Journal of Business and Economics, ISSN 2155-7950, USA
December 2015, Volume 6, No. 12, pp. 1999-2007
DOI: 10.15341/jbe(2155-7950)/12.06.2015/001

http://www.academicstar.us

Export Growth-economic Growth Nexus: An Empirical Re-examination

Swarna D. Dutt[1], Dipak Ghosh[2], Adrian Austin[1]
(1. University of West Georgia, Carrollton, GA 30118, USA; 2. Emporia State University, Emporia, KS 66801, USA)

Abstract: The economic literature on the export growth-economic growth causality is a study in contradictions. There is no unanimity among the researchers and by extension policy makers if the causality is uni-directional (and if so in which direction) or bi-directional. We want to revisit this academic quandary with a powerful econometric technique proposed by Pedroni (2004) where he introduces pooling of economic data which allows for one to vary the degree of heterogeneity among the panel members. It examines both the between dimension and within dimension residuals. The strength of this test is that the resultant "test statistic" is able to accommodate short run dynamics, deterministic trends and also different slope coefficients. This test statistic is "standard normal' and free of nuisance parameters. We want to include many countries over a long period of time, which will help increase the credibility of the test results. We will use data for OECD countries for the post World War II time period. We will start with stationarity characteristics of the data and then apply the Pedroni panel cointegration methods. We hope to shed some light on the export growth-economic growth relationship.

Key words: export growth; economic growth; PEDRONI; real GDP; real exports
JEL code: F43

1. Introduction

It would be logical to believe that trade positively effects economic growth, but somehow this trade-economic growth nexus has remained controversial. The reason for this could be the fact that the empirical evidence is all over the place, with contradictory outcomes ruling the roost. Many studies have found that foreign trade has a favorable effect on growth and hence is assumed to be a necessary condition for economic enhancement. But consensus is not a subscription to the general idea that it in itself is a sufficient condition for growth and development. For that trade must be complemented by productivity increases, a rise in savings and investment must rise surrounded by an environment of economic policy favorable to private initiative, capital inflows and the efficient use of resources.

The empirical evidence on the causal relationship between exports and growth is diverse. There is a substantial literature that investigates the relationship and causation between exports and economic growth, but the conclusions still remain a subject of debate. In particular, available time series studies fail to provide consistent support for the export-led growth hypothesis while most cross-sectional studies provide empirical

Swarna D. Dutt, Fuller E. Callaway Endowed Chair and Professor of Economics, Richards College of Business, University of West Georgia; research areas/interests: open economy macroeconomics, international finance. E-mail: bdutt@westga.edu.
Dipak Ghosh, Herman Baehr Endowed Chair and Professor, School of Business, Emporia State University; research areas/interests: open economy macroeconomics, international finance. E-mail: dghosh@emporia.edu.
Adrian Austin, Associate Professor of Economics, Richards College of Business, University of West Georgia; research areas/interests: open economy macroeconomics, econometrics. E-mail:aaustin@westga.edu.

evidence in support of the hypothesis. It is generally customary that countries which display good export performance also replicate healthy sign in their GDP performance and vice versa. This raises a vital question as to the nature of the association between the two. It also raises an interesting issue on whether there is a causal nexus between export and economic growth via GDP growth.

Economic theory proposes a number of different possibilities on the relationship between export growth and economic growth. For starters it could be a uni-directional (one way) causality of either export led economic growth or the reverse, which is economic growth driven exports. The other is a bi-directional (two way feedback) causality between exports and economic growth, and finally the possibility that there is no correlation at all. Research overwhelmingly attests to the fact that economic theory (and by extension theoreticians and practitioners) subscribe to the existence of some connection between the two, with few backing the "no connection" towline. It is our intention to investigate the relationship between export growth and economic growth using the Pedroni (2001a, 2004) panel cointegration methodology which allows us to accommodate for any heterogeneity that might exist between members of the panel. Section 2 contains a review of the literature. Section 3 is a description of the data set followed in section 4 by a description of the empirical results. Section 5 contains our concluding remarks.

2. Literature Review

The role of international trade in economic growth has always been a topic of academic as well as policy interest to economists and politicians respectively. Intellectual stalwarts as Robertson (1938) believed that trade was an engine of growth; while Haberler (1988) believed that trade confers both static gains (direct benefits) and dynamic gains (indirect benefits) on an economy. Static gains refer to the increase in income (arising from greater efficiency and a concomitant move to a higher possibilities frontier, while the dynamic benefits refer to the cumulative increases in income and other economy wide positive domino effects. Haberler contends that there are four pivotal benefits from trade. They are, first the provision of the capital goods, so indispensable for economic development. Secondly, trade acts as a vehicle for the dissemination of technological knowledge, the transmission of ideas and of know-how along with the growth of skills like managerial talents and entrepreneurship. Thirdly, trade helps in the movement of capital, especially from the developed to the underdeveloped countries. Fourthly, free trade is the best monopoly anti-dote helping in the process to maintain a healthy degree of free competition.

Export-led growth theories have also been propounded by Balassa (1978) and Bhagwati et al. (1978). According to them exports and by extension, the free entry and exit of goods and services are key causes of economic growth. They emphasize that foreign competition leads to a better and more efficient allocation of resources, increasing the possibility of enjoying scale economies and encouraging creativity and innovation. Moreover, export lead to greater import of intermediate goods and hence increased capital accumulation and output growth.

Ideally, international trade leads to an increase in income, in the level of investment and in the state of technical knowledge in the country. The increase in investment and improvements in innovations and technological progress then lead to increased productivity and competitiveness, and triggers a further increase in trade and in income. This positive feedback continues and brings about a virtuous circle of increased trade, rising income, and economic development. Nevertheless, experience has shown that successful export performance requires a broadly supportive policy environment including macroeconomic stability, public investment in infrastructure and human capital, and policies that provide adequate incentives for investment in the export sector. Above all, these policies should be

consistent, transparent and steadily maintained over a long period of time.

The abundant tableau of academic research in this area attests to the fact that both growth and trade theorists believe in an integral connection between exports and growth. Extensive studies on the export growth — economic growth nexus continue unabated, since we still do not have a well-established (and universally accepted) correlation between them. It could be because of the heterogeneity of country size, variation in natural resources, differences in the internal and external environment and domestic policy, which is the reason why it has been difficult to obtain a simple and unambiguous empirical relationship between foreign trade and economic growth/development.

Research has been (and is still being) conducted along a number of divergent lines. To begin with we have bivariate studies examining this correlation first in levels, and later in terms of rates of growth. The empirical evidence is all over the place. We have studies propounding a unidirectional causality. They emphasize on either the existence of an export led growth scenario (claiming that export growth advances economic growth) and/or a growth led export possibility (where first economic growth takes place and it leads to enhancement in exports.) Then there are studies which found a bi-directional causality, i.e., a two way link from exports to growth and from growth to exports. Lastly we do also have research which did not find any evidence for a connection/correlation and hence no causality between export and GDP.

Among the important cross-country studies are Massell et al. (1972) which used a sample of 11 Latin American countries, and found that export earnings had a greater impact on output growth than other alternative sources of foreign exchange earnings and foreign direct investment. Of particular importance is Balassa (1978) who used the rank correlation technique and pooled data for 11 countries covering 1960-73. He reported a strong relationship between exports and economic growth. Using a 55 country data set, Tyler (1981) also found strong evidence of exports stimulating economic growth. The problem with these early studies was that they were bivariate statistical, single equation analyses, and hence were naturally subject to the criticism of the lack of the “feedback effect”.

The next qualitative jump was done by Salvatore (1983), who used a simultaneous equation model specification, including running dynamic simulations. He also included a large and diverse sample set of 52 countries. He reported that exports do in fact stimulate growth, and there is a bilateral Granger causality between export and domestic demand.

Darrat (1986) studied four major Asian economies namely Hong Kong, South Korea, Singapore, and Taiwan. He did not find evidence of uni-directional causality from exports to economic growth in any case, but did identify a unidirectional causality from economic growth to export growth only in the case of Taiwan.

A technical paradigm shift took place right about this time, with the arrival of the powerful vector auto-regressions (VAR forthwith) techniques and the Granger Causality econometrics by Christopher Simsand Clive Granger respectively. It facilitated an examination of the interrelationship among non-stationary I (1) time-series variables, treating all of them as endogenous. Testing uni-directional versus bi-directional causality was now possible. Later developments have shown us that they are immensely powerful tools for time-series forecasting, error variance decomposition, examining the structure of short-and long-run dynamic variable relationships and impulse response statistics. The research floodgates were open again.

Ahmad and Harnhirun (1996) used a bivariate, two-equation VAR model covering the five Association of Southeast Asian Nations (ASEAN) countries namely Indonesia, Malaysia, the Philippines, Singapore, and Thailand, from 1966-1986. Four of the five countries had the same order of integration in their exports and GDP series. The exception was Thailand. For these four countries, they found that exports and GDP were not cointegrated, and hence

there was no possibility of using an error correction model (ECM forthwith) test. Their results did support Granger causality from GDP to exports for each of the four countries. This was an interesting finding since it went against the popular notion that these ASEAN countries were successful in achieving economic growth through export promotion policies.

Dutt and Ghosh (1996) examined the causality between exports and economic growth for a large sample of countries using the ECM format. For the countries in which they found cointegration, the VEC model was estimated, and tests for Granger causality were performed. No causality for Canada was found (between exports and GDP) in either direction, but they did report causality from GDP to exports for the United States. In the case of other countries it was a mixed bag, with evidence all over the place. Some countries experienced export led growth, while others had economic growth leading to exports. There was some evidence of bidirectional causality, while others demonstrated no causality at all. Using F and t tests, the paper also examined the source of both the short and / or long run causality for each country.

Next in line is Sinha (1999) who examined the relationship between export instability, investment and economic growth for the major Asian countries. The study found that in the case of Japan, Malaysia, Philippines and Sri Lanka, there was a negative relationship between export instability and economic growth, while for (South) Korea, Myanmar, Pakistan and Thailand it was a positive relationship. India gave mixed results, but overall economic growth was positively associated with domestic investment.

Vohra (2001) examined the same relationship for a set of Asian countries, namely India, Pakistan, the Philippines, Malaysia, and Thailand from1973 to 1993. The interesting part of his results is the claim that export growth significantly affects economic growth, but only after the country has reached and exceeded a baseline level of economic development. Below that demarcation, there is no effect. He also emphasizes the importance of applying liberal market policies and export expansion strategies along with enhanced foreign investments.

Lin, Cai and Li (2002) proposed a new estimation method and reported an objective measure of this relationship. They claimed that for China in the 1990's, a ten percent increase in exports resulted in a one percent increase in GDP. Their contention is that previous China studies underestimated the contribution of exports to GDP growth because they did not account for the indirect impact of exports on domestic consumption, imports, investment and government expenditures.

Shirazi et al. (2004) used the multivariate Granger causality methodology to study the short and long run relationship among real export, real import and economic growth. He reported unidirectional causality from export to output, but not so between import and export.

Kaushik et al. (2008), investigated the relationship between economic growth, export growth, export instability and capital formation for India during the 1971-2005 period. They used the vector ECM methodology and reported a unique longrun relationship among these variables. They also found evidence of anuni-directional Granger causality from real exports to real GDP.

3. Data

The data for this paper was obtained from the OECD Main Economic Indicators data set available on the OCED website. We obtained quarterly data for 18 OECD countries for the period 1960 Quarter 1 to 2014 quarter 4[1]. Data for 24 OECD members were available, however some of these countries had signed the OECD treaty

[1] Countries for which data was used in the paper: Australia, Austria, Belgium, Canada, Switzerland, Germany, Finland, United

during the 1990s, and we decided to stay with those who had signed in the 1970s and earlier. Countries like Denmark, Spain, and France were omitted due to unavailability of the data for the entire time span. We used data for real GDP, exports and CPI for this time period.

4. Econometric Methodology

Cointegration techniques are commonplace in the economics literature, when studying long run relationships among variables. But they inherently suffer from low power and confidence. Increasing the time span of the variable series increases its credibility, but in reality it is a difficult proposition, since data availability is not at the researcher's discretion. On the other hand if one blindly increases the time span, the test strength will possibly increase but one could have introduced major policy shifts and structural economic changes. An example of this would be using pre-war and post-war data together, just to increase the time span.

One remedy to solve this dilemma has been proposed by Pedroni (2001a, 2001b, and 2004) where he introduces cross-sectional data pooling, which has a problem of its own. Simple pooling of time series data would infuse unintended "in model" heterogeneity. His solution to these is the "panel cointegration" tests which allow one to vary the degree of heterogeneity among the panel members. Pedroni (1995, 1997, 2001a and 2004) has done residual based tests for the null of "no cointegration" for heterogeneous data, including slope coefficients. It examines both the between dimension and within dimension residuals. This test statistic is "standard normal' and free of nuisance parameters.

The starting point is the standard equation:

$$yit = \alpha i + \delta it + \beta Xit + eit \tag{1}$$

Where y_{it} = relevant variable where i = 1, 2….N observations and t = 1, 2….T time periods.

X_{it} = m-dimensional column vector for each member i

t = time period under consideration and

β_i == m-dimensional row vector for each member i

First we test for the order of integration of the raw data series y_{it} and x_{it}. Here α_i, δ_i and β_i are allowed to be heterogeneous. The null is H_o: Panel series are not cointegrated versus the alternative H_A: Panel series are cointegrated. Here when we are pooling different data series, the slope coefficient β_i does not have a common slope and it is allowed to be heterogeneous.[2] Here are the results of the tests distributional properties:

(1) The standard central limit theorem (CLT) is assumed to hold for each individual series.

(2) The matrix structure is (m+1) x (m+1) in size where the off diagonal entities Ω_{2li} capture the feedback between the regressors and the dependent variable.

(3) Also cross sectional independence or process i.i.d. (independent and identically distributed) is assumed. It allows the test statistic to converge asymptotically to the actual values.

$$T^{-2}\sum_{t=1}^{T} z_{it-1}\, z_{it-1}^{'} \Rightarrow L_i^{'} \int_0^1 Zi(\mathrm{r})\ \ Z_i(\mathrm{r})^{'}\ \mathrm{d_r L_i} \tag{2}$$

$$T^{-1}\sum_{t=1}^{T} z_{\mathrm{it-1}}\ \xi_{\mathrm{it}}^{'} \Rightarrow\ L_{\mathrm{i}}^{'} \int_0^1 Z_{\mathrm{i}}\ (\mathrm{r})\ \ \mathrm{d}\ \ Z_{\mathrm{i}}(\mathrm{r})^{'}\ \mathrm{dr L_i} + \Gamma_{\mathrm{i}} \tag{3}$$

These convergence results hold under standard assumptions. Moreover it also reduces the effect of "nuisance parameters" due to serial correlation in the data as T→∞. This makes the computation a lot simpler. They consider

Kingdom, Greece, Italy, Japan, Netherlands, Norway, New Zealand, Portugal, Sweden, Turkey, United States.

[2] If forcefully a common slope coefficient is imposed (in spite of the true slopes being heterogeneous) the residuals of the data series whose slope differs from the others will be stationary, although in truth they may be cointegrated.

two classes of statistics. The first pools the residuals of the regression "within panel dimensions" and the second pools the residuals "between panel dimensions". Here he gives the example of how $Z\rho_{NT}^{-1}$ in Equation (4)

$$Z\rho_{NT}^{-1} \equiv \left(\sum_{i=1}^{N} A_{22i}\right)^{-1} \sum_{i=1}^{N} (A_{21i} - T\hat{\lambda}_i) \tag{4}$$

is analogous to the semi parametric "ρ" of the Phillips-Perron (1988) and Phillips-Ouliaris (1990).

Similarly in Equations (5) and (6)

$$Z_{\hat{v}_{NT}} \equiv \hat{L}^2_{11} \left(\sum_{i=1}^{N} A_{22i}\right)^{-1} \tag{5}$$

$$Z_{\hat{t}_{NT}} \equiv \left(\tilde{\sigma}^2_{NT} \sum_{i=1}^{N} A_{22i}\right)^{-1/2} \sum_{i=1}^{N} (A_{21i} - T\hat{\lambda}_i) \tag{6}$$

$Z_{\hat{v}_{NT}}$ and $Z_{\hat{t}_{NT}}$ stand for "panel variance ratio statistic" and "panel t statistic" respectively, which are the same used in Phillips-Ouliaris (1990). Then Equations (7) and (8) below pool the data "between panel dimension" to compute the group mean of the time series.

$$\tilde{Z}_{\rho NT}^{-1} \equiv \sum_{i=1}^{N} A_{22i}^{-1} (A_{21i} - T\hat{\lambda}_i) \tag{7}$$

and

$$Z_{\hat{v}_{NT}} \equiv \sum_{i=1}^{N} A_{22i})^{-1/2} \sum_{i=1}^{N} (\hat{\sigma}_i^2 (A_{21i} - T\hat{\lambda}_i) \tag{8}$$

He also conducts Monte Carlo simulations to study the small sample properties of the "statistic" for different panel dimensions. Now regarding the data generating process, it is

$$y_{it} = x_{it} + e_{it}$$

Where

$$e_{it} = \text{ø} e_{it-1} + \eta_{it}$$

and $\Delta x_{it} \sim N(0,1)$; $\eta_{it} \sim N(0,1)$; ø = {0.9, 0.95, and so on…}

The alternative hypothesis here is that the residuals e_{it} is stationary. They use the autoregressive (AR) process, rather than a moving average (MA) error correction process.

5. Empirical Results

We run the Levin, Lin, and Chu (2002, LLC henceforth) and Im, Pesaran, and Shin (2003, IPS henceforth) panel unit root test on our data set to pre-test for non-stationarity. For these tests the null hypotheses is the presence of an unit root and the alternate hypotheses is the absence of an unit root. The results are given in Table 1. There is some evidence that the Real-GDP series does not have a unit root when it is time demeaned as the test statistic is significant in two cases. When the data is not time demeaned both the LLC-ADF statistic and the IPS-ADF statistics indicate the presence of a unit root. Both test statistics for the real exports indicate the presence of unit roots.

We then proceed to test for cointegration in order to investigate any co-movement between real GDP and real exports. Any existence of a causal relationship between the two series will require the series to be cointegrated. The cointgration tests are presented in Table 2. Here the null hypothesis is all countries in the panel are not cointegrated, versus the alternate hypothesis that a substantial portion of the countries in the panel are cointegrated. There is partial evidence in favor of cointegration for the standard model. None of the statistics for the time demeaned model are significant, indicating absence of cointegration.

Existence of cointegration would allow us to test for the existence of causality, i.e., whether economic growth (Real GDP growth) causes export growth or the reverse or if causality if bi-directional. Table 3 gives the results of our causality tests by country and for the entire panel. Seven out of eighteen countries show some evidence of causality (at the 10 percent level), and there is evidence that for the entire group that there is a causal relationship

between economic growth and export growth. The evidence is weak due to the weak evidence in favor of panel unit roots, and also the mixed evidence in favor of cointegration.

Table 1 LLC and IPS Panel Unit Root Tests

	Levin–Lin ADF statistic	Levin–Lin ADF stat (time demeaned)	IPS ADF statistic	IPS ADF stat (time demeaned)
OECD countries				
RealGDP	0.64	2.72**	0.71	2.91**
Real Exports	0.48	0.57	0.58	0.10

Note: All statistics in the above table are distributed as N(0,1) under the null hypothesis of an unit root. Therefore, we can conclude that all series in the data set have an unit root (there is only one significant value).

Table 2 Pedroni (2004) Tests for Panel Cointegration

	ν-stat	Rho-stat	t-stat	ADF-stat
Panel Statistics				
Standard	-3.18**	-1.07	-2.29**	-0.37
Time demeaned	-0.19	-0.57	-0.52	0.48

Note: All reported values are distributed as N (0.1) under the null hypothesis. An asterisk indicated rejection of the null hypothesis at the 10% level or higher.

Table 3 Causality Test

Country	Chi-square t-statistic	Significance level
Australia	4.037	0.40099
Austria	5.736	0.21972
Belgium	1.254	0.8691
Canada	12.768	0.01247
Switzerland	5.557	0.23474
Germany	8.719	0.06851
Finland	10.364	0.03472
United Kingdom	11.103	0.02543
Greece	13.022	0.01117
Italy	2.468	0.65034
Japan	2.554	0.63505
Netherlands	7.416	0.11549
Norway	7.348	0.11859
New Zealand	3.469	0.48263
Portugal	5.129	0.27433
Sweden	8.195	0.08471
Turkey	4.242	0.37419
USA	13.986	0.00734
Overall	127.368	0.00006

6. Conclusion

Our intention in this paper was to examine the relationship between economic growth and export growth for OECD countries, using panel data techniques which allow for a degree of heterogeneity among panel members. There are sound theoretical reasons to expect export growth and economic growth to move together over time (be cointegrated) and for some degree of causality to exist and perhaps even be bi-directional (i.e., export growth causes economic growth and vice versa). These countries, by themselves, are not large enough to be grow based

on their domestic market and are likely to require access to international markets to enjoy sustained economic growth. As a group, however, they comprise a significant proportion of the world economy and a significant proportion of the trade that they participate in will be with other members of the group. This is likely to lead to cointegration between export growth and economic growth for these countries and also to a causal relation between these variables.

The lack of strong evidence in favor of this leads us to believe that some of these countries have major trading partners who are not included in our sample (France and China would be at the top of that list).It is possible that there is a larger correlation between exports and economic growth between countries which belong in a trading bloc as these countries often tend to trade mostly with one another. It is also likely that the magnitude of exports is not necessarily the largest factor affecting economic growth (and vice versa) and it will be the ratio of Exports to GDP that is a more important determinant. It is also possible that due to the proliferation of free trade agreements exports are no longer the prime determinant of economic growth as most countries, including many developing countries, have the ability to export to most other countries. The determinants of economic growth remain the subject of future research projects.

References:

Ahmed J. and Harnhirun S. (1996). "Cointegration and causality between exports and economic growth: Evidence from the ASEAN countries", *Canadian Journal of Economics*, Vol. 24, Special Issue, April, pp. 413-416.

Balassa Bela (June 1978). "Exports and economic growth: Further evidence", *Journal of Development Economics*, Vol. 5, No. 2, pp. 181-189.

Bhagwati Jagdish N., Srinivasan T. N. and Wan Henry Y. Jr. (March 1978). "Value subtracted, negative shadow prices of factors in project evaluation, and immiserising growth: Three paradoxes in the presence of trade distortions", *Economic Journal*, Vol. 88, No. 349, pp. 121-125.

Darrat Ali F. (Fall 1986). "Trade and development: The Asian experience", *Cato Journal*, Vol. 6, No. 2, pp. 695-699.

Dutt Swarna D. and Ghosh Dipak (January 1996). "The export growth-economic growth nexus: A causality analysis", *Journal of Developing Areas*, Vol. 30, No. 2, pp. 167-181.

Haberler Gottfried (1988). "International trade and economic development", in: *International Trade and Economic Development*, pp. 17-53.

Im K. S., M. H. Pesaran and Y. Shin (2003). "Testing for unit roots in heterogeneous panels", *Journal of Econometrics*, Vol. 115, pp. 53-74.

Kaushik Krishan K., Arbenser Lawrence Nii and Klein K. K. (Spring 2008). "Export growth, export instability, investment and economic growth in India: A time series analysis", *Journal of Developing Areas*, Vol. 41, No. 2, pp. 155-170.

Levin A., Lin C. F. and Chu C. (2002). "Unit Roots tests in panel data: Asymptotic and finite sample properties", *Journal of Econometrics*, Vol. 108, No. 1, pp. 1-24.

Lin Justin Yifu, Cai Fang and Li Zhou (2002). "Social consequences of economic reform in China: An analysis of regional disparity in the transition period", in: *China and Its Regions: Economic Growth and Reform in Chinese Provinces*, pp. 33-56.

Massell Benton F., Pearson Scott R. and Fitch James B. (May 1972). "Foreign exchange and economic development: An empirical study of selected Latin American countries", *Review of Economics and Statistics*, Vol. 54, No. 2, pp. 208-212.

Pedroni Peter (1995). "Panel cointegration: Asymptotics and finite sample properties of pooled time series tests with an application to the PPP hypothesis", *Indiana University Working Papers in Economics*, pp. 95-013.

Pedroni Peter (1997). "Panel cointegration: Asymptotics and finite sample properties of pooled time series tests with an application to the PPP hypothesis: New results", *Indiana University Working Papers in Economics*.

Pedroni Peter (2001a). "Panel cointegration: Asymptotics and finite sample properties of pooled time series tests with an application to the PPP hypothesis", revised Working Paper, Indiana University.

Pedroni Peter (2001b). "Purchasing power parity in cointegrated panels", *The Review of Economics and Statistics*, Vol. 83, No. 4,pp. 727-731.

Pedroni Peter (2004). "Panel cointgration: Asymptotics and finite sample properties of pooledtime series tests with an application to

the PPP Hypothesis", *Econometric Theory*, Vol. 20, No. 3, pp. 597-625.

Phillips P. C. B. and Ouliaris S. (1990). "Asymptotic properties of residual based tests for cointegration", *Econometrica*, Vol. 58, pp. 165-193.

Phillip P. C. B. and Perron P. (1988). "Testing for a unit root in time series regression", *Biometrika*, Vol. 75, pp. 335-346.

Robertson D. H. (March 1938). "The future of international trade", *Economic Journal*, Vol. 48, pp. 1-14.

Salvatore Dominick (1983). "A simultaneous equations model of trade and development with dynamic policy simulations", *Kyklos*, Vol. 36, No. 1, pp. 66-90.

Shirazi Nasim Shah and Manap Turkhan Ali Abdul (Winter 2004). "Exports and economic growth nexus: The case of Pakistan", *Pakistan Development Review*, Vol. 43, No. 4, pp. 563-579.

Sinha Dipendra (1999). "Export instability, investment and economic growth in Asian countries: A time series analysis", Economic Growth Center, Yale University, Working Papers, 1999, p. 23.

Tyler William G. (August 1981). "Growth and export expansion in developing countries: Some empirical evidence", *Journal of Development Economics*, Vol. 9, No. 1, pp. 121-130.

Vohra Rubina (August 2001). "Export and economic growth: Further time series evidence from less-developed countries", *International Advances in Economic Research*, Vol. 7, No. 3, pp. 345-350.