Does Export Lead Economic Growth? Or Other Way? VEC-Granger Causality Evidence from Nine South-East Asian Countries

Abdus Samad
Utah Valley University

Applying the Vector Error Correction (VEC) model and the VEC Granger causality/Wald Exogeniety tests, this paper investigated the causal relation between export, economic growth, and financial development of nine South and South East Asian countries during 1974-2015. The significance of the error correction term (ECT) established short and long run dynamics. The VEC Granger causality/Wald Exogeniety tests found bidirectional Granger causality between economic growth (GDP) and export (EXPRT) in Malaysia, Singapore, and Thailand. Unidirectional causality running from EXPRT to GDP was found in Bangladesh, Pakistan and Sri Lanka. Unidirectional causality running from GDP growth to export was found in India. Bidirectional Granger causality between financial development (BKCRDT) and export growth was found in Thailand. Pairwise Granger causality results, because of lack of cointegration, found that GDP Granger caused EXPRT in Indonesia.

The paper provides policy prescription that the governments should provide emphasis on promoting and protecting the export industries that promotes the economic growth of the countries.

INTRODUCTION

Whether foreign trade promotes economic growth or economic growth promotes trade is a debatable issue. There are two views. First view, originated and developed by the classical economics from Adam Smith and David Ricardo believe that 'trade is an engine of growth' i.e. trade promotes economic growth. Trade is beneficial for both nations. According to them, international trade provides several advantages. (i) International trade promotes export and thus economic growth by offering large markets by opening up the opportunities of global market to the entrepreneurs of the developing nations. (ii) Capital and technology are essential requirement for economic growth. Developing countries cannot import essential technology without adequate foreign currencies. Opening the channel of export helps getting foreign currency which provides the latest technology readily available to the businesses operating in these countries. (iii) Foreign trade results in increased competition both in the domestic and global markets. To compete with their global counterparts, the domestic entrepreneurs try to be more efficient and this in turn ensures efficient utilization of available resources and low cost of production. (iv) An increase in exports means increase in employment in export sector industries which, in turn, increase income and GDP. (vi) Reallocating resources from less productive sectors to such sector as exports industry and exports growth promotes GDP growth (Ben-David and Loewy, 1998). Lastly, exports support foreign exchange earnings which, in turn, assist importing capital goods.

Second view is that the trade is the result of economic growth i.e. economic growth leads to export and imports and thus trade is the result of economic growth. Economic growth and development put pressure on the opening of foreign trade. Thus, exports and imports are the consequence of economic growth.

In view of two opposing hypotheses, this paper empirically examines the causal relation as well as the direction of causality between export and economic growth applying the Vector Error Correction (VEC) and *the VEC Granger Causality/Block Exogeneity Wald Tests* in the South East Asian countries. South East Asian countries provide good ground for testing the hypothesis whether trade promotes economic growth or the other way. Because of (i) the level of economic growth and the volume of trade are not the same. Some of them are in the categories of developed nations. (ii) The level of economic and political stability are also different among these countries.

The paper is organized as: the survey of literature will be discussed in Section 2. Data and the methodology are described in Section 3. Empirical results and policy prescriptions are presented in Section 4. Conclusions are provided in Section 5.

SURVEY OF LITERATURE

Trade and economic growth literature is large. Josheski and Lazarov (2002) examined 208 regions and found that the ratio of trade volume (sum of export and import) to GDP has positive impact on economic growth. Awokuse (2005), Balassa (1978a; 1988b), Buffie (1992) found that the import of capital and intermediate goods stimulated domestic growth. Cross-country studies by Balassa (1988) and Moschos (1989) found supports for export led growth i.e. positive association between exports and economic growth. Islam (1998) causality test found that export expansion led economic growth in two-third of fifteen Asian countries. Similarly, studies such as Grabowski et al (1990), Sharma et al (1991) found support in favor of exports led to economic growth (ELG).

On the other hand, studies as Yamada (1998), Boltho (1996) and Afxentiou and Serletis (1991) found contrary evidences that economic growth led export-growth. Using the Granger causality test to Chines growth and foreign trade, Kwan and Cots mitis (1991) found one-way causal relation i.e. economic growth granger caused export-growth.

Others, Awokuse (2005); Giles and Williams (2000); Hatemi (2002) and found bi-directional causality between exports and economic growth.

Among third group, Shan and sum (1998) who found no causal relation between economic growth and export. Similarly, Jung and Marshal (1985) also found no causal relation between the growth and trade openness.

The short survey of literature found no consensus on this issue. Second, the survey shows no evidence of studies for ASEAN countries. Second, there was no evidence of studies that incorporated the period under this study.

DATA AND METHODOLOGY

Data

Time series data for gross domestic product (GDP), export (EX), and private bank credit (PBKCREDT) during 1970-2015[1] are obtained from the World Bank publication, International Financial Statistics. All series are annual.

Methodology

As the exogeneity among variables, foreign trade, economic growth and financial growth, are indeterminate, based on Sim (1980), this paper applied Vector Error Correction. As the VEC required stationarity and the cointegration test of the series, this paper applied augmented Dickey-Fuller (ADF) test, Phillip Parron (PP) test, the Dicky Fuller (DF) Unit Root with Break test, and Johansen (1991 and 1995a) cointegration test.

Unit Root Tests

Since the publication of Nelson and Plosser (1982), it is widely recognized that most time series macroeconomic variables contain unit root i.e. variable $X_t \sim I(1)$. So, this paper, first, examines the existence of unit root for variables: GDP, NX, and PBKCRDT using the augmented Dickey-Fuller (ADF) test, Phillip Parron (PP) test, and the Dicky Fuller (DF) Unit Root with Break test. In the following equation, the null hypothesis, $\alpha=0$ is tested against the alternative hypothesis, $\alpha<0$:

$$\Delta y_t = \alpha_0 + \beta t + \gamma y_{t-1} + \sum_i^k \lambda i \Delta y_{t-1} + \varepsilon_t \quad (1)$$

Schwarz Bayesian Criterion (SBC) will be used to determine the lag length or K. The results of ADF and PP test are presented in the empirical section.

Structural Break Test

The issue of testing the presence of unit root gained further momentum when Parron (1989) emphasized the importance of structural break while testing the unit root test. The structural break test is needed because the most macroeconomic series suffers some kind of shock i.e. structural break. So, the unit root test is not enough. Parron (1989) argued that conventional unit root tests have low power to reject the null hypothesis of nonstationarity when there is a structural break in the series. To overcome this problem, Parron (1989) modified the augmented Dickey Fuller (ADF) test by adding dummy variables to account for structural breaks at known points in time. Zivot and Andrews (1992) suggested that structural breaks in the series may be endogenous and they extended Parron's methodology to allow for the endogenous estimation of the break date. We employ the following two alternative models proposed by Zivot and Andrews (hereafter ZA) to examine the presence of unit root with structural break in the GDP, NX and PBKCREDT series:

$$\text{Model C: } \Delta GDP_t = \mu + \emptyset DU_t(\lambda) + \beta t + \gamma DT(\lambda) + \alpha \Delta NX_{t-1} + \Sigma C_j \Delta PBKCREDT_{t-j} + \varepsilon_t \quad (2)$$

where GDP_t, DU_t and DT_t are indicator variables for mean shift and trend shift for the possible structural break-date (TB) and they are described as following:

$$DT_t = \begin{cases} t - TB & if\ t > TB \\ 0 & otherwise \end{cases}$$

The null hypothesis of unit root ($\alpha=0$) can be tested against stationary with structural breaks ($\alpha<0$) in Equations 1 and 2. Every time points are considered as a potential structural break date in the ZA unit root test and the break date is determined according to minimum one-sided t-statistic. Results of Zivot-Andrew test are provided in Table 3.

The null hypothesis of unit root ($\alpha=0$) can be tested against stationary with structural breaks ($\alpha<0$) in Equations 1 and 2. Every time points are considered as a potential structural break date in the ZA unit root test and the break date is determined according to minimum one-sided t-statistic.

Cointegration Test

Having established that the variables are non-stationary I(1), there raises the possibility that they are co-integrated. Consequently, the co-integration properties of the variables are examined. It is, thus, necessary to determine whether there is at least one linear combination of these variables that is I(0). To investigate multivariate cointegration, this paper applies Johansen (1991 and 1995) VAR based Trace and Maximum Eigenvalue tests. Johansen (1991 and 1995a) cointegration is a VAR test and written in general form as:

$$\Delta Yt = \pi Yt - 1 + \sum_{i=1}^{p-1} \tau i \Delta Yt - i + \beta Xt + \varepsilon t \quad (3)$$

where $\Pi = \sum_{i=1}^{p} \beta i - I$ and $\tau = -\sum_{j=i+1}^{p} \beta j$

Based on Granger's theorem, if the coefficient matrix Π has reduced rank r<k, then there exists k x r matrices α and β each rank r such that $\Pi = \alpha\beta'$ and $\beta' yt$ is I(0). r is the number of cointegrating relations (the cointegrating rank) and each column of β is the cointegrating vector. The null hypothesis is that number of cointegration:

$$H_0 : r=0, H_a : r=1$$

Vector Error Correction and Unrestricted VAR

Finally, this paper uses model for direction of causality. VEC is applied when series are found cointegrated tested by Johansen (1991 and 1995) VAR based Trace and Maximum Eigenvalue tests. Unrestricted VAR is employed to determine the direction of causality if the series are not cointegrated.

In terms of three variables, GDP, NX, and PBKCREDT, VECM can be written and estimated from:

$$\Delta GDP_t = \Sigma\alpha_1 \Delta GDP_{t-I} + \sum\beta_1 \Delta NX_{t-I} + \sum\gamma_1 \Delta PBKCREDT_{t-1} + \lambda_1(GDP_{t-1} - NX_{t-1} - PBKCRDT_{t-1}) + u_t \quad (4)$$

$$\Delta NX_t = \Sigma\alpha_2 \Delta NX_{t-I} + \sum\beta_2 GDP_{t-I} + \sum\gamma_2 \Delta PBKCREDT_{t-1} + \lambda_2(NX_{t-1} - GDP_{-1} - PBKCREDT_{t-1}) + u_t \quad (5)$$

$$\Delta PBKCREDT_t = \Sigma\alpha_3 \Delta PCREDT_{t-I} + \sum\beta_3 \Delta GDP_{t-I} + \sum \gamma_3 \Delta NX_{t-I} + \lambda_3(PBKCREDT_{t-1} - NX_{-1} - GDP_{-1}) + u_t \quad (6)$$

where λ_1, λ_2, and λ_3 are the coefficients of error correction term (ECT) for $(GDP_{t-1} - NX_{-1} - PBKCREDT_{-1})$, $(NX_{t-1} - GDP_{-1} - PBKCREDT_{-1})$, and $(PBKCREDT_{t-1} - NX_{-1} - GDP_{t-1}$ respectively.

The null hypothesis, now that NX does not Granger cause GDP given PBKCREDT, H_0 ($\alpha_1 = \lambda_1 = 0$. That is, there are two sources of causation for economic growth, GDP, either through the lagged terms of ΔNX_{t-1} or through the lagged Error correction term, i.e. the lagged cointegrating vector.

In the Error Correction Model, the causality inference is obtained through the significance of λ_i. That is, the null hypothesis that NX and PBKCREDTdo not Granger cause GDP is rejected if λ_i, (the coefficient of error correction term) is statistically significant even if $\sum\beta_i$ and $\sum\gamma_i$ (from 4,5, and 6) are not jointly significant.

Granger causality direction is obtained from VER estimates applying Granger Causality/block exogeneity - tests.

EMPERICAL RESULTS

Results of unit root test for variables, GDP, EXPRT, and BKCRDT are provided in Table 1 and Table 2. Results of Johansen cointegration test for GDP, EXPRT, and BKCRDT are provide in Table 3. Result of VEC model is presented in Table 4.

TABLE 1
RESULTS PF UNIT ROOT TEST OF AUGMENT DICKY-FULLER (ADF) AND PHILLIP PARRON

		Augment Dicky Fuller Test $\Delta y_t = \alpha_0 + \beta t + \gamma y_{t-1} + \sum_i^k \lambda i \Delta y_{t-1} + \varepsilon_t$		Phillip Parron (intercept and Trend)	
Country	Variables	Level	1st difference	Level	1st difference
Bangladesh	GDP	6.44	0.93	8.01	-3.94**
	EXPRT	0.51	-1.57	-0.12	-3.65**
	BKCRDT	-2.03	-6.49*	-2.02	-6.58*
India	GDP	7.35	-3.30***	16.32	3.00
	EXPRT	-2.95	-2.26	1.83	-5.98*
	BKCRDT	-2.69	-3.09	-1.72	-5.76*
Pakistan	GDP	-0.03	-3.47***	0.22	-3.53**
	EXPRT	-2.35	-7.28*	-2.37	-7.28*
	BKCRDT	-2.50	-5.43*	-2.54	-5.71*
Sri Lanka	GDP	3.75	-4.40*	4.16	-4.34*
	EXPRT	-1.60	-6.14*	-1.45	-8.49*
	BKCRDT	-2.19	-7.43*	-2.33	-7.43*
Indonesia	GDP	1.23	-4.76*	0.89	-4.69*
	EXPRT	-1.11	7.93*	-0.99	-7.94*
	BKCRDT	-1.34	-4.85*	-1.39	-4.94*
Malaysia	GDP	0.51	-6.91*	0.71	-6.91*
	EXPRT	-1.97	-6.61*	-1.97	-6.61*
	BKCRDT	-2.07	-6.27*	-2.10	6.27*
Philippine	GDP	4.01	-3.67**	4.04	3.68**
	EXPRT	-142	-9.38*	-0.95	-15.03*
	BKCRDT	-2.45	-5.34*	-2.44	-5.33*
Singapore	GDP	2.82	-1.90	0.03	-6.85*
	EXPRT	-1.22	-6.43*	-1.20	-6.47*
	BKCRDT	-1.79	-6.89*	-2.14	-6.93*
Thailand	GDP	-1.76	-5.45*	-1.78	-5.45*
	EXPRT	-1.13	-7.54*	-1.00	-15.26*
	BKCRDT	-2.37	-4.74*	-2.11	-4.74*

*= Significant at 1 percent level, ** = Significant at 5 percent level, and *** = Significant at 10 percent level.

Results of the ADF and the Phillip Parron unit root tests for stationarity of series show all series are stationary at first difference except for the GDP and export (EXPRT) series of Bangladesh and the EXPRT and BKCRDT of India. However, the Phillip Parron test suggests that both GDP and EXPRT of Bangladesh and the EXPRT and BKCRDT of India are stationary at first difference.

TABLE 2
DF UNIT ROOT WITH BREAK TEST AND ZIVOT-ANDREW UNIT ROOT WITH STRUCTURAL BREAK TEST

		ADF Break Point Unit Root Test Null hypothesis: Variable has unit root Lag Length: (Automatic-based on SIC, Maxlag= 10	Zivot-Andrew Unit Root test with a structural Break Chosen Lag length: 1 (Max lag=4)	
Country	Variables	Level	1st difference	Statistics
Bangladesh	GDP	-0.04	-6.73*	-0.58
	EXPRT	-4.51	-6.19*	-4.09
	BKCRDT	-5.80*	-8.90*	-5.39*
India	GDP	-0.10	-2.30	-0.26
	EXPRT	-6.13*	-6.63*	-3.88
	BKCRDT	-4.79	-5.98*	-3.73
Pakistan	GDP	-3.72	5.31*	-2.72
	EXPRT	-4.01	-9.55*	-3.33
	BKCRDT	-5.35**	-8.36*	-3.96
Sri Lanka	GDP	-2.98	-8.88*	-1.45
	EXPRT	-4.56	-9.66*	-3.39
	BKCRDT	3.30	-8.36*	-3.35
Indonesia	GDP	-1.98	-5.63*	-1.22
	EXPRT	-4.26	-9.13*	-3.75
	BKCRDT	-5.92*	-8.36*	-3.37
Malaysia	GDP	-1.03	-8.60*	-0.22
	EXPRT	-1.89	-7.54*	-2.88
	BKCRDT	-2.95	-9.01*	-3.88
Philippine	GDP	1.12	-4.39**	0.67
	EXPRT	-4.48	-10.00*	-3.53
	BKCRDT	-6.23*	-6.63*	-5.72*
Singapore	GDP	-1.69	-6.32*	-1.58
	EXPRT	-5.05**	-6.60*	
	BKCRDT	-3.09	-7.81*	-3.74
Thailand	GDP	-2.52	-6.66*	-3.05
	EXPRT	-3.49	-7.44*	-2.37
	BKCRDT	-2.09	-5.98*	-3.15

*= Significant at 1 percent level, ** = Significant at 5 percent level, and *** = Significant at 10 percent level.

Results of the ADF Break Point Unit test and the Zivot-Andrew unit root with structural break test show, in Table 2, that all series suffer from structural break. The null hypothesis of break point unit root is rejected for all series at first difference except for the GDP of India. Results of Zivot-Andrew test show that all series have structural break except for the bank credit (BKCRDT) of Bangladesh and Philippine.

TABLE 3
RESULTS OF JOHANSEN CO-INTEGRATION TESTS

	Johansen Trace Test Series: GDP NX PBKCREDT			*Johansen Maximum Eigen value Test Series: GDP NX PBKCREDT*		
Country	Hypothesized No of CE (S)	Trace Statistics	Critical Value	Hypothesized No of CE (S)	Max-Eigenvalue Statistics	Critical Value
Bangladesh	R=0	64.46*	29.79	R=0	48.61*	21.13
	R=1	15.85**	15.48	R=1	12.17	14.26
	R=2	3.68	3.84	R=2	3.68	3.84
India	R=0	30.74**	29.79	R=0	26.22*	21.13
	R=1	4.51	15.49	R=1	2.54	14.26
	R=2	1.96	3.84	R=2	1.96	3.84
Pakistan	R=0	31.07**	29.79	R=0	15.07	21.13
	R=1	16.00**	15.49	R=1	10.29	14.26
	R=2	5.70**	3.84	R=2	5.70**	3.84
Sri Lanka	R=0	33.06**	29.79	R=0	20.69	21.13
	R=1	12.36	15.49	R=1	11.54	14.26
	R=2	0.81	3.84	R=2	0.81	3.84
Indonesia	R=0	21.17	29.79	R=0	12.22	21.13
	R=1	8.94	15.49	R=1	8.94	15.49
	R=2	1.88	3.84	R=2	1.88	3.84
Malaysia	R=0	31.82**	29.79	R=0	21.43***	21.13
	R=1	10.79	15.49	R=1	9.74	14.26
	R=2	1.05	3.84	R=2	1.05	3.84
Philippine	R=0	19.60	29.79	R=0	10.66	21.13
	R=1	8.93	25.49	R=1	6.51	14.26
	R=2	2.41	3.84	R=2	2.41	3.84
Singapore	R=0	25.96**	24.27	R=0	22.08*	17.79
	R=1	3.87	12.32	R=1	3.02	11.22
	R=2	0.85	4.14	R=2	0.85	4.14
Thailand	R=0	35.33*	24.27	R=0	26.88	17.79
	R=1	8.44	12.32	R=1	8.44	11.22
	R=2	0.32	4.12	R=2	0.32	4.12

*= Significant at 1 percent level, ** = Significant at 5 percent level, and *** = Significant at 10 percent level.

Results of both Trace test and Eigen value test, in Table 3, shows that all series for GDP, EPRTX, and BKCRDT are cointegrated for all countries except for Indonesia and Philippine. The rejection of null hypothesis of no cointegration for all other countries provides strong support for conintegration. The establishment of cointegration justified the application of VEC model. Results of VEC are provided in Table 4.

Failures to reject the null hypothesis of no cointegration among the series for Indonesia and Philippine suggests the application of pairwise Granger causality test instead of the VEC Granger causality/Wald Exogeniety tests. Results of pairwise Granger causality test was provided in Table 6.

TABLE 4
RESULTS OF VECTOR ERROR CORRECTION MODEL

Countries	VEC Equation	Coefficient of ECT []	R^2	F-statistics
Bangladesh	D(GDP)	-0.10 [4.19]*	0.95	102.77
	D(EXPRT)	-0.03	0.37	2.64
	D(BKCRDT)	-0.000	0.08	0.43
India	D(GDP)	0.03[5.50]*	0.88	39.27
	D(EXPRT)	-0.006[-2.04]*	0.75	16.58
	D(BKCRDT)	-0.0000[-3.55]*	0.36	3.01
Pakistan	D(GDP)	-0.06[-0.74]	0.67	11.12
	D(EXPRT)	-0.37[-3.55]*	0.10	0.66
	D(BKCRDT)	0.000[0.52]	0.27	2.07
Sri Lanka	D(GDP)	-0.002 [-3.81]*	0.77	19.19
	D(EXPRT)	0.000 [1.67]	0.20	1.36
	D(BKCRDT)	-0.000[-1.05]	0.18	1.20
Malaysia	D(GDP)	-0.29[-4.48]*	0.51	5.75
	D(EXPRT)	0.22[2.05]*	0.12	0.77
	D(BKCRDT)	-0.000[-0.34]	0.08	0.49
Singapore	D(GDP)	-0.11[-4.65]*	0.63	7.08
	D(EXPRT)	0.27[3.88]*	0.60	6.63
	D(BKCRDT)	0.000[0.37]	0.22	1.22
Thailand	D(GDP)	0.14[1.59]	0.37	3.13
	D(EX)	-0.48[-5.70]*	0.57	7.22
	D(BKCRDT)	0.000[0.42]	0.45	4.38

[]=t-statistics, *= Significant at 1 percent level, ** = Significant at 5 percent level, and *** = Significant at 10 percent level.

Results of the error correction model, reported in Table 4, shows that the coefficient of the ECT for GDP was negative, as expected in the VEC model, and the coefficient of ECT was significant for Bangladesh. India, Sri Lanka, Malaysia, and Singapore, Thailand.

The coefficients of the ECT associated with export (EXPRT) were negative and significant for India, Pakistan, and Thailand.

The coefficient of the ECT term of BKCRDT was significant for India. The significance of the ECT suggests that there was short term dynamics. If the series are deviated from long run equilibrium, the variables will come back to equilibrium. The amount of time needed to restore equilibrium for variables can be determined by (1/coefficient).

TABLE 5
VEC GRANGER CAUSALITY/ BLOCK EXOGENEITY WALD TEST

		Dependent variables			
		Chai^2 Statistics			
	Independent variables	D(GDP)	D(EXPRT)	D(BKCRDT)	Causality direction
Bangladesh	D(GDP)		2.67	0.09	
	D(EXPRT)	8.53*		0.87	EX→GDP
	D(BKCRDT)	3.28	0.13		
India	D(GDP)		28.37*	14.16*	GDP→EXPRT GDP→BKCRDT
	D(EXPRT)	1.40		0.66	
	D(BKCRDT)	1.03	8.23*		BKCRDT→EXPRT
Pakistan	D(GDP)		1.34	1.03	
	D(EXPRT)	5.58*		2.11	EXPRT→GDP
	D(BKCRDT)	4.39	0.27		
Sri Lanka	D(GDP)		0.09	2.70	
	D(EXPRT)	10.28*		3.79	EXPRT→GDP
	D(BKCRDT)	4.53***	0.78		BKCRDT→GDP
Malaysia	D(GDP)		4.51***	0.43	GDP→EXPRT
	D(EXPRT)	7.99*		0.29	EXPRT→GDP
	D(BKCRDT)	0.01	0.24		
Singapore	D(GDP)		25.30*	3.09	GDP→EXPRT
	D(EXPRT)	13.08*		2.07	EXPRT→GDP
	D(BKCRDT)	3.41	3.54		
Thailand	D(GDP)		20.66*	9.40*	GDP→EXPRT
	D(EXPRT)	5.29***		12.39*	EXPRT→GDP
	D(BKCRDT)	2.27	13.16*		BKCRDT→EXPRT→BKCRDT

*= Significant at 1 percent level, ** = Significant at 5 percent level, and *** = Significant at 10 percent level.

Results of vector error correction Granger causality tests, in Table 5, showed that EXPRT Granger caused the economic growth (GDP) in Bangladesh, Pakistan, Sri Lanka, Malaysia, Singapore, and Thailand. The causation of economic growth (GDP) through the export of six out of nine South and South East Asia countries during 1967-2014 supports the hypothesis that trade is the promotes growth.

On the other hand, Table 5 shows that the GDP of India, Malaysia, Singapore, and Thailand Granger caused export for these countries.

Thus, bidirectional Granger causality between GDP and export (EXPRT) was found in Malaysia, Singapore, and Thailand.

Table 5 shows that bank financing (BKCRDT) Granger caused economic growth (GDP) in only Sri Lanka. Economic growth Granger caused bank financing growth only in India.

Bank financing growth (BKCRDT) Granger caused exports (EXPRT) in India and Thailand. On the other hand, export (EXPRT) Granger caused financial development in Thailand. Thus, bidirectional Granger causality between financial development (BKCRDT) and export growth was found in Thailand.

Summary: Bidirectional Granger causality between GDP and export (EXPRT) was found in Malaysia, Singapore, and Thailand. Unidirectional causality running from EXPRT to GDP was found Bangladesh, Pakistan and Sri Lanka. Unidirectional causality running from GDP growth to export was found in India. Bidirectional Granger causality between financial development (BKCRDT) and export growth was found in Thailand.

TABLE 6
PAIRWISE GRANGER CAUSALITY TESTS

	Indonesia	Philippine
Null Hypothesis	F-statistics	F-statistics
EXPORT does not Granger Cause GDP	0.44	1.82
GDP does not Granger Cause EXPORT	14.77*	1.33
BKCRDT does not Granger Cause GDP	0.99	0.81
GDP does not Granger Cause BKCRDT	0.23	1.06
BKCRDT does not Granger Cause EXPORT	0.37	0.98
EXPORT does not Granger Cause BKCRDT		1.15

*= Significant at 1 percent level, ** = Significant at 5 percent level, and *** = Significant at 10 percent level.

Policy Prescriptions

Government Bangladesh, Pakistan, Sri Lanka, Malaysia, Singapore, Thailand where export promoted economic growth should lay emphasis on promoting and protecting export industries that supported economic growth. The government should protect and support the export-import oriented industries of the country.

The government of the countries where bank credit promoted economic growth should undertake policies to provide incentive and encouragement to the local financial institutions for providing adequate credits to meet the growing needs of the export-import industries.

CONCLUSIONS

As the exogeneity among variables, export, economic growth and financial growth are indeterminate, this paper applied Vector Error Correction, as Sim (1980) recommended. As VEC required the test of stationarity and the cointegration in the series, this paper applied ADF and PP test for testing the unit root test as well as structural break test. Results showed that all series stationary at first difference. The null hypothesis of unit root at first difference was rejected. Results of the structural break showed that the series had break at level.

Johansen cointegration test was applied in testing whether the series were cointegrated. Results of the Johansen cointegration showed that the series were cointegrated for all countries, except Indonesia and Philippines. Lack of cointegration suggested the application of pairwise Granger causality test. Results of the VEC showed that the coefficient of the ECT for GDP was negative was significant for Bangladesh, India, Sri Lanka, Malaysia, and Singapore. The coefficients of the ECT of export (EX) and BKCRDT were negative and significant for India, Pakistan, and Thailand. The significance of the ECT suggests that there was short term dynamics. If the series are deviated from long run equilibrium, the variables will come back to equilibrium. The amount of time needed to restore equilibrium for variables is determined by (1/coefficient).

The direction of causality was established by the VEC Granger Causality/Block Exogeneity Wald Test. Results of vector error correction Granger causality tests showed that EXPRT Granger caused the economic growth (GDP) in Bangladesh, Pakistan, Sri Lanka, Malaysia, Singapore, and Thailand. The causation of economic growth (GDP) through the export of six out of nine South and South East Asia countries during 1967-2014 supports the hypothesis that trade is the promotes growth.

On the other hand, the GDP of India, Malaysia, Singapore, and Thailand Granger caused export for these countries. Thus, bidirectional Granger causality between GDP and export (EXPRT) was found in Malaysia, Singapore, and Thailand.

Table 5 shows that bank financing (BKCRDT) Granger caused economic growth (GDP) in only Sri Lanka. Economic growth Granger caused bank financing growth only in India.

Bank financing growth (BKCRDT) Granger caused exports (EXPRT) in India and Thailand. On the other hand, export (EXPRT) Granger caused financial development in Thailand. Thus, bidirectional Granger causality between financial development (BKCRDT) and export growth was found in Thailand.

The policy prescription this paper suggest that the government should protect and support the export-oriented industries where EXPRT promotes economic growth of the country. The government should undertake policies to provide incentive to the local financial institutions for providing the adequate credit to export industries where bank credit promotes economic growth and trade.

ENDNOTE

1. All countries don't have data series starting from 1970 and ending at 2015. The variation of year, if any, is mentioned

REFERENCES

Afxentiou, P. C., & Serletis. A. (1991). Exports and GNP causality in the industrial countries: 1950-1985. *Kyklos*, 44, 67-79.

Awokuse, O. (2005). Export led growth and the Japanese economy: Evidence from VAR and acyclic graph. *Applied Economic Letters*, 12: 849-858.

Balassa, B. (1978). Export and economic growth—further evidence. *Journal of Development Economics*, 5(2), 181-189.

Balassa, B. (1988). The lessons of East Asian development: an overview, Economic Development and Cultural Change. *Journal of Development Economics*, 36, 273-290.

Ben-David, D., & Loewy, M. B. (1998). Free trade growth and Convergence. *Journal of Economic Growth*, 3, 143-170.

Boltho, A. (1992). Was Japanese growth export led? *Oxford Economic papers,* 48, 415-432.

Buffie, E. (1992). On the condition for export-led growth, *Canadian Journal of Economics*, 25, 211-225.

Giles, J. A., & Williams, C. L. (2000). Export-led growth: a survey of empirical literature and some non-causality results, Part 1. *Journal of International Trade and Economic Development,* 9, 265- 341.

Grabowski, R., Sharma, S. C., & Dhakal, D. (1990). Exports and Japanese economic development. *Economic Letters*, 32, 127-132.

Granger, C. (1969). *Investigating Casual Relations by Econometric Models and Cross Spectral*.

Hatemi, J. A. (2002). Export performance and economic growth nexus in Japan: a bootstrap approach. *Japan and World Economy*, 14, 25-33.

Islam, N. M. (1998). Export expansion and economic growth: testing for cointegration and causality. *Applied Economics,* 30(3), 415-425.

Johansen, S. (1991). Estimation and Hypothesis testing of Cointegrating vectors in Gaussian Vector Autoregessive Models. *Econometrica*, 59, 1551-1580.

Johansen, S. (1995). *Likelihood-based Inference in Cointegrated Vector Autoregressive Models*. Oxford, Oxford University Press.

Josheski, D., & Lazarvo, D. (2002). International trade and economic growth: Cross-country evidence. *GRP International Journal of Business and Economics*, 2, 87-95.

Jung, S.W., & Marshal. (1985). Growth and causality in Developing countries. *Journal of development Economics*, 18, 1-12.

Kwan, A., & Cotsomitis, C. (1990): Economic growth and expanding export sector: China 1952-1958. *International Economic Journal*, 5,105-116.

Mashi, A. M. M., & Mashi, M. (1994). Temporal Causality Between Money and prices in LDC and the Error-Correction Approach: New Evidence from India. *Indian Economic Review*, 29(1), 33-55.

Moschos, D. (1989). Export expansion, growth and the level of economic development: an empirical analysis. *Journal of Development Economics,* 30, 93-102.

Nelson, C., & C. Plosser. (1982). Trends and Random Walk in Macroeconomics Time-series: Some Evidence and Implications. *Journal of Monetary Economics*, 10, 139-162.
Perron, P. (1989). The Great Crass, the oil price shock, and the unit Root Hypothesis. *Econometrica*, 57, 1631-1401.
Samad, A. (2007), Financial Development and Economic Growth: Causality test and evidence from Illinois. *International Journal of Financial Economics and Econometrics*, 4(1), 115-126.
Shan, J., & Sun, F. (1998). Export-led growth hypothesis for Australia: an empirical re-examination. *Applied Economic Letters*, 5, 423-428.
Shan, J., & Sum, F. (1998). On the Export-led Growth hypothesis: The Econometric Evidence From China. *Applied Economics*, 30, 1055-1065.
Sharma, S. C., Norris, N. M., & Chung, D. W. (199), Exports and economic growth in industrialized countries. *Applied Economics*, 23, 697-707.
Yamada, H. (1998). A note on the causality between exports and productivity. *Economic Letters*, 61. 111-114.
Zivot, E., & W. K. Donald Andrews. (1992). Further Evidence on the Great Crash, the Oil-price Shock, and the Unit-Root Hypothesis. *Journal of Business and Economic Statistics,* 10, 251-270.