



Trade Openness and Macroeconomic Dynamics: Evidence from China

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ARTICLE INFO

Article History:

Received: October 21, 2025
Revised: November 24, 2025
Accepted: December 06, 2025
Available Online: December 16, 2025

Keywords:

Trade Openness, Foreign Direct Investment, Inflation, ARDL, China.

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ABSTRACT

Foreign direct investment, exchange rate are the key variables that have a great influence on economic growth. This study investigates the relationship between foreign direct investment, inflation, exchange rate, economic growth and trade openness in China. This study used the ARDL technique. The data is collected from WDI and data range is 2000-2024. Trade openness is used as dependent variable while foreign direct investment inflow, inflation, exchange rate, and economic growth using as independent variables. The short run findings indicate that foreign direct investment, inflation, exchange rate positively impacts the trade openness however; the impact of inflation is insignificant. Economic growth correlates significant and negative with trade openness. In the long run ARDL results found that all variables foreign direct investment, inflation, exchange rate, and economic growth have significant except exchange rate positively associated with trade openness in China. Based on these results, policymakers and officials should focus on stabilizing the exchange rate, controlling inflation, and formulating policies that attract foreign investors and promote economic growth in China.

Introduction

China has become one of the most dynamic economy in the world in recent decades, evolving from centrally deliberate economy to a major player in the international trade. Since the late 1970s economic changes, the country has adopted policies that promote liberalization, industrialization, and globalization (Abdi et al., 2024; Mishra et al., 2025). Trade openness has a critical role in china's development, allowing it to access international markets, attract foreign investment and boost growth. Nevertheless, trade openness is affected by a number of variables, such as FDI, currency rates fluctuations and overall growth (Rakshit et al., (2022; Yi et al., 2025). It is

important to understand how these attributes interact with trade openness so that the long-term growth and competitiveness of china in the global economy can be achieved. One of the significant contributors of export led-economy and industrial transformation in china is foreign direct investment (Hossain et al., 2022; Kumar et al., 2025). FDI has significantly enhanced production capacity and export performance of china through inflow of capital, technology and management skills. The liberalization of the investment laws that are currently being experienced, and the establishment of special economic zones (SEZs) has been drawing international companies seeking to tap into the huge domestic market and trade network of china. Empirical studies indicate that FDI enhances trade openness because it helps export-oriented industries to gain growing international competitiveness (Senanayake et al.2010; Ahmad et al.2020). Therefore, FDI is not only a source of external financing but also a channel of further integration into global values chains. Trade openness is also affected by inflation. Stability of prices is essential in ensuring competitiveness in exports and investor confidence. The local monetary conditions and the international trade forces both perform a part in the dynamics of inflation in china. High inflation lower the real value of exports and imports whereas constant rate of inflation encourages trade by destroying certainty.

Research specifies that the developed the trade, the lower the inflationary pressures due to the increased competition and market efficiency (Marquez et al., 2007; Hye et al., 2016). Consequently, maintaining low inflation is essential to the success of china to enjoy the fruits of globalization and trade liberalization. Another factor that has an impact on trade openness is the exchange rate policy. With the transition of china to a managed fluctuating regime, instead of a fixed change rate, exchange rate stability became essential in order to balance trade flows and foreign investment (Cudjoe et al., 2023; Yang et al., 2024). A weakened exchange rate will make exports more competitive, which will boost the level of trade, whereas appreciation can lower the level of exports. There is empirical evidence that exchange rate stability enhances commerce by reducing transaction cost and uncertainty (Dalaseng et al., 2022; Tahir et al., 2023). So, the currency rate management strategy of china has been intertwined with its objective of enhancing trade openness and expansion of the external sector. Sustain growth is based on the up imports of technology, machinery and intermediate products needed to increase production and exports (Kong et al., 2021). A growing economy attracts FDI and more involvement in international trade. It has been discovered that the link of trade openness with growth in china is very favorable with free trade policies being associated with an increase in productivity, diffusion of technology and export diversification (Ma et al., 2019; Shah et al., 2025). Consequently, the economic growth and liberalization of trade are complementary developments in the model of development in china. Due to the interrelation between these macroeconomic variables, it is important to discuss the influence of FDI, inflation, exchange rates and EG on trade openness in china (Lal, 2017). Furthermore, the relative quantity and direction of the effects may have shifted over time (Kyophilavong et al., 2017; Yang et al., 2024). Thus, the purpose of this article is to conduct an empirical analysis of the joint influence of FDI, inflation, and exchange rate on economic development in China over time, taking into account the degree of trade openness. The goal is to determine how these variables interact, whether trade openness strengthens or diminishes those effects, and to provide policy implications for present macroeconomic difficulties.

This article is designed as follows: section 2 explains a comprehensive review of literature, highlighting the key theoretical perspectives. Section 3 represents the research methodology, including the data sources, model specification, estimation techniques, and diagnostic tests used in analysis. Section 4 reports and discusses the empirical results, providing an interpretation of the findings. Finally, Section 5 concludes and suggest policies.

Literature Review

The critical component of international economics are foreign investment and trade openness and they both also significant contributes in growth of a nation. A strong theoretical framework is need to link the link and economic expanding about growth and foreign investment. According to the neoclassical thoughts capital increase especially foreign direct investment direct contribute in economic growth and grow the country productivity (Solow 1956). This idea concluded that foreign investment may smother industrial growth by depending on economic power of foreign corporations. As foreign direct investment contributed in domestic economy but it's all depend on the host country industrial sector health. Trade openness decide the economy integration in global market on the behalf of trade barriers pattern and their trade history linked with economy growth. Theory of comparative advantages of Ricardo which is based on classical theory of trade opposes the profit of nations specializing industries where relative efficiency advantage they have (Rodrik, 1999; Farooq et al., 2025). Allocation of resources, market competition, and specialization promote TO and economic growth. Trade openness is now linked with economies of scale, inventions, and production gains as enterprises competing on a global scale are driven to enhance efficiency and embrace sophisticated technologies (Liu et al., 2024). However, in many studies warns trade openness increase the economic growth and its effects are depending on the stability of macroeconomic performance, quality of institutional and industrial condition. Rodrik (1999) & Tanzeel et al., (2025) found that role of FDI and trade openness have mutually effects on growth and it increase the production. Foreign investment can inforce trade growth by allocating domestic production sectors into global market, boost the export oriented sectors and provides customers access to foreign markets. At same time trade openness make a nation more efficient to investors by enhancing consumer markets, erase the barriers and insure a friendly trade policy in different economies. Liargovas & Skandalis (2012) explained that trade openness has a positive impact with foreign investment due to cost discrimination, access of markets and availability of resources. Dalaseng et al. (2022) suggested that economies with TO and a stable investment environment fascinate the more level of foreign investment, which run a cycle of growth with capital inflows, improvements in production and development of industry. Hussain et al. (2025) and Shabir et al. (2025) considered that jointly role of FDI and TO has positive impact on EG in China and Pakistan. Oana (2018) evaluated the impact of foreign and domestic investment on export in e EU states from 1998-2012. Revealed that adverse effects in diverse sectors and economies. Majid & Elahe (2016) & Farooq et al. (2025) calculated the relationship in trade, foreign investment in emerging EU and ASIAN states. Suggested the unidirectional relation among growth and foreign investment. Dritsakis & Stamatiou (2018) & Farooq et al. (2024) examine the association of trade, economic growth, and unemployment in china and also FDI in Pakistan. Some studies checked the impact of foreign direct investment on development of economics. Panagiotis (2015) & Sabir et al. (2024) examined that how foreign investment and gross capital formation increase the economic growth in Eurozone states, but found the alternate impacts. Kemal & Turgay (2019) and Hussain et al. (2024) analyzed the trade openness on economic growth in China and Turkey. Suggested that increased in trade openness, foreign investment promote the economic growth. Egger (2001) considered bilateral economic actions in EU member's countries, discovered positive impact between foreign investment, trade openness and economic growth. Mehmood et al. (2024) examined the association with trade openness and exchange rate and found adverse effects in Bangladesh. Radulescu et al. (2020) analyzed that foreign investment has considerable impact on trade in central European economies, particularly in export and imports. Hussain et al. (2023) analyzed the impact of exchange rate and economic growth in Pakistan. Used ARDL method and suggested that there was negative in short and positive in long run effects founds. Joo & Shawl (202) examined the correlation of FDI and financial growth in BRICS. Found that FDI had negatively impact, and trade positively impact. Faheem et al. (2023) and Francois et al. (2023)

investigated the relationship among FDI and economic growth in Africa. Remarked that in long run foreign investment positive impact on economic growth. Chaudhary et al. (2021) & Ogbuabor et al. (2024) described the impact of foreign investments on trade openness and inflation in emerging economies and found the negative impacts. Hussain et al. (2023) and Kang et al. (2024) looked that foreign investment, trade openness and infrastructure have positive contribute in economic growth. Despite substantial contributions in the existing literature, the combined effects of FDI, inflation, and growth on trade openness.

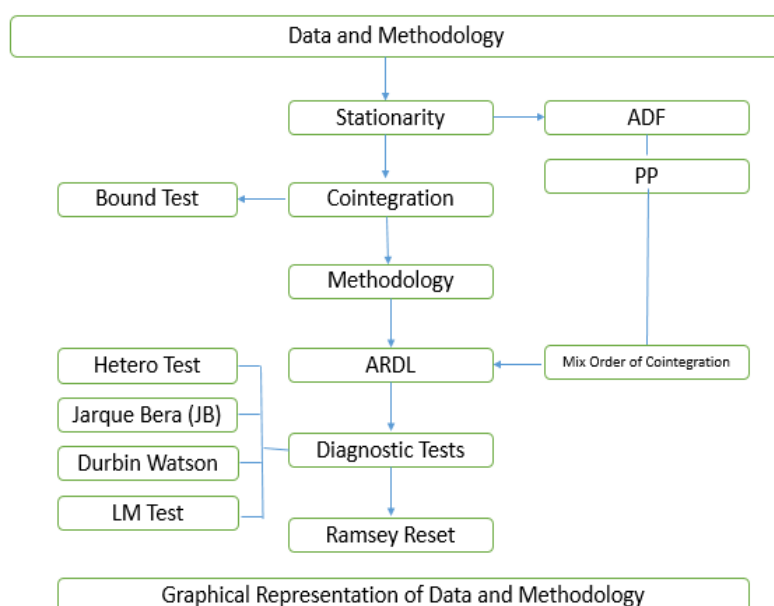
Data and Methodology

The study explores the association of foreign direct investment, inflation, growth, and exchange rate with trade openness of China over 2001 to 2024. Description of all variables including data source is given below. The study employs ARDL a dynamic procedure established by Pesaran et al. (1999). This method is broadly uses in analysis for long and short run estimations. The ARDL approach is suitable because it can accommodate variables that are either stationary or not. It is particularly appropriate for datasets with a mixed order of integration, where variables may be integrated at I(0) or I(1).

Table 1: Variables Description

Variable Name	Symbol	Measurement	Source
Trade Openness	TRO	(Exports+Imports/GDP)	WDI
Foreign Direct Investment	FDI	FDI, net inflows (% of GDP)	WDI
Economic Growth	GDP	GDP (constant 2015 US\$)	WDI
Inflation	INF	Inflation, consumer prices (annual %)	WDI
Exchange Rate	EXR	Official exchange rate (LCU per US\$, period average)	WDI
Trade Openness	TRO	(Exports+Imports/GDP)	WDI

The methodologies consequence for a comprehensive examination of multifaceted interactions between these economic determinants and trade openness. The main purpose of this study to declare the empirical insights hoe FDI, and other highlighted determinants effects the trade openness in China.



Model Specification

The study is based on the following analytical model:

$$TRO = f(FDI, INF, EXR, GDP) \quad (\text{Eq-1})$$

Where TRD represent the trade openness, INF inflation, EXR exchange rate, GDP (gross domestic product) economic growth.



Graphical Representation of Specific Model

Following is the general equation of the model,

$$TRO_t = \alpha_1 + \alpha_2 FDI_t + \alpha_3 INF_t + \alpha_4 EXR_t + \alpha_5 GDP_t + \mu_t \quad (\text{Eq-2})$$

Assumed in the mentioned model, $\alpha_2 > 0$, $\alpha_3 > 0$, $\alpha_4 > 0$, and $\alpha_5 > 0$. The signs α_2 , α_3 , α_4 , and α_5 are the elasticity of trade openness regarding the FDI, inflation, exchange rate(EXR), and economic growth (GDP). The conditions of the NARDL model are the follows:

$$\Delta LTRO_t = \alpha_0 + \sum_{i=1}^l a_{1i} \Delta LFDI_{t-i} + \sum_{i=1}^p \alpha_{2i} \Delta LINF_{t-i} + \sum_{i=1}^q \alpha_{3i} \Delta LEXR_{t-i} + \sum_{i=1}^q \alpha_{4i} \Delta LGDP_{t-i} + \alpha LTRO_{t-1} + \alpha_2 LFDI_{t-2} + \alpha_3 LINF_{t-3} + \alpha_4 LEXR_{t-4} + \alpha_5 LGDP_{t-5} + \mu_t \quad (\text{Eq-3})$$

Results and Discussions

The specified below table of descriptive statistics shows the values of statistical numbers where mean value of trade openness 0.9280, foreign direct investment 2.80E+11, inflation 9.5058, exchange rate 110.6007, and economic growth is 1.6007 respectively. The maximum value of trade openness 3.0357, foreign direct investment 4.15E+11, inflation 30.7681, exchange rate 280.3561, and economic growth is 2.3561 respectively. The minimum value of trade openness 0.3095, foreign direct investment 1.63E+11, inflation 2.5293, exchange rate 53.6481, and economic growth is 3.6481 respectively. The standard deviation value of trade openness 0.7561, foreign direct investment 7.91E+10, inflation 6.5202, exchange rate 64.0956, and economic growth is 6.0956 respectively. The skewness value of trade openness 1.8466, foreign direct investment 0.1896, inflation 1.5962, exchange rate 1.5463, and economic growth is 1.5478 respectively. The kurtosis value of trade openness 5.1432, foreign direct investment 1.8307, inflation 5.7751, exchange rate 4.5880, and economic growth is 2.5890 respectively. The Jarque Bera value of trade openness 18.9937, foreign direct investment 1.5740, inflation 18.6383, exchange rate 12.5903, and EG is 11.5621 respectively. The probability value of trade openness 0.0000, foreign direct investment 0.4551, inflation 0.0000, exchange rate 0.0018, and economic growth is 0.1818 separately.

Table 2: Descriptive Statistics

	TRO	FDI	INF	EXR	GDP
Mean	0.9280	2.80E+11	9.5058	110.6007	1.6007
Median	0.6846	2.65E+11	7.9210	93.3952	3.3954
Maximum	3.0357	4.15E+11	30.7681	280.3561	2.3561
Minimum	0.3095	1.63E+11	2.5293	53.6481	3.6481
Std. Dev.	0.7561	7.91E+10	6.5202	64.0956	6.0956
Skewness	1.8466	0.1896	1.5962	1.5463	1.5478
Kurtosis	5.1432	1.8307	5.7751	4.5880	2.5890
Jarque-Bera	18.9937	1.5740	18.6383	12.5903	11.5621
Probability	0.0000	0.4551	0.0000	0.0018	0.1818
Sum	23.2004	7.00E+12	237.6468	2765.018	65.0187
Sum Sq. Dev.	13.7205	1.50E+23	1020.334	98598.15	98.1526

The correlation matrix discloses pairwise relationship of variables. Foreign direct investment has a negative correlation with GDP (−0.2822), exchange rate (−0.3510), and trade openness coefficients values are −0.2822, −0.3510, and −0.3510 respectively., while it has a weak but positive correlation with inflation. GDP is positively correlated with inflation, exchange rate (0.8828), and trade openness (0.8816). It suggesting that higher economic growth is associated with greater inflationary pressures. Inflation is positively associated with the exchange rate at coefficient 0.6122 and trade openness at 0.6215. Exchange rate shows a strong and positive correlation with GDP 0.8828 and a moderate positive relationship with trade openness 0.3549. Finally, trade openness has a strong positive relationship with GDP 0.8816 and inflation 0.6215.

Table 3: Correlation Matrix

	TRO	FDI	INF	EXR	GDP
TRO	1				
FDI	-0.2822	1			
INF	0.1374	0.4515	1		
EXR	-0.3510	0.8828	0.6122	1	
GDP	-0.3510	0.8816	0.6215	0.3549	1

The unit root test results from ADF and PP indicate that all variables (TRO, FDI, INF, EXR, and GDP) are non-stationary at levels and become stationary at first difference. This approves that all series are integrated of order one, I(1).

Table 4: Unit Root

	ADF Test		PP Test	
	Level	1st Difference	Level	1st Difference
TRO	1.6166 (0.9990)	-13.1800 (0.0000)	7.0081 (1.0000)	-3.3491 (0.0242)
FDI	-2.4456 (0.1411)	-3.1422 (0.0373)	-1.9460 (0.3070)	-3.1422 (0.0373)
INF	-2.4835 (0.1316)	-4.8812 (0.0016)	-2.4378 (0.1426)	-4.7370 (0.0011)
EXR	1.6166 (0.9990)	-13.1800 (0.0000)	7.0081 (1.0000)	-3.3491 (0.0242)
GDP	0.7801 (0.9914)	-4.6516 (0.0013)	1.9434 (0.9997)	-4.7161 (0.0011)

The critical value of F statistics is bigger than the upper bound that reject the null hypothesis and checking the existing of a long run relationship between variables in model.

Table 5: Bound Test

F-stat.	4.9	
Significance	I(0)	I(1)
1%	4.29	5.61
5%	3.23	4.35
10%	2.72	3.77

The short-run calculations disclose that FDI has a positive and statistically substantial with p value 0.0141 and coefficient is 0.3944 effect on TO, suggesting that higher FDI inflows contribute to trade openness at 1.6654 percent in the short run. The inflation coefficient is 1.1572 shows a positive but insignificant relationship with p value of 0.2928. Showing that the inflation impact on trade openness is weak. The EXR also exerts a positive result on trade openness with a coefficient value of 0.4534 and is marginally significant at p p-value of 0.0541. In the short term, currency fluctuations play a role in shaping trade openness. Contrariwise, GDP hurts trade openness with a coefficient of 1.3391 and is statistically significant at p value is 0.0719. It postulates the increase in GDP will decrease the TO.

Table 6: Short Run Results

Variable	Coefficient	Std. Error	t – Statistic	Prob
D(LFDI)	0.3944	0.2368	1.6654	0.0141
D(LINF)	1.1572	1.0658	1.0856	0.2928
D(LEXR)	0.4534	0.2191	2.0694	0.0541
D(LGDP)	-1.3391	0.6976	-1.9194	0.0719
CointEq(-1)	-0.7579	0.2250	-3.3683	0.0036

Long run results concluded in table 7 where describes the impact of FDI, inflation, EXR and growth on TO in China. Where the coefficient of FDI is 1.5268 and p value is 0.0272 which showing positive relation trade openness. Mean that if 1 percent escalation in foreign direct investment it will boost the trade openness at 1.2529 percent. The coefficient of inflation is -0.5983 and p value is 0.0097 which describes a negative and statistically significant relation with trade openness. It concludes that if 1 percent boost in inflation it will reduce the trade openness at -2.9110 percent. Exchange rate coefficient is -1.7668 and p value is 0.0182 which shows also negative and significant impact on trade openness. Which suggests that if 1 percent rise in rate of exchange it will fall the trade openness at -2.6122 percent in long period. Economic growth (GDP) number is 0.4527 and probability value is 0.0298 explains the significant and positive relationship with trade3 openness. In China if 1 percent increase economic growth it will increase the trade openness in long time China economy.

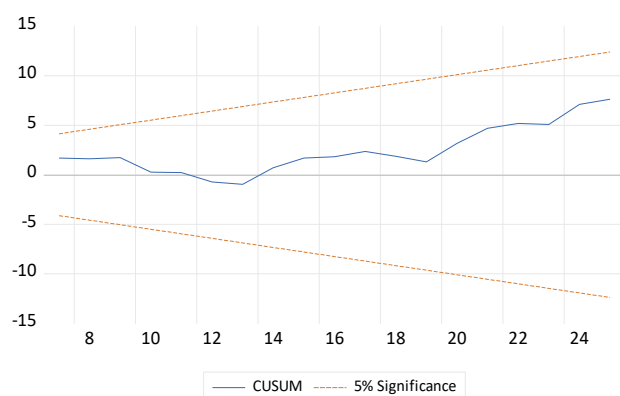
Table 7: Long Run Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LFDI	1.5268	1.2185	1.2529	0.0272
LINF	-0.5983	0.2055	-2.9110	0.0097
LEXR	-1.7668	0.6763	-2.6122	0.0182
LGDP	0.4527	0.1927	2.3485	0.0298
C	-33.5850	29.3471	-1.1444	0.2683

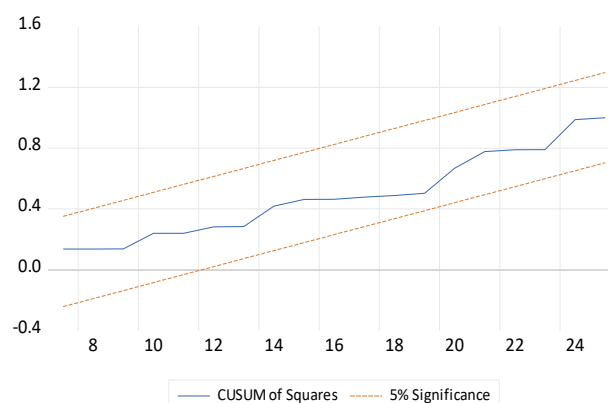
Diagnostics tests found that this model has high explanatory power, with R and R-squared coefficients of 0.9108 and 0.8998, respectively. This indicates that there is a 91 percent variation in trade openness, which is explained by variables such as foreign direct investment, inflation, exchange rate, and economic growth. The value of the F statistics is 7.6965, which confirms that the model is overall significant. No serious autocorrelation found by Durbin Watson test in this model the assessment of D.W is near to 2. To check the residual Jarque Berra test uses and they found residual are normally distributed with value is 0.9630 and probability figure is 0.6178. Ramsey reset test value is 2.7514 and p value is 0.1131 suggests that there is no model misspecification.

Table 8: Diagnostics Results

R Square	0.9108	F-Statistics (7.6965)
Adjusted R Square	0.8998	Durbin Watson (2.0578)
JB Test	0.9630	(0.6178)
LM Test	1.5132	(0.2484)
Hetero Test	0.4393	(0.7786)
Ramsey Reset	2.7514	(0.1131)



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Conclusions and Policy Implications

The findings of this study confirm the existence of both short-run and long-run relationships between trade openness, FDI, inflation, exchange rate, and GDP. The results highlight that FDI is a key driver of trade openness, while economic growth also plays a positive role in the long run, though its short-run impact is negative. Inflation supports trade only in the long run, whereas exchange rate depreciation undermines trade openness over time. Overall, the study concludes that sustainable trade openness requires balanced policies that attract FDI, promote growth, and ensure macroeconomic stability. Since FDI is a crucial driver of trade openness, governments should design comprehensive investment policies that ensure political stability, transparency, and efficient legal frameworks. Establishing special economic zones, improving infrastructure, and offering targeted tax incentives can attract quality foreign investors. Moreover, ensuring strong property rights and reducing bureaucratic hurdles will build investor confidence. Encouraging joint ventures between local firms and foreign investors can also enhance technology transfer and domestic capacity-building. The positive long-run association between inflation and trade openness suggests that moderate inflation can support economic activity. However, high and volatile inflation

damages competitiveness. Policymakers should adopt prudent monetary policies—such as inflation targeting and interest rate adjustments—to maintain stable price levels. Fiscal discipline is equally important to avoid excessive budget deficits that fuel inflation. In addition, supply-side measures such as supporting agricultural productivity and reducing energy costs can help keep inflation in check without sacrificing trade competitiveness. Exchange rate volatility has a negative long-run impact on trade openness, making exchange rate management a critical policy priority. Policymakers should adopt a managed exchange rate regime that balances competitiveness with stability. Building sufficient foreign exchange reserves can act as a buffer against speculative attacks and global shocks. Diversification of exports and promoting remittance inflows can also reduce pressure on the exchange rate. Moreover, engaging in bilateral currency swap agreements with trading partners can further stabilize exchange rate movements.

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