in the trade rather than the volume of trade itself. Third, it applies a strong DID model to establish causation between trade and policy implementation.

2 Literature Review

2.1 Infrastructure and Trade Costs

The general agreement is that transport infrastructure is a key variable in international trade performance. Infrastructure investments have a direct influence on the prices of trade and market accessibility by improving the speed of transit, reducing the cost of freight and improving the reliability of the logistics. Empirical experience has repeatedly demonstrated how improved transport systems have the potential to open the way to higher levels of trade by minimizing both physical and administrative congestion. As Cosar and Demir reveal, road infrastructure can multiply the export capabilities massively since it connects the production centres to the world markets.^[3] Similarly, Brancaccio et al. emphasize that the integrated transport networks affect the trade frictions and restructure the spatial trade modes by increasing the connectivity between regions.^[4] These studies all conclude substantially that development of infrastructure is not complementary to trade growth but is critical.

2.2 China–ASEAN Economic Integration

The China–ASEAN economic relations has emerged to be an important feature that has been enhanced over the past two decades due to trade agreements, geographic proximity, and economic complements. Regional structures have seen the tariff cut and increase in cross-border flows of investment. Infrastructure projects have helped to boost these linkages as they have led to an improved connectivity between the inland Chinese provinces and the ASEAN markets. In perspective of ownership, location and internalisation advantages, Dunning provides a valuable theoretical framework of insight into such cross-border economic integration.^[5] Likewise, institutional quality and political stability are key factors that determine the movement of trade and investment.^[6] A combination of these opinions makes it clear that physical infrastructure and institutional conditions are the two key elements of the sustainability of regional integration.

2.3 Trade Structure and Economic Complexity

Recent studies have abandoned the pursuit of aggregate volumes of trade in favor of the qualitative side of trade, particularly the structure and sophistication of exports. The economies that produce more complex and diversified products will be more prone to have higher and consistent growth by exporting these products.^[7] The same perspective is further explained by Hidalgo who links economic complexity to the diffusion of knowledge and productive power.^[8] This shows that the level of trade as well as the nature of trade including the nature of goods traded and the degree of participation in the value chain could be influenced by infrastructure advancements.

2.4 Research Gap

Despite the large body of work in infrastructure and trade, not much has been done on the impacts of some policies of the corridor on bilateral trade relations. The paper fills this gap by providing a detailed analysis of the Western Land-Sea Corridor.

3 Methodology

3.1 Data

The article uses panel data of Chinese provinces and ASEAN nations between 2012 and 2024. Trade data is found in the official customs statistics and international databases.

3.2 Variables

Trade Scale can be defined as a logarithm of total trade volume. Trade Balance is the difference between imports and exports. Market Share measures the percentage of ASEAN trade to provincial trade. The bilateral trade relations are measured using Trade Intensity.

The control variables are the GDP, industrial structure, government expenditure, education level and innovation capacity.

3.3 Model Specification

The DID model is specified as:

$$Y = \alpha + \beta(\text{Treat} \times \text{Post}) + \text{Controls} + \varepsilon$$

This model allows establishing the causal consequences by comparing changes in treated and control groups across a time interval.

3.4 Identification Strategy

The DID approach assumes parallel patterns of treatment and control groups prior to the change in policies. This assumption is tested using the pre-policy data.

4 Empirical Results

Table 1. Baseline Regression

VARIABLES	(1) Scale	(2) Balance	(3) Share	(4) Thi
<i>Treat × Post</i>	0.607*** (7.132)	-1.149*** (-5.741)	0.039*** (6.777)	1.081*** (5.364)
Ind	-0.644*** (-4.639)	1.124*** (3.448)	-0.003 (-0.291)	-1.170*** (-3.562)
Gov	0.244** (2.394)	-0.450* (-1.877)	-0.002 (-0.304)	0.497** (2.054)
Edu	-5.049** (-2.245)	0.200 (0.038)	-0.165 (-1.073)	7.154 (1.343)
Humcap	-0.817*** (-5.662)	-0.147 (-0.433)	-0.007 (-0.721)	-0.768** (-2.248)
Innovate	0.555*** (5.719)	-0.071 (-0.311)	-0.006 (-0.899)	0.125 (0.544)
Consume	0.353*** (4.772)	0.539*** (3.102)	0.015*** (3.066)	-0.498*** (-2.843)
Political	-0.063 (-0.830)	0.159 (0.896)	-0.019*** (-3.586)	0.210 (1.172)
Super	-0.251*** (-2.918)	0.532*** (2.632)	-0.012** (-2.022)	-0.061 (-0.300)
Constant	13.503*** (9.759)	-2.225 (-0.684)	0.082 (0.872)	5.310 (1.621)
Observations	4,030	4,030	4,030	4,030
R-squared	0.709	0.216	0.327	0.266
Province	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes

The baseline regression results show that the policy variable is significant to the trade scale and has a positive coefficient (about 0.607) (see Table 1). This indicates that the corridor plays a significant role in bilateral trade development.

Regarding the balance of trade, the coefficient is a negative figure (approximately -1.149) which means that imports have increased at a higher rate than exports. This signals a greater regional integration into the supply chains.

Increase in trade intensity which implies more economic linkages is quite high as well. The market share results indicate the redistribution advantage between the ASEAN nations.

Table 2. Parallel Trend Test

VARIABLES	(1) Scale	(2) Balance	(3) Share	(4) Thi
pre6	-0.041 (-0.209)	0.117 (0.147)	0.003 (0.187)	-0.456 (-0.852)
pre5	-0.288 (-1.541)	0.485 (0.662)	-0.003 (-0.203)	-0.065 (-0.130)
pre4	-0.082 (-0.409)	0.393 (0.525)	-0.001 (-0.042)	-0.135 (-0.256)
pre3	-0.107 (-0.532)	0.305 (0.421)	0.001 (0.037)	0.237 (0.448)
pre2	-0.065 (-0.310)	0.241 (0.344)	0.004 (0.233)	0.162 (0.301)
pre1	-0.269 (-1.281)	-0.623 (-0.920)	0.001 (0.034)	0.145 (0.270)
current	0.006 (0.026)	-0.409 (-0.588)	0.006 (0.369)	0.141 (0.260)
post1	0.604** (2.537)	-0.618 (-0.922)	0.064*** (3.468)	1.767*** (3.263)
post2	0.540** (2.325)	-1.821*** (-2.780)	0.049*** (2.836)	1.092** (2.021)
post3	0.556** (2.306)	-1.411** (-2.128)	0.054*** (3.173)	1.264** (2.325)
post4	0.524** (2.140)	-1.410** (-2.132)	0.049*** (2.938)	1.122** (2.044)
post5	0.505** (2.085)	-1.203* (-1.806)	0.037** (2.208)	1.293** (2.339)
post6	0.669** (2.146)	-1.308* (-1.786)	0.048** (2.284)	1.337** (2.043)
post7	1.275*** (3.803)	-1.341* (-1.762)	0.004 (0.198)	2.587*** (3.535)
Constant	13.203*** (9.158)	-3.060 (-0.878)	0.112 (1.127)	4.965 (1.488)
Observations	4,030	4,030	4,030	4,030
R-squared	0.712	0.221	0.333	0.271
Controls	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes

Parallel trend tests render the DID model valid. Placebo tests and PSM-DID are strong tests that guarantee the consistency of the findings (see Table 2).

5 Discussion

The findings indicate that the infrastructure corridors greatly improve the connectivity of the trade besides restructuring the trade patterns. The decreased trade surplus rec-

orded signifies a shift towards more integration of imports, which suggests a shift towards more and more involvement in regional value chains rather than a fall in trade performance. Such a change results in a more balanced and mutually dependent trade relationship between China and ASEAN economics. The gains are not however evenly distributed geographically and this leads to the significance of geographical position, industrial potential and the existing economic conditions in defining the scale with which different provinces and partner countries gain through the integration of infrastructure.

6 Conclusion

This paper demonstrates that the Western Land-Sea New Corridor is one of the key elements in improving the China-ASEAN trade by improving both the overall trade level and structural change in the trade patterns. The empirical data indicate that an improved connection enhances the economic linkage and encourages more integration in regional supply chains, particularly with growth in imports. These findings show that infrastructure projects can be strong instruments of regional economic integration. Policy wise, the results suggest that concerted action to invest in transport networks, complementary industrial and trade policies should be taken to ensure that the benefits of better connectivity are more evenly spread across the territories and industries.

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