Economic Modelling 35 (2013) 654–660

Contents lists available at ScienceDirect

Economic Modelling

journal homepage: www.elsevier.com/locate/ecmod

Trade-led growth hypothesis: An empirical analysis of South Asian countries

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ARTICLE INFO

Article history:
Accepted 31 July 2013

JEL classification:
F10
E23

Keywords:
Exports
Imports
Economic growth

ABSTRACT

In this paper we examine trade-growth nexus using data from six Asian countries. We apply the ADF unit root test to check for stationarity; and the autoregressive distributed lag (ARDL) approach for a long-run relationship among exports, imports and economic growth. For the direction of causality, we implement the modified Granger Causality test. We find that the export-led growth model is relevant to all countries except Pakistan, while the import-led growth model is relevant to all countries. The growth-led export model applies to all countries except Bangladesh and Nepal. The growth-led import model and export–import model are relevant for all countries in the sample. The results show that domestic and overseas demand contribute to economic growth and employment generation. Growth accruals through import-led model augur well for the countries studied. Our findings point to the potential for growth through tapping domestic demand in the event of global recession. It also appears that opportunities of joint catering for domestic demand through south–south trade expansion are possible.

1. Introduction

The theoretical and empirical link between international trade and economic growth has been investigated at length by academicians. The neoclassical economists point to the strong association between trade expansion and economic growth. They argue that export growth is the main driver of economic growth. Articulating this world view, Helpman and Krugman (1985) posit that export growth expedites economic growth through economies of scale – specialization in production and dissemination of technical knowledge. Bhagwati (1988), in supporting the neoclassical trade theory, proposed the growth led export hypothesis where he stated that economic growth stimulates both supply and demand sides of the economy. Bhagwati (1988) also noted that export growth promotes economic growth and in turn, economic growth promotes skill formation as well as technological progress. Both factors add to productive efficiency, and thus create a comparative advantage for the country. Easterly (2007) argues that exports help entry to the international market and expansion of the manufacturing sector. In addition exports boost economic efficiency through better allocation of resources and promote economic growth in the long run. According to Stiglitz (2007), the rapid growth of China and India is predominantly due to expansion of trade, mostly exports.

The extant empirical literature can be divided into three strands. Some use cross-country data and rank correlation method to test the Export-Led Growth (ELG) hypothesis (see Heller and Porter, 1978; Kravis, 1970; Maizels, 1963; Rana, 1986; Tyler, 1981), among others. The second group also uses cross-country data with regression technique e.g., OLS, 2SLS, 3SLS, Models; and panel data methods (SeeAlam, 1991; Amirkhalkhali and Dar, 1995; Balassa, 1985; Coppin, 1994; De Gregorio, 1992; Dodaro, 1991; Emery, 1967; Fosu, 1990, 1996; Mbaku, 1989; McNab and Moore, 1998; Michalopoulos and Jay, 1973; Otani and Villaneuva, 1990; Ram, 1985; Rana, 1986; Salvatore, 1983; Sheehey, 1992; Singer and Gray, 1988; Sprout and Weaver, 1993; Tyler, 1981; Voivodas, 1973; Williamson, 1978; Yaghmaian and Ghorashi, 1995).

The last group uses time series techniques to examine the export-growth nexus. For example Shan and Sun (1998) study the export-led growth hypothesis for China using monthly data and found bidirectional causality between export growth and economic growth. Ramos (2001) examines the association between export, import and GDP growth for Portugal using multivariate Johansen–Juselius (JJ) approach. He found bidirectional causality between GDP and exports, GDP and imports, imports and exports growth. Narayan and Smyth (2004) used co-integration and error correction model to examine the link between real exports, human capital accumulation and economic growth. The authors found a long-run relationship only if they included real exports as the dependent variable. Mah (2005) tested the autoregressive distributed lag (ARDL) model and found a long-run relationship and bidirectional causality between real GDP growth and export growth. In addition to data on term of trade, Awokuse (2005) used change in capital and foreign output shocks to Korean quarterly data. He used vector error correction model (VECM) and the augmented vector autoregressive (VAR) procedures to test causality. The results confirm the ELG and GLE hypothesis. The results show that capital, terms of trade and foreign output shocks influence economic growth.

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http://dx.doi.org/10.1016/j.econmod.2013.07.040

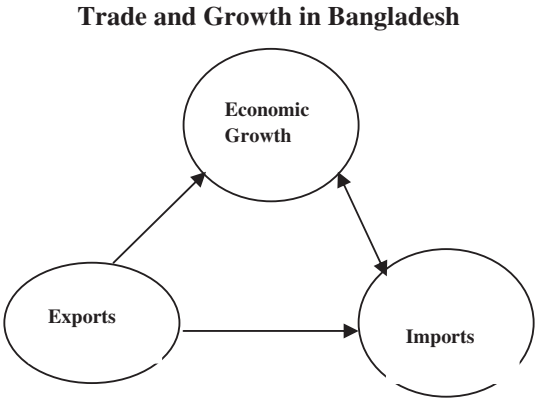

Fig. 1. Trade and growth in Bangladesh.

In addition, Tang (2006) reviewed the ELG hypothesis for China using imports as an additional variable. He used both the ARDL and the JJ approaches. The results failed to find co-integration between exports, imports and real GDP. Awokuse (2007) further tested the link between exports, imports and GDP using the Granger causality approach. He finds support for the ELG and the GLE hypotheses for Bulgaria; unidirectional causality from export and import to GDP growth for the Czech Republic; the ILG model for Poland. The variance decomposition and impulse response functions support the findings.

Subsequently, Herrerias and Orts (2009) explore the relationship between imports, investment, output and productivity in China. They show that in the long run both imports and investment stimulate output and labor productivity, but do not find causality between investment and imports. Katircioglu et al. (2010) employ the ARDL approach to examine a long-run relationship between trade and economic growth for Fiji Island, Papua New Guinea and Solomon Islands. They find that real income stimulates export growth in Fiji, but the ELG and ILG hypotheses cannot be validated for the Islands and the Pacific region. Hye and Siddiqui (2010) employ the rolling window bounds testing and variance decomposition methods to test foreign debt sustainability hypothesis for Pakistan. They conclude that imports cannot cause exports' but exports effectively cause imports; so foreign debt is unstable. Lee (2010) finds support for ELG, GLE, ILG and growth-led imports (GLI) in the short run only, but in the long run he does not find support for ELG and ILG for Pakistan. Shahbaz et al. (2011) employ the ARDL bounds testing approach to cointegration and error correction method (ECM) with quarterly data from Pakistan. They find that exports are positively correlated with economic growth.

Hye and Siddiqui (2011) further examine the relationship between exports, terms of trade and economic growth in Pakistan using ARDL with rolling regression method. They document that exports enhance economic growth, but *adverse* terms of trade hurt economic growth. They argue that it is necessary to promote exports in order to improve the terms of trade.[1] Hye (2012) further tests the ELG, GLE, ILG, GLI and foreign deficit sustainability hypothesis in China using annual data. The results confirm a long-run relationship between economic growth and exports, economic growth and imports, and exports and imports. They are in favor of the validity of ELG, GLE, ILG and GLI hypotheses. He also argues that foreign deficit is sustainable for China. Dar et al. (2013) apply wavelets based correlation and cross correlation methodology to Indian monthly data and find positive association between export growth and output growth. They also find that this relationship gets stronger as the time horizons expand. They also find bidirectional causality. Al-Khulaifi (2013) investigates a long-run relationship between exports and imports for Qatar using annual data. He employs JJ cointegration for long-run relationship and Granger causality test to determine the direction of causality. He finds co-integration between exports and imports, and international budget constraints in Qatar are not violated. The Granger causality results also indicate that imports cause exports in the long run.

[1] Related research on India includes Mallick (1996), Chandra (2002, 2003), Love and Chandra (2004, 2005)

Table 1
ADF unit root test results.

	Statistical level			Statistics (1st difference)		
	τ_T (ADF)	τ_μ (ADF)	τ (ADF)	τ_T (ADF)	τ_μ (ADF)	τ (ADF)
Bangladesh						
Ln(Y)	−0.431	3.021	7.014	−11.891*	−6.951*	−3.688*
Ln(X)	−1.515	0.217	6.798	−6.311*	−5.989*	−3.088*
Ln(M)	−2.742	3.021	7.014	−4.692*	−5.153*	−4.447*
Bhutan						
Ln(Y)	−1.989	−0.151	10.238	−3.834**	−3.912*	−1.527***
Ln(X)	−2.703	−1.178	2.029	−3.675**	−2.766**	−1.759***
Ln(M)	−1.075	−0.433	2.634	−6.143*	−6.264*	−3.929*
India						
Ln(Y)	−0.193	3.164	11.621	−7.685*	−6.314*	−2.504**
Ln(X)	−0.592	1.805	5.183	−2.464**	−4.885*	−5.491*
Ln(M)	−1.601	1.821	4.684	−2.877**	−7.095*	−7.619*
Nepal						
Ln(Y)	−2.171	1.437	9.114	−6.501*	−5.514*	−1.639***
Ln(X)	−1.714	−0.949	−0.949	−3.854**	−3.904*	−3.331**
Ln(M)	−2.642	−0.424	3.444	−6.521*	−6.587*	−3.908*
Pakistan						
Ln(Y)	−0.678	−1.299	4.633	−5.524*	−5.125*	−1.401
Ln(X)	−2.889	−0.196	2.592	−6.488*	−6.628*	−5.441*
Ln(M)	−0.661	−0.661	2.067	−3.386***	−3.559**	−3.047*
Sri Lanka						
Ln(Y)	−2.399	0.663	4.029	−5.638*	−5.586*	−1.715***
Ln(X)	−1.467	−0.923	2.668	−4.601*	−4.636*	−3.699*
Ln(M)	−1.901	−1.222	2.094	−4.779*	−4.803*	−4.041*

Note: Y represents the real gross domestic product, X represents real exports, M represents real imports. The series are in natural logarithm form. τT presents the model with a drift and trend; τμ the model with drift but without trend, while τ is the model without drift and trend.

2. Methodology

This study uses annual data from 1971 to 2009 for Pakistan and Bangladesh; 1960–2009 for India and Sri Lanka; 1965–2009 for Nepal and 1981–2009 for Bhutan. These data are from the World Bank online database (http://data.worldbank.org/data-catalog/world-development-indicators). The series, gross domestic product (GDP), export (X) and import (M) of goods and services are in constant 2000 dollars.[2] The ELG and GLE hypotheses are examined using causal link between economic growth and exports (Eqs. (1) & (2)).[3]

$$Y_t = \alpha_0 + \alpha_1 X_t + \psi_t \tag{1}$$

$$X_t = \beta_0 + \beta_1 Y_t + \nu_t \tag{2}$$

The causality between imports and economic growth is explored by the import-led growth and growth-led import hypothesis (Eqs. (3) & (4)).[4]

$$Y_t = \theta_0 + \theta_1 M_t + \psi_t \tag{3}$$

[2] The variables are transformed into natural logarithm, for estimation purposes.

[3] The export-led growth hypothesis suggests that export growth enhances economic growth through economies of scale by specialization in production and promoting the distribution of technical knowledge (Helpman and Krugman, 1985). All of these are discussed in review of literature.

[4] In the same way Deme (2002), Sato and Fukushige (2007), Katircioglu et al. (2010) have estimated the ILG and GLI hypothesis.