



RESEARCH PAPER

International Trade, Economic Development, and Inflation: Panel Data Analysis from South Asian Economies

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ABSTRACT

The current study aims to empirically explore the association among these complex issues and tackle the problem of endogeneity for the South Asian economies. The achievement of maximum gains from international trade, accelerated economic development, and price stability are the most ambitious macro-economic goals across the developing world. The study has conducted panel data analysis by applying the Three-Stage Least Square (3SLS) technique for the period 1990–2024. Findings have professed that inflation and economic development positively related with international trade, inflation is negatively associated with economic development, and international trade is positively linked with economic development, economic development and inflation are negatively related, while there is positive association between international trade and inflation. The study has suggested that South Asian authorities should devise such types of policies that focus on accelerating economic growth, removing trade barriers, and condensing inflationary pressure to a moderate level.

KEYWORDS 3SLS, Economic Development, Inflation, International Trade, South Asia

Introduction

The link between international trade and economic development is continually considered as a hot topic of debate among the economic theorists. Neoclassical exogenous growth model claims that changes in trade policy does affect the pattern of product specialization but it does not affect the economic development during long-run. New growth theory claims that changes in trade policy affect the rate of economic development in long-run, however, if the trading countries are structurally different in relations to modernization capabilities, effects of trade on economic growth in long-term becomes indistinguishable. The literature has mixed empirical evidence and leads to inconclusive debate about the effect of trade openness on economic development. Under certain conditions, trade between a developed and under developed country can improve the economic development during long-term in the under developed country (Grossman and Helpman, 1991). Spilimbergo (2000) has presented a model which has claimed that trade between an advanced country and less developed country can decrease long-term growth rate in the advanced country.

After World War 2nd, many economies have expanded international trade while raising inflation rate. Inflation is another global phenomenon which affects the economic growth of all the emerging economies of the world with no exception to South Asian economies. Persistent rise in inflation hurts economic growth, control of inflation has, therefore, become one of the most important objectives of government intervention in many developing countries. South Asian countries are encountered with the complex issues related with trade openness, economic growth, and inflation. None of the earlier studies has explored the association among trade openness, economic growth, and inflation in South Asia. In addition, there is clear endogeneity among trade openness, economic growth, and inflation but no research has been conducted to address these complex issues, as well as, to

tackle the problem of endogeneity. Therefore, there is dire need to address these complex issues for the South Asian economies. Remainder of the study proceeds as: second section is devoted to background literature. 3rd section provides the data, variables, and methodology. 4th section gives the estimates. Last section gives the conclusion and recommendations.

Literature Review

Background literature that deals with the association between economic development and inflation does not provide an exact trend about the connection among trade openness, economic development, and inflation. Many current studies have claimed inverse link between inflation and economic development, whereas, past research has advocated that inflation promotes economic development. Literature on the association between inflation and economic development has presented mixed evidence. Mallik and Chowdhury (2001) have claimed positive connection amid inflation and economic development, while, there exists a large number of studies which presents inverse link amongst inflation and economic development (e.g. Barro, 1995; Haile, 2017; Adu-Gyamfi et al., 2020). There are many recent studies have documented a threshold amid inflation and economic development (see for instance, Hasanov, 2011; Akgul and Ozdemir, 2012; Vinayagathan, 2013; Tung and Thanh, 2015).

Trade openness is considered as the critical driver that influences inflation (Feldkircher and Siklos, 2019). Empirical literature has provided contradictory evidence on the association concerning inflation and trade openness. There exist a large number of studies which has confirmed inverse relationship between inflation and trade openness (Romer, 1993; Lane, 1997; Gruben and McLeod, 2004; and Hanif and Batool, 2006; Wynne and Kersting, 2007; Al Nasser et al., 2009; Mukhtar, 2010; Feldkircher and Siklos, 2019). New growth theory has put forth that trade openness restrains inflationary pressure through its positive impact on economic development by increased efficiency, improved capacity utilization, improved resource allocation, and increase in investment (Jin, 2000). Contrary to these findings, empirical literature has also claimed positive relationship between inflation and international trade (i.e. Rodrik, 1992; Romer, 1993; Evans, 2007; Zakaria, 2010). Due to this contradiction, the economists have termed the inflation-openness relationship as the modern 'puzzle' in international macroeconomics (Temple, 2002).

Literature on association concerning trade and economic development have depicted inconsistent scenarios. There exists a large number of studies that have claimed a positive association amongst trade and economic g development. International trade positively affects the growth across the economies (Frankel and Romer, 1999). Positive association amongst trade and economic development has also been supported by many studies (see for instance, WTO, 2003; Stiglitz, 2007; Lippoldt, 2010; Nusair, 2012; Herzer, 2013; Seyoum et al., 2014). However, some studies have reported an income threshold between trade openness and growth i.e. after a certain limit, trade openness produces detrimental results (e.g., Foster, 2008; Chang et al., 2009; Kim, 2011). Nevertheless, there are many studies that have asserted a deleterious connection among international trade and development (Milesi-Ferretti and Razin, 2000; Glick and Hutchison, 2011; Adu-Gyamfi et al., 2020). The literature has mixed empirical evidence and leads to inconclusive debate about the connection among international trade and economic development, trade openness and inflation, and inflation and economic growth. There is dire need to explore the association among these complex issues, and South Asian middle income economies may be a good area for this purpose.

Material and Methods

Since, trade openness, economic growth, and inflation have interdependence and whenever, variables have interdependence then system equation or simultaneous equation model is considered as more appropriate.

Nature and Sources of Data

This study contains panel data of South Asian nations for the period of 1990-2024. Panel of these countries is selected on the basis that these countries are lower middle income, facing high inflation rate and considerable trade openness level. The data was collected from different sources like World Development Indicators and World Travel and Tourism Council (WTTC) and data of Overall Globalization have been taken from The Swiss Institute of Technology in Zurich, and the data of Governance is taken from World Governance Indicators (WGI).

Specification of Model

This study intends to check the interdependence among international trade, economic development, and inflation, as well as, to tackle the problem of endogeneity, specification of the models is as follows:

$$TOP = f(EGC, INF, EXR, GLOB) \dots\dots\dots (1)$$

$$INF = f(EGC, TOP, INR, GOV) \dots\dots\dots (2)$$

$$EGC = f(INF, TOP, GNS, TRM) \dots\dots\dots (3)$$

Where, TOP = Trade Openness, INF = Inflation, ECG = Economic Growth, EXR = Exchange Rate, GLOB = Globalization, INR = Interest Rate, GOV = Governance, GNS = Gross National Saving, and TRM = Tourism,

Construction of econometric models will be the transformation of equations (1), (2), and (3) as under:

$$TOP_{it} = \alpha_0 + \beta_{1it}EGC + \alpha INF + \alpha_{3it}EXR + \alpha_{4it}OAG + u_{it} \dots\dots\dots(4)$$

$$EGC_{it} = \beta_0 + \beta_{1it}INF + \beta_{2it}TOP + \beta_{3it}GNS + \beta_{4it}TRM + v_{it} \dots\dots\dots (5)$$

$$INF_{it} = \gamma_0 + \gamma_{1it}EGC + \gamma_{2it}TOP + \gamma_{3it}INR + \gamma_{4it}GOV + \epsilon_{it} \dots\dots\dots (6)$$

The summary included the Mean, Median, Minimum, Maximum, Observation and Probabilities of the all variables.

Results of Panel Unit Root Test

Results Levin Lin Chu (LLC) test for panel unit root are as under:

Table 2
Results of Panel Unit Root Test

Variables	Levin Lin Chu Test	
	1 st Difference	
	t-statistics	Prob.
Trade Openness	[-2.06793]	0.0193
Economic Growth	[-3.77334]	0.0336
Inflation	[-5.16606]	0.0000

Governance	[-4.56471]	0.0000
Gross National Saving	[-4.66931]	0.0000
Overall Globalization	[-1.90341]	0.0285
Tourism	[-1.86924]	0.0308
Interest Rate	[-2.45764]	0.0070
Exchange Rate	[-4.20830]	0.0000

[] in brackets the value of t-statistics has been shown and the value without brackets is P-value.

Results of given in table 2 reveal the presence of a unit root in the 1st difference for all the main variables i.e. trade openness, economic growth, and inflation, as well as, all the instrumental variables, i.e. governance, gross national savings, overall globalization, tourism, interest rate, and exchange rate.

Table 3
Three-Stage Least Square (3SLS) Panel Estimates

Dependent Variables	Independent Variables	Coefficients	t-statistics	Prob.
Trade Openness Equation (4)	Inflation	1.8650	2.86	0.000
	Economic Growth	2.7562	3.05	0.001
	Exchange rate	.15997	1.99	0.012
	Overall globalization	.27886	1.46	0.167
	Constant	-8.1821	-0.74	0.131
Economic Growth Equation (5)	Trade	.07605	.0246	0.021
	Inflation	-.13224	.0695	0.074
	Gross national saving	.17185	.0342	0.000
	Tourism	.13765	.1855	0.236
	Constant	-3.0304	1.151	0.013
Inflation Equation (6)	Economic Growth	-.879598	-2.83	0.001
	Trade	.134655	2.95	0.006
	Governance	-.639205	-1.97	0.012
	Interest Rate	.447646	4.97	0.000
	Constant	-.109857	-0.06	0.935

Results and Discussion

Results given in table 3 show that inflation and trade openness have positive and significant associations with each other. If inflationary pressure rises due to rise in consumer price index, it will exert force on Central Banks to increase the interest rate. Due to rise in interest rate, there will be appreciation in the value of the currency which will appeal the investors who are induced by high rate of returns. The speculators are attracted to this economy because of profit and international trade. Results indicate that international trade has a positive effect on inflation. Since the South Asian countries have a substantial degree of international trade, their domestic price level becomes vulnerable from foreign shocks. The anticipated empirical outcomes demonstrate a significant positive correlation between inflation and international trade, openness of import and export, hence, Romer's proposition is rejected in South Asian countries. This result is acknowledged by the results derived by many studies (Kim and Beladi, 2005; Razin and Loungani, 2007; Berument et al., 2008; Zakaria, 2010 etc). Estimates designate that international trade has a positive and significant influence on inflation. Rate of interest rises, which induces the investors, and hence, value of the currency is appreciated. On the other hand, lower interest rates discourage the investors, which leads to depreciation in the value of the currency. When foreign investment increases the import of that country increases which further

increases the inflation indirectly. Fischer (1993) has also reported the identical findings which are referred to as Fisher Effect.

Results also indicate that economic development is positively correlated with international trade. Economic development leads to expansion of output, modernization, specialization and innovations in the economy, which results extended trade activities and handsome gains from the trade. Results also reveal that international trade is positively connected with economic development. International trade among the countries creates the number of opportunities for the global markets which has an inducement for the entrepreneurs of under developed economies, ultimately, economic activities tends to expand across the globe. The availability of the latest technology for the developing economies is only because of international trade. As a result, competition among the trading countries rises, hence, there is increase in competency and efficiency, and efficient resource allocation takes place. The similar findings reported by (Andersen & Babula, 2008). Positive association amongst trade and economic development has also been supported by many studies (see for instance, WTO, 2003; Stiglitz, 2007; Lippoldt, 2010; Nusair, 2012; Herzer, 2013; Seyoum et al., 2014).

Findings given in table 3 indicate that inflation is negatively associated with the economic development of the South Asian economies. Inflation plays a crucial role in accelerating the growth rate of the country. High inflation rate is not considered as the factor of raising the growth rather it may lead to converse situation. It does not only cause to shrink the level of business activities, but also leads the down trend in the productive efficiency. As, there is rise in inflation rate, it reduces the purchasing power of people which means consumption level decreases and growth rate decreases. Similarity results are reported by Gokal and Hanif (2004). Negative link between economic development and inflation has been observed by many studies. In developing countries exports are considered as the major contributor of increasing the growth rate. Exports affect supplies of products available to domestic consumers, and hence prices. Prices will increase at that time when domestic demand for goods increases and goods domestically not produced. When goods domestically produced, or domestically produced goods have greater supply then price level cannot increase. In this way growth affects inflation negatively. Many studies have professed negative correlation amongst inflation on economic development (e.g. Barro, 1995; Ratnasiri, 2011; Muktadir-Al-Mukit and Shafiullah, 2014; Haile, 2017; Adu-Gyamfi et al., 2020).

Results related the instrumental variables indicate that exchange rate is positively connected with international trade which designates the internal correlation between imports and exports of a country and the exchange rate of the country. Appreciation in the currency of the country enables the cheap availability of the goods, as a result, volume of imports increases, and otherwise, converse circumstances are faced. When either exports increase or imports increase both indicate the trade openness. Results given in table 3 illustrate that there is a positive and significant connection between economic development and gross national saving. Savings are considered as an essential element for accelerating the process of capital formation which further leads to technical modernization and advancement, eventually, rapid economic development is achieved (Jagadeesh, 2015). Results reveal that governance is negatively connected the inflation. Good governance has always been termed as an inevitable factor for the boosting the economic activities which finally lead to economic development. During the process of making development, economy has to face adverse economic as well as social evils at the peak level which become obstacle in the way of economic development. Without the removal of all such types of hindrances, accelerated growth cannot be achieved. The ultimate solution lies only with the good governance. Good governance can assure the provision and protection of social rights to all the citizens. Finally, economic activities reach to full swing and inflation is also maintained at the moderate level. South Asian countries lack all the characteristics and no proper policies to control inflation.

Table 5
Results of Kurtosis Test

Component	Kurtosis	Chi-Square	DF	P-Value
1	3.988732	4.688263	1	0.0304
2	2.619819	0.400442	1	0.5269
3	3.493810	1.330848	1	0.2487
JOINT		6.419554	3	0.0929

Since the joint probability of the Kurtosis test is 0.1657 which is greater than 0.05, it is concluded that residuals are multivariate and normally distributed and hence, fulfill the assumption of the Classical Linear Regression Model.

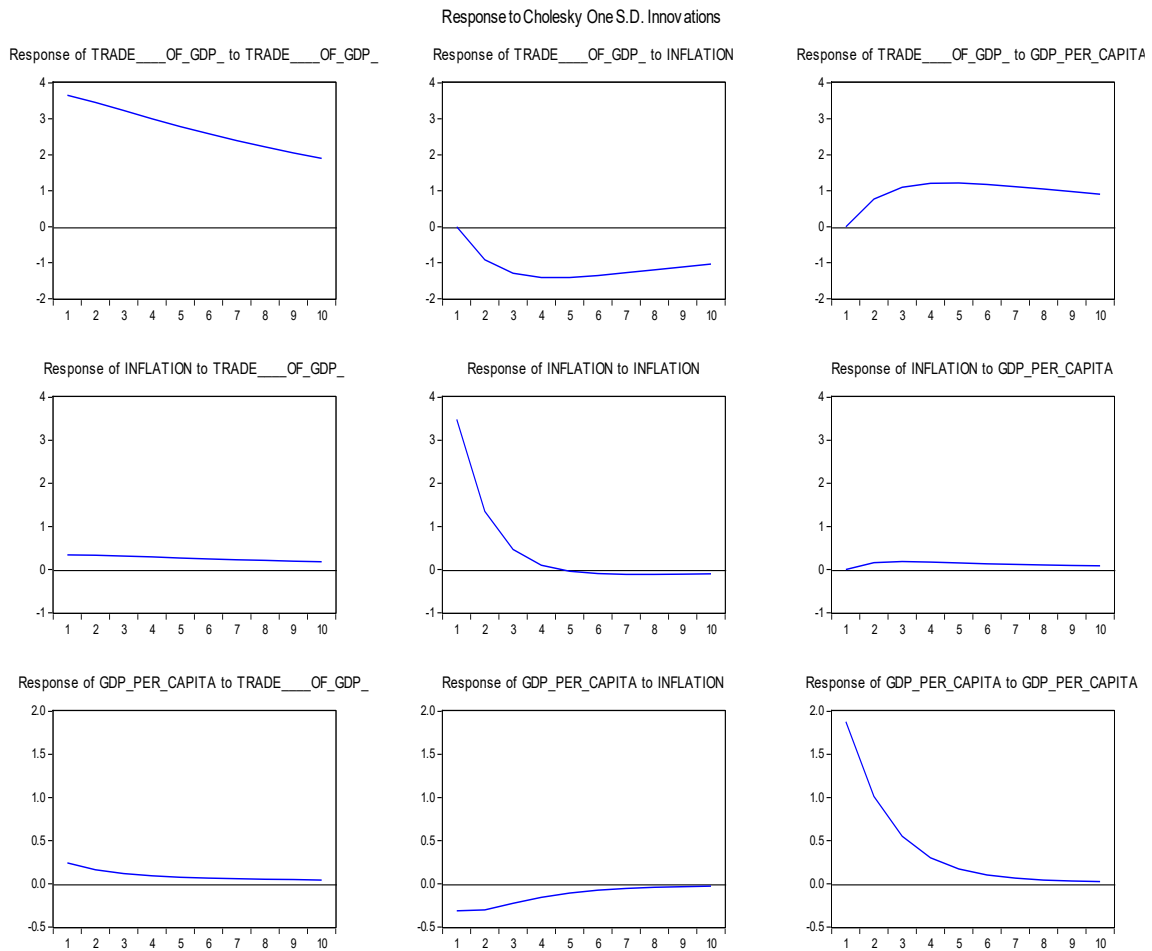


Figure 1: Cholesky Impulse Response

Cholesky impulse response entails that there should not be correlation between impulses of one variable to the other. Conversely, it will not be that other variable can be held static even the variable goes on moving. Findings indicate that impulse response of inflation and international trade to development, international trade and development to inflation and development and inflation to international trade are unrelated to each other as shown by the figure1.

Conclusion

The achievement of maximum benefit from international trade, high development, and stable inflation rate are the most ambitious macro-economic goals across the Developing World. Current study has attempted to scrutinize the empirical association among the international trade, economic development and inflation in South Asian lower middle income countries (Pakistan, India, Sri Lanka, and Bangladesh). The empirical

approximation is done by using a macroeconomic dataset spanning from 1990 to 2024 using a panel of four South Asian countries. The study has applied the Levin Lin Chu test to determine the stationarity of all variables. Three-Stage Least Square (3SLS) approach with instrumental variables is applied on the panel of South Asian countries. The study concludes that the accelerated economic development is beneficial for international trade and international trade leads to raise the economic growth in South Asia. Increase in inflation rate causes to increase international trade and increase in international trade de openness leads to increased inflation rate. Inflation rate and economic growth are inversely related to each other. In control variables, exchange rate can improve trade openness, gross national savings are positively related with economic growth, governance can relieve inflation, and interest rate exerts positive impact on inflation.

Recommendations

In view of above conclusions, it suggested that the authorities should devise such types of policies that focus on accelerated economic growth and international trade while inflationary pressure could be curtailed across the South Asian countries. In control variables, exchange rate should be improved to increase trade openness, gross national savings should be raised which will put a positive impact on economic growth, governance and interest rate may be effective tools to curb inflationary pressure in South Asia.

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