Trade, investment and economic growth in India and China

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Abstract

Using time series data from 1980 to 2014, this study examines the relationship between trade, investment and economic growth in India and China. The present study attempts to assess the contributions of not only foreign direct investment and exports as done by the previous studies but also incorporates domestic direct investment and imports. The study uses more comprehensive and recent autoregressive distributed lag (ARDL) bound testing approach to examine the existence of short-run and long-run relationships. The main advantage of this approach is that it can be used regardless of the stationarity properties of the variables in the sample. The study gives different results for both countries. In case of China, exports, FDI and domestic investment have positive impact on economic growth whereas for India only the variable of domestic investment has been found to be significant. China is a world leader in merchandise exports and its services exports have complemented its goods exports. The main weakness of Indian economy is the poor performance of manufacturing sector as a result of which India's merchandise exports are concentrated around a few categories. Though India is a leader in IT related services exports but these exports are unable to compensate for poor performance of merchandise exports.

Keywords*: Trade, FDI, Economic growth, ARDL.*

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INTRODUCTION

Trade and investment are important drivers of economic growth. Hsiao and Hsiao (2006) noted that trade promotes economic growth through transfer of technology and knowledge in an open economy. Similarly, foreign direct investment positively affects economic growth through capital accumulation and technology or knowledge transfer under open trade regime. However, the studies have pointed out that these positive effects may be insignificant or may even be negative due to crowding out effects of domestic capital or enclave economies.

The relationship between trade and economic growth has received much attention from researchers and policy makers. Majority of the studies highlight trade-growth linkages and exclude foreign and domestic investment. Therefore, present study explores the relation by taking into account foreign and domestic investment under multivariate framework. The present study attempts to assess the contributions of not only foreign direct investment and exports as done by the previous studies but also incorporates domestic investment and imports.

The present study takes into account two Asian Giants namely India and China. There are several reasons that explain the need to study India and China. India and China have experienced rapid economic growth in past three decades. These are world's most populous countries. Both India and China are among the largest economies in the world. Both economies have prospered through an outward oriented strategy. Though

both economies began to liberalize trade in late 1970s but China moved much faster than India. Both the economies had similar initial conditions but the performance varied over the period. Therefore, the present study approaches comparative and analytic framework to examine the relationship between trade investment and economic growth in these economies.

India is second most populous nation after China. India rigorously followed import substitution and inward looking policies during initial decades after independence. Starting in the mid-1970s and then later on in the 1980s, a few tentative steps were taken to liberalize the regulatory regime.

As a part of IMF agreement, Indian economy moved on the path of liberalization in a big way in 1991 when comprehensive economic reforms were introduced under 'New Economic Policy' (Rajan and Sen, 2002; Kaur, 2012). An important thrust of this policy was liberalization of external sector by important trade policy changes including tariff reduction, removal of quantitative restrictions, incentives for export sector, promotion of foreign investment etc (Khan, 2005; Sahni, 2014). Because of these policies, there was substantial increase in exports as well as in imports and the Indian economy became more and more trade oriented.

As a result of trade policy changes, tariffs were significantly reduced, quantitative restrictions were removed except in a few cases of banned items and the licensing system was phased out (GOI, 2015). In 1994, India accepted IMF obligation on agreement on current account convertibility (IMF, 2015).

Apart from these reforms, India initiated establishment of Export Processing Zones (EPZs) as a part of export promotion strategy in Asia- Pacific region. The first export-processing zone was set up in Kandla in 1965. Another EPZ was established in Santacruz in 1973. During 1980s, the government established five more zones at Noida (Uttar Pradesh), Falta (West Bengal), Cochin (Kerala), Chennai (Tamilnadu) and Vishakhapatnam (Andhra Pradesh).

However, later on these were converted into Special Economic Zones (SEZs) through 2000 Export- Import (EXIM) policy (Aggarwal, 2004). India started efforts towards integration in 1980s as a part of its foreign trade policy. A significant step was taken with the establishment of SAARC in 1985. As a part of 'Look East Policy' in 1991, India strengthened its relation with East and Southeast Asian economies. India became a full dialogue partner of ASEAN in 1995. India also joined WTO in 1995. It became a member of ASEAN Regional Forum (ARF) in 1996. Further, India-ASEAN signed 'Comprehensive Economic Co-operation Agreement' (CECA) in 2003 (Haokip, 2012 and Wapmuk, 2015).

Asian Financial Crisis of 1997-98 didn't affect much Indian economy due to restrictions on current account and less exposure of domestic market (Gutowski, 2001). Again, Global economic crisis of 2007-08 didn't hit Indian economy too severely (Ghosh, 2009; Venu, 2011; Joseph, 2013). The impact of both the crisis was limited on the Indian economy.

As a part of its trade promotional measures, India signed its first free trade agreement with Sri Lanka in 1998 which became operational in 2000. 'Comprehensive Economic Cooperation Agreement' (CECA) between India and Singapore was signed in 2005. 'Agreement on South Asian Free Trade Area' (SAFTA) was signed in 2004 and implemented in 2006. 'India- ASEAN Free Trade Agreement' (AIFTA) covering trade in goods only was signed between India and the ASEAN members in 2009 and it came into effect in 2010 (Sikdar and Nag, 2011; IMC, 2013).

In the same year, 'Comprehensive Economic Partnership Agreement' (CEPA) was signed between India and South Korea. In 2011, India-Japan 'Comprehensive Economic Partnership Agreement' (CEPA) and India-Malaysia 'Comprehensive Economic Cooperation Agreement' (CECA) was signed. More recently, India signed 'India - ASEAN Services and Investment Agreement' in 2014 which became operational in 2015. In addition to free trade agreements (FTAs), India also signed Preferential Trade Agreement (limited tariff lines with Margin of Preference i.e. percentage of Tariff concession) with Afghanistan (2003), MERCOSUR (2004) and Chile (2006). MERCOSUR trading block was formed in 1991 to facilitate free movements of goods, services, capital and people among four member countries of Latin America namely Argentina, Brazil, Paraguay and Uruguay (GOI, 2014).

China is the most populated country in the world. After Chinese civil war, Republic of China collapsed and communist party established modern China named as the People's Republic of China in 1949 (Zhu, 2012; Govt. of China, 2016). China adopted agriculture development-led industrialization strategy and transformed from traditional agricultural to an industrial and finally service economy (Briones & Felipe, 2013; Cheng, 2013). China's trade reforms were not based on any pre-determined blueprint rather they were the result of experimental changes promoted by Deng Xiaoping (Purushottam, 1999; Chow, 2004). China shifted from a centrally planned economy to a market based economy in 1978.

Before adopting reforms, state monopolies were governing its foreign trade. Since the trade policy reforms were initiated, China's foreign trade system has completely transformed and a significant progress in trade liberalization has been achieved (Zhang, 1999; Gibbons and Kulkarni, 2011; Kumari and Malhotra, 2014; www.gov.cn). The initial focus of reforms was to promote exports by attracting foreign direct investment (FDI). An export processing law favouring incentives for the processing and assembly of imported inputs was passed in 1979 (Wignaraja, 2011; Kumari and Malhotra, 2014). As a part of export promotion strategy, China established four Special Economic Zones (SEZs) in Shenzhen, Zhuhai, Shantou and Xiamen in 1980 (Fu and Gao, 2007).

In the same year, China actively registered membership of most influential international organization, International Monetary Fund (IMF) and World Bank. China also formally joined Asian Development Bank (ADB) in 1986. These institutions funded China to make structural reforms (Bottelier, 2006; Zhihai, 2011). In 1987, China allowed duty free imports of raw material, intermediate goods or inputs used for further production (Ianchovichina, 2004; Naughton, 2007; Wignaraja, 2011). China unified the dual exchange rate system i.e. the official and market regulated exchange rate of China's currency, the Renminbi (RMB) in 1994 (Zhang, 1999; Denoon, 2007; Gang, 2008; www.gov.cn).

Finally, China's accession to the WTO in 2001 was a major step towards liberalization. China agreed to follow the commitments under WTO accession. Therefore, noticeable tariff reduction was facilitated by China (Gibbons and Kulkarni, 2011; Sally 2011 and Wignaraja, 2011). Further China and ASEAN (Association of South East Asian Nations) signed 'Framework Agreement on the Comprehensive Economic Cooperation between ASEAN and China' in 2002. Under WTO rules, China signed free trade agreement with Hong-Kong referred as 'Closer Economic Partnership Arrangement' (CEPA) in 2003.

Besides CEPA agreement, China also signed agreements with Australia in 2003 and New Zealand in 2004 (Gabrlela and Luclan, 2007). China's external sector suffered

during Asian Financial Crisis of 1997-98. However, it managed to avoid crisis (Fernald and Babson, 1999; He and Zhang, 2010). But the global crisis of 2007-08 severely hit China's exports particularly the manufacturing sector (Agarwal et al. 2009; Bulman, 2010).

During 2004-2009, ASEAN and China signed three agreements. Agreements on trade in goods (2005), trade in services (2007) and investment (2009) were signed between China and ASEAN. Comprising these agreements ASEAN-China Free Trade Area (ACFTA) formally established in 2010. It was third largest regional trade agreement by value after European Union (EU) and NAFTA (North American Free Trade Agreement) (Brown, 2010; GAO, 2015; Salidjanova, 2015; Govt. of China (MOFCOM), 2016). An agreement on bilateral economic and technical cooperation between China-Afghanistan was signed in 2011(Nedumpara, Garg and Gyanchandani, 2011).

In 2013, China (Shanghai) Pilot Free Trade Zone (CSPFTZ) comprised four areas namely Waigaoqiao Free Trade Zone, Waigaoqiao Free Trade Logistics Park, Yangshan Free Trade Port Area and Pudong Airport Free Trade Zone was established for further liberalization of trade in services and capital account transactions. Under CSPFTZ several trade facilitation measures were adopted by simplifying custom and investment procedures (WTO, 2014; Govt. of China, 2016).

REVIEW OF LITERATURE

The majority of studies either examine export-led growth hypothesis or FDI led growth hypothesis. Empirical evidences based on export-growth and FDI-growth relationship are mixed. For example, using time series data for the period 1978-96, Shan and Sun (1998) tested export-led growth hypothesis for China. Toda-Yamamoto estimation results revealed bidirectional causality. To examine export-led growth hypothesis for India, Dhawan and Biswal (1999) employed vector autoregressive (VAR) model taking time series data for the period 1961-93. The study found evidence for short run causality running from exports to GDP.

Chandra (2003) investigated the issue of causality between incomes and export growth in India using Johansen's multivariate cointegration framework for the period 1950-96.The evidence suggested bi-directional causality between real exports and real income in the long run. Padhan (2004) examined the long run and short run dynamic relationship between exports and economic growth in India during 1950-51 to 2000-2001.The study found evidence of unidirectional causality between exports and economic growth running from export to economic growth found through Granger causality test. So the study supported the export led growth strategy for India.

Hsiao and Hsiao (2006) examined the relationship between GDP, exports and FDI for eight rapidly developing East and Southeast economies including China. The findings suggested unidirectional causality from FDI to GDP and bidirectional causality between exports and GDP. Yao (2006) used panel data estimation technique to investigate the effect of exports and FDI on economic growth for 28 Chinese provinces over the period 1978-2000. The empirical evidence showed positive and strong effect of exports and FDI on economic growth.

Mah (2007) examined the relationship among exports, export composition and economic growth for the period 1980 to 2001. The results obtained from error correction model indicated bidirectional causality between export expansion and economic growth while no causal relationship was found between export composition and other variables. Tang, Selvanathan and Selvanathan (2008) tested relationship

between FDI, domestic investment and economic growth in China for the period 1988 to 2003. The findings indicated bidirectional causal link between domestic investment and GDP while unidirectional causality was found from FDI to domestic investment and FDI to GDP.

Jayachandran and Seilan (2010) investigated the relationship between trade, FDI and economic growth for India over the period 1970-2007. The causality results supported unidirectional causality from FDI to growth and exports to growth. No reverse causation was observed for India. Agrawal and Khan (2011) investigated the effect of FDI on economic growth of China and India for the period 1993-2009. The findings obtained from ordinary least square method indicated positive and significant effect of FDI. Marelli and Signorelli (2011) analyzed the relationship between trade openness, FDI and economic growth for India and China over the period 1980-2007. The results obtained from panel data estimation methods revealed positive and significant effect of trade openness and FDI.

Mishra (2011) investigated the dynamics of the relationship between exports and economic growth for India over the period 1970 to 2009. The Granger causality test indicated that there was a causal relationship running from GDP to exports in the long run but not in the short run which provided the evidence of growth driven exports over the sample period. Thus findings rejected export-led growth hypothesis in India. Kumari and Malhotra (2014) conducted comparative study to examine trade-led growth hypothesis for India and China during 1980-2012. Time series econometric techniques (Johansen Cointegration & Toda-Yamamoto (TY) approach) have been applied to test the hypothesis. The empirical findings for India suggested unidirectional causality running from GDP per capita to exports. However, no causation was found between imports and GDP per capita. For China, a strong evidence of bi-directional causality was found from GDP per capita to exports/ imports and vice versa. The study concluded that China performed better as compared to India.

Theoretical framework

The neoclassical growth equation as proposed by Feder (1983) is used as the basis for our empirical study. Assuming that economy can be segregated into two sectors, and hence the total output (Y) of the economy is made up of output of the export sector (X) and that of the non-export sector (NX). Thus, total output can be written as follows:

$$Y=X+NX \quad (1)$$

These two sectors employ homogenous labour and capital and the export sector has a spillover effect on the non-export sector. The production functions for the export and non-export sectors can be stated as follows:

$$X= G(K_X+ L_X) \quad (2)$$

$$NX= F(K_{NX}+ L_{NX}, X) \quad (3)$$

where K_X and K_{NX} are the capital stock mobilized by the export and non-export sectors respectively and L_X and L_{NX} are labour employed by these sectors respectively. Based upon the assumption of Feder (1983), the marginal factor productivities in the export sector are greater than in the non-export sector by a factor δ, that is:

$$\left(\frac{G_K}{F_K}\right)= \left(\frac{G_L}{F_L}\right)= 1+\delta \quad (4)$$

The variations in marginal productivities between the export and non-export sectors exist principally due to differences in the level of technology innovation, management skills and the level of competition (Feder, 1983). The Feders' growth model could then imply the following empirical per capita growth equation:

$$\dot{Y} = \psi_0 + \psi_1 \dot{K} + \psi_2 \dot{X} \quad (5)$$

where a dot over a variable denotes the growth rate of that variable. Economic growth is driven by capital and exports. In line with the purpose of this study, the present study segregated capital into domestic and foreign. It should be noted that both domestic and foreign capitals could complement each other in fostering economic growth via forward and backward linkages apart from other spillover effects such as through demonstration. As new foreign owned industries are established, there would be greater demands for products of local entrepreneurs. This could spur domestic direct investment. Hence the empirical model may be written as follows:

$$LNGDPPC_t = \beta_0 + \beta_1 LNEXP_t + \beta_2 LNIMP_t + \beta_3 FDI_t + \beta_4 DI_t + \varepsilon_t \quad (6)$$

DATABASE & METHODOLOGY

Data

The time series data covers the period from 1980 to 2014. The annual data at the 2005 constant US dollar prices have been compiled from two international sources. Data on real GDP, real exports, real imports, and real gross capital formation have been compiled from World Development Indicators constructed by World Bank while data on foreign direct investment have been collected from United Nations Conference on Trade and Development (UNCTAD). The domestic direct investment series was obtained by netting out foreign direct investment from total investment. Tang (2015) noted that previous studies like Choong et al (2005), Lee and Tan (2006) Merican (2009) and Tan and Lean (2010) used gross fixed capital formation (total investment) as a proxy for domestic direct investment which is not appropriate measure as foreign direct investment is already included in it. All the variables are taken in their natural logarithms. The variables used for analysis are-

1. LNGDP = Log of Real Gross Domestic Product
2. LNEXP = Log of Real Exports of Goods & Services.
3. LNIMP = Log of Real Imports of Goods & Services.
4. LNFDI = Log of Real Foreign Direct Investment
5. LNDI = Log of Real Domestic Investment

Note: Real indicates data at the 2005 constant US dollar prices

Methodology

Unit root test

The study applied Augmented Dickey Fuller (ADF) and Phillips & Perron (PP) tests to obtain the order of integration of each time series used in the analysis so as to determine the appropriate technique that can be used to find out relationship among variables.

The Augmented Dickey-Fuller (ADF) test

Consider a simple Autoregressive AR (1) process:

$$y_t = \rho y_{t-1} + x_t'\delta + \varepsilon_t, \quad (7)$$

where x_t are optional exogenous regressors which may consist of constant, or a constant and trend,ρ and δ are parameters to be estimated, and the ε_t are assumed to be white noise. If $|\rho| \geq 1$, y is a nonstationary series and the variance of y increases with time and approaches infinity. If $|\rho| < 1$, y is a (trend-) stationary series. Thus, the hypothesis of (trend-) stationarity can be evaluated by testing whether the absolute value of ρ is strictly less than one.

The standard DF test is carried out by estimating Equation (7) after subtracting y_{t-1} from both sides of the equation:

$$\Delta y_t = \alpha y_{t-1} + x_t'\delta + \varepsilon_t, \quad (8)$$

Where α= ρ-1. The null and alternative hypotheses may be written as:

$$H_0: \alpha = 0$$
$$H_1: \alpha < 0 \quad (9)$$

and evaluated using the conventional t - ratio for α:

$$t_\alpha = \alpha/(se(\alpha)) \quad (10)$$

where α is the estimate of α, and se(α) is the coefficient standard error.

The Augmented Dickey-Fuller (ADF) test constructs a parametric correction for higher-order correlation by assuming that the y series follows an AR (p) process and adding p lagged difference terms of the dependent variable y to the right-hand side of the test regression:

$$\Delta y_t = \alpha y_{t-1} + x_t'\delta + \beta_1 \Delta y_{t-1} + \beta_2 \Delta y_{t-2} + \ldots + \beta_p \Delta y_{t-p} + v_t \quad (11)$$

This augmented specification is then used to test (9) using the t -ratio (10). An important result obtained by Fuller is that the asymptotic distribution of the t -ratio for α is independent of the number of lagged first differences included in the ADF regression.

The Phillips-Perron (PP) Test

Phillips and Perron (1988) propose an alternative (nonparametric) method of controlling for serial correlation when testing for a unit root. The PP method estimates the non-augmented DF test equation (8), and modifies the t-ratio of the α coefficient so that serial correlation does not affect the asymptotic distribution of the test statistic. The PP test is based on the statistic:

$$\tilde{t}_\alpha = t_\alpha \left(\frac{\gamma_0}{f_0}\right)^{1/2} - \frac{T(f_0 - \gamma_0)(se(\alpha))}{2 f_0^{1/2} s} \quad (12)$$

where α is the estimate, and t_α the t-ratio of α, $se(\alpha)$ is coefficient standard error, and s is the standard error of the test regression. In addition, γ_0 is a consistent estimate of the error variance in (8) (calculated as $(T-k)s^2/T$, where k is the number of regressors).The remaining term, f_0, is an estimator of the residual spectrum at frequency zero (Eviews, 2006).

Bound testing approach or Autoregressive Distributed Lag Model (ARDL) for cointegration

This study employs advanced Bound testing approach or Autoregressive Distributed Lag Model (ARDL) proposed by Pesaran and Shin (1999). Shahbaz, Ahmad and Asad (2011) noted that ARDL is more dynamic and provides better results for small sample sizes than traditional techniques in the literature. The ARDL framework for cointegration analysis used in the study has been given below-

$$\Delta LNGDP_t = \beta_0 + \beta_1 LNGDP_{t-1} + \beta_2 LNEXP_{t-1} + \beta_3 LNIMP_{t-1} + \beta_4 LNFDI_{t-1} + \beta_5 LNDI_{t-1} + \sum_{i=1}^{p} \beta_6 \Delta LNGDP_{t-i} + \sum_{i=1}^{p} \beta_7 \Delta LNEXP_{t-i} + \sum_{i=1}^{p} \beta_8 \Delta LNIMP_{t-i} + \sum_{i=1}^{p} \beta_9 \Delta LNFDI_{t-i} + \sum_{i=1}^{p} \beta_{10} \Delta LNDI_{t-i} + \varepsilon_t \quad (13)$$

The null hypothesis and alternative hypothesis under the bound test approach tested on the basis of F test for joint significance of all the regressors has been specified below-

Null Hypothesis (H_0) = $\beta_1=\beta_2=\beta_3=\beta_4=\beta_5$ (No long run relationship)

Alternative Hypothesis (H_1) = $\beta_1\neq\beta_2\neq\beta_3\neq\beta_4\neq\beta_5$ (Long run relationship exists)

RESULTS AND DISCUSSIONS

There are number of tests which can be employed to check stationarity. Two standard unit root tests most commonly used are Augmented Dickey Fuller (ADF) test and Phillips- Perron (PP) test. Both tests examine the hypothesis that a unit root exists at a level of a variable. If the calculated ADF and PP statistics are less than their critical value, then variables X and Y are said to be stationary at level or integrated to the order zero i.e. I (0). If this does not occur, then the ADF and PP tests are performed on the first differences of X and Y (i.e. ΔX and ΔY). If the variables are found to be stationary in this case, then variables X and Y are said to be integrated to order one i.e. I (1).

Table 1. Results of unit root tests for variables

	INDIA					CHINA				
	ADF (Test Statistics)									
	Test Statistics	1% critical	5% critical	10% critical	p-value	Test Statistics	1% critical	5% critical	10% critical	p-value
LNGDP										
I(0)	-1.038	-4.252	-3.548	-3.207	0.924	-4.711*	-4.284	-3.562	-3.215	0.003
I(1)	-5.627*	-4.262	-3.552	-3.209	0.000	-	-	-	-	-
LNEXP										
I(0)	-2.924	-4.252	-3.548	-3.207	0.167	-2.503	-4.252	-3.548	-3.207	0.324
I(1)	-4.841*	-4.262	-3.552	-3.209	0.002	-5.543*	-4.262	-3.552	-3.209	0.000
LNIMP										
I(0)	-2.325	-4.262	-3.552	-3.209	0.409	-2.801	-4.262	-3.552	-3.209	0.206
I(1)	-4.965*	-4.262	-3.552	-3.209	0.001	-4.654*	-4.262	-3.552	-3.209	0.003
LNFDI										
I(0)	-3.659**	-4.252	-3.548	-3.207	0.039	-1.822	-4.262	-3.552	-3.209	0.671
I(1)	-	-	-	-	-	-3.249***	-4.273	-3.557	-3.212	0.093
LNDI										
I(0)	-2.129	-4.252	-3.548	-3.207	0.511	-3.482***	-4.262	-3.552	-3.209	0.058
I(1)	-7.389*	-4.262	-3.552	-3.209	0.000	-	-	-	-	-
	PP (Test Statistics)									
LNGDP										
I(0)	-0.814	-4.252	-3.548	-3.207	0.954	-2.406	-4.252	-3.548	-3.207	0.369
I(1)	-6.809*	-4.262	-3.552	-3.209	0.000	-3.413***	-4.262	-3.552	-3.209	0.066
LNEXP										
I(0)	-2.970	-4.252	-3.548	-3.207	0.154	-2.503	-4.252	-3.548	-3.207	0.324
I(1)	-4.854*	-4.262	-3.552	-3.209	0.002	-5.544*	-4.262	-3.552	-3.209	0.000
LNIMP										
I(0)	-2.128	-4.252	-3.548	-3.207	0.512	-2.203	-4.252	-3.548	-3.207	0.472
I(1)	-4.964*	-4.262	-3.552	-3.209	0.001	-4.548*	-4.262	-3.552	-3.209	0.005
LNFDI										
I(0)	-3.497**	-4.252	-3.548	-3.207	0.055	-4.288*	-4.252	-3.548	-3.207	0.009
LNDI										
I(0)	-2.129	-4.252	-3.548	-3.207	0.511	-2.239	-4.252	-3.548	-3.207	0.454
I(1)	-7.614*	-4.262	-3.552	-3.209	0.000	-4.147**	-4.262	-3.552	-3.209	0.013

Note: *, ** and *** indicate significance at the 1%, 5% and 10% respectively.

The results of ADF and PP tests have been presented in table 1. The results for India indicated that all the variables are I(1) or integrated of order one except for LNFDI while for China variables are of mixed order. Thus, the stationarity property of variables proves that analysis suited to proceed with autoregressive distributed lag (ARDL) bound testing approach.

ARDL or Bound testing approach proposed by Pesaran and Shin (1999) avoids the problem of mixed orders and provides the possibility of testing long run relationships whether the variables are I(0) or I(1). The results of Autoregressive Distributed Lag (ARDL) Bound Testing Approach have been summarised in Table 2. ARDL involves two steps of estimating relationships among variables. First step investigates the existence of long run relationship and second step involved the estimation of short run coefficients. Null hypothesis of no cointegration is rejected if F-statistic is higher than upper bound value. Table 2 shows that F-statistics is lower than upper bound value which concludes that there is lack of steady state long run equilibrium relationship among variables in case of India whereas in case of China, F-statistics is higher than upper bound value which concludes that there exists steady state long run equilibrium relationship among variables. Hence, null hypothesis of no cointegration can be rejected for China. The ECT_{t-1}term is also significant and has negative sign which indicates the speed of adjustments from short run to long run. The short run coefficients are also significant.

Table 2. Results of Autoregressive Distributed Lag (ARDL) bound testing approach

INDIA				**CHINA**			
Long Run Coefficients		**Short Run Coefficients**		**Long Run Coefficients**		**Short Run Coefficients**	
Dep. Var. (LNGDP)	Coefficients (p-value)	Dep. Var. (LNGDP)	Coefficients (p-value)	Dep. Var. (LNGDP)	Coefficients (p-value)	Dep. Var. (LNGDP)	Coefficients (p-value)
Constant	8.170* (0.000)	ECT_{t-1}	-0.324* (0.000)	Constant	6.953* (0.000)	ECT_{t-1}	-0.726* (0.000)
LNEXP	-0.085 (0.399)	D(LNEXP)	-0.027 (0.381)	LNEXP	0.147* (0.000)	D(LNEXP)	0.107* (0.000)
LNIMP	0.113 (0.248)	D(LNIMP)	0.036 (0.237)	LNIMP	-0.084* (0.007)	D(LNIMP)	-0.061** (0.024)
LNFDI	-0.009 (0.421)	D(LNFDI)	-0.003 (0.433)	LNFDI	0.056* (0.000)	D(LNFDI)	0.040* (0.000)
LNDI	0.362* (0.001)	D(LNDI)	0.117* (0.001)	LNDI	0.384* (0.000)	D(LNDI)	0.278* (0.000)
Trend	0.033* (0.000)	Trend	0.010* (0.005)	Trend	0.037* (0.000)	Trend	0.027* (0.000)
F- statistic=1.479		$\boldsymbol{R^2}$= 0.592		**F- statistic**=5.622		$\boldsymbol{R^2}$= 0.999	
95 % Lower Bound =4.089		**Adjusted**$\boldsymbol{R^2}$=0.501		**95 % Lower Bound** =4.089		**Adjusted**$\boldsymbol{R^2}$=0.998	
95 % Upper Bound =5.422		**DW**= 1.859		**95 % Upper Bound** =5.422		**DW**= 1.555	

Note: *, ** indicates significance at the 1% & 5% level.

Thus, results give evidence that trade and investment have positive and significant effect on China's economic growth. While for India, only domestic investment was found to be significant in short run as well as in long run.

CONCLUSIONS AND POLICY IMPLICATIONS

Conclusions

In order to examine the relationship between trade, investment and economic growth in India and China, the study used time series data from 1980 to 2014. The findings highlighted that exports, foreign direct investment and domestic investment have positive and significant effect on China's economic growth in both short run and long run. While for India, only domestic investment was found to be significant in short run as well as in long run.

Several studies have highlighted the reasons behind poor performance of Indian economy as compare to China's economy. According to Ye (2014) FDI liberalization in China remained ahead of India. Though starting rate of China's FDI inflow in 1980 was below India's FDI inflow but it increased rapidly. China managed to attract remarkably high FDI along with high per unit FDI contributions to employment, exports, revenue, research and development (R&D), wages and capital formation. It has also been successful in mobilizing FDI inflow. China has been quite open for FDI in almost all manufacturing and most service industries (World Bank, 2010) while India's approach towards FDI has been relatively conservative initially but progressively started catching up in early 1990s onwards.

Considering the strength of trade linkages China is highly integrated with emerging Asian economies relative to India. China has specialization in high tech goods while Indian exports constituted mainly low- tech exports. China has produced new and more sophisticated manufactures that has benefitted other countries to expand their processing industries (Dimaranan, Ianchovichina and Martin, 2009). Indian export structure is highly concentrated on one category of goods i.e. jewellery & works of art. This category consists 20 percent of total Indian exports and only 1.4 percent of world trade. In case of service exports, Chinese exports of services complemented its export of goods while Indian exports continued to grow in deregulated sector such as IT related services (Bussiere and Mehl, 2008). Rada (2010) also found that India has failed to break away its past trade deficit despite fast economic growth and integration into global economy. Apart from above, most enterprises in India are very small and informal sector is huge and growing over time therefore causing low advantages of economies of scale as compare to China (Valli and Saccone, 2009).

Policy implications

In terms of policy implications, the study proposes further reforms and liberalization of FDI, so that Indian economy can also fully utilize its growth potential. The export-oriented strategy seems to be underutilized in case of India. There are structural deficiencies in case of India and hence ongoing reforms must continue to achieve targets. China must emphasize on policies and practices that primarily focus on sustainability of trade and investment opportunities.

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