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Economic Growth, Export, and External Debt Causality: The Case of Asian Countries

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I. INTRODUCTION

The issue of how developing countries can accelerate their economic growth is of crucial importance. The two primary alternative routes to development are inward-oriented growth strategies, which emphasises import-substitution industrialisation (ISI); and outward-oriented policies, which emphasises the economic benefits of participation in the world economy, that is, export-led growth (ELG). The late 1960s and 1970s witnessed a disillusionment with ISI in many developing countries, leading to a reduction in protectionist measures. The 1980s witnessed further intensification of liberalisation measures as many countries retreated from socialism, regulation and planning. The dis-advantages of ISI, the potential strength of ELG policies and the conditions necessary for successful transition from an inward-oriented regimes to an outward oriented have been extensively researched[1] and beyond the scope of the present study. Moreover many of the rapidly growing newly industrialising countries (NICs) lend support to the idea that export promotion can be an effective development strategy. Naturally such a line of causation is consistent with macroeconomic theory, where exports are treated as injections into the economy [Kaldor (1967); Feder (1982); Romer (1989); Krueger (1990) and Marin (1992)][2].

Studies on the export growth-economic growth nexus have been conducted along a number of divergent lives. The initial test were done on a bivariate level to

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[1]See Jung and Marshall (1985); and Greenaway and Sapsford (1994) for a recent survey.

[2]However, according to the basic tenets of international trade and comparative advantage theory, a reversed causal sequence can also be envisaged, that is, that economic growth leads to export growth. In this scenario, and increase in economic growth generally leads to a corresponding expansion of trade, unless the pattern of growth-induced supply and corresponding demand creates an anti-trade bias [For a good review, See Bhagwati (1988) and Pack (1994)].

study the correlation between exports and economic growth in levels and then in terms of rate of growth [Jung and Marshall (1985)]. Correlation between exports and economic growth via other economic growth-determining fundamentals such as labour and capital in a production-type function with investment (capital formation), manufacturing, and total exports was also investigated [Balassa (1988); Tyler (1981) and Feder (1982)]. Studies were also conducted to consider the differential impacts of exports on economic growth depending on the level of economic/industrial development of the country-critical-minimum effort hypothesis [Kohli and Singh (1989) and Moschos (1989)].

Recently, there has been emphasis on empirical investigation of the relationship between export revenue and economic growth using the bivariate causality tests of Granger (1969) and Sims (1972). This has resulted a considerable number of studies both for developed and developing countries [Jung and Marshall (1985); Kwan and Costomitis (1990); Bahmani-Oskooee *et al.* (1991); Dutt and Ghosh (1996); Darrat (1987); Afxentiou and Serletis (1992); Henriques and Sadorsky (1996); Marin (1992) and Khan *et al.* (1995)]. However, most recent studies that have use time-series data to investigate the bivariate causality between a country's export growth and its economic growth have provided mix-evidence to support the export-led growth hypothesis[3]. Such papers include Bahmani-Oskooee *et al.* (1991); Chow (1987); Jung and Marshall (1985); Dutt and Ghosh (1996); Darrat (1987); and Dodaro (1993)]. The evidence in these studies demonstrate that, though export growth and GDP growth have weak bidirectional causality, but, export-promotion deserves a consideration in developing countries. It was also found that exports and economic growth are cointegrated for a majority of sample countries.

To date there are only very few studies that consider the nature and direction of causation between export growth and economic growth in Asian countries context, [e.g., Chow (1987); Kwan and Costomitis (1990); Jung and Marshall (1985); and Khan *et al.* 1995)]. Empirical evidence based on these causality studies are, however, mixed and in some cases contradictory. The absence of a consistent causal pattern, particularly in the case of Asian countries, may be attributed to the misspecification of the causal model used in these studies due to the omission of an important third variable, such as foreign debt. Consequently, the parameter estimates are likely to be biased and inconsistent, leading to misleading causal links between exports and growth. If most of the foreign borrowings being utilised to finance economic development activities via exports oriented sectors of an economy, as my be the case of many Asian economies being under consideration, than export growth spuriously appears to cause economic growth, even though they may infect be causally unrelated.

[3]There is another group of studies that have used cross-sectional data and have provided support the ELG hypothesis [See in particular, Balassa (1988); Feder (1982); Kavoussi (1984) and Tyler (1981)].

Therefore, the omission of foreign debt servicing variable may seriously bias the empirical causality results between exports and growth in the case of Asian economics, because, for the sample of Asian countries being under consideration, foreign debt servicing is a major disbursement item on their foreign export earnings budget (Table 1). Whereas, the debt servicing burden of South-Asian countries has been among the highest in the indebted developing countries. In lines with this, effective external debt management was a significant part of their structural adjustment programme being persuaded by their donor agencies. Furthermore, studies using multiple regressions and statistical techniques other than bivariate causality tests indicate there are more significant variables, such as external debt, which affect economic growth in addition to export revenue [Levine and Renalt (1992); Remamurti (1992); Levy (1988); and Islam (1992)]. Finally, most of the Asian-South and South-East-countries have adopted IMF structural economic adjustment programmes to reduce macroeconomic instability, remove economic distortions, manage external debt burden, promote the growth of exports, and restore sustainable economic growth and investment [IMF Annual Reports (1991)]. The implicit assumption is that, additional foreign loans can restore investment and economic growth.

Table 1

Total External Debt Servicing as a Percentage of Export Revenue in Asian Countries: 1970–1997

(%)

Countries	1970	1980	1990	1997
South Asia				
Bangladesh	N.A.	13.13	23.62	11.39
		(0.60)	(1.74)	(1.38)
India	7.91	10.86	31.06	21.48
	(0.46)	(0.86)	(2.48)	(2.59)
Pakistan	7.45	19.83	21.85	35.40
	(1.16)	(2.28)	(2.97)	(5.36)
Sri Lanka	2.76	4.91	9.89	6.27
	(0.96)	(1.26)	(2.89)	(2.33)
South East Asia				
Indonesia	1.39	9.76	29.08	29.15
	(0.47)	(3.76)	(6.63)	(7.90)
Korea	6.63	11.86	9.73	5.54
	(0.44)	(2.38)	(2.31)	(2.27)
Malaysia	1.19	4.68	10.22	5.98
	(0.54)	(2.11)	(7.22)	(5.74)
Thailand	4.13	12.61	12.05	13.05
	(0.61)	(2.38)	(3.87)	(5.42)

Figures in parenthesis are total debt servicing as a percentage of GDP.

It is a stylised fact that, investment influence on the export-growth relationship. Theoretically, an increase in export allows an increase demand for imported capital goods, which raises the growth rate of capital formation and thus stimulates growth. Since, most of these investment activities took place in the export-oriented industries, thus resulted in important scale effects and externalities for GDP growth, in the region under consideration. This, given relatively rigid and artificially high exchange rates and domestic fiscal deficits, threw the trade balance into a deficit position, necessitating foreign borrowings. Since, export revenues is the major source of foreign debt retirement, in many Asian countries, therefore, the causal relationship between economic growth and exports growth needs to be empirically reconsidered taking into consideration the role of foreign debt servicing in such indebted countries. Levy (1988) and Murthy *et al.* (1994) find that foreign aid had a positive contribution to economic growth, and Hussain (1994) finds that, some countries have achieved significant economic growth since the introduction of the adjustment programmes.

The preceding discussion indicates if a greater proportion of the export revenue is being used to service external debt than a positive relationship between export revenue growth and debt servicing may be conceivable because, countries with promising export potential tend to succeed in obtaining more foreign loans and, hence, to carry larger external debt and have a larger foreign debt servicing burden [Feder (1982)]. Thus the expected positive relationship between exports growth and economic growth may not be significantly obtained, because, the resources from exports are directed to servicing external debt instead of investment.

The establishment of the causal pattern between exports and growth has important implications for development strategies for developing countries. If export causes economic growth ($X \rightarrow Y$), then the achievement of a certain degree of development may be a prerequisite for the country to expand its exports. A bi-directional causality (or feed back) between exports and growth ($X \leftrightarrow Y$) would imply that, one reinforces the other. The primary objective of the present study is to further investigate the causality between exports and economic growth by introducing external debt servicing as a third variable, which may have a significant effect on the causality between exports and growth in developing countries of South and South East Asia. Undoubtly, the issue is a serious one and worthy of investigation. To achieve this objective, a trivariate causality framework is being adopted. Unit root and cointegration tests are first used to test whether long-run equilibria exist among the variable combinations considered. This is to establish justification for a search for causal linkages between related variables through employing error-correction model in a multivariate framework. The model is tested on the time-series data of eight Asian countries viz; four South Asian and four South-East Asian over the period, 1970–1977. The rest of the paper is organised as

follows. The next section outlines the methodology and data. Section three presents the estimation results. The final section presents conclusions.

II. METHODOLOGY AND DATA

In this study, we examine the causality between export revenue and economic growth by introducing external debt servicing as a third economic variable which may have a significant effect on the causality between exports and growth in developing countries. A trivariate causality framework was adopted to implement the empirical analysis.

Cause and effect relationship are often difficult to determine given the non experimental nature of most economic data, and that evidence of long-run equilibrium must be found in the data for valid Granger-type causal inferences to be made. Only recently has attention been drawn to the need for prior examination of the time series properties, notably unit roots and co-integration, that bear on the significance and direction of causality findings. If the time series are characterised by non-stationarity it is appropriate to test first for the existence of a long-run relationship between the variables. Statistically, a long run equilibrium is said to exist when a linear combination of two or more non-stationary time series (i.e., integrated of order 1 or I(1) is integrated of order 0 (or I(0)).[4] It is important that the testing procedure capture the long run dynamics in the time series properties of the data since where co-movement is present, short-run divergences from the equilibrium will be counteracted by long run forces. Thus reducing the risk of spurious causation results. For valid inferences test should therefore be undertaken on the I(0) variables. Granger (1988) shows that in the presence of cointegration there must be at best one direction[5] of 'Granger-Causality'.

Following Engle and Granger, we use a three-step procedure to test for the direction of causality. The first step tests for the order of integration of the variables was done with the aid of PP statistics [Philips and Perron (1988)]. This statistics test for the presence of a unit root under the alternative hypothesis that the time series is stationary around a fixed trend. If a unit root is present and stationarity is achieved by first-differencing the data, the second step tests cointegration test. If cointegration is not detected, the third step test for causality by using standard Granger test. Assuming that the levels of all variables in real terms are I(1) and cointegrated. At first test the bivariate causality relationship between export growth and economic growth, as specified below:

$$Y_t = \alpha_0 + \sum_{i=1}^{4} \alpha_i Y_{t-i} + \sum_{i=1}^{4} b_i X_{t-i} + V_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

[4]Technically, the linear combination is integrated of lower order than the component series.

[5]Note that this causality may run from the error correction variable to the increments only.

$$X_t = \gamma_0 + \sum_{i=1}^{4} \beta_i X_{t-i} + \sum_{i=1}^{4} \lambda_i Y_{t-i} + \eta_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

where Y is the growth rate of real GDP measured as $\ln(GDP_t/GDP_{t-1})$, and X is the growth rate of real exports of goods and services measured as $ln(Export_t/Export_{t-1})$.

The hypothesis that export revenue causes economic growth, if supported by the data, should imply that the null hypothesis of $\sum_{i=1}^{4} b_i \neq 0$ and $\sum_{i=1}^{4} \lambda_i \neq 0$. For the bivariate analysis the F-value is calculated as:

$$F_{(4,\, n-2m-1)} = \frac{(R^2_{UR} - R^2_R) \big/ 4}{(1 - R^2_{UR}) \big/ (n-2m-1)} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

where R^2_{UR} and R^2_R are the unrestricted R^2 and restricted R^2 for unrestricted and restricted causality regressions respectively, n is the total number of observations and m is the number of lags per variable.

The second test examines the jointly influence of two variables on the third variable. The joint trivariate causality model is specified as:

$$Y_t = \alpha_0 + \sum_{i=1}^{4} \alpha_i Y_{t-i} + \sum_{i=1}^{4} b_i X_{t-i} + \sum_{i=1}^{4} c_i Z_{t-i} + u_t \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

$$X_t = \gamma_0 + \sum_{i=1}^{4} \beta_i X_{t-i} + \sum_{i=1}^{4} \lambda_i Y_{t-i} + \sum_{i=1}^{4} h_i Z_{t-i} + e_t \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

$$Z_t = \phi_0 + \sum_{i=1}^{4} q_i Z_{t-i} + \sum_{i=1}^{4} d_i Y_{t-i} + \sum_{i=1}^{4} f_i X_{t-i} + \varepsilon_t \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

The difference between our approach and the extent literature cited in the introduction is the inclusion of a third variable, Z_t, defined as the growth rate of foreign debt service, also measured as ln (debt service$_t$/debt service$_{t-1}$). The focus of this paper is on the role of foreign debt servicing in the export and economic growth relationship and not the identification of the numerous determinants of growth [Levine and Renelt (1992)].

If the cointegration is detected, in the third step test for causality, we applying a standard Granger test modified with an appropriate error-correction term[6]. The trivariate tests are specified as generalised extensions of the standard case [Granger (1969)] as follows:

[6]Toda and Phillips (1993) show that, in testing causality in cointegrated systems, the error-correction form is preferred to level autoregressions.

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^{4} \alpha_i \Delta Y_{t-i} + \sum_{i=1}^{4} b_i X_{t-i} + \sum_{i=1}^{4} c_i \Delta Z_{t-i} + K_1 R1_{t-1} + u_t \quad \ldots \quad (7)$$

$$\Delta X_t = \gamma_0 + \sum_{i=1}^{4} \beta_i \Delta X_{t-i} + \sum_{i=1}^{4} \lambda_i \Delta Y_{t-i} + \sum_{i=1}^{4} h_i \Delta Z_{t-i} + K_2 R2_{t-1} + e_t \quad \ldots \quad (8)$$

$$\Delta Z_t = \phi_0 + \sum_{i=1}^{4} q_i \Delta Z_{t-i} + \sum_{i=1}^{4} d_i \Delta Y_{t-i} + \sum_{i=1}^{4} f_i \Delta X_{t-i} + K_3 R3_{t-1} + \varepsilon_t \quad \ldots \quad (9)$$

where, all variables are stationary time series, Δ is the first difference operator and the $R1_{t-1}$, $R2_{t-1}$ and $R3_{t-1}$ are the lagged values of the error correction terms derived from the long run cointegration equation.

Specifically, Granger's causality test examines the causal relationship between a set of variables by testing for their predictability based on past and present values. In Granger's sense, a set of variables Z_t is said to be caused by X_t if the information in past or present X_t helps to improve the forecasts of Z_t. If X_t causes Z_t and Z_t causes X_t, then $Y_t' = (Z_t', X_t')$ is a feedback system. The following describes the test and therefore a statistical procedure. All events have a theoretical population counterpart. But in our trivariate specification, five outcomes only are of interest on the grounds of economic theory. They are: (i) *X* and *Z* Granger-cause *Y* if $b_i = c_i = 0$, is not true. Given data, we conclude this if $b_i = c_i = 0$ is rejected; (ii) similarly, if $\lambda_i = h_i = 0$ is rejected, *Y* and *Z* Granger-cause X; (iii) and so, if $d_i = f_i = 0$ is rejected *X* and *Y* Granger-cause *Z*; (iv) a feedback system exists if (i)–(iii) hold simultaneously; and finally, (v) one cannot reject that *X*, *Y* and *Z* are causally independent if all coefficients of *X* and *Z* in Equation (7), *Y* and *Z* in Equation (8) and *X* and *Y* in Equation (9) are not statistically different from zero.

The hypothesis being tested with Equations 4, 5, 6 and Equations 7, 8 and 9, are:

(1) Whether *X* and *Z* jointly cause *Y* after controlling for *Y*'s own lags.
(2) Whether *Y* and *Z* jointly cause *X* after controlling for *X*'s own legs.
(3) Whether *X* and *Y* jointly cause Z after controlling for *Z*'s own lags.

Though questions about optimal lags are raised in the literature, Jones (1989) demonstrates that ad-hoc methods for determining the lags to use in Granger's causality test performed better than some of the statistical methods used to search for optimal lags. Earlier, Thornton and Batten (1985) also found the final prediction methods to be a better technique for determining the optimal lag. Thus, the issue of the best statistical method to use in determining the optimal lags is unresolved. We, therefore, estimated Equations 4 to 6 and 7 to 9 assuming four lags for each variable. The *F*-statistic for the trivariate causality test is calculated as:

$$F_{(4,n-3m-1)} = \frac{(R^2_{UR} - R^2_R)/4}{(1-R^2_{UR})/(n-3m-1)} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (10)$$

Data

Annual data on real Gross Domestic Product (GDP) and real exports of goods and services of four South Asian (Bangladesh, India, Pakistan and Sri Lanka) and four South East Asian Countries (Indonesia, Korea, Malaysia and Thailand) for the period of 1970 to 1997 were taken from World Development Indicators and data on external debt servicing was obtained from Global Development Finance. All the data were in 1995 constant US dollars.

III. ESTIMATION RESULTS

Testing causality between exports, growth and external debt: Granger and error-correction tests.

The test procedure given in the previous section requires that the time series used for causality be stationary. Therefore, prior to any causality analysis, the integration order of the time-series under consideration should be tested. The results of the unit root tests for the variables in their first difference are presented in Table 2. On the basis of the Phillips-Perron (PP) statistics, the null hypothesis of a unit root cannot be rejected whether or not trend is included in the regressions, at all levels of significance, for each variable. This suggests that all of our data series for each country are first difference stationary (i.e., I(1)). This implies that combination of one or more of these series may exhibit a long-run relationship. We, therefore, proceed with cointegration tests.

It was argued earlier that; cointegration aims at dealing explicitly with the relationship between non-stationary time series. In particular, it allows individual time series to be integrated of order one or I(1) in the terminology of Engle and Granger (1987), but requires that, linear combinations of these series I(0). Therefore, the basic concept of cointegration is to search for linear combinations of individually non-stationary time-series that are themselves stationary.

As stated earlier that, present endeavor's main concern is to re-examine the causality between exports and economic growth by adopting trivariate analysis in which the joint influence of exports and external foreign debt may cause economic growth in developing countries, such as Asian. To achieve this objective, causality tests are used to investigate causal relationship between exports, economic growth and foreign debt servicing and as well as to identify the direction of such causality. For this purpose, standard Granger test is employed when the time series under consideration have unit roots, but not cointegrated (Equations, 4, 5, and 6). If

Table 2

Phillips Perron Unit Root Test[(1)]

Countries	Variable (First Differences)	Constant, No Trend	Constant, Trend	No. of Lags
South Asian				
Bangladesh	X	–9.09*	–9.78*	1
	Y	–4.53*	–4.51*	1
	Z	–4.73*	–4.84*	1
India	X	–5.15*	–5.54*	1
	Y	–5.30*	–6.30*	1
	Z	–4.41*	–4.25**	1
Pakistan	X	–5.48*	–5.49*	1
	Y	–4.03*	–3.74**	1
	Z	–8.45*	–8.41*	1
Sri Lanka	X	–5.15*	–5.17*	1
	Y	–4.40*	–4.35**	1
	Z	–3.83*	–4.00**	1
South East Asia				
Indonesia	X	–3.78*	–3.68**	1
	Y	–4.48*	–4.42*	1
	Z	–2.44*	–3.54***	1
Korea	X	–4.05*	–4.17**	1
	Y	–4.12*	–4.04**	1
	Z	–4.19*	–4.59*	1
Malaysia	X	–5.02*	–5.64*	1
	Y	–3.81*	–3.74**	1
	Z	–5.38*	–6.04*	1
Thailand	X	–4.57*	–4.64*	1
	Y	–2.29	–1.92	1
	Z	–7.13*	–7.42*	1

*1 percent. **5 percent. ***10 percent. [(1)]All variables are non-stationary at level.

cointegrated is detected, the third step's tests for Granger causality is to apply an error-correction model (ECM) as proposed by Engle and Granger (1987) to our time series data (Equations 7, 8 and 9). Hence, the next empirical stage, naturally involves testing the existence of a long-run equilibrium relationship among the relevant time-series, for each country. Cointegration tests were applied to discover the possible long-term relationships between the variables. The results of the Engle-Granger cointegration tests conducted on the residuals of the cointegration regressions for various combinations of the logged variables are presented in Table 3. The reverse cointegration

Table 3

Test for Cointegration

Countries	Dependent Variable	PP Test Statistics	Inference
South Asia			
Bangladesh	Export Growth	–0.069	Not Cointegrated
	Economic Growth	–3.092	Cointegrated
	Debt Servicing Growth	–3.544	Cointegrated
India	Export Growth	–0.327	Not Cointegrated
	Economic Growth	–2.433	Not Cointegrated
	Debt Servicing Growth	–2.364	Not Cointegrated
Pakistan	Export Growth	–2.229	Not Cointegrated
	Economic Growth	–2.509	Not Cointegrated
	Debt Servicing Growth	–2.569	Not Cointegrated
Sri Lanka	Export Growth	–1.832	Not Cointegrated
	Economic Growth	–2.171	Not Cointegrated
	Debt Servicing Growth	–1.947	Not Cointegrated
South East Asia			
Indonesia	Export Growth	–1.662	Not Cointegrated
	Economic Growth	–3.824	Cointegrated
	Debt Servicing Growth	–4.721	Cointegrated
Korea	Export Growth	–0.055	Not Cointegrated
	Economic Growth	–0.989	Not Cointegrated
	Debt Servicing Growth	–2.239	Not Cointegrated
Malaysia	Export Growth	–1.851	Not Cointegrated
	Economic Growth	–2.355	Not Cointegrated
	Debt Servicing Growth	–3.062	Not Cointegrated
Thailand	Export Growth	–1.509	Not Cointegrated
	Economic Growth	–1.935	Not Cointegrated
	Debt Servicing Growth	–2.919	Not Cointegrated

was also performed. It is clearly evident from the results that, all derived PP statistics are insignificant at the 95 percent confidence level, implying that, there is no evidence of long-run equilibrium relationship exist among the relevant time series, with notable exceptions for Bangladesh and Indonesia. These results, in general, provide weak support for a cointegration relationship between exports, economic growth and foreign debt servicing among several Asian Countries, including Pakistan. However, it is plausible that, a long-run equilibrium relationship exists among the relevant time-series in the case of Bangladesh and Indonesia. These, results, however, do not exclude the possibility of a causal relationship among the time series under consideration.

Next we perform the causality test for examining the nature and direction of the hypothesised causal links in the trivariate analysis in which the joint influence of two variables may cause the third variable. Since, we conjecture that foreign debt servicing, as a third economic variable, may have a significant effect on the causality between exports and economic growth in developing countries. As discussed earlier, the choice of a particular causality test depends upon the results of cointegration. The standard multivariate Granger causality test is performed for the non-cointegrating series. The ECM is tested for Bangladesh and Indonesia for which a cointegrating relation between the causal factors cannot be rejected. The results of these tests reported in Table 4.

In general, the empirical results do not provide evidence that the economic growth is being significantly affected either by the export revenue growth or by the combine effort of exports and foreign debt, in the South and South-East Asian countries between 1970 to 1997. Neither the inclusion of foreign debt servicing growth, though brought some changes into the results, fail to display any significant affect on the causality between exports and economic growth in the South and South-East Asian countries due to lack of uniformity in the empirical results obtained, with the exception of Bangladesh.

In the case of Bangladesh estimated results provide significant evidence of bidirectional and negative causality between export revenue growth and GDP growth after controlling for foreign debt servicing. This may support the rejection of both export-led growth and GDP growth-driven exports hypothesis for Bangladesh in the 1971–97 period. In the same period evidence also indicate bidirectional and negative causality between export revenue growth and foreign debt servicing after excluding GDP growth. Similarly, we find strong evidence of negative and bidirectional causality from foreign debt servicing to GDP growth after excluding export revenue growth. This implies that for Bangladesh growth of external debt results in lower export revenue growth and foreign debt servicing appeared to be negatively affecting the export-growth relationship in this poor country. While in the case of India export-led growth hypothesis is being supported and foreign debt enhanced economic growth in the period 1971–97. Whereas, we find unidirectional and

Table 4

Trivariate Analysis of Causal Relationship among GDP Growth (Y), Export Revenue Growth (X), and Foreign Debt Service (Z) for the 1970–1997 Period

Countries	Null Hypothesis	Sum of the Coefficients	*F*-statistics	Causal Inference
South Asia				
Bangladesh	X (Z) ≠ > Y[a]	–0.759	28.12*	Reject H_O
	Z (X) ≠ > Y[b]	–0.445	10.95*	Reject H_O
	Y (Z) ≠ > X[c]	–1.330	3.38**	Reject H_O
	Z (Y) ≠ > X[d]	–15.109	3.81**	Reject H_O
	X (Y) ≠ > Z[e]	–3.408	6.71*	Reject H_O
	Y (X) ≠ > Z[f]	–21.221	1.64	Accept H_O
India	X (Z) ≠ > Y	0.408	2.86***	Reject H_O
	Z (X) ≠ > Y	0.206	4.80**	Reject H_O
	Y (Z) ≠ > X	0.641	0.66	Accept H_O
	Z (Y) ≠ > X	–0.899	2.79***	Reject H_O
	X (Y) ≠ > Z	–2.125	2.28	Accept H_O
	Y (X) ≠ > Z	2.101	1.02	Accept H_O
Pakistan	X (Z) ≠ > Y	0.127	0.74	Accept H_O
	Z (X) ≠ > Y	0.016	1.68	Accept H_O
	Y (Z) ≠ > X	0.140	0.51	Accept H_O
	Z (Y) ≠ > X	4.697	0.60	Accept H_O
	X (Y) ≠ > Z	–1.746	1.74	Accept H_O
	Y (X) ≠ > Z	0.197	0.19	Accept H_O
Sri Lanka	X (Z) ≠ > Y	–0.050	0.55	Accept H_O
	Z (X) ≠ > Y	–0.071	0.54	Accept H_O
	Y (Z) ≠ > X	–0.201	1.85	Accept H_O
	Z (Y) ≠ > X	–2.207	1.46	Accept H_O
	X (Y) ≠ > Z	0.010	2.36	Accept H_O
	Y (X) ≠ > Z	–1.414	1.04	Accept H_O
South East Asia				
Indonesia	X (Z) ≠ > Y	–0.003	0.78	Accept H_O
	Z (X) ≠ > Y	0.162	1.90	Accept H_O
	Y (Z) ≠ > X	–0.089	1.40	Accept H_O
	Z (Y) ≠ > X	–1.649	1.16	Accept H_O
	X (Y) ≠ > Z	0.369	1.88	Accept H_O
	Y (X) ≠ > Z	–3.895	1.12	Accept H_O

Continued—

Table 4—(*Continued*)

Countries	Null Hypothesis	Sum of the Coefficients	*F*-statistics	Causal Inference
Korea	X (Z) ≠ > Y	0.144	1.51	Accept H_O
	Z (X) ≠ > Y	–0.002	2.48***	Reject H_O
	Y (Z) ≠ > X	–0.182	1.56	Accept H_O
	Z (Y) ≠ > X	–1.979	2.17	Accept H_O
	X (Y) ≠ > Z	2.284	0.44	Accept H_O
	Y (X) ≠ > Z	–5.453	0.56	Accept H_O
Malaysia	X (Z) ≠ > Y	0.159	0.72	Accept H_O
	Z (X) ≠ > Y	–0.006	1.60	Accept H_O
	Y (Z) ≠ > X	–0.075	0.71	Accept H_O
	Z (Y) ≠ > X	–2.101	2.17	Accept H_O
	X (Y) ≠ > Z	–5.163	4.42**	Reject H_O
	Y (X) ≠ > Z	0.826	4.52**	Reject H_O
Thailand	X (Z) ≠ > Y	–0.091	1.55	Accept H_O
	Z (X) ≠ > Y	0.178	0.42	Accept H_O
	Y (Z) ≠ > X	–0.229	1.23	Accept H_O
	Z (Y) ≠ > X	–1.600	2.64***	Reject H_O
	X (Y) ≠ > Z	4.024	1.89	Accept H_O
	Y (X) ≠ > Z	–2.260	2.10	Accept H_O

*Significant at the 1 percent level, indicating that there is a significant causal relationship.
**Significant at the 5 percent level, indicating that there is a significant causal relationship.
***Significant at the 10 percent level, indicating that there is a significant causal relationship.
(a) $X(Z) \rightarrow Y$ is interpreted as X and Z jointly cause Y, after excluding Z.
(b) $Z(X) \rightarrow Y$ is interpreted as Z and X jointly cause Y, after excluding X.
(c) $Y(Z) \rightarrow X$ is interpreted as Y and Z jointly cause X, after excluding Z.
(d) $Z(Y) \rightarrow X$ is interpreted as Z and Y jointly cause X, after excluding Y.
(e) $X(Y) \rightarrow Z$ is interpreted as X and Y jointly cause Z, after excluding Y.
(f) $Y(X) \rightarrow Z$ is interpreted as Y and X jointly cause Z, after excluding X.

negative causal relationship between foreign debt service with export revenue growth after excluding GDP growth. This may implies growth of external debt servicing resulted in lower export revenue in India during 1971–97 period.

Evidence for remaining countries neither support the hypothesis of export-led growth nor GDP growth-driven exports hypothesis in the 1971–97 period. This indicates that, neither foreign loan nor IMF-led structural programmes exert any significant impact on the economic growth in these countries in 1971–97 period. Rather, it may implies that for these countries growth of external debt results in lowering both economic growth and export-revenue growth.

IV. CONCLUSION

Recent empirical studies of export-driven economic growth analysis which investigate the direction of causality between export revenue and the growth of GDP, have been inconclusive. The major shortcoming with the bivariate causality analysis is the omission of other relevant variable, such as foreign debt servicing. Such omission can bias the empirical results. In this study, foreign debt servicing is introduced as a third variable within trivariate causality analysis of exports and economic growth for South and South-East Asian countries. The evidence indicates that, generally, there is no joint feedback affect between export revenue, external debt service and economic growth, with notable exception for India where unidirectional causality support ELG hypothesis and foreign loans appeared to be effective in enhancing GDP growth.

The general conclusion is that both the export-driven GDP growth and GDP growth-led export promotion hypotheses are not being supported in all the cases examined, especially in the 1971–97 total period, except for India. Furthermore, the structural adjustment programmes, though removed some of the economic distortions and encouraged regular repayment of the external debt failed to enhance economic growth and result in lowering export revenue in these countries, particularly, these effect are more pronounced in the case of relatively poor countries, such as Bangladesh.

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Comments

In this paper the authors have employed the standard causality tests developed by Granger and Sims "to investigate causal relationship between exports, economic growth and foreign debt servicing and as well as to identify the direction of such causality". The macroeconomic data for the period 1970–1997 is used to study the exports, growth and debt nexus for the eight Asian countries namely Bangladesh, India, Pakistan, Sri Lanka, Indonesia, Korea, Malaysia and Thailand.

A critical perusal of the paper gives an impression that the basic framework, the primary hypothesis and the methodology adopted to analyse the triviate relationship between exports, growth and debt are based on an oversimplified approach and nieve thinking with the result that the authors come up with confused and contradictionary conclusions.

The major problem in the thinking of the authors is reflected in the introduction of the paper as they compare the two main strategies to economic growth i.e. import-substitution industrialisation (ISI) and export-led growth (ELG) strategy. The authors have claimed that "the late 1960s and 1970s witnessed disillusionment with ISI in many developing countries, leading to a reduction in protectionist measures. The 1980s witnessed further intensification of liberalisation measures as many countries retreated from socialism, regulation and planning". The authors then refer to a number of authors such as Kaldor, Feder, Romer, Krueger, Marin, Bhagwati, Pack etc. to highlight the inherent "disadvantages" of ISI and potential "strength" of ELG policies.

The debate on the relative merits and demerits of ISI and ELG strategies is not yet concluded. However, the introduction of the paper gives an impression that the authors intend to extend the scope of the debate by some original insight and empirical analysis. Contrarily, the main body of the paper is narrowly focussed on the causal relationship between exports, growth and debt. The introductory theme of the paper is therefore left halfway without developing it to any logical end.

The main theme of the paper relates to the causal linkages between exports, growth and debt. However, there is confusion in the mind of authors as they fail to clearly distinguish between debt as a stock variable and debt-servicing as a flow variable. This becomes clear when we look at the two pivotal statements of the authors one following the other:

"If most of the foreign borrowings being utilised to finance economic development activities via exports oriented sectors of an economy, as may be the case of

"Therefore, the omission of foreign debt servicing variable may seriously bias the empirical causality results between exports and growth in the case of Asian economies, because for the sample of Asian countries being under consideration,

foreign debt servicing is a major disbursement item on their foreign export earnings budget".

As the above statements show, the authors hibernate between foreign loans and external debt-servicing as determinants of economic growth and finally reach the conclusion that the expected positive relationship between exports growth and economic growth may not be significantly obtained, because the resources from exports are directed to servicing external debt instead of investment. This conclusion is statistically derived without supporting it by logical reasoning.

The paper is primarily a mechanical exercise making an extensive use of the Granger causality tests. However, the value of these tests is limited as these are not related to any well-defined and clearly conceived hypotheses. For that reason, the results of the tests make no substantive and meaningful contribution to our understanding of growth process, export generation or the impact of debt servicing on the economy. In fact, the econometric methods based on Granger tests when applied within a diffused and blurred theoretical framework are bound to give contradictionary results which is the case of this paper.

The conclusions of the paper need a serious analysis. The authors suggest: "The evidence indicates that, generally, there is no joint feedback effect between export revenue, external debt service and economic growth, with notable exception for India where unidirectional causality supports ELG hypothesis and foreign loans appeared to be effective in enhancing GDP growth".

This is followed by the general conclusions of the paper that both the export-driven GDP growth and GDP-growth-led export promotion hypotheses are not being supported in all the cases being examined especially in the 1970–1997 period except for India. Obviously these results are misleading.

The conclusions of the paper therefore are counter-intuitive and provide no guidance for policy formulation for the developing countries.

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