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Macroeconomic Convergence in Economic Community of West African States: Evidence from Cointegration Test

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Abstract: *Using annual data from 1970 to 2009 for Economic Community of West African States (ECOWAS), we employed the Johansen (1988) cointegration technique to investigate the long-run macroeconomic convergence of these countries. The robust combined impulse response function of the VAR provides further support to the hypothesis of a long run macroeconomic convergence in ECOWAS region. The implication of this finding is that the idea of future single currency in ECOWAS may be realistic with the presence of macroeconomic convergence, which is a pre-condition for forming a currency union. This paper concludes that there is presence of long-run macroeconomic convergence in ECOWAS countries.*

Keywords: Macroeconomic convergence, cointegration test, impulse response, ECOWAS Countries.

Introduction

Empirical literature has been awash with issues of convergence hypothesis for developed countries especially European Union (EU) (Sarno 1997, Pesaran 2007, Siklos and Wohar 1997, Homles 2002, among others). Regional economic communities have realised that they cannot achieved economic union status unless there is sustainable macroeconomic convergence. It is a known fact that it is through economic integration that member countries can work together to secure macroeconomic stability, financial stability, facilitating intra-regional trade as well as sustainable economic growth. The benefit of economic integration and the birth of EU has been a source of revitalizing regionalism in Africa. A number of regional economic communities in Africa have evolved such as Southern African Development Community (SADC), and East African Community (EAS), West African Monetary Zone (WAMZ) Central African Monetary and Economic Community (CEMAC), Common Market for East and Southern Africa (COMESA) among others. Inflation convergence, fiscal balance, and current account balance are major determinants in achieving macroeconomic convergence (Mutasa 2003). The macroeconomic convergence of regional countries as a precondition for a currency union brings the benefit of lower transaction cost associated with trading goods and services between countries that use different currencies.

This paper, therefore examines the existence of macroeconomic convergence in ECOWAS countries using co integration technique. Although, some papers have discussed regional integration issues in Africa (Oyejide et al 1997, Bayoumi and Ostry 1998) and some on SADC region such as (Jenkins and Thomas 1998 Guillaume and Stasavage 2000, Sparks 2002 and the book by Masson and Patillo (2005). The relevance of this work lies in the need to ascertain whether ECOWAS countries are indeed converging or not and to analyse the implications of this for the proposed single currency for African. Secondly, the idea of convergence among ECOWAS countries would also be useful in evaluating the long-run economic relationships among these coun-

tries. The outcome of this study, therefore, would provide a useful guide to the extent of the feasibility of the recent move towards regional integration in Africa in general.

The remaining part of the article is organized as follows: Section 2 contains a brief overview of macroeconomic developments in ECOWAS region while section 3 presents a review of theoretical and empirical literature. Section 4 deals with econometric procedure while section 5 presents empirical analysis and section 6 conclude.

A Brief Overview of Macroeconomic Development in the Region

The Economic Community of West African States (ECOWAS), which comprises fifteen countries, was created on May 28, 1975 in Lagos, Nigeria by regional leaders. ECOWAS was conceived as a means toward economic integration and development intended to lead to the eventual establishment of an economic union in West Africa. The formation of ECOWAS was to enhance economic stability and strengthens economic and political relations between member states, as well as to accelerate growth in the region. ECOWAS members are abundantly endowed with mineral resources apart from being exporters of primary commodities. Nigeria, for instance, had earned US$350 billion between the year 1965 and 2000. Similarly, Ghana is endowed with gold, diamond, manganese ore and bauxite. Liberia, also, is blessed with iron, timber and rubber. Mali is also an exporter of gold. Sierra Leone has the largest deposit of rutile, titanium ore. Uranium is the main export, apart from gold in Niger (World Bank Survey, 2007). Before the discovery of mineral resources in the 1960s, ECOWAS countries depended on agricultural production such as cotton, cereal, cocoa, rubber, livestock, cowpeas, timber, animal products and food crops. Import substitution strategy was widely accepted by these countries as a means of achieving growth in the 1960s and 1970s. However, with devaluation of exchange rates, following financial liberalization as part of the structural adjustment policies implemented in these economies in the mid-1980s, export promotion policies were embarked upon to achieve long term growth. The export promotion strategy could not lead to sustainable growth due to weak manufacturing capacity. By 1980s, most of these countries were forced to pursue an economic policy of exporting primary products and importing manufactured goods which resulted to trade imbalance[1]. The economic condition of most countries in the region was worse in the mid-1980s and as a result many began to approach the International Monetary Fund (IMF) and World Bank for loan. The accumulation of such debt made[2] countries like Mali and Niger to be classified as Highly Indebted Poor Countries (HIPC) (IMF 2005).

A complete re-orientation of economic policy was thought essential to promote growth. Structural Adjustment Programs (SAP) and major economic reforms, which were guided by free market principle, were adopted by many ECOWAS countries in the 1980s. For instance, Nigeria adopted SAP policies in 1986. Even with the pursuit of economic reforms, some of these countries still experienced internal crisis and macroeconomic instabilities brought about partly by trade openness, civil war and long period of military rule. The GDP growth of Senegal for example in the 1990s averaged 3 per cent to 5 per cent while the average per capita income of Mauritius was US$4135 (World Bank 2004). Mali had a GDP growth rate of 6.3% (see Table I) in 2005 from 2.2% in 2004. While some of the countries experienced high inflation rate running into three-digit level, Nigeria experienced 72.9% of inflation in 1995. In Ghana alone, inflation

[1] Experience of civil war, corruption, long military rule, coup, poor economic management and political instability have been the common source of macroeconomic instability in most ECOWAS countries.

[2] The African Union (AU), which was a political Africa-wide body, is envisaged to have a common currency and central bank by 2025 (IMF, 2006).

rate increased gradually from the average of 56% in 1976 to 116% in 1977. It was 73% in 1978 and about 116% in 1981. By 2005, Nigeria, Ghana, Sierra Leone and Mauritania had inflation rate running to 2 digits (see Table 1). The combined GDP for ECOWAS members was about $74.2 billion, excluding Mauritania that opted out of the union in 2002. While the average GDP per capita was $329.5, the region's economies grew at a combined average rate of 3.97% and 4.34% in 2001 and 2002 respectively. The real growth rate of the region improved to 6% in 2005, fell again to 5.7% in 2006 and rose to 7.3% in 2008 (World Fact book 2009). The growth rate was possible with recent liberalization policies and increased private-sector participation in the region.

Despite the macroeconomic challenges in these countries, efforts on monetary union are continually made by their head of states and governments. According to the reports of ECOWAS (2001), the launching of the West African Monetary Institute (WAMI) established in January 2001 towards the introduction of a single currency and a common central bank in the WAMZ is a pivotal step towards the creation of a single economic space in West Africa and Africa in general.

Table I: Macroeconomic indicators in selected ECOWAS countries in 2009

Countries	Investment (% of GDP)	Export (% of GDP)	Import (% of GDP)	Inflation
Nigeria	20.86**	31.40	27.61	12.36
Burkina Faso	20.77***	11.53***	26.81	2.61
Cape Verde	53.79	23.62	65.40	0.98
Ghana	29.77	49.87	75.19	19.25
Mali	22.36****	26.18****	35.58****	2.20
Niger	18.92**	15.38**	24.77**	4.31
Guinea Bissau	23.89	29.82*****	49.80*****	-1.65
Liberia	16.44	31.10*****	172.61*****	7.0**
Sierra Leone	15.13	15.68	28.53	17.47*****
Senegal	28.70	21.70	41.75	-1.05
Gambia	24.77*	30.44	50.13	4.55
Mauritania	25.93****	57.67****	64.86****	2.22
Togo	22.26**	41.94****	62.45****	1.95
Cote d"Ivoire 11.36		42.19	34.14	1.03

Source: World Bank, World Development Indicator, WDI (2009 online database)

In Table 1,* represents the data for year 2004, ** represents year 2005, *** indicates year 2006, while **** and ***** are for 2007 and 2008 respectively. The rest of the data are for the year 2009.

Convergence Theory and Empirical Literature

Macroeconomic convergence is a concept of coordination of economic policies. Proponents of economic convergence are of the opinion that coordination of economic policies leave countries better off without others being worse off. By cooperating to coordinate policies to take account of spillovers, each country will better achieve its specific objectives. Convergence is a prelude and is crucial to economic integration. The basics of economic integration were promulgated by Hungarian Economist Balassa (1964). Balassa argued that as economic integration increases, barriers to trade among countries diminish. According to him, it often makes sense for countries to coordinate their economic policies to generate benefits that are not possible otherwise.

Economic convergence exists when member countries tend to reach a similar level of development and wealth (Barrientos, 2007). According to Solow's (1956) economic growth model, an

economy converges towards a steady state due to diminishing returns to investment in physical capital. Solow assumed that countries are equal in all aspects but their initial levels of per capita capital stock are different and poor countries have higher marginal capital productivity than rich countries, thus, poor countries will eventually grow faster and catch up with the richer ones.

Solow's assumption was affirmed by the findings of Dowrick and Ngunyen (1989) where convergence was confirmed among developed countries. However, convergence does not apply among the poorest world economies. Pesaran (2007) cautioned that the conclusion of the existence of a convergence club might be spurious results, reflecting inconsistency in model structure, choice of sample period and data generation problems. Sachs and Warner (1995) indicated that technology affects comparative advantage and has a tendency to increase economic growth. This conclusion of the role of technology is consistent with the findings in Goo and Park (2007). They stated that convergence holds among countries with sound human capital base and use of modern technology. Mallick and Moshin (2007) also developed an inter-temporal optimizing model to test for long-run real effects of inflation on real variables for Israel and Turkey. Their result showed that inflation rate in the two countries did not affect real variables in the long run.

In the developed countries of the EU, there exists evidence of convergence in macroeconomic variables along with the presence of institutional arrangements. For example, the EU countries participating in the European Monetary System (EMS) already have a record of exchange rate convergence. Sarno (1997) found evidence of long-run convergence for both nominal and real exchange rates in countries that adhered to the Exchange Rate Mechanism (ERM) than for the non-ERM countries. Kocenda and Papell (1997) also found evidence of a dramatic convergence in inflation rates among the countries that adhered to the ERM. Siklos and Wohar (1997) run co integration tests for several European countries to obtain evidence for the presence of a single stochastic trend, a result that is consistent with the hypothesis of convergence. Holmes (2002) finds that inflation convergence was strongest during the years 1983–90, whereas the turbulence experienced within the ERM in the early nineties conferred some degree of macroeconomic independence to certain member countries. More recently, Beck and Weber (2003) have performed a beta and sigma convergence analysis of regional inflation data for the United States, Japan, and Europe over the period 1981–2001, showing that inflation dispersion among European regions is higher than in the United States or in Japan. Lastly, Ben Hammouda, Karingi, Njugura and Sadni-Jallab (2007) used plot of dispersion for inflation series from 1988 Q3 -2004 Q4 among ECOWAS member countries. The sigma test conducted supports the tendency of a monetary policy convergence within ECOWAS countries.

Econometric Procedure

Type and Sources of Data

This study utilized annual secondary data on ECOWAS countries for the period 1970 to 2009. Guinea was excluded however due to lack of consistent and reliable data. The ECOWAS member countries are Benin republic, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea Bissau, Liberia, Mali, Nigeria, Senegal, Sierra Leone, Togo, and Mauritania. The use of annual data and focusing on the macroeconomic variables namely consumption (final household consumption expenditure expressed as a percentage of GDP) and investment also expressed as a percentage of GDP is to capture the household and the firm sectors of these countries respectively. The choice of current account balance is determined to account for the aspect of trade, while inflation variable on the other hand represents one of the ECOWAS macroeconomic convergence criteria. For all the sample countries, we sourced all our variables from the World Devel-

opment Indicator (WDI, Online database 2010). All the variables are expressed in real terms deflated by each country's CPI. Both investment and consumption variables are expressed in logs while inflation and current account balance are expressed in levels due to their negative values. Seasonally adjusted data is used only in the case of the scale variable (e.g. inflation variable).

The Model

The methodology adopted in this paper follows Hall et al. (1997) that convergence of two series X_t and Y_t occurs at $\lim_{t\to\infty}(X_t - \emptyset Y_t) - \alpha$……..(2)

Where is a non-stochastic constant that might be required to be zero. This is a clear definition of convergence but it is unrealistically strong and mathematical. The above model can be extended to economic system in a stochastic convergence or convergence in expectation as

$\lim_{t\to\infty} E(X_t - \emptyset Y_t) =$ ……..(3)

If X_t and Y_t are non-stationary, then sensible definition can be offered through the notion of co-integration. The idea is that convergence may limit the difference either in the limit or over a given interval. It also indicates the probability that the two series differ by a given amount should be small. This is essentially applicable in the case of non-stationarity series.

Given this definition, several tests exist for determining convergence in the literature. First is the test based on measures of dispersion, tests of mean of reversion, test based on time-varying parameter estimates and tests based on cointegration methodology. The advantage of cointegration methodology lies in its ability to capture the long run. Indeed, one of the major pillars of forming regional integration is to achieve long run growth in the region. Therefore, this paper adopted co-integration techniques since convergence is a long-run phenomenon and cointegration test accounts for this long-run.

Unit Root[3] *and Cointegration Tests*

One of the major econometric issues to deal with when one is using time series data for economic analysis is the issue stationarity of baseline macroeconomic data. In this section, the stationarity of the countries' macroeconomic variables was tested using the Augmented Dickey Fuller (ADF) and Philip Peron (PP) unit root-tests.

With unit roots in individual country macroeconomic data, the next empirical procedure will be to investigate the existence or otherwise of cointegration among non-stationary series. We therefore proceed to co integration analysis to examine whether long run equilibrium actually exists among the countries. The null hypothesis of co integration is tested using the Johansen (1988) multivariate cointegration test. To assess the robustness of our results, we also applied the impulse response function. The cointegration test results are presented in Table I(a), which shows the presence of long run equilibrium relationship among the countries.

Table I(a): Johansen (1988) Multivariate Cointegration Test

No of coint. Eq.	Eigenvalue	P-value	Trace statistics	P-value
H_O: r ≤ 0*	156.1	0.000	154.7	0.000
H_O: r ≤ 1*	51.52	0.000	61.81	0.004
H_O: r ≤ 2	22.88	0.237	26.34	0.408
H_O: r < 3	17.76	0.720	17.76	0.720

*denotes the rejection of the hypothesis of no cointegration at 0.005 level
p-values are based on MacKinnon-Haug-Michelis (1999).

[3] Unit root results summarised in Tables II-V are presented in the appendix.

Empirical Results and Discussion

The null hypothesis of the ADF and PP unit-root tests is that the series are non-stationary. The results of the ADF and PP unit root tests are presented in Table II-V. From the results, it is clear that most of the macroeconomic variables are non-stationary. From Table II, inflation variables are stationary at 5% level of significance for Benin, Burkina Faso, Liberia, Mali, Niger, Nigeria, Senegal, Togo and Mauritania. Concerning the PP test, inflation variables are stationary for Burkina Faso and Togo at 1%. It is stationary for Senegal and Ghana at 5%while it is stationary for Gambia, Mauritania Guinea Bissau and Cote d'Ivoire at 10%. In Table III, investment series for Benin, Burkina Faso Mauritania, Mali and Liberia are stationary using PP test. Also, consumption series are stationary for Gambia and Guinea in Table IV while PP consumption series are also found stationary for Benin, Cote d'Ivoire, Ghana, Guinea Bissau, Mali Mauritania, Nigeria and Togo. Lastly, the ADF test for current account balance series are stationary for only Benin, Burkina Faso and Niger while the PP test stationary for Benin, Mali and Togo in Table V. Both the ADF and PP unit-root tests generally confirm that the macroeconomic variables are generally non-stationary. The Philip Perron (PP) unit root test was equally conducted to account for structural breaks as this in stationary time series can induce unit roots, as shown empirically by Perron (1989). The rejection of stationarity can then be used as a basis for investigating cointegration (convergence test).

Next, we applied the Johansen (1988) cointegration test to determine the existence or otherwise of convergence among ECOWAS countries. This is because Hamilton (1994) affirms that univariate and single equation econometric methods for determining cointegration like Engle and Granger (1986) are inferior to Johansen procedure, which is multivariate in nature. Concerning the cointegration test, Table VI shows that the Eigen value and trace statistics support the existence of at least one cointegrating equation at 5% significance level.

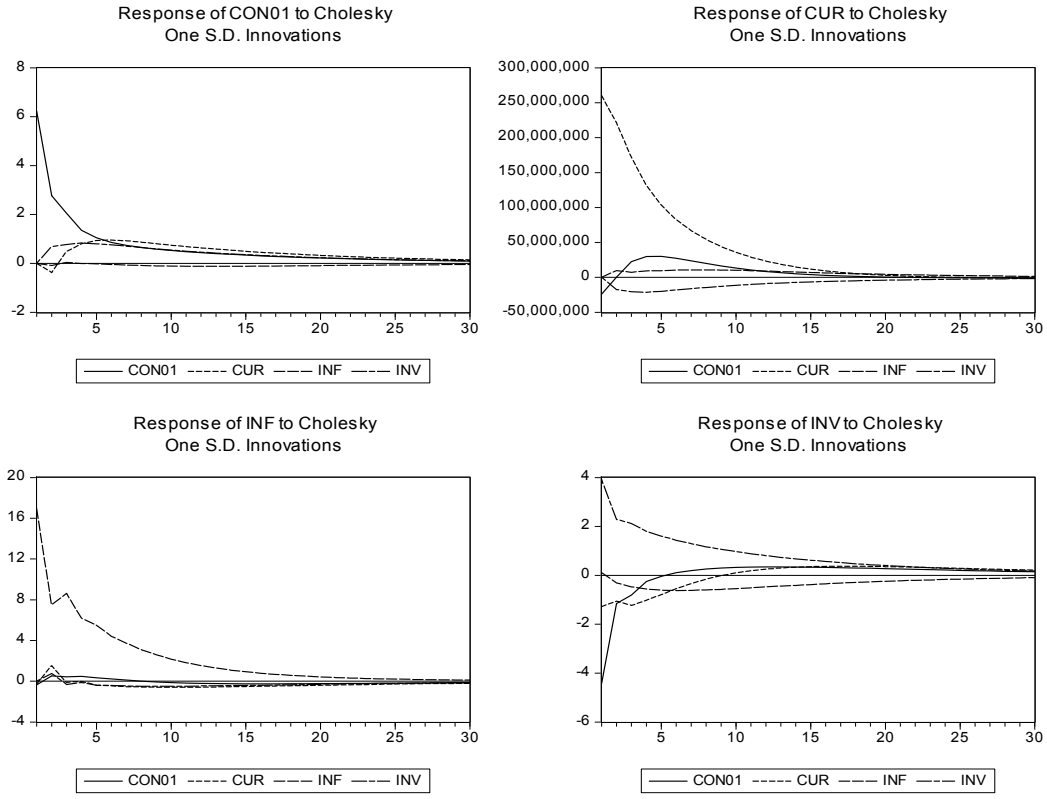
Further Evidence

To further understand and explain the long-run convergence, the impulse response shock analysis was also performed. The combined impulse response functions analysis was employed to examine whether after the reaction of the macroeconomic variables to shocks they converge to their steady state. The issue of convergence is a long run phenomenon and the combined impulse response shock analysis gives more information about the long-run than the estimated VAR regression coefficients (Stock and Watson 2001). The impulse response function, apart from tracing the effect of one standard deviation shock to one of the innovations on current and future values of the endogenous variables, it also shows the time path of the response of the macroeconomic variables to shocks.[4] The advantage of this method is that it can be used to assess movement from non-convergence[5] to convergence. The similarity of shocks and business cycle among countries reinforces the feasibility of monetary union (De Grauwe, 1997). The impulse response further confirms that these countries experience similar shocks as their macroeconomic shocks converge to their steady state even before the 30th year (see Figure I)

[4] Earlier studies on the feasibility of monetary unions focused on four conditions such as: the extent of trade, the similarity of shocks and business cycles, the degree of labour mobility and the system of fiscal transfer. Surveys of the literature are available in Bayoumi and Eichengreen (1994), De Grauwe (1997), La France and St-Amant (1999) and Alesina et al (2002).

[5] Our finding of evidence of cointegration is consistent with the findings of Ben Hammouda, Karingi, Njugura and Sadni-Jallab (2007).

Figure I: The Responses of Macroeconomic Variables to one Standard Deviation (SD) Innovations



Concluding Remarks

The findings from the estimated impulse response functions further confirm the evidence of long run macroeconomic convergence among ECOWAS countries. This, therefore, suggests that these countries have common shocks, which die out to bring the economies back to the steady state. The implication of this is that, with macroeconomic convergence, the current move toward regional integration and the proposed introduction of a single currency in Africa is a feasible project. However, this macroeconomic convergence should not be seen as automatic, but rather be an opportunity for African countries to stabilize their economy and promote economic growth so as to speed-up economic integration especially in the area of trade creation. It should also be noted that ECOWAS countries should be aware of economic cost and benefit of belonging to a monetary union. The primary cost of monetary union entails the forgone possibility of dampening business cycle fluctuations through the use of country-specific counter-cyclical monetary policy as against the benefit of reduction in transaction costs.

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Appendix

Table II: Univariate ADF and PP Unit-root Tests on Inflation

Variables	ADF (with Intercept)	ADF (with intercept and trend)	PP (with intercept)	PP (with intercept and trend)
Ghana	-2.4915(1)	-2.9079(1)	-2.9372	-4.1870*
Nigeria	-3.5610(1)	-3.5362(1) *	-3.003	-2.9588
Sierra Leone	-2.9075(0)	-2.8409(0)	-2.7974	-2.708
Benin	-8.8942(1)	-5.4067(1) * *	-2.9372	-4.1864
Burkina Faso	-5.8970(0)	-6.1980(0) **	-5.96	-6.195**
Cape Verde	-1.2973(1)	-2.5884(1)	-1.5853	-2.1639
Cote d'ivore	-2.9453(1)	-3.6884(1) *	-3.4827	-3.76***
Gambia	-2.7451(1)	-2.9114(1)	-3.4975	-3.55***
Guinea Bissau	-1.8252(1)	-3.8539(1)	-1.5032	-3.82***
Liberia	-3.5520(1)	-4.4639(1) *	-2.3083	-2.3263
Mali	-3.1435(1)	-3.0385(1) *	-2.7055	-2.6071
Niger	-3.7129(1)	-3.9484(1) *	-2.6748	-2.7215
Senegal	-4.3352(0)	-4.9843(0) * *	-4.3757	-4.9448*
Togo	-4.2242(0)	-4.4081(0) **	-4.2353	-4.385**
Mauritania	-3.8564(0)	-3.6619(0) **	-3.8395	-3.64***

Notes: The numbers in the parentheses are lags (k) and k was determined using Schwarz criterion and Akaike information criterion . 1%, 5% and 10% critical values ADF intercept are -3.8304, -3.0294and -2.6552 respectively, while the ADF trend and intercept for 1%, 5% and 10% critical values are -4.2414, -3.7347 and -3.3086 respectively. 1%, 5% and 10% critical value for Philip Perron (PP) intercept are -4.1366, -3.1483 and -2.7180, while PP intercept and trend are -4.9893, -3.8730, and 3.3820. The test value s with ***, * and ** indicate that the corresponding null model is significant at the 10%, 5% and 1% significance level respectively.

Table III: Univariate ADF and PP Unit-root Tests on Investment

Variables	ADF (with Intercept)	ADF (with intercept and trend)	PP (with intercept)	PP (with intercept and trend)
Ghana	-0.6219(0)	-2.7299(0)	-0.1219	-2.5761
Nigeria	-2.5864(0)	-2.5419(0)	-2.3577	-2.3872
Sierra Leone	-2.4926(1)	-1.0862(1)	-0.5987	-1.6933
Benin	-3.6722(0)	-3.8003(0) *	-3.5659	-3.734*
Burkina Faso	-3.2311(0)	-3.0153(0) *	-3.3724	-3.2445*
Cape Verde	-1.8258(1)	2.1266(1)	-1.6641	-1.7836
Cote d'ivore	-1.3121(1)	-2.0249(1)	-1.2648	-1.8555
Gambia	-1.8845(0)	-1.9696(0)	-2.0411	-2.2226
Guinea Bissau	-2.3070(0)	-2.3884(0)	-2.1066	-2.1966
Liberia	-0.6775(0)	-2.5209(0)	-1.646	-5.164**
Mali	-1.5573(1)	2.7464(1)	-2.2642	-4.0978*
Niger	-2.1825(0)	-2.2160(0)	-2.6833	-2.6395
Senegal	-1.0888(0)	-1.9949(0)	-0.5987	-1.6923
Togo	-2.3305(0)	-2.7537(0)	-2.4098	-2.7913
Mauritania	-1.2594(0)	-2.2074(0)	-4.9165	-4.850**

Notes:The numbers in the parentheses are lags (k) and k was determined using Schwarz criterion and Akaike information criterion . 1%, 5% and 10% critical values ADF intercept are -3.9304, -3.065 and -2.6752 respectively, while the ADF trend and intercept for 1%, 5% and 10% critical values are -4.6712, -3.7347 and -3.3086 respectively. 1%, 5% and 10% critical value for Philip Perron (PP) intercept are -3.6289, -2.9472 and -2.6118, while PP intercept and trend are -4.2412, -3.5426, and 3.2032. The test value with * indicate that the corresponding null model is significant at the 5% significance level.

Table IV: Univariate ADF and PP Unit-root Tests on Consumption

Variables	ADF (with Intercept)	ADF (with intercept and trend)	PP (with intercept)	PP (with intercept and trend)
Ghana	-2.2643(1)	-2.2649(1)	-3.6822	-3.743*
Nigeria	-2.7278(0)	-3.1367(0)	-2.6245	-3.09***
Sierra Leone	-1.9682(0)	-3.1017(0)	-1.9206	-2.9909

Benin	-2.9845(0)	-4.1206(0)	-2.9145	-4.080*
Burkina Faso	-1.5644(0)	-1.8109(0)	-1.6124	-1.8948
Cape Verde	-1.2588(0)	-1.7655(0)	-1.3761	-1.9649
Cote d'ivore	-2.4111(0)	-2.5252(0)	-2.7015	-3.23***
Gambia	-3.1286(1)	-3.8498(1) *	-2.4599	-2.6315
Guinea Bissau	-3.2122(0)	-3.2536(0) *	-6.9723	-6.808**
Liberia	-1.9155(0)	-1.3215(0)	-1.9481	-1.2355
Mali	-2.5570(0)	-3.7438(0)	-2.4521	-3.597*
Niger	-2.8912(0)	-2.9047(0)	-2.997	-2.9988
Senegal	-1.9249(0)	-2.1568(0)	-1.9206	-2.1344
Togo	-1.6492(1)	-3.4849(1)	-2.5934	-5.580*
Mauritania	-4.9024(1)	-4.8267(1) **	-4.8647	-4.934**

Notes:The numbers in the parentheses are lags (k) and k was determined using Schwarz criterion and Akaike information criterion . 1%, 5% and 10% critical values ADF intercept are -3.6504, -3.0294and -2.613 respectively, while the ADF trend and intercept for 1%, 5% and 10% critical values are -4.7314, -3.761 and -3.3228 respectively. 1%, 5% and 10% critical value for Philip Perron (PP) intercept are -3.6289, -2.9472 and -2.6118, while PP intercept and trend are -4.2412, -3.5426, and 3.2032. The test value with ***, * and ** indicate that the corresponding null model is significant at the 10%, 5% and 1% significance level respectively.

Table V: Univariate ADF and PP Unit-root Tests on Current Account Variables

Variables	ADF (with Intercept)	ADF (with intercept and trend)	PP (with intercept)	PP (with intercept and trend)
Ghana	-2.7131(0)	-3.3289(0)	-2.6417	-3.1886
Nigeria	-0.5458(1)	-1.4025(1)	-2.6748	-2.7215
Sierra Leone	-2.7875(0)	-2.7599(0)	-2.9119	-2.8576
Benin	-3.5830(0)	-3.9623(0) *	-3.4636	-3.8553*
Burkina Faso	-3.7495(1)	-4.0857(1) *	-2.054	-2.0582
Cape Verde	-1.6991(0)	-2.3212(0)	-1.5853	-2.1639
Cote d'ivore	-1.8436(0)	-2.6085(0)	-2.054	-2.6458
Gambia	-1.7109(0)	-2.4617(0)	-1.5756	-2.5244
Guinea Bissau	-0.7651(0)	-2.2347(0)	-0.2748	-2.1593
Liberia	-2.4908(1)	-5.5050(1)	-0.8955	-1.3701
Mali	-2.0137(0)	-4.4138(0)	-1.4546	-4.2702*
Niger	-3.1423(1)	-3.0607(1)	-2.6748	-2.7215
Senegal	-2.2172(0)	-2.336(0)	-2.1206	-2.303
Togo	-2.1895(1)	-2.7599(1)	-4.0698	-4.2680*
Mauritania	-4.2939(0)	-4.2241(0) *	-1.4546	-2.2644

Notes: The numbers in the parentheses are lags (k) and k was determined using Schwarz criterion and Akaike information criterion . 1%, 5% and 10% critical values ADF intercept are -3.9228, -3.0659 and -2.6745 respectively, while the ADF trend and intercept for 1%, 5% and 10% critical values are -4.6712, -3.7347 and -3.3086 respectively. 1%, 5% and 10% critical value for Philip Perron (PP) intercept are -3.6289, and -2.9472 and -2.6118, while PP intercept and trend are -4.2412, -3.5426, 3.2032. The test value with * indicate that the corresponding null model is significant at the 5% significance level.

Re-examining Export-led Growth Hypothesis: A Review of Literature

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Abstract: *This paper has attempted to examine the inter-temporal causal relationship between export growth and output growth on the basis of a thorough research on the existing empirical literature. The study focused on the issue that how ELG strategy has influenced the economic growth of different countries. One school of thought argues that ELG strategy does not have uniform impact on all the sections of the society and all countries. Other school of thought view that ELG strategy have contributed positively to the economic growth of all the countries, which is being percolated to all sections of the society. Several studies find positive impact of exports on economic growth rate while the others find either negative or neutral effects. Majority of these studies had supported ELG Hypothesis and they concluded that export sector of a country has imperative role in the economic growth. The study recommends that the policy makers should develop such policies for export-led growth so that the gains from trade should percolate to all sections of the society.*

Keywords: Export Growth, Economic Growth, ELG Hypothesis

Introduction

The issue of how developing countries can attain their economic growth is one of the crucial questions for policy makers. Many of the rapidly growing newly industrializing countries (NICs) lend support to the idea that export promotion can be an effective development strategy (Doraisami, 1996). The export-led growth hypothesis, which asserts that export, is the important key to attain the higher level of economic growth and provides one of the answers to this basic question. Theoretical agreement on export-led–growth (ELG) emerged among neoclassical economists due to the success of free-market, and outward-oriented policies of Asian Tigers[6] (World Bank, 1993).

Feder (1983) and Rati (1985) argued in favour of exports, which help in reducing the foreign exchange constraints that facilitate in the imports of modern technologies and new production methods. Exports are the main source of foreign exchange that can be used to ease pressure on the Balance of Payments (BOPs) and generate job opportunities in developing countries. It can help the country to integrate in the world economy and to reduce the impact of external shocks on the domestic economy.

A number of developing countries including China, Mexico, South Africa, India and Israel etc have also emphasized on export promotion approach instead of import substitution during the trade liberalization period. There are usually four reasons mentioned for the support of export-led-growth hypothesis: (a) fostering specialization helps to benefit from the comparative advantages; (b) utilizing the full capacity of the plant size, where domestic demand is less than the full capacity production; (c) getting benefits of the greater economies of scale due to large mar-

[6] Asian tigers include Taiwan, Hong Kong, Singapore and Korea have been successful in achieving high and persistent rates of economic growth since early 1960s; because of their free market, outward oriented economies.

ket; and (d) increasing the rate of investment and technological change (Dash, 2009). Therefore, export promotion strategy is considered as an important instrument of economic growth.

The hypothesis of 'Export-Led Growth'(ELG) sees the growth of exports as having a stimulating influence across the economy as a whole in the form of technological spill over and other externalities (Dalia, 1992). Several studies like Michealy (1977), Balassa, B. (1978), Tyler (1981), Kavoussi (1984), Gupta (1985), Mbaku (1989) and Marin (1992) had found positive support for the export-led growth hypothesis for different countries. On the other hand, the findings of many studies like Boltho, 1996 and Medina-Smith (2001) has challenged the empirical literature of ELG Hypothesis and raise doubts with regard to promoting exports as a comprehensive development strategy. Some studies like Dutt and Ghosh (1996) and Maneschiold (2008) had found mixed results for ELG Hypothesis for all the countries.

A vast literature was conducted to address the issue of ELG hypothesis and since 1960s various economists have tried to explain this phenomena with their own reasoning but the results are mixed and contradictory for developed, industrialized and developing countries. This is the main anxiety that would explain why this theme is still at the peak of the agenda for many scholars, economists and policy-makers. In view of this, the present paper is an attempt to reinvestigate the relationship between exports and economic growth by analyzing the existing empirical literature.

Objectives and Methodology

No doubt, substantial empirical literatures have been conducted to analyze the export-led growth hypothesis. But the empirical evidence on ELG Hypothesis has shown mixed and contradictory consequences for developing and developed economies. So this hypothesis has been the subject of considerable research. The present paper is an attempt to organize the literature on ELG Hypothesis. The present study revolves around the following objectives:

- To analyze the relationship between export growth and economic growth;
- To suggest some policy implications.

A thorough research for existing empirical literature (all over the world) has been conducted to achieve the objectives of present study. The studies have been collected with the help of various online databases such as SSRN, Oxford University Press, NBER, Cambridge University Press, Chicago University Press etc. The appendix mentions the list of journals selected in the final sample and analysed for the present study.

The paper is organized as follows: the first section introduces the subject matter of the present paper. The objectives and methodology of the paper is presented in Section-II. The third section explains the phenomena of export performance and economic growth at global level. The important studies are presented in tabulation form. The section-IV concludes the paper with policy implications.

Export Performance and Economic Growth

Economists consider exports as an 'engine of growth'. The export expansion approach leads to better resource allocation, creating economies of scale and higher level of productivity, which enlarged higher level of output growth in an economy. The emphasis of outward oriented policies has been shifted towards export promotion policies from import substitution policies during the trade liberalization period. The access to advanced technologies and better management practices may also be possible through outward oriented policies, which may result in further efficiency gains. It is widely acknowledged that carefully managed openness to trade through an

Export-led Growth (ELG) can be a mechanism for achieving rapid growth (Giles and William, 2000). The extensive literature concerning the relationship between export and growth is also the consequence of the many changes that have taken place in the field of development economics and international trade during the last two decades (Dash, 2009). The International Trade and Development theory argue that exports growth due to export oriented policies contributes positively to economic growth (measured by output growth) and vice versa. Moreover, two recent developments, the 'new growth theory' and 'new developments in econometric theory' have added an additional twist to the literature on export-led growth.

Export Performance and Economic Growth: An Analysis

The empirical literature focusing on the export-led growth hypothesis is presented in table1. The connection between exports and economic growth can be examined in a number of ways like growth rates relating to GDP and export, the share of exports to growth, different strategies adopted by nations to accelerate economic growth and export etc. The relationship between exports and output growth has been explored extensively in the literature. The economists and researchers like Oskooee (2005), Hatemi, J. and Irandoust (2002), Henriques and Sadorsky (1999), Chandra (2003), Shirazi and Abdul Manap (2004, 2005), Eusuf and Ahmed (2007), Dutt and Ghosh (1996), Boltho, (1996), Dash (2009), Ibrahim (2002), Maneschiold (2008), Jordaan and Eita (2007), Mohan and Nandwa (2007), Ekanayake (1999), and Bahmani-Oskooee and Alse (1993), Summer (2004), Bhattacharya J. and M. Bhattacharya (2009), Dawson (2005), Dimkpah (2002), Dash (2009), Ibrahim (2002), Mamun and Nath (2005), Uddin and Noman (2007), Marin (1992), Awokuse (2002), Ferda (2007), Husein (2009), Doraisami (1996), Dhawan and Biswal (1999), Ullah, et al. (2009) etc. have attempted in their respective studies to establish causal relationship between exports and output growth.

Most of the early studies like Michaely (1977), Balassa (1978), Tyler (1981), Feder (1983), Kavoussi (1984), Ram (1985), Sheehey (1990), Lopez (1991), Edwards (1993), and Ngoc et al. (2003), were based on the cross section approaches except Ram (1985) and remarkably evidenced that exports have significant causal effect on economic growth (Abu and Ahmed, 2007). The initial studies had used simple correlation coefficient to examine the relationship between export performance and economic growth. A high degree of positive correlation between the two variables was taken as evidence supporting the ELG hypothesis but logically, without the information of causality structure it did not mean much. So cross section studies contain a serious drawback of causality and these studies assume, rather than prove, that causality runs from export growth to GDP growth, while successful growth episodes in an economy can exhibits high export growth. The issue of causality can be tackled by time series analysis. New advanced techniques in time series analysis have facilitated more refined assessment of the time series evidence on causal links between exports and economic growth.

Table 1
Empirical Literature Focusing on the Export-Led Growth Hypothesis: A Global View

Study	Country	Variable (Period)	Conclusions
M. Michaely* 1977	41 LDCs	Exports and GDP	The study found that economic growth tended to be affected significantly by exports 'only once countries achieve some minimum level of economic development'.
Balassa* 1978	11 Countries	Exports and factor productivity	The study found a significant positive effect of export growth on factor productivity.
Tyler* 1981	55 Middle Income LDCs	Export growth and GNP	The study found that export expansion leads to significant increase in Gross National Product.
Kavoussi* 1984	73 Countries	Exports and GNP i.e. Stock of Capital, Labour Force and Time.	The study found that positive relationship between export growth and GNP growth and 'higher rates of economic performance' to be associated with 'higher rates of export growth'.
Gupta* 1985	Isreal and South Korea	GNP and Export Growth (Quarterly data : 1960I-1979IV)	The study found that there is a positive relationship between GNP (Gross National Product) Growth and export growth
Rati 1985	73 LDCs	Real Output, Labour Input and Exports (Two Periods :1960-70 and 1970-77)	The study found that the differential impact of exports in the low-income and the middle-income LDCs, for both periods. The study found that the importance of exports seems to have increased during the 1970s and the impact of export performance on growth had appear small in the low-income LDCs (although large in the middle-income group) over the period 1960-70, the impact differential almost disappears in 1970-77, during which period the positive impact of exports on growth seems quite large and of almost equal magnitude for the two groups.
John M. Mbaku* 1989	37 African Countries	GNP, Stock of Capital, Labour Force and Time (1970-1981)	The study found that Export expansion approach has positively affected economic performance in Africa and export expansion's contribution to growth appears stronger in the middle income countries than low-income countries.
Marin* 1992	Four OECD Countries; Germany, United Kingdom, United States and Japan	Exports, Productivity, Terms of Trade and World Output (1992)	The findings of the study supported ELG Hypothesis for all and the study supported outward oriented regime which enhanced the productivity performance of developed market economies as well as of developing countries.
Bahmani-Oskooee and Alse* 1993	Nine LDCs (Colombia, Greece, Korea, Malaysia, Pakistan, Philippines, Singapore, South Africa and Thailand)	Real Exports and Real Output (GDP) Quarterly data (1973I-1988IV)	The study found a bi-directional causality between export growth and output growth and they receives strong empirical support in almost all nine countries. The study further found that a long-run relationship exist between real exports and real output and this relation is a positive one.
Boltho** 1996	Japan	Exports and Growth (1913-37, 1952-73 and 1973-90)	This study has attempted to shed light on whether Japan's exceptional economic performance in those periods in which its growth was twice, or nearly twice, as rapid as that of its major competitors, was primarily stimulated by external or by domestic forces. The researcher used five different approaches to examine the ELG hypothesis but the study found that no one test out of the five tests support the E-L-G hypothesis for Japan and the long-run growth is pushed from domestic demand rather than foreign demand.
Dutt and Ghosh 1996	26 Low, Middle and High-income countries including 4 NICs	GDP and Exports (1953-1991)	The outcomes of this study are different for all countries because of number of reasons: different time period; different sample intervals; use of an incomplete ECM specification; unverified stationary conditions and differences in the level of economic development and their stage. The export growth-economic growth causality structure is economy specific, and attempts for generalizations are inappropriate.

Doraisami* 1996	Malaysia	GDP and Exports (1963-1993)	The study found a bi-directional growth between exports and output and a positive long run relationship between exports and growth.
Shan and Tian* 1998	Shanghai (China)	GDP, Exports, Imports, Labour, Gross Fixed Capital Expenditure and FDI (Monthly data of period from 1990 (1) to 1996 (12)	The study found that there is a one-way causality running from GDP to exports.
Dhawan and Biswal* 1999	India	Real Exports, Real GDP and Terns of Trade (from 1963 to 1993)	The study found that there is a long-run equilibrium relationship among three variables i.e. Real Exports, Real GDP and Terns of Trade and further found that GDP and Terms of Trade jointly Granger cause exports in the short run as well as in the long run and causality from exports to GDP appears to be a short run phenomena
Henriques and Sadorsky* 1999	Canada	Real Exports, Real GDP and Real Terms of Trade (1877-1991)	The study found that a one way Granger Causal relationship exists in Canada whereby changes in GDP precede changes in exports
Ekanayake* 1999	Eight Asian Developing Countries	Real Exports and Real GDP (1960-1997) {India 1960-96; Indonesia 1965-97; Korea, Malaysia, Pakistan, Sri Lanka and Philippines 1960-97; and Thailand 1962-97}	The study found that short run Granger Causality running from economic growth to export growth in all cases except Sri Lanka. The study further found strong evidence for long-run Granger Causality running from export growth to economic growth in all cases but short run causality running from export growth to economic growth only in case of Indonesia and Sri Lanka.
Ghali* 2000	Tunisia	Real Exports and Real GDP (1963-1993)	Granger causality running in both directions between economic growth and export growth and it support the ELG theory
Giles and Williams* (2000)	Different Countries	More than 150 empirical papers	Export sector led to growth in own economies but their relationship is diverse and complex.
Medina-Smith** 2001	Costa Rica	GDP, Gross Domestic Investment; , Exports of goods and services; real Gross Fixed Capital Formation and Population series (1950-97)	The study found that ELGH is valid only on limited number of developing countries at certain extent; physical investment and population mainly drove economic growth of Costa Rica from 1950 onwards; and findings of this study challenge the empirical literature of ELGH and raise doubts with regard to promoting exports as a comprehensive development strategy.
Vohra* 2001	Less Developed Countries (India, Pakistan, Philippines, Malaysia and Thailand etc.)	Labour, Capital and Exports (1973-1993)	The study found that Exports have positive impact on economic growth when a country has achieved some level of economic development and the study also signify the importance of liberal market strategies by pursuing export expansion policies, which create the opportunities of foreign investments.
Hatemi-J and Irandosust* 2002	Greece, Ireland, Mexico, Portugal, and Turkey.	Real output and Real Exports (1960-97)	The study found that export and output are causally related in long run for Ireland, Mexico and Portugal. The researcher used Granger Causality procedure developed by Toda and Yamamoto (1995) and found that Granger causality is Uni-directional, running from economic growth to export growth in Portugal and running from export growth to economic growth in Ireland and Mexico. The study revealed that export-led-growth hypothesis is not only supported by outward oriented economy such as Ireland but also by a moderately inward oriented country such as Mexico.
Dimkpah* 2002	107 Countries	Dependent variable is Growth Rate of GDP and independent variables include growth rate of population (labour), investment (capital) and exports. (1980-90)	The study found that Export growth is positive contributor to the economic development in low as well as middle-income Countries and have stronger impact on middle than low. The study further found that labour growth is significant in low and high-income countries and capital growth is positively contributed in economic growth but significant only in low and middle-income countries
Izani Ibrahim* 2002	Hong Kong, Korea, Malaysia, Philippines, Singapore and Thailand	GDP Growth and Exports	There is a positive export productivity differentials in all six countries in the sample, and positive export externalities in all except the Philippines
Lin and Li* 2002	China	GDP, Investment, Consumption, Imports and Exports	The study found foreign trade as a crucial factor for economic growth.
Awokuse* 2002	Canada	Variables: Real Exports, Real GDP, Real Terms of Trade, Gross Capital Formation, Industrial Production index proxy as foreign output shock. (Quarterly data from 1960:1 to	The study found that changes in exports precede changes in real GDP and support ELG hypothesis.

		2000:4)	
Shirazi and Abdul Manap* 2004	Pakistan	Exports, Imports and Output (1960 to 2003)	The study found that strong relationship exists among three variables; Unidirectional causality running from exports to output and there is no significant causality between exports and imports and also found a feedback effect between imports and output.
Summer 2004	South Asia Region, Namely, India, Pakistan, Sri Lanka, Bangladesh and Nepal	Real Exports, Real Imports and Real GDP (1960-2002)	The study found bi-directional causality between exports and output growth in Bangladesh, India and Sri Lanka in the short run. The study found that a long-run equilibrium relationship exists among exports, imports, and output in case of Bangladesh; Pakistan; and India. The study also found no long-run relationship in case of Nepal and Sri Lanka.
Mamun and Nath* 2005	Bangladesh	Industrial Production, Exports of Goods and Services, Exports of Goods only (Quarterly data 1976 to 2003)	The study found a stronger long-term equilibrium relationship between industrial production and exports of goods only as compared with the relationship among industrial production and exports of goods and services. The causality is running from exports to industrial production in the long-run but the study further found that there is no relationship between the variables in short run.
Dawson* 2005	India	Exports and GDP	The study found that a 1 per cent increase in exports (income) leads to a 0.06 per cent (0.35 per cent) increase in income (exports) in the following year and these effects are long lived. India's EXIM policies, which seek to promote exports with the eventual aim of increasing economic growth, appear justified
Abou-Stait* 2005	Egypt	Exports, Imports, GDP and Capital Formation (investment) (1977 to 2003)	The study found that Exports, Imports and GDP are not co integrated; exports granger cause GDP growth but do not support the Granger Causality between exports and capital formation. VAR and IRFs investigate the response of the system to economic shock and it showed that shocks to exports lead to a significant response in GDP, which support ELG.
Shirazi and Abdul Manap* 2005	five south Asian countries, India, Sri Lanka, Nepal, Pakistan, Bangladesh	real output (GDP), real imports and exports	The study found that a long run relationship among 3 for all (India, Bangladesh, Pakistan, Nepal) countries except Sri Lanka and support ELG in three except India and Sri Lanka. A unidirectional causality has been observed i.e. from exports to output in case of Pakistan. The study further found a feedback effect between imports and GDP in case of Nepal, Pakistan and Bangladesh. The study further found a unidirectional causality from imports to output growth in case of Sri Lanka.
Keong et al. * 2005	Malaysia	Economic Growth, Exports, Imports of consumption goods, Capital Formation (gross fixed capital formation), Labour Force and Exchange Rate.	This study used Error correction model. The empirical evidence revealed that all variables except exchange rate granger cause economic growth in short run at 5 % level. The study further found that ELG hypothesis is valid in long and short run in Malaysian Economy. The study also found that the growth rate of capital formation and imports have positive impact on economic growth, whereas the variable of labour force has negatively affected the economic growth of Malaysia in the short run.
Eusuf and Ahmed* 2007	South Asian Countries	GDP and Exports (Different period 1995, 1999, 2004, 2006)	The study found that Real exports and Real GDP are co-integrated only in case of Bangladesh, Pakistan and Nepal. The export-led growth hypothesis is proved in case of Pakistan, Sri Lanka and Bhutan; growth-led export is proved in case of India, Nepal and Maldives; and no causality in case of Bangladesh.
Musonda* 2007	Zambia	GDP, Exports, Imports, Gross Fixed Capital Formation, Labour Force, Real Exchange Rate, Terms of Trade and Degree of Openness (1970-2003)	The study found the long-run equilibrium relationship between variables under study of Zambian Economy. The study further found a bi-directional relationship between economic growth and export growth.
Uddin and Noman* 2007	Bangladesh	industrial production index and exports (Monthly data 1973 m7 to 2006 m8)	The study found a long-run bidirectional causality, which is running from export growth to economic growth and vice-versa.
Jordaan and Eita* 2007	Botswana	GDP and Exports (Quarterly data from 1995 Q1 to 2005 Q4)	The study found that GDP causes exports of Botswana and there is bi-directional causality between exports and economic growth.
Mohan and Nandwa* 2007	Kenya	Exports and GDP growth (1960-70 to 1970-80)	The empirical evidence supported that there is a Long term relationship between exports and economic growth. The study further found that a unidirectional causality, which runs from exports to GDP growth. The study recommended adoption of export promotion policies in Kenya.

Ferda* 2007	Turkey	Exports, Industrial Production and Terms of Trade (Quarterly data 1980 to 2005)	The study found the unidirectional causation from exports to industrial production.
Maneschiold 2008	Argentina, Mexico and Brazil	GDP and Exports of goods and services {Database. For Argentina covers q1 1993 to q1 2006 (53 observations); Brazil covers Q1 1991 to Q1 2006 (63 obsers) and Mexico covers period from q1 1980 to q1 2006 (105 observations)}	The study found that Co-integration relationship for Argentina and Mexico for the period before and after the introduction of NAFTA (i.e. pre and post break) but no such relationship for Brazil and the causal relationship is bi-directional from export to GDP in the post-break period and unidirectional in pre-break period and Short run causality test for Brazil revealed an unidirectional from exports to GDP.
Bhattacharya et al.* 2009	India	FDI inflow, Exports, Imports and GDP (quarterly data from 1996-97 to 2007-08)	The study used co-integration test and VEC Model to examine the ELG hypothesis. The study found the long-run relationship among four variables i.e. FDI, Export, Import and GDP under study. The study further found that a bi-directional causality has been observed between FDI inflow and GDP and between Exports and GDP. The unidirectional causality has been observed from exports to FDI inflow.
Husein* 2009	Jordan	GDP; Exports and Terms of Trade (1969-2005)	The study found that variables under study are co-integrated and the evidences revealed that there is a long-run bi-directional causality between real exports and real GDP.
Silaghi* 2009	CEE (Central and Eastern European Countries)	Real exports, Real GDP and Real Imports	The study found that causality from exports to GDP is obtained for Bulgaria, the Czech Republic, Estonia, Latvia and Lithuania in bi-variate systems. Causality from GDP to exports is indicated for Bulgaria, the Czech Republic, Estonia, Hungary, Lithuania, Romania and Slovenia. The study also found that these results remained valid including the other relevant component of the foreign trade, i.e. imports. In tri-variate systems, ELG remains valid in the Czech Republic only and becomes valid in Lithuania while GLE is validated in Hungary, Romania and Slovenia.
Elbeydi, Hamuda and Gazda* 2010.	Libya	Exports, GDP and Exchange Rate (1980-2007)	The empirical evidence revealed that there is a long-run bi-directional causality between exports and income growth. The study found that export promotion policy influence positively the economic growth.

Source: complied by authors.

Notes:

1) Sign star (*) represented those studies, which supported ELG Hypothesis.
2) Sign double star (**) represented those studies, which against ELG Hypothesis.
3) No sign represented those studies, which provide mixed results for ELG Hypothesis.

A group of studies including Bahmani-Oskooee and Alse (1993), Mamun and Nath (2005), Ghali (2000), Pandey (2006), Uddin and Noman (2007), Marin (1992), Awokuse (2002), Ferda (2007), Husein (2009), Doraisami (1996), Dhawan and Biswal (1999), Ullah, et al. (2009), Oskooee (2005), Hatemi, J. and Irandoust (2002), Henriques and Sadorsky (1999), Chandra (2003), Shirazi and Abdul Manap (2004, 2005), Eusuf and Ahmed (2007), Dutt and Ghosh (1996), Boltho (1996), Dash (2009), Ibrahim (2002), Maneschiold (2008), Jordaan and Eita (2007), Mohan and Nandwa (2007), Ekanayake (1999) had adopted time series analysis for explaining the causal link between export growth and economic growth. But these recent studies that have used time series data to investigate causality have failed to provide uniform support for export-led growth hypothesis. However, to hypothesize a uniform relationship between export growth and economic growth among countries is not feasible, given the extensive differences in economic structure exhibited by developing economies and low developed countries.

For the measurement of the effects of exports on economic growth, most of the studies in the review of literature in the present study have been used the Granger Procedure in order to analyze the possibility of dual causal relationship between export growth and economic growth *(Granger procedure is an effective way to explore nexus in export and economic growth)*. The causality issue was firstly addressed by Jung and Marshall (1985), who applied Granger concept of Causality on the data of 37 countries for the period 1950-81 to examine ELG hypothesis. The study found statistical evidence supporting ELG hypothesis in only 4 out of 37 countries. The findings of this study received support from others like Bahmani-Oskooee and Alse (1993), Doraisami (1996), Henriques and Sadorsky (1999), Awokuse (2002), Summer (2004) etc., who have also been used the Granger concept of Causality.

Some studies used the Engle-Granger (1987) approach and error correction model for the study of causality. If the time series in question are co-integrated, as pointed out by Granger (1988), the traditional causality tests would miss out on some of the 'forecast ability' and hence, reach to incorrect conclusions about causality (Chandra, 2003). C.W.J Granger pointed out that Standard Granger and Sims tests are invalid if the time series are co-integrated. Further, if co-integration is established, then error correction modelling should be used to establish causality like, Bahmani-Oskooee and Alse (1993), who applied Co integration and Error Correction Model (ECM) on the Quarterly data (1973I-1988IV) instead of annual data for the nine countries studied. The study found long-run relationship among the variables, namely, real exports and real output under the study and this relation is a positive one. The study found a bi-directional causality between export growth and output growth of all nine countries. In spite of this, there are some recent studies, which used Co-integration test and Error Correction Models, including, Doraisami (1996), Dutt and Ghosh (1996), Dhawan and Biswal (1999), Ekanayake (1999), Medina-Smith (2001), Awokuse (2002), Mamun and Nath (2005), Musonda (2007), Maneschiold (2008), and Gazda (2010).

A one way causality from economic growth to exports growth is justified according to Oskooee (2005), Shah and Tian (1998) and Henriques and Sadorsky (1999). These studies supported GLE hypothesis and it is also proved by Shirazi and Manap (2004, 2005), Mohan and Nandwa (2007) and Ferda (2007).

A group of studies had found the degree to which the relationship between exports and economic growth is genuine (in both directions), including, Oskooee (1993), Doraisami (1996), Ghali (2000), Summer (2004) Musonda (2007), Noman (2007), Husein (2009), Bhattacharya et al. (2009) and Gazda (2010). They found that bi-directional causality running from export

growth to economic growth and vice versa in the long run and short run except Summer (2004) who found bi-directional causality in short run only.

Conclusions

In the process of liberalization and globalization, Export Promotion Strategies are being strongly advocated as an effectual development strategy. The theory of export-led Growth argued that export-oriented policies promote economic growth due to externalities of competing in the world markets. The present study has examined the inter-temporal causal relationship between export growth and output growth on the basis of a thorough research on the existing empirical literature around the world. A vast literature addressed to this issue has highlighted number of factors and their contribution in the exports-economic growth nexus. These factors includes, namely, efficient allocation of resources, economies of scale, high factor productivity, enhanced capacity utilization and diffusion of technological knowledge and innovation.

The study found that there are several studies, which found positive impact of exports on economic growth rate while the others find either negative or neutral effects. Michealy (1977), Balassa, B. (1978), Tyler (1981), Kavoussi (1984), Gupta (1985), Mbaku (1989) and Marin (1992) had found positive support for the export-led growth hypothesis for different countries. On the other hand, the findings of many studies like Boltho (1996) and Medina-Smith (2001) challenge the empirical literature of ELG Hypothesis and create doubts with regard to promoting exports as a comprehensive development strategy. Some studies like Dutt and Ghosh (1996) and Maneschiold (2008) had found mixed results for ELG Hypothesis for all the countries. The researcher like Giles and Williams (2000) conducted a comprehensive survey of more than 150 empirical papers on Export-led-Growth (ELG) and found that export sector led to growth in exporting countries but their relationship is diverse and complex. Foreign trade is very crucial factor for economic growth (Lin and Li, 2002) and the studies, Michealy (1977) and Vohra (2001) had found exports have positive impact on economic growth when a country has achieved some minimum level of economic development.

From the above discussion of the literature, it is clear that Export expansion approach is playing a central role in the economic growth particularly for developing countries and it has emerged as an important economic development strategy. But, the controversy still persists regarding the real effects of exports on economic growth. However, to assume a uniform relationship between export growth and economic growth among countries is unrealistic due to the wide differences in economic structure exhibited by developing economies. Of course, exports played a significant role in economic development of a nation. The outcome of this study leads us to the conclusion that developing and least-developing countries should emphasize on the promotion of exports to accelerate the process of economic development. This can be done with the help of a number of steps like the diversification of export commodities, infrastructure development, more reduction in tariff barriers and quantitative restrictions, increase in the incentives and subsidies to exporters and operationalization of Export Processing Zones (EPZs).

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Corruption and the Size of the Government: A Panel Analysis

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Abstract: *The paper uses regression analysis on a panel of annual data for one hundred and sixty four countries for the thirteen-year period from 1996 to 2008 to see whether the size of government has an influence on corruption. The findings indicate that bigger government size; higher levels of economic development, and greater globalization reduce corruption.*

Keywords: Corruption, government size, level of economic development, globalization

Introduction

One of the basic functions of the government is to provide law and order. In the dynamic process of achieving this objective, or attempting to do so, government often expands through the passage of additional laws and regulations and the establishment of new regulatory institutions. An important component of the government's law and order endeavors is to keep corruption within check. Corruption can undermine trust in the government upon which its very legitimacy depends. The purpose of this paper is to look to see whether the size of the government matters with regard to corruption in a panel of annual data consisting of one hundred and sixty four countries for the years 1996 to 2008. In particular, the paper investigates whether there is a negative relationship between corruption and the size of the government. In an attempt to do so, the paper runs panel regressions of corruption on the size of government, of corruption on the size of government adjusted for the level of economic development, and of corruption on the size of government adjusted for the level of economic development and the degree of globalization.

Recently, a lot of studies have postulated a nonlinear inverted U relationship between the size of government and economic growth and have found that the actual size of government is beyond its optimal value. If the size of government is important for corruption, and, if, in turn, corruption is a potential potent determinant of economic growth, then studies looking at the optimal size of the government for economic growth need to take into account the effect of the size of government on economic growth that operates through its effect on corruption.

The paper is broken down into several sections. The first provides a small literature review. The second discusses a little theoretical model and furnishes the data sources for the variables that are used in the empirical work. The third section shows the results of panel regressions of corruption on the size of government, and the fourth section concludes.

Literature Review

A recent article suggesting that corruption has a negative growth effect on economic performance is the article by Podobnik, Shao, Njavro, Isanov, and Stanley (Podobnik, Shao, Njavro, Isanov, and Stanley 2008). They regress economic growth for the five year period 1999-2004 on the change in Transparency International's corruption perception index on countries around the world and find that a reduction in corruption as measured by a one unit increase in the corruption perception index results in an increase of one and seventh tenths percent in the per capita growth rate of GDP. They suggest that one of the reasons that lower corruption leads to higher economic growth is that it provides more favorable conditions for foreign direct investment in a country.

As Africa is an area in which corruption is particularly high, studies of the relationship between growth and corruption focusing on African countries is particularly interesting.

In a very informative and well written article, Kwabena Gyimah-Brempong (Gryimah-Brempong 2002) employs a general method of moment's estimator to estimate a growth equation which includes corruption as a regressor on a panel consisting of annual data for twenty one African countries for the period 1993 through 1999. He finds that the magnitude of the effect of corruption on growth is quite substantial. A decrease in corruption as measured by a reduction in the corruption perception with a ten point range by a single point leads to a sixth tenths of a point upward increase in the growth rate of real GDP. Kawbena also estimates an investment equation with corruption as an argument and an income inequality equation with corruption as an argument and finds that corruption has a negative effect on investment and on income equality.

Another article looking at African countries is the article by Anoruo and Braha (Anoruo and Braha N.D.). Using Phillips-Hansen fully modified ordinary least squares on a sample of annual data for eighteen African countries from 1984 to 2000, Anoruo and Braha find evidence that corruption has both direct and indirect negative effects on economic growth.

Corruption can also have an indirect negative influence on economic growth by adversely affecting Foreign Direct investment. Habib and Zurawicki (Habib and Zurawicki 2002) find evidence that corruption is detrimental to foreign direct investment.

With regard to the effect of government size on corruption, a couple of the more recent articles include DiPietro (DiPietro 2003) and Goel and Budak (Goel and Budak 2006).

DiPietro (DiPietro 2003) finds a negative relationship between corruption and government size using cross county regression analysis for set of countries around the world.

Goel and Budak (Goel and Budak 2006) look at annual pooled data for the period 1998 through 2002 for twenty five transition economies. They find a negative relationship between corruption and government size for the transition economies. In their empirics they account for a whole host of other variables including economic prosperity, country size, and the extent of privatization.

Finally, a comprehensive literature review covering articles on a whole variety of the various aspects of corruption, its causes and consequences, can be found Johann Graf Lambsdorff's article (Lambsdorff 2005)

Overall Operational Model and the Data Sources for The Variables

The model is comprised of a single equation. It is given below and labeled as equation number 1.

$$C = f(S, D, G) \quad \delta C/\delta S < 0,\ \delta C/\delta S < 0, \text{ and } \delta C/\delta G < 0 \tag{1}$$

In the equation, C represents corruption, S, government size, D, the level of economic development, and G, the extent of globalization. All the partial derivatives are expected to have negative signs. The model simply hypothesizes that corruption depends on the size of the government, the level of economic development, and the degree of globalization, and maintains that increases in any one of these variables will lead to a reduction in corruption.

In order to empirically look at the relationship between corruption and government size, a data panel is constructed consisting of measures of each of the four variables in the model.

The measure of corruption is ten minus the corruption perception index of Transparency International (Transparency International 2009). The corruption measure varies from zero to ten with higher values indicating greater corruption. The government size variable, the percentage of government spending to GDP (%GOVTGDP), the level of economic development variable, real per capita gross domestic product in 2000 U.S dollars(GDPPC2000), and, the globalization variable,