Asian Journal of Economics and Empirical Research
Vol. 5, No. 2, 165-172, 2018
ISSN(E) 2409-2622 / ISSN(P) 2518-010X
DOI: 10.20448/journal.501.2018.52.165.172

The Relationship among Economic Growth, Trade, Unemployment, and Inflation in South Asia: A Vector Autoregressive Model Approach

Anh Tru Nguyen[1]

[1]*The University of Newcastle Level 6, New Space, 409 Hunter Street, Newcastle NSW 2300, Australia*
Email: AnhTru.Nguyen@uon.edu.au

Abstract

The article aims to investigate the causal relationship among economic growth, exports, imports, unemployment, and inflation in five developing countries in South Asia for the last two decades (1997-2016) using a VAR model. We found that GDP has a negative relationship with inflation, while imports positively affect inflation in South Asian countries. Results demonstrated that there are no directional causalities between GDP, exports, imports, and unemployment rate and other variables in the short run. In contrast, there is a directional causality between inflation rate and other variables in the short run. We also found that there is a long-term relationship among economic growth, exports, imports, unemployment, and inflation in South Asia. Lastly, policies are recommended in order to ensure economic growth and a sustainable development in the South Asia.

Keywords: Economic growth, Trade, Unemployment, Inflation.
JEL Classification: E02, O11, O47.

Citation | Anh Tru Nguyen (2018). The Relationship among Economic Growth, Trade, Unemployment, and Inflation in South Asia: A Vector Autoregressive Model Approach. Asian Journal of Economics and Empirical Research, 5(2): 165-172.
History:
Received: 18 June 2018
Revised: 22 August 2018
Accepted: 25 September 2018
Published: 19 October 2018

Publisher: Asian Online Journal Publishing Group

Funding: This study received no specific financial support.
Competing Interests: The author declares that there are no conflicts of interests regarding the publication of this paper.
Transparency: The author confirms that the manuscript is an honest, accurate, and transparent account of the study was reported; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained.
Ethical: This study follows all ethical practices during writing.

Contents

1. Introduction

South Asia has been seen as the fastest growing region in the world. Inflation of this region has increased because of vibrant economic activities and higher oil prices. Although economic growth in destination markets, exports present a low performance, while imports are growing sharply (World Bank, 2018). This region has to deal with macroeconomic vulnerabilities. For example, fiscal deficits and public debt are higher than those of other regions. Despite capitalization levels of the region's banking systems appear generally adequate, underlying financial vulnerabilities are a matter of concern (IMF, 2018). Most of South Asian countries export textile, readymade garments, leather, and agricultural products, while the majority of petroleum and capital-intensive goods are imported. Consequently, trade between South Asian economies is likely to be more competitive rather than complementary. Further, the region faces serious troubles insecurity due to civil violence, intrastate separation, and religious conflicts (Kher, 2012).

There are some previous studies examining the relationship among macroeconomic indicators in South Asia (Rizavi *et al*., 2010; Sarwar *et al*., 2013; Behera, 2014; Bibi *et al*., 2014). However, none of these uses the vector autoregressive (VAR) model in order to investigate the relationship among economic growth, trade, unemployment, and inflation in South Asia. This research, therefore, expects to narrow down existing gaps of previous studies and more importantly, based on findings, affordable policies are recommended to the governments of South Asian countries to enhance economic growth and achieve the target in sustainable development. The VAR model is employed in this study because it interprets the endogenous variables solely by their own history, apart from deterministic regressors and therefore this method incorporates non-statistical a priori information (Pfaff, 2008). In addition, the VAR model is a consistent approach since it can examine the dynamic relationship between economic growth and other macroeconomic indicators (Gudeta *et al*., 2017).

The rest of this paper is organized as follows. Section 2 presents empirical literature. Research methods are presented in section 3. Section 4 presents results and discussion. Finally, conclusions are summarized in section 5.

2. Empirical Literature

The theme in the relationship among macroeconomic indicators is still debated by scholars in recent years. A study by Ramanayake and Lee (2015) assessed the relationship between export growth, trade openness, export diversification, and foreign direct investment (FDI) and economic growth in developing countries. They concluded that simply opening an economy for international integration does not guarantee sustained economic growth unless these actions lead to export growth. Likewise, Enejoh and Tsauni (2017) examined influences of inflation on economic growth in Nigeria over the period 1970-2016. They found that inflation and foreign exchange have positive relationships with economic growth in both the short run and long run. However, inflation and foreign exchange rates do not Granger cause economic growth.

There are a number of studies assessing the causal relationship among macroeconomic determinants in South Asia in recent years. Rizavi *et al*. (2010) estimated the relationship between openness and growth in South Asia for the period 1980-2008. Results addressed that openness of the economy is an important component to accelerate economic growth in South Asia. Likewise, a research by Behera (2014) examined the effects of inflation on economic growth in six South Asian countries from 1980 to 2012. Results showed that there is a positive relationship between inflation and economic growth for all the countries. Bibi *et al*. (2014) evaluated the impacts of trade openness, inflation, imports, exports, real exchange rate and foreign direct investment on economic growth in Pakistan over the period 1980-2011. They found that there is a long run relationship among variables. However, negative impacts of trade openness can be reduced by producing import substitutes and creating conditions for trade surplus. In addition, FDI and trade are essential elements to foster economic growth.

Furthermore, Mallick (2002) investigated influences of factors on economic growth in India from 1950 to 1995 using a VAR model. The study found that economic output depends upon private investment, human capital, real interest rate, and public investment. Private investment is determined by public investment, domestic credit, real interest rate, and human capital. The long-run of economic growth of this country has not been driven by exports. Similarly, Ali *et al*. (2016) assessed contributions of exports and other determinants on economic growth in Pakistan over the period 1972-2015 using the Auto-Regressive Distributed Lag (ARDL) Model. They concluded that exports and other trade policy variables have played vital contributions to economic growth of this country. Lastly, a research by Akram (2017) examined the impacts of public debt on economic growth in Sri Lanka from1975 to 2014 by employing the ARDL model. Results demonstrated that public debt has a positive effect on economic growth, but debt servicing presents a negative influence on GDP per capita and investment.

3. Research Methodology

3.1. Data and Sources

A panel dataset for the relationship among economic growth, trade, unemployment, and inflation in South Asia is gathered from the database released by the World Bank (WB). Due to constraints in human and financial resources, five developing countries in South Asia, including Bangladesh, India, Nepal, Pakistan, and Sri Lanka, are chosen for the study. A panel dataset is collected for the last two decades (1997-2016). Thus, a total of 100 observations are entered for data analysis. The panel data is used for this research because of the following advantages: (1) it benefits in terms of obtaining a large sample, giving more degree of freedom, more information, and less multi-collinearity among variables; and (2) it may overcome constraints related to control individual or time heterogeneity faced by the cross-sectional data (Hsiao, 2014).

3.2. The Vector Autoregressive (VAR) Model

The VAR model is used to examine the causality among gross domestic product (GDP), exports, imports, unemployment, and inflation in five developing countries in South Asia for the last two decades (1997-2016). The VAR model is chosen for this study because it interprets the endogenous variables solely by their history, apart from deterministic regressors and therefore this method incorporates non-statistical a priori information (Pfaff,

2008). Furthermore, the VAR model is a popular method in economics and other sciences since it is a simple and flexible model for multivariate time series data (Suharsono *et al.*, 2017).
The specification of a VAR model can be defined as follows (Pfaff, 2008):

$$Y_t = A_1 Y_{t-1} + \cdots + A_p Y_{t-p} + \varepsilon_t \qquad (3.1)$$

Where: Y_t denotes a set of K endogenous variables (GDP, exports, imports, unemployment rate, and inflation rate); A_i represents (K x K) coefficient matrices for i = 1,…, p; and ε_t is a K-dimensional process with $E(\varepsilon_t) = 0$.

An important characteristic of the VAR model is stability and therefore it generates a stationary time series with time-invariant means, variances and covariance structure, given sufficient starting values. The stability of an empirical VAR model can be analyzed by considering the companion form and computing the eigenvalues of the coefficient matrix. A VAR model may be specified as follows (Pfaff, 2008).

$$\varepsilon_t = A\varepsilon_{t-1} + V_t \qquad (3.2)$$

Where: ε_t denotes the dimension of the stacked vector; A is the dimension of the matrix (K_p x K_p); and V_t represents (KP x 1).

Table-3.1. Description of Covariates in the VAR Model

Variable Definitions	Label	Unit
GDP	Y_1	US$
Export value	Y_2	US$
Import value	Y_3	US$
Unemployment rate	Y_4	%
Inflation rate	Y_5	%

Note: US$ means United States Dollar

In this research, the procedure of a VAR model comprises six steps, consisting of (1) performing the unit root test; (2) determining lag length; (3) estimating the VAR model; (4) testing the Granger causality; (5) checking the stability of eigenvalues; and (6) implementing the Johansen test for co-integration. The VAR model is estimated by the Stata MP 14.2 software.

4. Results and Discussion

4.1. Characteristics of Economic Growth, Trade, Unemployment, and Inflation of Selected Countries in South Asia

Due to the slowdown of India, the growth in South Asia slightly declined by 0.2 percent from 6.7 percent in 2016 to 6.5 percent in 2017. Growth is projected to reach 7.1 percent in 2018 because of stability in all countries, except Nepal. Growth in the region is determined by domestic demand along with support from favorable financial conditions and improvement of external demand (IMF, 2018).

Table-4.1. Characteristics of Macroeconomic Indicators in South Asia

Variable	Mean	SD	Min	Max
GDP	2.90e+11	5.24e+11	4.86e+09	2.27e+12
Export value	3.90e+10	7.58e+10	4.06e+08	3.23e+11
Import value	5.88e+10	1.14e+11	1.25e+09	4.90e+11
Unemployment rate	4.33	2.06	0.6	10.6
Inflation rate	7.34	3.65	2	22.6

Source: Author's calculation
Note: SD denotes standard deviation

The average value of GDP of five countries accounts for US$290 billion. The average values of export and import account for US$39 billion and US$58.8 billion, respectively. Unemployment and inflation rates account for 4.3 percent and 7.3 percent, respectively, on average (Table 4.1).

4.2. The Relationship among Economic Growth, Exports, Imports, Unemployment, and Inflation in South Asia

4.2.1. Implementation of the Unit Root Test

The unit root test is performed to check the stationarity of the time series variables (Adeola and Ikpesu, 2016). In this research, the Augmented Dickey-Fuller (ADF) test is employed to examine the stationarity of GDP, exports, imports, unemployment rate, and inflation rate with the hypothesis as follows:
Null hypothesis (H_0): The variables contain a unit root
Alternative hypothesis (H_a): The variables do not contain a unit root

Table-4.2. The ADF Test for the Unit Root

Variables	Level	1st difference	2nd difference
LnGDP	T-statistic: -2.18 P-value: 0.21 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	T-statistic: -2.23 P-value: 0.19 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	T-statistic: -2.27 P-value: 0.17 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58
LnExports	T-statistic: -2.16 P-value: 0.21 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	T-statistic: -2.17 P-value: 0.21 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	T-statistic: -2.19 P-value: 0.20 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58
LnImports	T-statistic: -2.13 P-value: 0.23 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	T-statistic: -2.33 P-value: 0.16 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	T-statistic: -2.41 P-value: 0.13 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58
LnUnemployment rate	T-statistic: -2.99 P-value: 0.03 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	T-statistic: -2.88 P-value: 0.04 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	T-statistic: -2.67 P-value: 0.07 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58
LnInflation rate	T-statistic: -5.19 P-value: 0.00 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	T-statistic: -5.04 P-value: 0.00 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58	T-statistic: -3.71 P-value: 0.00 Critical values: 1% level: -3.51 5% level: -2.89 10% level: -2.58

Source: Author's calculation, 2018

Results show that we cannot reject the null hypothesis because P-values of all variables are greater than critical values at 1%, 5%, and 10%, respectively and these imply that variables exhibit a unit root (Table 4.2).

4.2.2. Determination of the Lag Length

The purpose of this step is to identify the optimal lag for the VAR model. If the lag is used too little, then the residual of the regression will not show the white noise process and as the result, the actual error could not be accurately estimated by the model (Suharsono *et al.*, 2017).

Table-4.3. Selection of the Lag Length

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-358.59				0.001	7.904	7.959	8.041
1	-107.06	503.08	25	0.000	0.000*	2.979*	3.311*	3.801*
2	-92.11	29.89	25	0.228	0.000	3.198	3.806	4.705
3	-76.30	31.61	25	0.170	0.000	3.397	4.283	5.590
4	-61.90	28.80	25	0.272	0.000	3.628	4.789	6.506
5	-44.28	35.24	25	0.084	0.000	3.788	5.226	7.352
6	-25.8	36.96	25	0.058	0.000	3.930	5.645	8.179
7	-10.16	31.26	25	0.181	0.000	4.134	6.125	9.068
8	14.27	48.89*	25	0.003	0.000	4.146	6.414	9.765
Endogenous: LnGDP LnExports LnImports LnUnemployment rate LnInflation rate								
Exogenous: Constant								
Number of observations = 92								

Source: Author's calculation, 2018

Notes: * denotes lag order selected by the criterion; LL means log likelihood values; LR represents sequential modified LR test statistics; FPE denotes final prediction error; AIC means Akaike information criterion; SC denotes Schwarz information criterion; HQIC represents Hannan-Quinn information criterion; and SBIC means Schwarz's Bayesian information criterion.

As seen in Table 4.3, results suggest that the optimal lag length in this case is one lag because this value is recommended by FPE, AIC, HQIC, and SBIC indicators. Therefore, one lag (the number of lag is equal to 1) is chosen to run the VAR model in the next step.

4.2.3. Estimation of the VAR Model

Table-4.4. Estimation of the VAR Model

Variables	Coefficient	Standard Error	t	P-value
LnGDP				
LnGDP (L1)	0.931***	0.27	3.39	0.001
LnExports (L1)	0.059	0.19	0.31	0.758
LnImports (L1)	-0.100	0.29	-0.34	0.735
LnUnemployment rate (L1)	0.029	0.15	0.19	0.853
LnInflation rate (L1)	0.186	0.16	1.15	0.254
Constant	2.347*	1.31	1.79	0.077
LnExports				
LnGDP (L1)	0.103	0.28	0.36	0.716
LnExports (L1)	0.836***	0.19	4.19	0.000
LnImports (L1)	-0.045	0.30	-0.15	0.883
LnUnemployment rate (L1)	0.146	0.16	0.90	0.371
LnInflation rate (L1)	0.166	0.16	0.99	0.324
Constant	1.740	1.35	1.28	0.203
LnImports				
LnGDP (L1)	0.093	0.23	0.39	0.694
LnExports (L1)	0.055	0.16	0.34	0.738
LnImports (L1)	0.739***	0.25	2.90	0.005
LnUnemployment rate (L1)	0.040	0.13	0.30	0.766
LnInflation rate (L1)	0.154	0.13	1.11	0.269
Constant	2.206*	1.12	1.96	0.053
LnUnemployment rate				
LnGDP (L1)	-0.067	0.11	-0.58	0.564
LnExports (L1)	-0.019	0.08	-0.23	0.816
LnImports (L1)	0.118	0.12	0.94	0.350
LnUnemployment rate (L1)	0.828***	0.06	12.32	0.000
LnInflation rate (L1)	-0.077	0.06	-1.13	0.263
Constant	-0.282	0.55	-0.51	0.615
LnInflation rate				
LnGDP (L1)	-0.280*	0.16	-1.74	0.085
LnExports (L1)	-0.178	0.11	-1.59	0.116
LnImports (L1)	0.512***	0.17	2.95	0.004
LnUnemployment rate (L1)	0.113	0.09	1.23	0.224
LnInflation rate (L1)	0.433***	0.09	4.56	0.000
Constant	-0.039	0.76	-0.05	0.960

Source: Author's calculation, 2018
Notes: L1 means lag 1; *** and * denote statistical significance at 1% and 10%, respectively

We found that GDP negative affects inflation and this implies that an increase of GDP leads to a decrease in inflation. In contrast, imports had a positive relationship with inflation and this reflects that if imports rise, then inflation also increases (Table 4.4).

4.2.4. Testing the Granger Causality

The goal of the Granger causality is to evaluate the predictive capacity of a single variable on other variables (Musunuru, 2017). In this research, five hypotheses need to be tested as follows:

Testing the relationship between GDP and other variables (H_1):
Null hypothesis (H_0): GDP does not cause exports, imports, unemployment rate, and inflation rate
Alternative hypothesis (H_a): GDP causes exports, imports, unemployment rate, and inflation rate
Testing the relationship between exports and other variables (H_2):
Null hypothesis (H_0): Exports does not cause GDP, imports, unemployment rate, and inflation rate
Alternative hypothesis (H_a): Exports causes GDP, imports, unemployment rate, and inflation rate
Testing the relationship between imports and other variables (H_3):
Null hypothesis (H_0): Imports does not cause GDP, exports, unemployment rate, and inflation rate
Alternative hypothesis (H_a): Imports causes GDP, exports, unemployment rate, and inflation rate
Testing the relationship between unemployment rate and other variables (H_4):
Null hypothesis (H_0): Unemployment rate does not cause GDP, exports, imports, and inflation rate
Alternative hypothesis (H_a): Unemployment rate causes GDP, exports, imports, and inflation rate
Testing the relationship between inflation rate and other variables (H_5):
Null hypothesis (H_0): Inflation does not cause GDP, exports, imports, and unemployment rate
Alternative hypothesis (H_a): Inflation causes GDP, exports, imports, and unemployment rate

Table-4.5. Results of the Granger Causality Wald Test

Hypotheses	F-Statistic	Probability
H_1	0.412	0.799
H_2	0.461	0.764
H_3	0.388	0.816
H_4	0.565	0.688
H_5	2.470	0.050

Source: Author's calculation, 2018

For the first four hypotheses (H_1, H_2, H_3, and H_4), we cannot reject the null hypothesis since the probabilities are greater than the critical value (0.05) and these imply that GDP, exports, imports, and unemployment rate do not cause other variables. In terms of H_5, we can reject the null hypothesis because the probability is equal to the critical value (0.05) and this implies that inflation rate causes GDP, exports, imports, and unemployment rate (Table 4.5). We can conclude that there are no directional causalities between GDP, exports, imports, and unemployment rate and other variables. By contrast, there is a directional causality between inflation rate and other variables.

4.2.5. Examination of Eigenvalue Stability

The purpose of this assignment is to check stability of the eigenvalues in the VAR model. All the eigenvalues lie inside the unit circle and we can conclude that the VAR model satisfies stability condition (Table 4.6 and Figure 4.1).

Table-4.6. Eigenvalue Stability Condition

Eigenvalue	Modulus
0.921	0.921
0.831	0.831
0.812	0.812
0.720	0.720
0.481	0.481

Source: Author's calculation, 2018

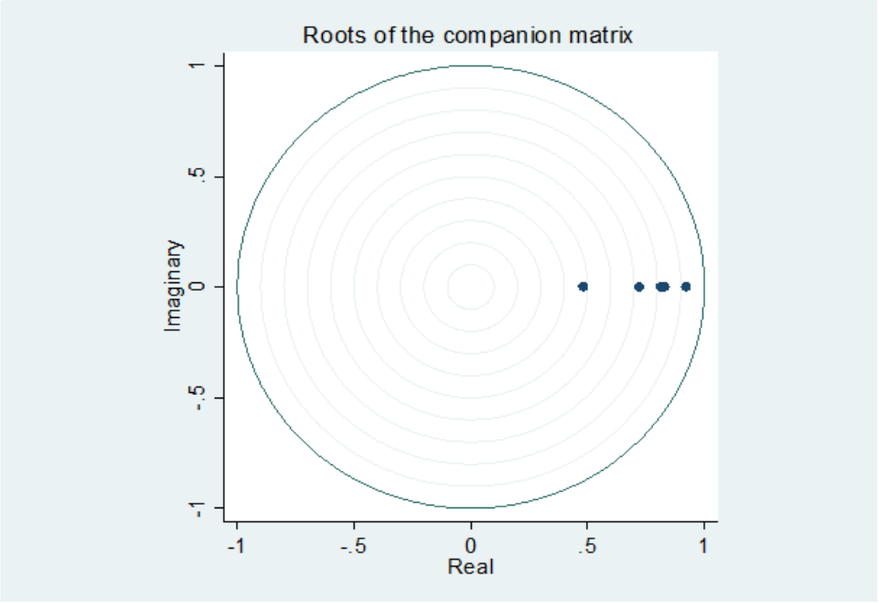

Figure-4.1. Checking Eigenvalue Stability

Source: Author's calculation, 2018

4.2.6. Performance of the Johansen Co-integration Test

The Johansen co-integration test is carried out in order to examine the long-run relationship among variables. If variables are co-integrated, it suggests that there is a long term relationship among variables (Musunuru, 2017).

The hypothesis to be tested can be identified as follows:

Null hypothesis (H_0): There is no co-integration among variables

Alternative hypothesis (H_a): There is co-integration among variables

In this study, the Johansen co-integration test is carried out by both trace and max statistic tests. Both trace and max tests are all likelihood-ratio-type tests, which operate under different assumptions in the deterministic part of the data generation process. In some situations, the trace tests tend to have more distorted sizes compared to that of the maximum eigenvalue tests (Lüutkepohl *et al.*, 2001).

Table-4.7. Results of Trace Statistic in the Johansen Co-integration Test

Maximum rank	LL	Eigenvalue	Trace statistic	5% critical value	1% critical value
0	-129.39		84.03	68.52	76.07
1	-107.86	0.355	40.97*1*5	47.21	54.46
2	-99.15	0.162	23.55	29.68	35.65
3	-93.63	0.106	12.51	15.41	20.04
4	-89.64	0.078	4.53	3.76	6.65
5	-87.37	0.045			

Source: Author's calculation, 2018

Notes: *1 and *5 denote the number of co-integrations (ranks) chosen to accept the null hypothesis at 1% and 5% critical values, respectively

Table-4.8. Results of Max Statistic in the Johansen Co-integration Test

Maximum rank	LL	Eigenvalue	Max statistic	5% critical value	1% critical value
0	-129.39		43.06	33.46	38.77
1	-107.86	0.355	17.42	27.07	32.24
2	-99.15	0.162	11.03	20.97	25.52
3	-93.63	0.106	7.98	14.07	18.63
4	-89.64	0.078	4.53	3.76	6.65
5	-87.37	0.045			

Source: Author's calculation, 2018

As seen in Table 4.7, we cannot reject the null hypothesis in the rank one (one co-integration) because trace statistic is less than the 5% and 1% critical values (40.97 < 47.21 and 40.97 < 54.46) and this implies that there is a co-integration among variables.

4.3. Discussion

We found that GDP has a negative impact on inflation, while imports positively affect inflation in South Asian countries. Results indicated that there are no directional causalities between GDP, exports, imports, and unemployment rate and other variables in the short run. In contrast, there is a directional causality between inflation rate and other variables in the short run. We also found that there is a long term relationship among economic growth, exports, imports, unemployment, and inflation in South Asia.

Our results in a long run relationship among economic growth, exports, imports, and inflation are consistent with conclusions of Bibi *et al.* (2014). However, we found that there is no causality between trade and economic growth in the short term, while (Rizavi *et al.*, 2010) claimed that trade openness positively influences on economic growth in South Asia. Further, we stated that economic growth has a negative effect on inflation and this result is contrast to arguments of Behera (2014). Lastly, our results addressed that there is the relationship among economic growth, trade, unemployment, and inflation in the long term, while (Mallick, 2002) concluded that there is no correlation between exports and economic growth in the long run. Differences in research outcomes can be interpreted by differences in scopes and research methods. For example, Rizavi *et al.* (2010) used the ordinary least square (OLS) and random effect models to estimate the relationship between trade openness and economic growth in South Asia, while we employ the VAR model. Bibi *et al.* (2014) employed a dynamic OLS to examine the long-term relationship among trade, inflation, and economic growth in Pakistan for the period 1980-2011, and Mallick (2002) investigated the relationship between exports and economic growth in India from 1950 to 1995.

5. Conclusions

The article aims to investigate the causal relationship among economic growth, exports, imports, unemployment, and inflation in five developing countries in South Asia for the last two decades (1997-2016) using a VAR model. We found that GDP has a negative relationship with inflation, while imports positively affect inflation in South Asian countries. Results demonstrated that there are no directional causalities between GDP, exports, imports, and unemployment rate and other variables in the short run. In contrast, there is a directional causality between inflation rate and other variables in the short run. We also found that there is a long-term relationship among economic growth, exports, imports, unemployment, and inflation in South Asia.

There is a great potential for growth of South Asia. However, this region needs to overcome vulnerabilities such as religious conflicts and natural disasters. Stability and growth of South Asia have played a crucial role in the stability and growth of Asia (JICA., 2017). In order to accelerate economic growth in South Asian countries, inflation should be controlled by imposing consistent fiscal and monetary policies. Moreover, domestic productions should be facilitated to substitute imported commodities which currently is contributing to an increase of inflation. Finally, the program in job creation should be urgently implemented because recently India, Pakistan, and Bangladesh would have to create nearly 13 million jobs, 2 million jobs, and 1.6 million jobs annually (WB, 2018).

References

Adeola, O. and F. Ikpesu, 2016. An empirical investigation of the impact of bank lending on agricultural output in Nigeria: A vector autoregressive (VAR) approach. The Journal of Developing Areas, 50(6): 89-103. Available at: https://doi.org/10.1353/jda.2016.0140.

Akram, N., 2017. Role of public debt in economic growth of Sri Lanka: An ARDL approach. Pakistan Journal of Applied Economics, 27(2): 189-212.

Ali, G., Z. Li and M.A. Khan, 2016. Evaluating the importance of exports and its determinants in economic growth of Pakistan: An empirical analysis from ARDL approach. Global Business and Management Research, 8(4): 31-51.

Behera, J., 2014. Inflation and its impact on economic growth: Evidence from six South Asian countries. Journal of Economics and Sustainable Development, 5(7): 145-154.

Bibi, S., S.T. Ahmad and H. Rashid, 2014. Impact of trade openness, FDI, exchange rate and inflation on economic growth: A case study of Pakistan. International Journal of Accounting and Financial Reporting, 4(2): 236-257. Available at: https://doi.org/10.5296/ijafr.v4i2.6482.

Enejoh, S.Y. and A.M. Tsauni, 2017. An analytical study of the impact of inflation on economic growth in Nigeria (1970-2016). International Journal of Academic Research in Accounting, Finance and Management Sciences, 7(4): 110-120. Available at: https://doi.org/10.6007/ijarafms/v7-i4/3438.

Gudeta, D.O., B.G. Arero and A.T. Goshu, 2017. Vector autoregressive modelling of some economic growth indicators of Ethiopia. American Journal of Economics, 7(1): 46-62.

Hsiao, C., 2014. Analysis of panel data. 3rd Edn., New York: Cambridge University Press.

IMF, 2018. South Asia: The Robust Outlook Continues. South Asia Regional Update, January 2018.

JICA., 2017. South Asia: Aiming for Economic Growth and Realization of Peaceful and Fair Societies Serving as the Center of the Indian Ocean-Rim Economic Region. JICA Annual Report 2017.

Kher, P., 2012. Political economy of regional integration in South Asia. Background Paper No. RVC 5, UNCTAD October 2012.

Lüutkepohl, H., P. Saikkonen and C. Trenkler, 2001. Maximum eigenvalue versus trace tests for the cointegrating rank of a var process. The Econometrics Journal, 4(2): 287-310. Available at: https://doi.org/10.1111/1368-423x.00068.

Mallick, S.K., 2002. Determinants of long-term growth in India: A Keynesian approach. Progress in Development Studies, 2(4): 306-324. Available at: https://doi.org/10.1191/1464993402ps043ra.

Musunuru, N., 2017. Causal relationships between grain, meat prices and exchange rates. International Journal of Food and Agricultural Economics, 5(4): 1-10.

Pfaff, B., 2008. VAR, SVAR and SVEC models: Implementation within R package vars. Journal of Statistical Software, 27(4): 1-32. Available at: https://doi.org/10.18637/jss.v027.i04.

Ramanayake, S.S. and K. Lee, 2015. Does openness lead to sustained economic growth? Export growth versus other variables as determinants of economic growth. Journal of the Asia Pacific Economy, 20(3): 345-368. Available at: https://doi.org/10.1080/13547860.2015.1054164.

Rizavi, S.S., M.K. Khan and S.H. Mustafa, 2010. Openness and growth in South Asia. South Asian Studies, 25(2): 419-428.

Sarwar, K., M. Afzal, M. Shafiq and H. Rehman, 2013. Institutions and economic growth in South Asia. Journal of Quality and Technology Management, 9(2): 01-23.

Suharsono, A., A. Aziza and W. Pramesti, 2017. Comparison of vector autoregressive (VAR) and vector error correction models (VECM) for index of ASEAN stock price, in AIP Conference Proceedings 1913, 1, pp. 020032-1-020032-9. AIP Publishing. Doi: 10.1063/1.5016666. International Conference and Workshop on Mathematical Analysis and its Applications (ICWOMAA 2017).

World Bank, 2018. Jobless growth. South Asia Economic Focus Spring.