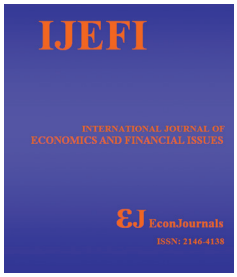

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The Causal Nexus between Exports and Economic Growth: Evidence on the Role of Omitted Variables

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ABSTRACT

Over the past two decades, the export-growth nexus has been extensively investigated yielding to inconclusive findings. Most of existing studies used a bivariate framework ignoring the role of other relevant variables. This study re-examines the nexus for 12 African countries by incorporating capital, labor, and imports into the analysis. The results are sensitive to the inclusion of controlling variables. Within the bivariate framework, we found long-run relationships between export and output in eight countries and the export-led growth hypothesis holds in Benin, Burkina Faso, Cameroon, Gabon, Ghana, Nigeria, and South Africa. However, when capital, labor and imports are controlled for, the results show long-run relationships among the variables in all countries and the export-led growth hypothesis holds in Cameroon, Cote d'Ivoire, Gabon, Ghana, Senegal, and South Africa. These results highlight the risk of misleading conclusions based on bivariate models.

Keywords: Export, İmport, Economic Growth
JEL Classifications: F14, F43, O4

1. INTRODUCTION

The relationship between exports and economic growth has been the subject of intense research in the economic literature. Theoretically, exports can stimulate economic growth through various channels including efficient allocation of resources, economies of scale, enhanced capacity utilization, improved productivity, and diffusion of technological knowledge and innovation. It is mainly in view of these considerations that many developing countries have adopted export-oriented policies as part of their development strategy. Moreover, outward trade orientation has been cited as one of the reasons for the spectacular success of East Asian tiger economies over the past three decades (World Bank, 1993; Stiglitz, 1996). Today, exports are widely accepted as an engine for economic growth. However, it is not very clear that export expansion causes economic growth in all economies. This is because there is no empirical consensus on whether or not export expansion leads to economic growth. It is possible that exports may be caused by economic growth or that exports and economic growth may be caused by other variables. Understanding the direction of causation between exports and economic growth has a great implication about the appropriate policies to adopt for economic growth. If the causality runs from exports to economic growth, then the outward-looking export-oriented industrialization strategy is relevant. On the contrary, if the causality runs from economic growth to exports, then the inward-looking development strategy becomes relevant to promote and sustain economic development. In the case of bidirectional causal relationship, the suitable policies should be a balanced mixture of both strategies.

The empirical evidence regarding the causal relationship between exports and economic growth is mixed and inconclusive. A number of studies found that exports lead to economic growth (e.g., Mamun and Nath, 2005; Jordaan and Eita, 2007; Rangasamy, 2009), while others found that economic growth drives exports (e.g., Chandra and Love, 2005; Alimi and Muse, 2013; Hassan and Murtala, 2016). Further studies still reported a bidirectional causal relationship between exports and economic growth (e.g., Mahadevan, 2007; Tsen, 2010; Lam, 2016) while others failed to find any significant causal relationship between the two variables (e.g., Tang, 2006; Bahmani-Oskooee and Economidou, 2009; Afzal and Hussain, 2010). The empirical inconclusiveness

arises in large part from methodological limitations. Most of previous empirical studies have relied on a bivariate framework in which the role of other relevant variables has been ignored. It is well-known that causality tests are sensitive to omitted variables and hence a bivariate model may not be suitable for testing the export-growth causality nexus. Some studies have suggested that import is an important variable while examining causality between exports and economic growth, and omission of this variable could lead to biased results (Esfahani, 1991; Riezman et al., 1996; Thangavelu and Rajaguru, 2004). In addition, there is empirical evidence that the growth effect of trade openness depends upon a wide array of country-specific characteristics including financial market depth, economic structure, government regulation and policies (e.g., Bahmani-Oskooee and Economidou, 2009; Chang et al., 2009; Dreger and Herzer, 2013; Minier and Unel, 2013; Krishna and Levchenko, 2013).

This study adopts a multivariate framework including real gross domestic product (GDP), capital, labor force, exports, and imports to reconsider the results of previous studies for selected African countries. First, it examines whether there is a causal relationship between exports and economic growth. Second, it determines the direction of this causation. On the empirical front, this study fills the gap in the literature for Sub-Saharan African countries that have not been previously studied. The study uses the autoregressive distributed lag (ARDL) bounds test to co-integration proposed by Peasaran et al. (2001) and performs Granger-causality tests to shed light on the causal relationships between exports and economic growth. Given the contradictory results in the empirical literature, we adopt a country-by-country case study rather than a panel data approach. The mixed empirical evidence from existing studies may be due to the impact of the estimation method used for investigation. For this reason and also for comparison purposes, this study applies the same methodology to all countries.

The rest of the paper is organized as follows. Section 2 provides a review of the literature regarding the export-growth relationship. Section 3 describes the analytical framework and methodological issues. Section 4 presents the empirical results, while section 5 provides summary and gives some policy implications.

2. LITERATURE REVIEW

The export and economic growth relationship has stimulated a growing body of research at both theoretical and empirical levels. Theoretically, four views characterize the causal nexus between exports and economic growth. The first view is the well-known neoclassical export-led growth hypothesis that identifies exports as a major driver of economic growth. According to this view, more opened countries will grow faster than less opened economies. This works through several channels. Exports contribute to relax foreign exchange constraints allowing importation of capital and intermediate goods for domestic production (McKinnon, 1964; Chenery and Strout, 1966). In addition, exports give access to advanced technologies and better management practices that lead to technological improvement and increase in economic growth (Helpman and Krugman, 1985). The second view posits a causality flowing from economic growth to exports, which is known as the growth-led exports hypothesis. According to this view, higher economic growth results in higher exports if the domestic output increases faster than the domestic demand. Output growth has a positive impact on productivity growth that reduces unit cost and stimulates exports (Lancaster, 1980; Krugman, 1984). The third view suggests a bidirectional causal relationship between exports and economic growth. The fourth one posits that there is no causal relationship between the two variables. This is the case when both exports and economic growth are determined by other unrelated variables such as investment or climatic conditions.

A growing body of empirical studies has examined the validity of these hypotheses. Giles and Williams (2000), Bahmani-Oskooee and Economidou (2009), Ozturk and Acaravci (2010), Acaravci and Ozturk (2012) and Tang et al. (2015) provide surveys of this literature. The empirical evidence is mixed and conflicting. For example, in the case of Pakistan, Shahbaz et al. (2011) confirmed the export-led growth model while Bahamani-Oskooee and Alse (1993) and Khan and Saqib (1993) found a two-way causal relationship between exports and GDP. On the contrary, Dodaro (1993) and Afzal and Hussain (2010) failed to find any significant relationship in either direction. Riezman et al. (1996) used a bivariate framework and found evidence of causality in Algeria, Egypt, and Tunisia. There was no evidence of causality in Israel, Jordan, Morocco, Sudan, and Turkey. However, when imports are included as a third variable, the export-led growth hypothesis was validated in Jordan and Sudan. Islam (1998) studied the export-growth nexus for 15 Asian countries and found support for the export-led growth model in two-third of the countries. He did not find any causal relationship for Malaysia, the Philippines and Thailand. For Malaysia, Al-Yousif (1999) and Khalafalla and Webb (2001) confirmed the export-led growth hypothesis, while Hassan and Murtala (2016) provided evidence consistent with the growth-led exports hypothesis. On the other hand, Baharumshah and Rashid (1999), Furuoka (2007) and Mahadevan (2007) found a two-way causal relationship between exports and GDP. In the case of India, Dash (2009) confirmed the export-led growth model, while Dhawan and Biswal (1999) found evidence of economic growth causing exports, and Chandra (2003) and Kumari and Malhotra (2014) reported a two-way causal relationship between exports and GDP. Ekanayake (1999) tested the export-growth nexus for eight Asian countries over the period 1960–1997. Using a bivariate framework, the author found two-way causality in seven countries, namely: India, Indonesia, Korea, Pakistan, the Philippines, Sri Lanka and Thailand. Short run causality from economic growth to exports was found in all countries except Sri Lanka. Malaysia is the only country of the sample that experienced the export-led growth hypothesis. Lee and Huang (2002) applied threshold VAR model for five East Asian countries. They found that, except for Hong Kong, the export-led growth hypothesis was found for Japan, Korea, Taiwan, and the Philippines. For Korea, Japan and the Philippines, the export-led growth hypothesis does not hold when the conventional one-regime VAR model is used. Abual-Foul (2004) found evidence of unidirectional causality from exports to GDP in Jordan while Husein (2009) reported a bidirectional causality between the two variables. Begum and Shamsuddin (1998), Mamun and Nath (2005) and Paul (2014) found support for the export-led growth hypothesis for Bangladesh,

while Chandra and Love (2005) validated the growth-led exports model. Mah (2005) examined the case of China using a two-variable model. He found evidence of bidirectional causality between exports and economic growth. Tang (2006) extended the work by Mah (2005) by adding imports as a third variable. He found no long run relationship between real GDP, exports and imports. He further found no causal relationship between exports and economic growth while economic growth does cause imports in the short-run.

Reppas and Christopoulos (2005) used fully modified OLS techniques to address the export-growth nexus for a sample of 22 African and Asian countries. They found evidence supporting the growth-led export model and not the export-led growth hypothesis for 12 countries (Cote d'Ivoire, Gabon, Mauritius, South Africa, India, Korea, Malaysia, Nepal, Pakistan, Singapore, Sri Lanka and Thailand) as well as for the panel as a whole. For the other countries of the sample, there is no significant relationship between exports and output. Shirazi and Manap (2005) examined the export-led growth hypothesis for five south Asian countries, namely: Bangladesh, India, Nepal, Pakistan and Sri Lanka. They used a trivariate framework including real exports, real imports and real GDP. The results provided strong support for a long run relationship among the variables for all the countries except Sri Lanka. Exports and imports are found to be positively associated with economic growth in the long run. The results of Granger causality tests showed bidirectional causality between exports and GDP for Bangladesh and Nepal, and unidirectional causality from exports to GDP for Pakistan. No causality was found for Sri Lanka. Furthermore, bidirectional causality exists between imports and GDP for Pakistan, Bangladesh, and Nepal, as well as causality from imports to GDP for Sri Lanka. In addition, there was a feedback effect between exports and imports in Bangladesh and Nepal, and causality from exports to imports in India. Bahmani-Oskooee and Oyolola (2007) employed the bounds testing approach to study the case of 44 countries. They found that in a majority of the countries there is a short-run causal relationship between exports and economic growth in both directions. However, in the long run the export-led growth hypothesis holds in only 60% of the countries while the growth-led exports hypothesis is supported in 40% of the countries. These findings are obtained using a two-variable framework. Chen (2007) found evidence in support of bidirectional causality between exports and growth in Taiwan. Bahmani-Oskooee and Economidou (2009) in a study of 61 countries concluded that there is no clear support for neither of the two hypotheses and the results are country-specific. Furuoka and Munir (2010) in the case of Singapore did not find evidence in support of the export-led growth hypothesis. They found a negative impact of exports on economic growth in the long-run, and a short-run causality running from economic growth to exports. They recognize that their results may suffer from variable omission bias and thus suggested incorporating financial development or other important variable that may affect economic growth and the degree of the diversification of the economy. Tsen (2010) found bi-directional causality between exports, domestic demand and economic growth in China. Rahmaddi and Ichihashi (2011) examined the case of Indonesia and found supporting evidence of export-led growth in the long-run and growth-led export in the short-run. Dreger and Herzer (2013) used various panel data regression methods to examine the impact of exports on non-export GDP for a panel of 45 developing countries. They found that exports have a positive short-run effect on non-export GDP while the long-run effect of exports on non-export GDP is negative. Nevertheless, there are large differences in the long-run effect of exports across countries. More precisely, the positive effect is observed in 31 countries while a negative effect works in 14 countries. They also found that within each group the individual country estimates of long-run effects show considerable heterogeneity due to country-specific factors such as primary export dependence, business and labor regulation. Hye et al. (2013) examined the export-led growth nexus for six Asian countries using the ARDL approach. They found evidence supporting the export-led growth hypothesis for all countries except Pakistan, while the import-led growth hypothesis holds for all countries. The growth-led export hypothesis holds for all countries except Bangladesh and Nepal, while the growth-led import applies to all countries. However, these results are obtained from bivariate models. Lam (2016) analyzed the export-GDP nexus for four ASEAN countries (Indonesia, Malaysia, Thailand and the Philippines). He found short-run bidirectional causality for Malaysia, the Philippines and Thailand and unidirectional causality from economic growth to exports for Indonesia. In the long-run, bidirectional causality is found for Malaysia and Thailand, unidirectional causality from economic growth to exports for Indonesia. Sothan (2016) found long-run bidirectional causality between exports and GDP in 21 Asian countries.

Studies concerning African countries are relatively limited and again provide mixed results. Fosu (1990) studied the impact of exports on economic growth in 28 African countries using an augmented production function including labor, capital formation, and exports. He found that exports exert a positive impact on economic growth. Ahmed and Kwan (1991) found support for the growth-led export hypothesis but not for the export-led growth hypothesis in a study of 47 African countries over the period 1981–1987. In the case of Nigeria, Alimi and Muse (2013) found that economic growth causes exports. Ukpolo (1998) used a bivariate model and provided support for the growth-led export hypothesis in South Africa for the period 1964–1993. Rangasamy (2009) examined the case of South Africa with a model including the terms of trade as additional variable. The results provided support for the export-led growth hypothesis both in the short and long run. Abdulai and Jaquet (2002) studied the case of Cote d'Ivoire for the period 1961–1997. While controlling for investment and labor force, they found evidence supporting the export-led growth hypothesis both in the short and long run. Foster (2006) applied threshold regression techniques to a sample of 43 African countries over the period 1960–1999. He found a positive relationship between exports and per capita income. This positive relationship exists for countries with lower levels of initial development and lower levels of exports to GDP, but not for countries with higher levels of these variables. Jordaan and Eita (2007) used cointegration techniques to provide support for the export-led growth hypothesis in Namibia for the period 1970–2005. Tekin (2012) examined the case of 18 least developed countries over the period 1970–2009. He used

a panel data approach that properly copes with the problem of cross-sectional dependency. He did not find any causality for Central African Republic and Liberia. The results provided evidence of the export-led growth model in Haiti, Rwanda and Sierra Leone, and the growth-led exports model in Angola, Chad and Zambia. There is no causality between exports and economic growth for Benin, Burkina Faso, Gambia, Niger, Senegal and Togo. Jarra (2013) examined the relationship between exports, domestic demand and economic growth in Ethiopia for the period 1960–2011. He found evidence of a long-run relationship between the variables, and both exports and domestic demand are important for economic growth and economic growth has an important impact on exports and domestic demand. Muhoro and Otieno (2014) confirmed the export-led growth for Kenya during the period from 1976 to 2011. He employed a seven-variable model including GDP, exports, imports, household consumption, government consumption, gross fixed capital formation and foreign direct investment. Mah (2015) applied the bounds test to economic growth, investment, exports and aid inflow in Tanzania. He found that export expansion causes economic growth positively. Finally, Ee (2016) carried out a panel data study of export-led growth hypothesis for three Sub-Saharan African countries, namely Botswana, Equatorial Guinea and Mauritius for the period of 1980–2014. Applying the FMOLS and DOLS estimations he found a positive impact of investment, government expenditure and exports on economic growth, providing support for the export-led growth hypothesis.

From this literature review it is clear that the evidence regarding the exports and economic growth nexus is not conclusive and therefore remains an empirical issue. Furthermore, empirical case-studies on African countries are relatively limited. In this study, we examine the export-growth linkage for a sample of selected African countries.

3. MODEL AND METHODOLOGY

3.1. Empirical Model

This study adopts a modeling framework that goes beyond the traditional neoclassical production function by estimating an augmented cobb-douglas function including exports and imports as additional variables. The empirical model is specified as follows:

$$y_t=\theta_0+\theta_1 k_t+\theta_2 l_t+\theta_3 x_t+\theta_4 m_t+\mu \quad (1)$$

Where y, k, l, m and x represent the log of real GDP, real physical capital, labor force, real imports and real exports, respectively.

3.2. Methodology

Our empirical investigation involves three steps. The first step is to test for unit root in the data. The second step is to test for the presence of long-run relationships between the variables. To achieve this, the study uses the ARDL bounds testing approach to cointegration developed by Peasaran et al. (2001). The advantages of this method over other alternative methods have been documented in the literature. The bounds testing procedure is based on the following ARDL-ECM equation:

$$\Delta y_t=\varphi_0+\varphi_1 y_{t-1}+\varphi_2 x_{t-1}+\varphi_3 z_{t-1}+\sum_{i=1}^{m}\gamma_{1i}\Delta y_{t-i}+\sum_{i=0}^{n}\gamma_{2i}\Delta x_{t-i}+\sum_{i=0}^{p}\gamma_{3i}\Delta z_{t-i}+e_t \quad (2)$$

Where, Δ is the difference operator, $z=(k, l, m)$, ϕ_1, ϕ_2 and ϕ_3 are the long-run multipliers and ϕ_0 is the drift constant, while γ_{1i}, γ_{2i} and γ_{3i} are the short-run dynamics of the variables. Eq. (2) is estimated using each variable as the dependent variable.

The presence of long-run relationship is tested by restricting coefficients of lagged level variables equal to zero. That is, the null hypothesis of no long-run relationship is $\phi_1=\phi_2=\phi_3=0$. This hypothesis is tested by the mean of an F-test. The asymptotic critical values are provided by Pesaran et al. (2001). The bounds testing procedure is sensitive to the selection of the lag structure (m, n, p). In this study, the lag structure was selected using the Akaike Information Criterion (AIC) with maximum lag length on each variable set to five.

Cointegration indicates only whether or not a long-run relationship exists between the variables. However, it does not indicate the direction of the causal relationship among them. Hence, to provide information on the direction of causal relationships, we perform the ECM-based causality tests. For this purpose, we estimate the following model:

$$\begin{bmatrix}\Delta y_t\\ \Delta x_t\\ \Delta z_t\end{bmatrix}=\begin{bmatrix}\alpha_1\\ \alpha_2\\ \alpha_3\end{bmatrix}+\sum_{i=1}^{p}\begin{bmatrix}\beta_{1i} & \gamma_{1i} & \delta_{1i}\\ \beta_{2i} & \gamma_{2i} & \delta_{2i}\\ \beta_{3i} & \gamma_{3i} & \delta_{3i}\end{bmatrix}\times\begin{bmatrix}\Delta y_{t-i}\\ \Delta x_{t-i}\\ \Delta z_{t-i}\end{bmatrix}+\begin{bmatrix}\lambda_1\\ \lambda_2\\ \lambda_3\end{bmatrix}ECT_{t-1}+\begin{bmatrix}e_{1t}\\ e_{2t}\\ e_{3t}\end{bmatrix} \quad (3)$$

Where, ECT_{t-1} denotes the lagged residuals of the long-run relationship. The lag length p is determined using the AIC. The significance of the differenced explanatory variables indicates the short-run causality, whereas the significance of ECT_{t-1} confirms the long-run causal relationship. For example, exports do not cause GDP in the short-run if $\gamma_{11}=\gamma_{12}=\ldots=\gamma_{1p}=0$. Similarly, GDP does not cause exports if none of β_{2i} is statistically different from zero.

4. DATA AND EMPIRICAL RESULTS

The study uses annual data for 12 African countries, namely: Benin, Burkina Faso, Cameroon, The Democratic Republic of the Congo (Congo, DR), the Republic of the Congo (Congo), Cote d'Ivoire, Gabon, Ghana, Kenya, Nigeria, Senegal and South Africa. The countries were selected based on data availability. The data set for each country consists of observations for real GDP, real imports (Imports), real exports (Exports), real gross fixed capital formation as proxy for capital (Capital) and population (ages 15–64 years) as proxy for labor force. The data is sourced from the 2015 World Development Indicators of the World Bank. Real exports and imports have been computed on the basis of their respective shares in GDP. All data are in constant 2005 US dollar and converted into natural logarithms.

Table 1 reports some descriptive statistics on the variables. As can be seen, most African countries import more than they export. The

correlation coefficients suggest a positive relationship between exports and GDP. Is there any evidence of the export-led growth or the reverse? Does any causality exist between exports and GDP in the countries under study? Our empirical analysis will address these questions.

Prior to investigating the relationships between the variables, we test for the stationarity of the data by means of the unit root test of Phillips and Perron (1988). This step is necessary to ensure that none variable is I(2). The results displayed in Table 2 suggest that all the variables are stationary after taking the first difference. This implies the possibility of long run relationships among them.

In the empirical analysis, three models were estimated. We first estimate a basic two-variable model consisting of GDP and exports. We then expand the model to include both gross fixed capital formation and labor force. Lastly, we include imports into the analysis. By including capital, labor and imports in the modeling framework we check the sensitivity of the results. As our analysis will show, causality results are dependent on the inclusion of controlling variables, and this may explain in part the conflicting evidence in previous empirical studies.

Table 3 reports the results of the bounds test for the three models. These results indicate that exports and GDP are not cointegrated

Table 1: Descriptive statistics of variables

Country	Sample	Mean±SD					ρ
		GDP	Capital	Imports	Exports	Labor	
Benin	1982-14	22.00±0.39	20.30±0.63	20.90±0.45	20.46±0.54	15.03±0.33	0.93
Burkina	1979-14	21.99±0.53	20.39±0.69	20.68±0.57	19.82±0.80	19.82±0.80	0.95
Cameroon	1975-14	23.28±0.32	21.62±0.38	21.79±0.39	21.76±0.32	15.75±0.33	0.84
Congo, DR	1970-14	23.42±0.21	21.18±0.70	21.91±0.52	21.82±0.49	16.78±0.38	0.51
Congo	1974-14	22.26±0.41	20.89±0.45	21.57±0.52	21.72±0.64	14.15±0.34	0.95
Cote d'Ivoire	1970-14	23.38±0.25	21.40±0.33	22.32±0.35	22.47±0.37	15.67±0.43	0.93
Gabon	1970-14	22.74±0.32	21.52±0.35	21.76±0.25	22.14±0.35	13.20±0.32	0.89
Ghana	1970-14	22.65±0.49	20.69±1.03	21.31±1.16	21.05±1.04	15.92±0.38	0.91
Kenya	1970-14	23.24±0.49	21.58±0.48	22.10±0.51	21.87±0.39	16.29±0.47	0.93
Nigeria	1981-14	25.07±0.47	22.91±0.59	23.45±0.65	23.84±0.61	17.92±0.26	0.81
Senegal	1970-14	22.47±0.38	20.78±0.62	21.49±0.48	21.16±0.38	15.21±0.38	0.93
South Africa	1970-14	25.96±0.30	24.38±0.26	24.57±0.42	24.66±0.37	16.87±0.33	0.93

Standard denotes standard deviation. ρ is the correlation coefficient of exports with GDP. GDP: Gross domestic product

Table 2: Results of unit root tests

Country	*y*	*k*	*l*	*x*	*m*	*Δy*	*Δk*	*Δl*	*Δx*	*Δm*
Benin	−2.85	−5.37*	−2.97	−2.88	−2.94	−6.54*	−10.60*	−2.48	−7.04*	−7.63*
Burkina	−1.86	−2.41	−11.28*	−1.59	−0.96	−6.39*	−8.26*	−2.06	−5.70*	−4.64*
Cameroon	−2.04	−2.65	−5.36*	−2.46	−1.28	−4.17*	−5.70*	−3.48*	−6.32*	−6.02*
Congo, DR.	−0.46	−2.95	−1.08	−2.38	−2.54	−2.36	−10.17*	−2.01	−7.16*	−8.43*
Congo	−1.91	−2.17	−0.31	−2.60	−2.83	−3.67*	−5.17*	−1.87	−5.81*	−6.95*
Cote d'Ivoire	−2.82	−1.72	−0.67	−2.60	−2.29	−4.31*	−5.28*	−1.03	−6.92*	−6.08*
Gabon	−3.50	−3.47	−8.41*	−3.78*	−4.39*	−4.59*	−6.89*	−3.96*	−7.49*	−7.35*
Ghana	−0.63	−2.48	−2.33	−2.10	−2.41	−4.22*	−6.42*	−2.34	−4.42*	−4.46*
Kenya	−4.65	−3.18	0.90	−3.26**	−4.97*	−5.66*	−9.52*	−1.80	−6.57*	−19.35*
Nigeria	−1.87	−1.93	−2.66	−3.42	−3.56	−4.23*	−4.43*	−2.90	−8.24*	−6.83*
Senegal	−1.66	−3.51	−1.56	−3.52	−2.05	−8.29*	−8.13*	−1.89	−10.82*	−6.91*
South Africa	−1.47	−1.33	0.03	−2.09	−1.65	−4.51*	−3.66*	−1.20	−5.35*	−6.69*

y, *k*, *l*, m and *x* denote log of real GDP, capital, labor force, real imports and real exports, respectively. *and **denote the rejection of the null hypothesis of unit root at the 5% and 10% levels, respectively. GDP: Gross domestic product

Table 3: Results of bounds test for cointegration

Country	GDP and exports		GDP, capital, labor and exports			GDP, capital, labor, exports and imports			
	F_{GDP}	F_X	F_{GDP}	F_X	F_K	F_{GDP}	F_X	F_K	F_M
Benin	19.87*	4.29	19.78*	3.00	10.42*	57.13*	19.29*	7.11*	2.19
Burkina	1.57	4.04	6.09*	2.87	3.58	181.96*	166.51*	1.39	5.11*
Cameroon	14.86*	3.37	7.52*	4.55*	10.46*	11.69*	14.13*	12.02*	6.40*
Congo, DR.	4.08	3.18	15.57*	7.88*	6.00*	4.75*	9.88*	16.11*	14.65*
Congo	2.49	1.09	3.06	6.04*	4.13**	9.85*	11.10*	2.89	13.18*
Côte d'Ivoire	5.03	2.49	4.21*	4.15	5.26*	5.01*	4.73*	6.49*	8.69*
Gabon	15.73*	5.40**	6.24*	7.32*	4.66*	11.34*	7.09*	4.94*	7.79*
Ghana	16.45*	4.32	34.65*	7.01*	5.85*	27.18*	5.24	4.71	7.23*
Kenya	1.87	5.21*	9.21*	3.31	3.60**	3.45	4.05*	2.10	11.46*
Nigeria	6.65*	5.34*	3.00	8.04*	5.83*	8.11*	12.13*	4.45*	2.30
Senegal	2.81	6.97*	4.57*	7.53*	8.96*	5.47*	4.61*	15.65*	6.24*
South Africa	4.88**	5.12**	15.23*	4.79*	14.16*	8.05*	6.25*	7.92*	8.15*

*and **indicate the rejection of the null hypothesis of no cointegration at the 5% and 10% levels, respectively. Critical values for F-statistics are from Peasaran et al. (2001). Maximum lag length on each variable was set to five. GDP: Gross domestic product

in Burkina Faso, the Democratic Republic of the Congo, the Republic of Congo and Cote d'Ivoire, if tested within a bivariate model. However, such an inference is incorrect since the two variables share a reliable long-run relationship if considered in a multivariate framework. As the bounds test results indicate, the null hypothesis of no long-run relationship is rejected at the 10% level for eight countries if a bivariate model is considered. However, when capital and labor are controlled for, the results show long-run relationships among the variables in all countries. These results confirm that export-growth studies with a bivariate framework are biased due to the omission of relevant variables. Hence, the inclusion of capital, labor and imports is probably the cause of the improvement of the cointegration results.

Given the evidence of cointegration, we further present the estimates of the long-run coefficients for countries where cointegration was found. Results are disclosed in Table 4. As expected all the signs are positive in the bivariate model indicating that exports and GDP are positively correlated in the long-run. Furthermore, the results support the export-led growth hypothesis for six countries. Nigeria has the highest export elasticity of output (1.57), followed by Ghana (1.13), Benin (0.95), Cameroon (0.56), South Africa (0.31) and Gabon (0.23). Exports are playing a significant role in the economic growth of these countries. However, when controlling variables are included, the number of countries where the export-led growth hypothesis holds falls to four. The results also support the import-led growth hypothesis for seven countries (Benin, Burkina Faso, Cameroon, Gabon, Ghana, Nigeria and South Africa). The fact is that most African countries rely more on imports, especially in terms of raw materials, machines and productive technology that are further used for production of goods and services. Furthermore, exports have positive effects on imports in the Democratic Republic of the Congo, Cote d'Ivoire and Kenya, while imports are positively related to exports in Ghana. The evidence of exports promoting imports is in line with the view that greater exports, through accumulation of foreign exchange facilitate more imports, which provides further beneficial effects on economic growth.

The results of Granger causality tests are reported in Table 5. In the bivariate model, the results support that exports cause economic growth in the long run in Benin, Cameroon, Gabon, Ghana, Nigeria, and South Africa, and in the short run in Benin, Burkina Faso and Ghana. The reverse causality running from GDP to exports is found only in the long run in Kenya and Senegal, meaning that economic growth contributes to export promotion in these two countries. There is bidirectional causality between GDP and exports in the Democratic Republic of Congo in the short run. On the contrary, no causal relationship was found for Congo and Cote d'Ivoire. These results change when controlling variables are considered. The results for all models are summarized in Table 6. The results from model including GDP, capital, labor and exports show evidence supporting the export-led growth hypothesis in Benin, Cameroon, Cote d'Ivoire, Ghana, Kenya, Senegal, and South Africa. They also indicate evidence of bidirectional causality between GDP and exports in Gabon and Burkina Faso when capital and labor are included into the analysis and in Benin, Burkina Faso, and Nigeria when imports are controlled for. This result indicates

Table 4: Long run ARDL estimates

Country	GDP and exports		GDP, capital, labor and exports				GDP, capital, labor, exports and imports				
	GDP	X	GDP	K	L	X	GDP	K	L	X	M
Benin	1	0.95* (13.30)	1	0.22* (4.43)	0.94* (8.80)	−0.11 * (−3.94)*	1	0.45* (3.09)	6.76* (4.38)	−0.31* (−5.50)	0.28* (4.00)
Burkina	-	-	1	0.10* (3.05)	−0.11 (−0.43)	−0.03 (−1.62)	1	−0.09* (−3.36)	1.22* (16.29)	−0.24* (−13.52)	0.63* (9.17)
Cameroon	1	0.56* (5.77)	1	0.27* (7.69)	−7.68* (−6.25)	0.30* (8.60)	1	−0.16* (−3.15)	0.10 (1.69)	−0.13** (−1.83)	0.87* (7.32)
Congo, DR.	-	-	1.54* (3.75)	0.02 (0.14)	−16.82* (−3.54)	1	−0.64* (−3.02)	0.17* (2.18)	3.19* (4.34)	0.99* (11.74)	1
Congo	-	-	0.11 (0.80)	0.39* (7.94)	4.40 (0.00)	1	−1.26* (−5.59)	1.90* (8.26)	3.80* (5.62)	−1.58* (−3.55)	1
Cote d'Ivoire	-	-	1	0.08* (2.09)	0.30* (5.37)	0.35* (3.63)	1.20* (4.51)	0.17* (2.34)	−0.86* (−4.09)	0.27* (2.48)	1
Gabon	1	0.23* (3.43)	1	0.35* (6.40)	0.24* (2.89)	0.15* (3.08)	1	0.01 (0.06)	0.47* (5.83)	0.17* (4.08)	0.42* (3.78)
Ghana	1	1.13* (42.33)	1	−0.45* (−4.05)	3.27* (12.30)	−0.17* (−2.59)	0.44* (2.48)	0.03 (0.18)	−8.04* (−2.86)	1	1.05* (12.53)
Kenya	0.63* (5.75)	1	1	0.62* (10.47)	0.48* (8.03)	−0.15* (−2.02)	−0.70 (−1.16)	0.46* (2.03)	0.58 (1.41)	0.96* (5.27)	1
Nigeria	1	1.57* (2.17)	2.52* (4.83)	−0.78* (−4.92)	−1.81* (−2.43)	1	1	0.32* (16.90)	1.06* (10.60)	0.19* (3.05)	0.07** (1.93)
Senegal	0.93* (10.98)	1	1	0.28* (3.07)	2.01* (3.22)	0.68* (5.88)	1	0.92 (1.65)	3.56* (2.28)	1.25* (2.21)	−0.42 (−1.16)
South Africa	1	0.31* (6.42)	1	0.15* (3.71)	0.58* (18.30)	0.27* (5.39)	1	0.15* (3.18)	0.58* (23.16)	0.16* (4.96)	0.11 (1.94)**

Figures enclosed in parentheses are t-statistics. *and **indicate significance at 5% and 10% levels, respectively. GDP: Gross domestic product, ARDL: Autoregressive distributed lag

Table 5: Granger causality test results

Country	Depvar.	Model 1: GDP and exports				Model 2: GDP, capital, labor and exports					Model 3: GDP, capital, labor, exports and imports					
		Lag	Source of causation			Lag	Source of causation				Lag	Source of causation				
		(p)	GDP	X	ECT	(p)	GDP	K	X	ECT	(p)	GDP	K	X	M	ECT
Benin	GDP	4	-	0.02*	−2.85*	3	-	0.02*	0.00*	−4.12*	4	−	0.00*	0.13	0.00*	−2.26*
	X	4	0.15	-	0.21	3	0.24	0.27	-	−0.89	4	0.00*	0.00*	-	0.03*	−2.97*
	M	-	-	-	-	-	-	-	-	-	4	0.67	0.49	0.85	-	−0.69
Burkina	GDP	1	-	0.00*	-	5	-	0.14	0.03*	−2.51*	4	-	0.83	0.00*	0.00*	−2.89*
	X	1	0.64	-	-	5	0.08**	0.29	-	0.83	4	0.00*	0.00*	-	0.00*	−4.31*
	M	-	-	-	-	-				-	4	0.00*	0.01*	0.01*	-	−4.11*
Cameroon	GDP	3	-	0.89	−2.27*	4	-	0.00	0.12	−2.83*	3	-	0.37	0.00*	0.00*	−2.95*
	X	3	0.34	-	0.59	4	0.14	0.17	-	−1.43	3	0.78	0.83	-	0.32	025
	M	-				-	-	-	-	-	3	0.82	0.24	0.03*	-	−0.79
Congo,	GDP	2	-	0.06**	-	5	-	0.49	0.17	0.45	1	-	0.40	0.83	0.77	−0.58
DR.	X	2	0.06**	-	-	5	0.28	0.78	-	−2.54*	1	0.20	0.13	-	0.76	−0.31
	M	-	-	-	-	-	-	-		-	1	0.01*	0.01*	0.40	-	−2.19*
Congo	GDP	1	-	0.54	-	4	-	0.18	0.82	−0.36	4	-	0.00*	0.38	0.01*	−1.33
	X	1	0.15	-	-	4	0.00*	0.00*	-	−4.23*	4	0.00*	0.03*	-	0.01*	−3.42*
	M	-	-	-	-	-	-	-	-	-	4	0.27	0.19	0.00*	-	−2.78*
Cote	GDP	1	-	0.24	-	1	-	0.63	0.27	−3.67*	5	-	0.90	0.77	0.81	−2.76*
d'Ivoire	X	1	0.64	-	-	1	0.92	0.84	-	−0.34	5	0.93	0.88	-	0.43	−0.30
	M	-	-	-	-	-	-	-	-	-	5	0.02*	0.55	0.45	-	−2.28*
Gabon	GDP	1	-	0.37	−4.58*	4	-	0.27	0.71	−1.93*	4	-	0.09**	0.64	0.00*	−2.05*
	X	1	0.12	-	−0.33	4	0.26	0.23	-	2.40*	4	0.44	0.46	-	0.90	1.29
	M	-	-	-	-	-	-	-	-	-	4	0.13	0.45	0.23	-	1.57
Ghana	GDP	5	-	0.11	−3.01	5	-	0.08**	0.06**	−2.61*	4	-	0.18	0.21	0.05*	−2.28*
	X	5	0.00*	-	1.02	5	0.17	0.92	-	−0.45	4	0.10**	0.97	-	0.56	2.50*
	M	-	-	-	-	-	-	-	-	-	4	0.06**	0.38	0.39	-	−2.94*
Kenya	GDP	1	-	0.54	0.51	4	-	0.04*	0.71	−2.53*	5	-	0.77	0.13	0.61	−0.56
	X	1	0.15	-	−3.66*	4	0.70	0.54	-	0.12	5	0.83	0.25	-	0.56	0.40
	M	-	-	-	-	-	-	-	-	-	5	0.08**	0.30	0.55	-	−2.01*
Nigeria	GDP	1	-	0.29	−2.11*	5	-	0.10**	0.16	0.30	2	-	0.20	0.18	0.55	−3.19*
	X	1	0.77	-	1.12	5	0.00*	0.00*	-	−3.12*	2	0.39	0.16	-	0.55	2.57*
	M	-	-	-	-	-	-	-	-	-	2	0.74	0.44	0.12	-	1.43
Senegal	GDP	1	-	0.53	0.88	4	-	0.85	0.03*	−3.98*	5	-	0.12	0.08**	0.87	−2.97*
	X	1	0.33	-	−2.96*	4	0.42	0.13	-	0.41	5	0.17	0.11	-	0.04*	−1.03
	M	-	-	-	-	-	-	-	-	-	5	0.68	0.30	0.16	-	−0.63
South	GDP	1	-	0.61	−2.31*	1	-	0.33	0.46	−2.28*	5	-	0.62	0.67	0.54	−5.65*
Africa	X	1	0.80	-	1.44	1	0.18	0.11	-	1.28	5	0.47	0.71	-	0.15	−0.21
	M	-	-	-	-	-				-	5	0.00*	0.00*	0.01*	-	−2.14*

Figures reported are P values of Wald statistics for lagged differenced coefficients. Values for ECMT are t-statistics for the ECT coefficients. *and **indicate significance at 5% and 10% levels, respectively. GDP: Gross domestic product

Table 6: Summary of granger causality tests

Results	Time horizon	Model 1: GDP and exports	Model 2: GDP, capital, labor and exports	Model 3: GDP, capital, labor, exports and imports
Export-led growth	Long-run	Benin, Cameroon, Gabon, Ghana, Nigeria, South Africa	Benin, Cameroon, Cote d'Ivoire, Ghana, Kenya, Senegal, South Africa	Cameroon, Cote d'Ivoire, Gabon, Ghana, Senegal, South Africa
	Short-run	Benin, Burkina Faso, Ghana	Benin, Senegal, Ghana	Cameroon, Senegal
Growth-led exports	Long-run	Kenya, Senegal	Congo DR, Nigeria	Congo
	Short-run	-	Congo, Nigeria	Benin, Congo, Ghana
Two-way causality	Long-run	-	Gabon	Benin, Burkina Faso, Nigeria
	Short-run	Congo, DR.	Burkina Faso	Burkina Faso
No causality	-	Congo, Cote d'Ivoire	-	Congo DR., Kenya

GDP: Gross domestic product

that exports and economic growth reinforce each other in these countries. It is consistent with the view of Helpman and Krugman (1985) and Bhagwati (1988) that exports may arise from the realization of economies of scale due to productivity gains. When we control for imports, there is no causal relationship between GDP and exports in the Democratic Republic of the Congo and Kenya.

5. CONCLUSION AND POLICY IMPLICATIONS

During the last two decades, a wide empirical literature has been accumulated to investigate the relationship between exports and economic growth. The evidence from this literature is however mixed and inconclusive. Most of existing studies have relied on a bivariate framework and the role of capital and imports has been largely ignored. This study addresses this shortcoming by adopting a multivariate framework to analyze the export-growth nexus for 12 Sub-Saharan African countries. The results are compared with those from a bivariate framework.

The empirical analysis shows mixed evidence across countries and model specifications. Within the bivariate framework, we found evidence of long-run relationships between exports and GDP in eight countries and the export-led growth hypothesis holds in Benin, Burkina Faso, Cameroon, Gabon, Ghana, Nigeria, and South Africa. However, when capital, labor and imports are included into the model, the results show long-run relationships among the variables in all countries and the export-led growth hypothesis holds in Cameroon, Cote d'Ivoire, Gabon, Ghana, Senegal, and South Africa. These findings provide an empirical basis for promoting exports in these countries. To gain sustainable economic growth, these countries should make the economic environment conducive to trade through appropriate regulatory and trade policy reforms. This can be achieved by reducing the cost of doing business, reducing trade barriers and improving public infrastructures. The growth-led exports hypothesis is confirmed in Kenya and Senegal in the bivariate model while it holds in Benin, the Republic of the Congo and Ghana in the multivariate model. There is bidirectional causal relationship between GDP and exports only in the Democratic Republic of the Congo under the bivariate model, and in Benin, Burkina Faso and Nigeria in the multivariate framework.

The results of this study highlight the risk of misleading conclusions based on bivariate models when examining the export-growth nexus. The role of imports and capital cannot be ignored when investigating this nexus. In addition, studies using panel regressions may provide fragile findings because the results are country-specific. These results bring home the usefulness of country case studies in order to address heterogeneity and offer more relevant policy recommendations.

REFERENCES

Abdulai, A., Jaquet, P. (2002), Exports and economic growth: Cointegration and causality evidence for Côte d'Ivoire. African Development Review, 14(1), 1-17.

Abual-Foul, B. (2004), Testing the export-led growth hypothesis: Evidence from Jordan. Applied Economics Letters, 11(6), 393-396.

Acaravci, A., Ozturk, I. (2012). Foreign direct investment, export and economic growth: Empirical evidence from new EU countries. Romanian Journal of Economic Forecasting, 2, 52-67.

Afzal, M., Hussain, I. (2010), Export-led growth hypothesis: Evidence from Pakistan. Journal of Quantitative Economics, 8(1), 130-147.

Ahmed, J., Kwan, A.C.C. (1991), Causality between exports and economic growth: Empirical evidence from Africa. Economic Letters, 37(3), 243-248.

Alimi, S.R., Muse, B.O. (2013), Export-led growth or growth-driven exports? Evidence from Nigeria. British Journal of Economics, Management and Trade, 3(2), 89-100.

Al-Yousif, K. (1999), On the role of exports in the economic growth of Malaysia: A multivariate analysis. International Economic Journal, 13(3), 67-75.

Bahamani-Oskooee, M., Alse, J. (1993), Export growth and economic growth: An application of cointegration and error correction modelling. Journal of Developing Areas, 27(4), 535-542.

Bahmani-Oskooee, M., Economidou, C. (2009), Export led growth vs. growth led exports: LDCs experience. Journal of Developing Areas, 42(2), 179-209.

Bahmani-Oskooee, M., Oyolola, M. (2007), Export growth and output growth: An application of bounds testing approach. Journal of Economics and Finance, 31(1), 1-11.

Baharumshah, A.Z., Rashid, S. (1999), Exports, imports and economic growth in Malaysia: Empirical evidence based on multivariate time series. Asian Economic Journal, 13(4), 389-406.

Begum, S., Shamsuddin, A.F.M. (1998), Exports and economic growth in Bangladesh. Journal of Development Studies, 35(1), 89-114.

Bhagwati, J.N. (1988), Poverty and public policy. World Development, 16(5), 539-555.

Chandra, R. (2003), Reinvestigating export-led growth in India using a multivariate cointegration framework. Journal of Developing Areas, 37(1), 73-86.

Chandra, R., Love, J. (2005), Testing export-led growth in Bangladesh

in a multivariate VAR framework. Journal of Asian Economics, 15(6), 1155-1168.
Chang, R., Kaltani, L., Loayza, N.V. (2009), Openness can be good for growth: The role of policy complementarities. Journal of Development Economics, 90, 33-49.
Chen, S.W. (2007), Exactly what is the link between export and growth in Taiwan? New evidence from the Granger causality test. Economics Bulletin, 6(7), 1-10.
Chenery, H., Strout, A. (1966), Foreign assistance and economic development. American Economic Review, 56, 679-733.
Dash, R.K. (2009), Revisited export-led growth hypothesis: An empirical study on India. South Asia Economic Journal, 10(2), 305-324.
Dhawan, U., Biswal, B. (1999), Re-examining export-led growth hypothesis: A multivariate cointegration analysis for India. Applied Economics, 31(4), 525-530.
Dodaro, S. (1993), Export and Growth: A reconsideration of causality. Journal of Developing Areas, 27(2), 227-244.
Dreger, C., Herzer, D. (2013), A further examination of the export-led growth hypothesis. Empirical Economics, 45(1), 39-60.
Ee, C.Y. (2016), Export-led growth hypothesis: Empirical evidence from selected Sub-Saharan African countries. Procedia Economics and Finance, 35, 232-240.
Ekanayake, E.M. (1999), Exports and economic growth in Asian developing countries: Cointegration and error-correction models. Journal of Economic Development, 24(2), 43-56.
Esfahani, S.H. (1991), Exports, imports and economic growth in semi-industrial countries. Journal of Development Economics, 35, 93-116.
Fosu, A.K. (1990), Exports and economic growth: The African case. World Development, 18(6), 831-835.
Foster, N. (2006), Exports, growth and threshold effects in Africa. Journal of Development Studies, 42(6), 1056-1074.
Furuoka, F. (2007), Do exports act as "engine" of growth? Evidence from Malaysia. Economics Bulletin, 6(37), 1-14.
Furuoka, F., Munir, L. (2010), Does export dependency hurt economic development? Empirical evidence from Singapore. Economics Bulletin, 30(1), 204-218.
Giles, J.A., Williams, C.I. (2000), Export-led Growth: A Survey of the Literature and some non-causality results, Part 1. Journal of International Trade and Economic Development, 9(3), 261-337.
Hassan, S., Murtala, M. (2016), Market size and export-led growth hypothesis: New evidence from Malaysia. International Journal of Economics and Financial Issues, 6(3), 971-977.
Helpman, E., Krugman, P. (1985), Market Structure and Foreign Trade. Cambridge, MA: MIT Press.
Husein, J. (2009), Export-led growth hypothesis: A multivariate cointegration and causality evidence for Jordan. Journal of Developing Areas, 42(2), 253-266.
Hye, Q.M.A., Wizarat, S., Lau, W.Y. (2013), Trade-led growth hypothesis: An empirical analysis of South Asian countries. Economic Modelling 35, 654-660.
Islam, M.N. (1998), Export expansion and economic growth: Testing for cointegration and causality. Applied Economics, 30(3), 415-425.
Jarra, S.T. (2013), Exports, domestic demand and economic growth in Ethiopia: A Granger causality analysis. Journal of Economics and International Finance, 5(9), 357-372.
Jordaan, A.C., Eita, J.H. (2007), Export and economic growth in Namibia: A Granger causality analysis. South African Journal of Economics, 75(3), 540-547.
Khan, A.H., Saqib, N. (1993), Exports and economic growth: The Pakistan experience. International Economic Journal, 7, 53-64.
Khalafalla, K.Y., Webb, A.J. (2001), Export-led growth and structural change: Evidence from Malaysia. Applied Economics, 33(13), 1703-1715.
Krishna, P., Levchenko, A. (2013), Comparative advantage, complexity, and volatility. Journal of Economic Behavior and Organization, 94, 314-329.
Krugman, P.R. (1984), Import protection as export promotion. In: Kierzkowski, H., editor. Monopolistic Competition in International Trade. Oxford: Oxford University Press.
Kumari, D., Malhotra, N. (2014), Export-led growth in India: Cointegration and causality analysis. Journal of Economic and Development Studies, 2(2), 297-310.
Lam, T.D. (2016), An empirical analysis of the ASEAN-4's causality between exports and output growth. International Journal of Economics and Financial Issues, 6(2), 497-502.
Lancaster, K. (1980), Intra-industry trade under perfect monopolistic competition. Journal of International Economics, 10, 151-175.
Lee, C.H., Huang, B.N. (2002), The relationship between exports and economic growth in East Asian countries: A multivariate threshold autoregressive approach. Journal of Economic Development, 27(2), 45-68.
Mah, J.S. (2005), Export expansion, economic growth and causality in China. Applied Economics Letters, 12(2), 105-107.
Mah, J.S. (2015), Export expansion and economic growth in Tanzania. Global Economy Journal, 15(1), 173-185.
Mahadevan, R. (2007), New evidence on the export-led growth nexus: A case study of Malaysia. The World Economy, 30(7), 1069-1083.
Mamun, K.A.A., Nath, H.K. (2005), Export-led growth in Bangladesh: A time series analysis. Applied Economics Letters, 12(6), 361-364.
McKinnon, R. (1964), Foreign exchange constraint in economic development and efficient aid allocation. Economic Journal, 74, 388-409.
Muhoro, G., Otieno, M. (2014), Export led growth hypothesis: Evidence from Kenya. Journal of World Economic Research, 3(4), 37-46.
Minier, J., Unel, B. (2013), When is trade protection good for growth? Economic Inquiry, 51, 62-71.
Ozturk, I., Acaravci, A. (2010), Testing the export-led growth hypothesis: Empirical evidence from Turkey. The Journal of Developing Areas, 44(1), 245-254.
Paul, B.P. (2014), Testing export-led growth in Bangladesh: An ARDL bounds test approach. International Journal of Trade, Economics and Finance, 5(1), 1-5.
Pesaran, H., Shin, Y., Smith, R.J (2001), Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289-326.
Phillips, P.C.B., Perron, P. (1988), Testing for a unit root in a time series regression. Biometrika, 75(2), 335-346.
Rahmaddi, R., Ichihashi, M. (2011), Exports and economic growth in Indonesia: A causality approach based on multivariate correction model. Journal of International Development and Cooperation, 17(2), 53-73.
Rangasamy, L. (2009), Exports and economic growth: The case of South Africa. Journal of International Development, 21(5), 603-617.
Reppas, P., Christopoulos, D. (2005), The export-output growth nexus: Evidence from African and Asian countries. Journal of Policy Modelling, 27(8), 926-940.
Riezeman, R.G., Summers, P.M., Whiteman, C.H. (1996), The engine of growth or its handmaiden? A time series assessment of export led growth. Empirical Economics, 21, 77-113.
Shahbaz, M., Azim, P., Ahmad, K. (2011), Export-led growth hypothesis in Pakistan: Further evidence. Asian Economic and Financial Review, 1(3), 182-197.
Shirazi, N.S., Manap, T.A. (2005), Export-led growth hypothesis: Further econometric evidence from South Asia. The Developing Economies, 43, 472-488.
Sothan, S. (2016), Foreign direct investment, exports and long-run

economic growth in Asia: Panel cointegration and causality analysis. International Journal of Economics and Finance, 8(1), 26-37.
Stiglitz, J.E. (1996), Some Lessons from the East Asian Miracle. The World Bank Research Observer, 11(2), 151-177.
Tang, T.C. (2006), New evidence on export expansion, economic growth and causality in China. Applied Economics Letters, 13(12), 801-803.
Tang, C.F., Lai, Y.W., Ozturk, I. (2015), How stable is the export-led growth hypothesis? Evidence from Asia's four little dragons. Economic Modelling, 44, 229-235.
Tekin, R.B. (2012). Economic growth, exports and foreign direct investment in least developed countries: A panel Granger causality analysis. Economic Modelling, 29(3), 868-878.
Thangavelu, S.M., Rajaguru, G. (2004), Is there an export or import-led productivity growth in rapidly developing Asian countries? A multivariate VAR analysis. Applied Economics, 36, 1083-1093.
Tsen, W.H. (2010), Exports, domestic demand, and economic growth in China: Granger causality analysis. Review of Development Economics, 14(3), 625-639.
Ukpolo, V. (1998), Exports and economic growth in South Africa: Evidence from cointegration and Granger-causality tests. The African Economic and Business Review, 1(1), 1-6.
World Bank. (1993), The East Asian Miracle: Economic Growth and Public Policy. New York: Oxford University Press.