

An Analysis of the Impacts of Inflation, Trade Openness and Exchange Rate on Foreign Direct Investment in Bangladesh and Some Selected Emerging Countries

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Abstract

This paper investigates the impacts of inflation, trade openness and exchange rate on foreign direct investment (FDI) in Bangladesh, Colombia, India, Indonesia, Mexico, Philippines, and Turkey. Johansen-Juselius (1988) procedure is applied to test the cointegration relationship among the variables followed by the Vector Error Correction model. The empirical results trace a long-run equilibrium relationship in the variables. Among the three independent variables, inflation and exchange rate are found as important factors in explaining the changes in FDI inflows in both short-run and long-run. Therefore, the challenge before the central banks of these emerging countries including Bangladesh is to maintain a stable exchange rate that will boost domestic production, increase FDI and maintain internal and external balance. In order to protect external competitiveness, one of the possible ways is to intervene in the domestic foreign exchange market by the concerned central banks. As trade openness is a means of the market-related economic determinant regarding attracting FDI inflow in the host country, so trade policy vis-a-vis monetary and fiscal policies should be made proactive considering the global perspectives.

Keywords: Foreign Direct Investment, Inflation, Exchange Rate, Trade Openness.

JEL Classification: O190, O110, E31, F31 and F21.

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Introduction

Foreign direct investment (FDI) has been receiving greater attention to policymakers of developing countries for accelerating the pace of economic growth and development since the mid- 1990s as these countries have embarked upon a process of reform and liberalization and placing FDI as an important policy priority in their development agenda. A number of studies find FDI that inflows have strong and positive effect on economic growth (see, for example, Lean and Tan 2011, Seila 2011, Thilakaweera 2011 Bjorvatn et al. 2002). FDI brings new capital for investment, contributing to the balance of payments, adding to the country's capital stock, and future economic growth and development. FDI can also help to bring technology and fill 'idea gaps' and 'object gaps'.

In the context of the new theory of economic growth, FDI is considered as an engine of growth of mainstream economics and accounts for more than half of the private capital flows between countries in the world (Thilakaweera, 2011). According to Shaari, Hong & Shukeri (2012), FDI can enhance economic growth. FDI in any country not only represent the investment of foreign nation but also transfers the better and current technological innovations, enhanced human resource and administrative ideas, well-trained labor force and managerial skills (Tabassum & Ahmed, 2014). FDI has the potentiality to enhance economic growth of developing countries like Bangladesh. Bangladesh became an independent country in the year 1971 and IDA provided more than US\$ 16 billion support for policy reforms and investment projects since 1972 (Tabassum and Ahmed, 2014).

FDI flows to emerging markets countries (EMCs) increased rapidly during the 1990s and have become by far the single largest component of their net capital inflows. The surge in FDI to EMCs was led largely by mergers and acquisitions, reflecting the extensive privatization of state-owned assets in a number of countries in Latin America and Eastern Europe and the sale of distressed banking and corporate assets in several Asian Economies following the crisis. Furthermore, in contrast to traditional forms of FDI associated with either extractive activity or labor intensive manufacturing for exports, the 1990s witnessed a significant shift towards market-seeking FDI in a number of countries notably into the service sector. Therefore, we attempt to analyze the impacts of inflation, trade openness, and the exchange rate on FDI net inflows in Bangladesh and selected six emerging countries.

This study is divided into eight sections. After an introduction in section I, Section II presents objectives of the study while Section III reviews relevant literature. Data description and methodology is presented in Section IV. Empirical results are discussed in

the Section V. Finally, Section VI discusses conclusion and policy recommendations. Tables and figures of the study are presented in Section VII.

Literature Review

Foreign Direct Investment (FDI) can be defined as investment in which a firm acquires a substantial controlling interest in a foreign firm or set up a subsidiary in a foreign country (Chen, 2000). According to IMF BOP Manual (1993), a foreign direct investment enterprise is an incorporated or unincorporated enterprise in which direct investor own 10 percent or more of the ordinary shares or voting power for an incorporated enterprise or the equivalent for an unincorporated enterprise.

Impacts of Macroeconomic variables on FDI have been studied by many researchers all over the world. Mottaleb and Kalirajan (2010) did a study on the determinants of foreign direct investment in developing countries. Using panel data from 68 low-income and lower-middle income developing countries, they attempted to identify the factors that determine FDI inflow to the developing countries. Based on a comparative discussion focusing on why some countries are successful in attracting FDI while others are not, their paper demonstrated that countries with larger GDP and high GDP growth rate, a higher proportion of international trade and with the more business-friendly environment are more successful in attracting FDI.

Adhikary (2012) investigated the impact of foreign direct investment (FDI), trade openness, domestic demand, and exchange rate on the export performance of Bangladesh over the period of 1980-2009 using vector error correction (VEC) model. The Johansen-Juselius procedure was applied to test the Cointegration relationship between variables followed by the VEC regression model. The empirical results traced a long-run equilibrium relationship in the variables. FDI was found to be an important factor in explaining the changes in exports both in the short-run and long-run. However, the study did not trace any significant causal relationship for the cases of trade openness, domestic demand, and exchange rate. The study concluded that Bangladesh should formulate FDI-led policies to enhance its exports.

Enu, Havi and Attah-Obeng (2013) examined the determinants of foreign direct investment inflows to Ghana. The main objective of their study was to find out the major macroeconomic determinants of foreign direct investment in Ghana between the periods 1980 to 2012. All the variables considered were integrated at first order, as a result, the Johansen's Cointegration approach was used and the result showed that the variables were

not Cointegrated. Therefore, the vector autoregressive model was estimated. Results showed that the first past year of foreign direct investment, the last two years of the exchange rate and trade openness were statistically significant.

Tabassum and Ahmed (2014) examined the relationship between foreign direct investments and economic growth of Bangladesh during the period 1972-2011. These studies evaluated the association between FDI and economic growth using multiple regression methods by considering the relationship between real gross domestic product, foreign direct investment, domestic investment and openness of the trade policy regime. Results of their study indicated that domestic investments exerted a positive influence on economic growth whereas foreign direct investments, the openness of trade were less significant.

Lean and Tan (2011) examined the effect of Foreign Direct Investment (FDI) and Domestic Investment (DI) on economic growth in Malaysia using yearly data for the period of 1970 to 2009. Authors applied Augmented Dicky Fuller (ADF) test, Phillips-Perron test, Johansen's Cointegration approach etc. to establish a long-run relationship among the variables. The paper found that FDI, DI, and economic growth are cointegrated in the long run while FDI had a positive impact on economic growth and was crowding in domestic investment. On the other hand, the paper found a one-way causal relationship from economic growth to FDI in short run applying granger causality.

Seila (2011) analyzed the impact of FDI on the economic growth, domestic investment and productivity of Cambodia, Vietnam, and Thailand for the period from 1987 to 2008. The author applied fixed effect estimation method to carry out the objectives. In the study, FDI was found not to have deteriorated growth in Cambodia, Vietnam, and Thailand. Though the study found a neutral crowding-in effect of FDI on domestic investment for Cambodia, the effect was significant for Vietnam and Thailand. The author found a positive effect of FDI on productivity in all three countries but at different extent.

Thilakaweera (2011) investigated the long-run relationship and causality among real per capita GDP, foreign direct investment (FDI) and the level of the infrastructure in Sri Lanka for annual time series of 1980 to 2011. The author applied ADF test, Johansen's Full Information Maximum Likelihood (FIML) approach and granger causality test to examine the relationship. The analysis of the paper concluded that there was a long-run relationship among real per capita GDP, FDI and the level of infrastructure when unidirectional causality from the level of the infrastructure to FDI was found.

Bjorvatn et al. (2002) reviewed the determinants of FDI and its role in economic development through analyzing the experience of five countries: South Korea, Malaysia, Mozambique, Philippines and South Africa for various point of time in between 1960 to 1999. The paper concluded that though FDI was not necessary to achieve economic development, the entry of foreign firms might play a vital role in adding technology and competition to the host economies acknowledging the scope of loss in market shares and consequent profit loss by local firms from the entry of foreign firms.

Ibrahim and Muthusamy (2014) examined the necessity of foreign direct investment in Indian economy for the period following the economic reform and analyzed the role played by the FDI in the economic development of the country. Authors covered the period of 2003-04 to 2012-13 and applied growth rates, regression, correlation etc. statistical measures to do the analysis. The study found significant improvement in FDI in India accompanying with the development of the economy.

An Overview of FDI

1. Bangladesh

Foreign Direct Investment in Bangladesh increased by 1833.87 USD Million in 2015 fiscal year. while the stock of Foreign Direct Investment in Bangladesh stood at USD 12,501 Million in 2015.

Table 1: FDI inflow from Top Ten Countries in 2015

	Country	% of FDI to Total FDI inflow (Stock)
1	U.S.A	24.10
2	U.K.	10.88
3	South Korea	7.48
4	Australia	7.06
5	Netherlands	5.35
6	Malaysia	5.30
7	Hong Kong	5.16
8	Singapore	3.36
9	Japan	2.58
10	India	2.53

Bangladesh received FDI \$1495.50 million in FY 14 compared to \$1730.63 million in FY13 and \$1194.88 million in FY12. Annual average FDI inflows in Bangladesh during the last five years are \$1222.61 million. FDI in Bangladesh constitutes a low share in GDP which varies between 0.89 percent in FY97 to 1.5 percent in FY14. Equity capital, reinvested earnings, and intra-company loans are the components of FDI. Despite attractive investment incentives and regulations, the flow of FDI to Bangladesh is very poor mainly due to political instability, inadequate infrastructure, bureaucratic complexities and higher cost of doing business.

Source: Bangladesh Bank.

FDI inflow in the manufacturing sector is the highest which is (35%) of total FDI followed by the power, gas and petroleum sector (32%) and trade and commerce sector (18%). However, the total FDI inflow in Bangladesh is still very low compared with other emerging countries.

Facilities and Incentives for a foreign investor ³

In order to increase FDI, Bangladesh government adopted a number of supportive policies. Among them, the following measures are noteworthy: tax exemption on royalties, technical know-how and technical assistance fees and facilities for their repatriation, interests on foreign loans, capital gains from transfer of shares by the investing company.

No restrictions on issuance of work permit to project related foreign nationals and employees, facilities for repatriation of invested capital, profits and dividends provision of transfer of shares held by foreign share holders to local investors, reinvestment of remittable dividends would be treated as new investment, foreign-owned companies duly registered in Bangladesh will be on the same footing as locally owned ones.

100% foreign equity is allowed. In addition, facilities such as unrestricted exit policy, citizenship by investing a minimum of US\$5,00,000, and permanent resident permits on investing US\$75,000 were allowed. An investor can wind up investment either through a decision of the AGM or EGM. He or she can repatriate the sales proceeds after securing proper authorization from the central bank.

Fiscal and Financial incentives

Corporate tax holiday of 5 to 7 years for selected sectors, reduced tariff on import of rawmaterials capital machinery, bonded warehousing, accelerated depreciation on cost of machinery is admissible for new industrial undertaking (50% in the first year of commercial production,30% in the second year, and 20% in the third year). Tax exemption on capital gains from the transfer of shares of public limited companies listed on a stock exchange, reduced Corporate Tax for 5 to 7 years in lieu of tax holding and agricultural depreciation. Cash incentives and export subsidies ranging from 5% to 20% granted on the FOB value of the selected products, 90% loans against letters of credit (bybanks), permission for domestic market sales of up to 20% of export-oriented companies outside EPZ (relevant duties apply)

³ Abdin MJ(2015) Foreign Direct Investment(FDI) in Bangladesh: Trends,Challenges and Recommendations. Int J Econ Manag Sci:276. doi:10.4172/21626359.1000276

2. Colombia

Foreign Direct Investment in Colombia increased by 2843.60 USD Million in the fourth quarter of 2015. Foreign Direct Investment in Colombia averaged 1868.31 USD Million from 1996 until 2015. The two main destinations of FDI are the hydrocarbon (the oil sector accounted for 30% of FDI in 2014) and mining sectors (10% of FDI in 2014), but an increasing degree of diversification has been observed in recent years, in particular in telecommunications and tourism. In Colombia, FDI stock accounted for 37 of GDP in 2014 which was 31% in 2012.

In Colombia, FDI benefits from a very attractive legislative framework. The country ranks 54th out of 189 economies in the Doing Business 2016 classification established by the World Bank, thanks to major improvements in property registration and access to credit. The ratification of a bilateral free trade agreement with the U.S. in October 2011 and the establishment of special regulations in the free trade zones have contributed to improving the country's attractiveness. Moreover, the richness of its natural resources and a significant domestic market are Colombia's main assets.

3. India

FDI in India is the major financial source for economic development. Foreign companies invest directly in fast-growing private Indian businesses to take benefits of cheaper wages and changing business environment of India. Economic liberalization started in India in the wake of the 1991 economic crisis and since then FDI has steadily increased in India. According to the Financial Times, in 2015 India overtook China and the US as the top destination for the Foreign Direct Investment. In the first half of 2015, India attracted investment of \$31 billion compared to \$28 billion and \$27 billion of China and the US respectively.

The Government of India has amended FDI policy to increase FDI inflow. In 2014, the government increased the foreign investment upper limit from 26% to 49% in the insurance sector. It also launched Make in India initiative in September 2014 under which FDI policy for 25 sectors was liberalized further. As of April 2015, FDI inflow in India increased by 48% since the launch of "Make in India" initiative. India was ranking 15th in the world in 2013 in terms of FDI inflow, it rose up to 9th position in 2014 while in 2015 India became at top destination for foreign direct investment.

During 2014-15, India received most of its FDI from Mauritius, Singapore, Netherlands, Japan and the US. On 25 September 2014, Government of India launched Make in India⁴ initiative in which policy statement on 25 sectors was released with relaxed norms on each sector. Following are some of the major sectors for Foreign Direct Investment. Infrastructure, Automotive, Pharmaceuticals, Service, Railways, Chemicals, Textile. Make in India is an initiative launched by the Government of India to encourage multi-national, as well as national companies to manufacture their products in India. It was launched by Prime Minister Narendra Modi on 25 September 2014.

4. Indonesia

Foreign direct investment in Indonesia rose 17.1 percent year-on-year to an IDR96.1 trillion in the first quarter of 2016, slowing from a 26 percent growth in the preceding quarter, data from the Investment Coordinating Board showed. Foreign Direct Investment in Indonesia averaged IDR 58909.09 Billion from 2010 until 2015.

FDI flows into Indonesia have been experiencing growth and their base has been expanding. Indonesia has allowed foreign investment in the service industries, such as port management. According to the UNCTAD 2015 World Investment Report, in 2014, Indonesia lost its place among the three most attractive destinations for multinational companies, although it stayed among the top 20 at 14th place and 4th among the East-Asian countries, after China, Hong Kong, and Singapore. More than 20% of FDI inflows come from Singapore, one of its three most important trade partners. In Indonesia, FDI stock accounted for 29 of GDP in 2014 which was 23% in 2012. In Indonesia, the main invested sectors are mining (16.4%), food industry (11.0%), transport, storage and communications (10.5%),

5. Philippines

Foreign Direct Investment in the Philippines increased by PHP 138618 million in the fourth quarter of 2015. Foreign Direct Investment in the Philippines averaged PHP 41129.66 million from 2000 until 2015, reaching an all-time high of PHP 230215 million in the fourth quarter of 2012 and a record low of PHP 3959 Million in the first quarter of 2009.

⁴ Make in India is an initiative launched by the Government of India to encourage multi-national, as well as national companies to manufacture their products in India. It was launched by Prime Minister Narendra Modi on 25 September 2014. India would emerge, after initiation of the programme (and if successful) in 2015, as the top destination globally for foreign direct investment, surpassing the United States of America as well as China. India received US\$63 billion in FDI in 2015

Foreign direct investment (FDI) has been rising steadily in recent years. In 2014, FDI inflows reached USD 6.2 billion, which represents a more than 65% increase compared to 2013. However, FDI inflow into the Philippines remains relatively weak, considering the country's comparative advantages, such as an English speaking and well-skilled workforce, a strong cultural proximity to the U.S. and a geographical location in a dynamic region. This can be partially explained by the fact that the country is evolving into a service society with low capital strength, which means that it needs only minimal equipment. In addition, the Government favors subcontracting agreements between foreign companies and local enterprises rather than FDI in the strict sense of the term. Lastly, corruption, instability, inadequate infrastructure and lack of juridical security discourages investment.

6. Turkey Foreign Direct Investment

Foreign Direct Investment in Turkey increased to USD 16800 million in 2015. Foreign Direct Investment in Turkey averaged USD 12750.62 million from 2003 until 2015, reaching an all-time high of USD 22046 Million in 2007 and a record low of USD 1800 million in 2003. Foreign Direct Investment in Turkey is reported by the Investment Support and Promotion Agency (ISPAT).

According to the UNCTAD 2015 World Investment Report , Turkey has become the largest recipient of FDI in West Asia, ahead of the United Arab Emirates. The country has adopted a series of legislative reforms to facilitate the reception of foreign investment, such as the creation of Investment Support and Promotion Agency of Turkey (ISPAT), a showcase effort undertaken to attract foreign operators. FDI inflows improved in light of the development of public-private partnerships for major infrastructure projects, the measures to streamline administrative procedures and strengthen intellectual property protection, the end of FDI screening and the structural reforms carried out with a view to the future accession into the EU. In 2014, Turkey announced a major national infrastructure development plan that should attract major foreign investment.

After reaching a record high (USD 22 billion) in 2007, FDI flows to Turkey have decreased, now stagnating around USD 12.5 billion. The factors hindering FDI development include the weak currency, inflation, and proximity to the Middle East conflict.

The countries of the European Union, the Gulf States, and the United States are among the main investors in Turkey. In Turkey, FDI stock accounted for 20.9% of GDP in 2014 which was 24.1% in 2012.

7. Mexico

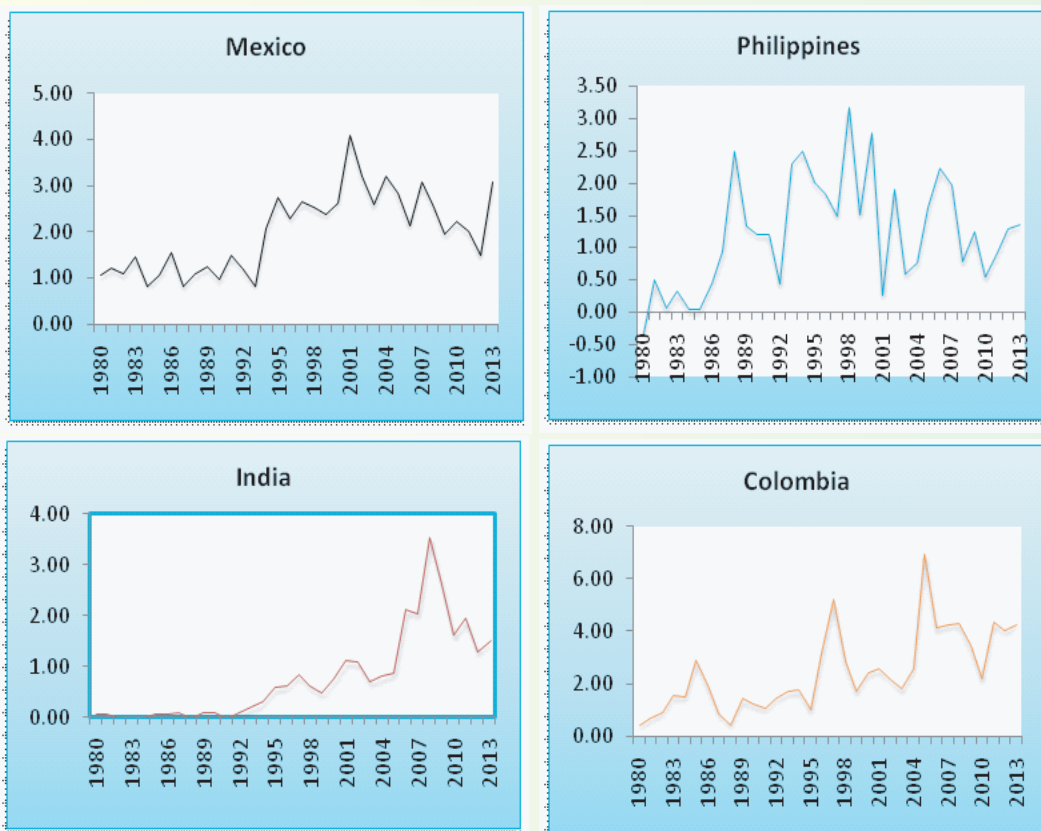
Foreign Direct Investment in Mexico increased by USD 4.891 billion in the fourth quarter of 2015. Foreign Direct Investment in Mexico averaged USD 2.289 billion from 1960 until 2015, reaching an all-time high of USD 20.995 billion in the second quarter of 2013.

Mexico is one of the emerging countries most open to foreign direct investment. According to 2015 World Investment Report published by UNCTAD, Mexico is the world's tenth largest FDI recipient. FDI inflows peaked in 2013 and dropped sharply in 2014, largely due to the arrival and departure of large international groups. The next year, FDI inflows grew considerably, ultimately reaching USD 21.5 billion. Investments in the aerospace sector were particularly substantial that year and were primarily carried out in the State of Queretaro.

A wave of reforms initiated in 2014 may help improve the regulatory situation in Mexico: the energy, telecommunications, labor, financial and education sectors have undergone sweeping reforms aimed at improving the country's competitiveness. Since 2014, the Government has also been planning to create new industrial centers (located in Guerrero, Oaxaca, and Chiapas), which could encourage FDI. Substantial infrastructure development, especially focused on airports, is planned to attract foreign investors. The business climate in Mexico has improved and the country ranked 38th in the 2016 Doing Business report of the World Bank.

Foreign investments are mostly concentrated in the border towns with the United States (where many assembly factories are located), as well as in the capital. Sectors receiving significant foreign investment are financed, the automobile industry and the electronics and energy sectors. Thanks to its robust tourism industry, the Yucatan Peninsula also receives substantial foreign investment (largely from the U.S. and Spanish banking sector). In Mexico, FDI stock accounted for 26.3% of GDP in 2014.

Figure 1: FDI Inflow of Bangladesh, Colombia, India, Indonesia, Mexico, Philippines and Turkey



Data Description and Methodology

Theoretical Model

The identified model is a four variable model which hypothesize that FDI as a function of inflation, trade openness, and exchange rate.

$$FDI_t = F(INFLA_t, TRADEOP_t, EXCHANGE_t)$$

Where FDI represents annual FDI inflow as a percentage of GDP, INFLA represents Inflation measured by GDP deflator (annual %), TRADEOP represents the sum of import and export as a percentage of GDP and EXCHANGE represents official exchange rate (local currency unit per US\$). In the Equation t-sign represents time trend. In this study, seven countries were taken into consideration- Bangladesh, Colombia, Indonesia, India,

Indonesia, Mexico, Philippines, and Turkey. Emerging countries were selected on the basis of IMF's (2012) emerging country list. Data were collected from World Development Indicators (WDI) of the World Bank. Numbers of periods used in the study varied between 33-44 years depending on the countries. Data of trade openness and exchange rate are converted into the log-log equation for time series processing. Thus, the coefficients can be interpreted as elasticity.

Stationarity Test

Stationarity of a series is an important phenomenon because it can influence its behavior. If x and y series are a non-stationary random process (integrated), then modeling the x and y relationship as a simple OLS relationship as in equation below will only generate a spurious regression.

$$Y_t = \alpha + \beta X_t + \varepsilon_t$$

Time series stationarity is the statistical characteristics of a series such as mean and variance over time. If both are constant over time, then the series is said to be a stationary process (i.e. it is not a random walk/has no unit root), otherwise, the series is described as being a non-stationary process (i.e. a random walk/has unit root). If a series is stationary without any differencing it is designated as I(0) , or integrated of order 0. On the other hand, a series that has stationary first differences is designated I(1) or integrated of order one (1). Augmented Dickey Fuller test (Dickey and Fuller, 1979), Phillips-Perron test (Phillips and Perron,1988), ADF-GLS test (Graham ,Thomas & James, 1996) and KPSS (Kwiatkowski , Phillips, Schmidt & Shin, (1992) test have been used to test the stationarity of the variables.

Johansen and Juselius Cointegration Test

Following Johansen and Juselius (1988) two tests are used to determine the number of cointegration vectors: the Maximum Eigenvalue test and the Trace test. The maximum Eigenvalue statistic tests the null hypothesis of r cointegrating relations against the alternative of r+1 no cointegrating relations for r=0,1,2...n-1. This test statistics are computed as :

$$LR_{max} \left(\frac{r}{n+1} \right) = -T * \log (1 - \lambda^r)$$

Where λ is the Maximum Eigenvalue and T is the sample size . Trace statistics investigate the null hypothesis of r cointegrating relations against the alternative of n cointegrating relations, where n is the number of variables in the system for r= 0,1,2...n-1. Its equation is computed according to the formula:

$$LR_{tr} \left(\frac{r}{n+1} \right) = -T * \sum_{i=r+1}^n \log (1 - \lambda_i)$$

In some cases, Trace and Maximum Eigenvalue statistics may yield different results and (Alexander,2001) indicates that in this case the results of trace test should be preferred.

Vector Error Correction Model (VECM)

According to Adhikary (2012) in the presence of one or more cointegrating vectors, VEC model will be applied in the study as outlined in Granger (1988).

$$\begin{aligned} \Delta FDI_t = & \\ & \alpha + \lambda e_{t-1} + \sum_{i=1}^n bi \Delta FDI_{t-i} + \sum_{i=1}^m ci \Delta INFLA_{t-i} + \sum_{i=1}^p di \Delta TRADEOP_{t-i} + \\ & \sum_{i=1}^p ei \Delta EXCHANGE_{t-i} + \varepsilon_t \dots\dots\dots(1) \end{aligned}$$

Notably, in this specification, the parameter (λ) of the lagged error correction term (e_{t-1}) indicates the long run relationship in the variables being studied, and also the speed of adjustment from the short run to long run equilibrium state. The appropriate lag length of the variables has been selected through different information criteria such as FPE, AIC, HQIC and SBIC (Akaike,1969; Brooks, 2008). Notably, the parameter of the error correction term needs to be negative and statistically significant in terms of its associated t value to confirm long -run equilibrium relationship in the variables. Changes in inflation, trade openness and exchange rate cause changes in FDI when ci's, di's, ei's are significant in terms of F test (Bahmani-Oskooee & Payeshteh, 1993) . Impulse Response Analysis has been performed by giving a shock of one standard deviation (+2 S.E innovations) to inflation, trade openness and exchange rate to visualize the duration of their effects on the FDI of Bangladesh and six emerging countries. Finally, a forecast model is used to forecast FDI, trade openness, inflation and exchange rate of Bangladesh and six emerging countries for the next seven years.

Empirical Results and Discussion

Descriptive Statistics

Jarque-Bera test was conducted to see whether the series were normally distributed. The hypothesis of Jarque-Bera test under the null Hypothesis H0: Residuals are normally distributed against the alternative hypothesis H1: Residuals are not normally distributed. From the Tables (Appendix 1), it is found that Jarque-Bera test statistics fails to reject the null hypothesis of the normal distribution of most of the variables (for most of the variable value of Prob>chi2 is greater than .05).

Stationarity Results

Four unit root tests namely Augmented Dickey-Fuller test (ADF), Phillips-Perron (PP) test, ADF-GLS test and KPSS test are used in the study. From the above-mentioned tests it is found that all the four variables used in the model have unit root (absolute value of test statistics is less than critical values at 5% level) at levels while at the first differencing, these variables are found stationary.

The same procedure was followed for testing stationarity of the variables for remaining six emerging countries and it was found that all the variables have a unit root. All the series confirmed non-stationarity but stationary at the first difference. Thus, it is concluded that they depict the same order of integration, that is, I(1) behavior. As a result, the study employs the Johansen-Juselius cointegration test on the level series to detect the cointegration relationship in the variables.

Table 2: Results of Unit-Root Tests

Variables	With Trend		
	ADF	PP	KPSS
Bangladesh			
FDI	-2.067	-1.700	0.285
Infla	-4.506	-33.037	0.153
tradeop	-1.971	-1.205	0.198
exchange	-4.206	-5.051	0.30
D(FDI)	-4.182**	-36.190***	0.0392
D(Infla)	-9.319***	-49.703***	0.0377
D(tradeop)	-6.278***	-45.668***	0.054
D(exchange)	-5.777***	-25.685***	0.0481
Colombia			
FDI	-4.851***	-8.590	0.0533
Infla	-2.361	-14.372**	0.399***
tradeop	-2.856	-5.139	0.0679
exchange	-0.377	0.087	0.242***
D(FDI)	-4.879***	-8.590	0.0533
D(Infla)	-10.72**	-62.283***	0.036
D(tradeop)	-9.982***	-67.781***	0.0551
D(exchange)	-3.846**	-23.481**	0.29***

Variables		With Trend	
India	ADF	PP	KPSS
FDI	-2.565	-4.383	0.163*
Infla	-4.598***	-32.890***	0.0973
tradeop	-2.324	0.909	0.319***
exchange	-1.912	-6.207	0.19 [#]
D(FDI)	-7.034***	-43.619***	0.0522
D(Infla)	-4.970***	-32.890***	0.0973
D(tradeop)	-6.479***	-45.572***	0.0622
D(exchange)	-4.884***	-34.094***	0.111
Indonesia			
FDI	-1.70	9.85	0.10
Infla	-3.15	-38.25	0.12
tradeop	-1.98	-9.02	0.30
exchange	-2.59	-14.43	0.11
D(FDI)	-4.84***	-27.83***	0.05***
D(Infla)	-10.80***	-62.00***	0.03***
D(tradeop)	-12.21***	-70.56***	0.05***
D(exchange)	-7.48***	-46.47***	0.06***
Mexico			
FDI	-2.85	-5.19	0.13
Infla	-2.59	-10.33	0.30
tradeop	-3.81	-0.13	0.16
exchange	-1.71	-4.09	0.22
Phillippines			
FDI	-2.58	-23.55	0.16
Infla	-4.75	-34.11	0.22
tradeop	-1.04	-4.46	0.17
exchange	-1.94	-7.43	0.22
D(FDI)	-5.25***	-60.97***	0.03***
D(Infla)	8.57***	-50.29 ***	0.03***
D(tradeop)	-6.53***	-44.17***	0.12***
D(exchange)	-5.35***	-49.04***	0.06***

Variables	With Trend		
	ADF	PP	KPSS
Turkey			
FDI	-3.60	-6.45	0.12
Infla	-1.88	-8.06	0.33
tradeop	-3.36	-3.83	0.18
exchange	-1.93	-4.91	0.29
D(FDI)	-5.42***	-28.78***	0.03***
D(Infla)	-8.12***	-48.98***	0.05***
D(tradeop)	-3.36	-42.45	0.03***
D(exchange)	-3.10	-15.67	0.32

Note: Critical values for ADF Tests are -4.25, -3.54 and -3.20 respectively at 1%, 5% and 10% significance levels. Critical values for Phillip Perron Test are -18.28, -13.01 and -10.52 respectively at 1%, 5% and 10% significance levels. Critical Values for KPSS tests are 0.216, 0.146 and 0.119 respectively at 1%, 5% and 10% significance levels

Cointegration Tests

The trace test and the maximum eigenvalue test yield one cointegrating equation at the 5% level of significance. Thus, it is concluded that the series are cointegrated, and a long run equilibrium relationship exists among them. As a result, the study proceeds to run the vector error correction model as outlined as outlined in (1).

Table 3: Johansen's Co-integration Tests

Null hypothesis	Alternative hypothesis	Statistic	Trace Test 95% Critical value
Bangladesh			
r=0	r=1	63.78***	47.21
r≤1	r=2	25.06	29.68
r≤2	R=3	10.51	15.41
r≤3	R=4	0.66	3.76
Colombia			
r=0	r=1	59.06***	47.21
r≤1	r=2	27.59	29.68
r≤2	R=3	12.69	15.41
r≤3	R=4	5.66	3.76
India			
r=0	r=1	57.6934***	47.21
r≤1	r=2	22.40	29.68
r≤2	R=3	6.16	15.41
r≤3	R=4	1.61	3.76

Null hypothesis	Alternative hypothesis	Statistic	Trace Test
		Statistic	95% Critical value
Indonesia			95% Critical value
r=0	r=1	75.36***	47.21
r≤1	r=2	17.88	29.68
r≤2	R=3	7.03	15.41
r≤3	R=4	1.79	3.76
Mexico			
r=0	r=1	81.34***	47.21
r≤1	r=2	24.93	29.68
r≤2	R=3	7.70	15.41
r≤3	R=4	2.30	3.76
Philippines			
r=0	r=1	62.93***	47.21
r≤1	r=2	19.96	29.68
r≤2	R=3	6.31	15.41
r≤3	R=4	2.35	3.76
Turkey			
r=0	r=1	87.97***	47.21
r≤1	r=2	21.23	29.68
r≤2	R=3	7.94	15.41
r≤3	R=4	2.45	3.76

Table 4 : Normalized Co-integrating Coefficient

LogFDI	infla	Logtradeop	Logexchange	C
Bangladesh				
1.00	-0.42*** (0.000)	-0.68*** (0.004)	-0.40*** (0.006)	4.235
Colombia				
1.00	0.04** (0.089)	5.42** (0.020)	-0.84*** (0.000)	-16.46
India				
1.00	-0.19*** (0.000)	-0.33 (0.494)	-1.27*** (0.001)	5.99
Indonesia				
1.00	0.28*** (0.000)	-3.63 (0.11)	-0.39 (0.24)	11.83
Mexico				
1.00	-0.29*** (0.00)	2.92 (0.55)	-0.37 (0.65)	-15.69
Philippines				
1.00	-0.28*** (0.000)	-1.11 (0.17)	-1.44*** (0.001)	10.41
Turkey				
1.00	-0.01** (0.06)	-0.33 (0.17)	-0.10*** (0.00)	0.75

Vector Error Correction Model

Seven vector error correction models have been run for Bangladesh, Colombia, India, Indonesia, Mexico, Philippines and Turkey using appropriate lag length selected by FPE, AIC, HQIC and SBIC criteria. Results of VECM reveals that a long-run equilibrium relationship exists among the variables. This has been observed by the parameter (λ) of the error correction term e_{t-1} , which is negative as expected. From the tables and using speed of adjustment formula [*Speed of adjustment* = $\ln(0.5)/\ln(1+\lambda)$], it is found that equilibrium will be restored for Bangladesh, Colombia, India, Indonesia, Mexico, Philippines in 8.22, 0.58, 4.38, 1.88, 114.82 and 1.78 years. For the countries like Philippines and Indonesia, Inflation has significant (p value less than .05) short run impact on FDI. Regarding Exchange rate, India and Colombia has significant (p value less than .05) short run impact on FDI.

From the results, it is also found that for all the countries except Colombia, inflation has significant (p-value less than .05) long run impact. Regarding trade openness, Bangladesh and Colombia have significant (p-value less than .05) long run impact whereas exchange rate has significant (p-value less than .05) long run impact on FDI for Bangladesh, Colombia, India, Indonesia, Philippines, and Turkey.

For most of the countries relationship between FDI and inflation is found negative which means if inflation increases, then FDI inflow decreases. According to Romer (1990), inflation distorts tax system and investors are uncomfortable with it because of money illusion. The level of inflation is positively correlated with its volatility. Greater inflation volatility is consistent with higher inflation rates and hence increase uncertainty and discourages long-term investment. However, this study has found a significant positive relationship between FDI and inflation for some countries like Indonesia and Mexico. Domination of other factors such as political stability, market size and low level of corruption can generate such type of relationship.

According to Ahmed and Tanin (2010), trade Openness generally positively influences the export-oriented FDI inflow into an economy. Overall, the empirical literature reveals that one of the important factors for attracting FDI is trade policy reform in the host country. Investors generally want big markets and like to invest in countries which have regional trade integration, and also in countries where there are greater investment provisions in their trade agreements. However, this study has found a significant negative relationship between FDI and trade openness for some countries like Bangladesh. According to Seim

(2009), trade openness can have a negative impact on the countries in transition. This may be an explanation why for Bangladesh relationship between trade openness and FDI is found negative.

According to Benassy-Quere et al. (2001) on the study of the impacts of exchange rate on foreign direct investment flows, the impact of exchange rate on foreign direct investment flows depends on the type of investment (horizontal foreign direct investment or vertical foreign direct investment). In the case of horizontal foreign direct investment, a depreciation of the host country's exchange rate will have a positive impact on the flows it receives through reduced cost of capital; and the appreciation of the local currency will also increase the flows of foreign direct investment because the local consumers will have a higher purchasing power. In the case of vertical foreign direct investment, an appreciation of a local currency has a negative effect on foreign direct investment inflows because items produced locally are becoming expensive abroad. The depreciation of a local currency, on the other hand, has a positive effect on foreign direct investment inflows because the products are less expensive.

Vector Error Correction Model (VECM) (P> I Z I) **Value is given in the parenthesis)**

Bangladesh

$$\Delta \ln FDI_t = 0.14 + 0.07 \Delta \ln FDI_{t-1} - 0.01 \Delta \ln infla_{t-1} - 0.10 \Delta \ln tradeop_{t-1} - 0.67 \Delta \ln exchange_{t-1} - 0.16 \Delta EC_{t-1}$$

(0.033)	(0.705)	(0.063)	(0.680)	(0.129)
(0.016)				

Colombia

$$\Delta \ln FDI_t = 0.62 + 0.16 \Delta \ln FDI_{t-1} + 0.01 \Delta \ln infla_{t-1} + 2.84 \Delta \ln tradeop_{t-1} - 3.99 \Delta \ln exchange_{t-1} - 0.90 \Delta EC_{t-1}$$

(0.003)	(0.310)	(0.734)	(0.231)	(0.003)
	(0.000)			

India

$$\Delta \ln FDI_t = 0.28 - 0.02 \Delta \ln FDI_{t-1} - 0.01 \Delta \ln infla_{t-1} - 0.84 \Delta \ln tradeop_{t-1} - 3.12 \Delta \ln exchange_{t-1} - 0.27 \Delta EC_{t-1}$$

(0.016)	(0.915)	(0.528)	(0.511)	(0.004)
(0.020)				

Indonesia

$$\Delta \ln FDI_t = -0.27 + 0.41 \Delta \ln FDI_{t-1} - 0.14 \Delta \ln infla_{t-1} - 1.77 \Delta \ln tradeop_{t-1} - 2.80 \Delta \ln exchange_{t-1} - 0.51 \Delta EC_{t-1}$$

(0.32)	(0.01)	(0.00)	(0.40)	(0.09)
(0.00)				

Mexico

$$\Delta \ln FDI_t = 0.62 - 0.53 \Delta \ln FDI_{t-1} - 0.001 \Delta \ln infla_{t-1} + 0.17 \Delta \ln tradeop_{t-1} - 0.09 \Delta \ln exchange_{t-1} - 0.01 \Delta EC_{t-1}$$

(0.003)	(0.00)	(0.83)	(0.87)	(0.90)
(0.68)				

Philippines

$$\Delta \ln FDI_t = -0.000 - 0.25 \Delta \ln FDI_{t-1} - 0.12 \Delta \ln infla_{t-1} - 2.96 \Delta \ln tradeop_{t-1} - 2.77 \Delta \ln exchange_{t-1} - 0.53 \Delta EC_{t-1}$$

(0.99)	(0.15)	(0.00)	(0.05)	(0.06)
(0.00)				

Turkey

$$\Delta \ln FDI_t = 0.28 - 0.66 \Delta \ln FDI_{t-1} - 0.01 \Delta \ln infla_{t-1} - 0.64 \Delta \ln tradeop_{t-1} - 0.89 \Delta \ln exchange_{t-1} - 1.13 \Delta EC_{t-1}$$

(0.016)	(0.00)	(0.01)	(0.18)	(0.05)
(0.00)				

Autocorrelation Test

The results from autocorrelation tests depict no autocorrelation for the models used in the study (p-value greater than .05) at the lag order for all the seven countries.

Impulse Response Functions

In the case of Bangladesh, it is observed that for an initial shock in the inflation, FDI trend will be upward up to the second year. After that, it will start to decline. For the initial shock in trade openness, FDI will have a sharp increase, then a sharp decline and lastly a sharp increase. After that, the FDI will start to stabilize. For initial shock in exchange rate Bangladesh will have a sharp decline and gradually it become stable. Interpretation for the other six countries will follow the same procedure.

Regarding Colombia, it is observed that after initial shock in inflation there will be a sharp decline in FDI and in the 5th period it will become relatively stabilized. As regard shock in trade openness, there will be a sharp decline of FDI up to period 3. After that, FDI will go

up and become stabilized after 5th period. If there is a shock in the exchange rate, there FDI will decline sharply up to the 1st period and then an upward sloping trend of FDI will be noticed.

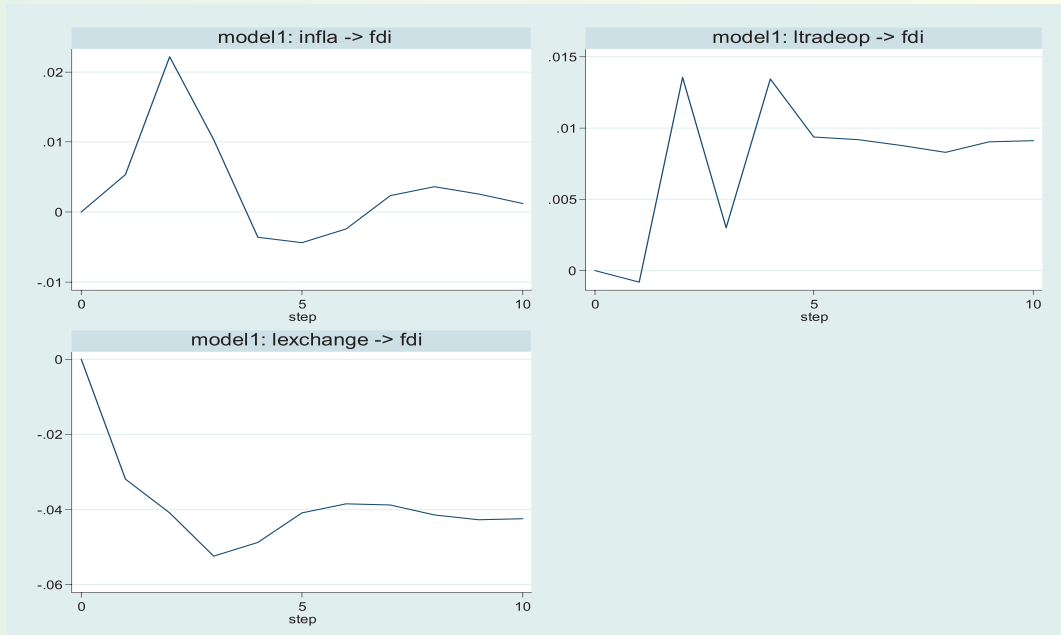
Regarding India, if there is a shock in inflation then there will be a sharp increase in FDI and after 5th or 6th period, it will become stable. If there is a shock in trade openness then initially there will be a sharp decline in FDI. After 2nd period FDI will go up and after a 5th period it will become stabilized. If there is a shock in the exchange rate, then initially there is a sharp decline but after 3rd or 4th year, it will become stabilized.

As regard to Indonesia, if there is a shock in inflation then initially FDI will go down and after some fluctuations, it will be stabilized. If there is a shock in trade openness, then FDI will increase. At a 5th year it will reach its peak level and after that, some decline will be noticed. As regard exchange rate, if there is a shock in exchange rate then FDI will decline sharply. After that, it will go up and will reach its peak at the 7th time period. The impulse response of Mexico exhibits a very interesting relationship. In all cases of shocks such as inflation, trade openness, and exchange rate, FDI shows volatility in responses.

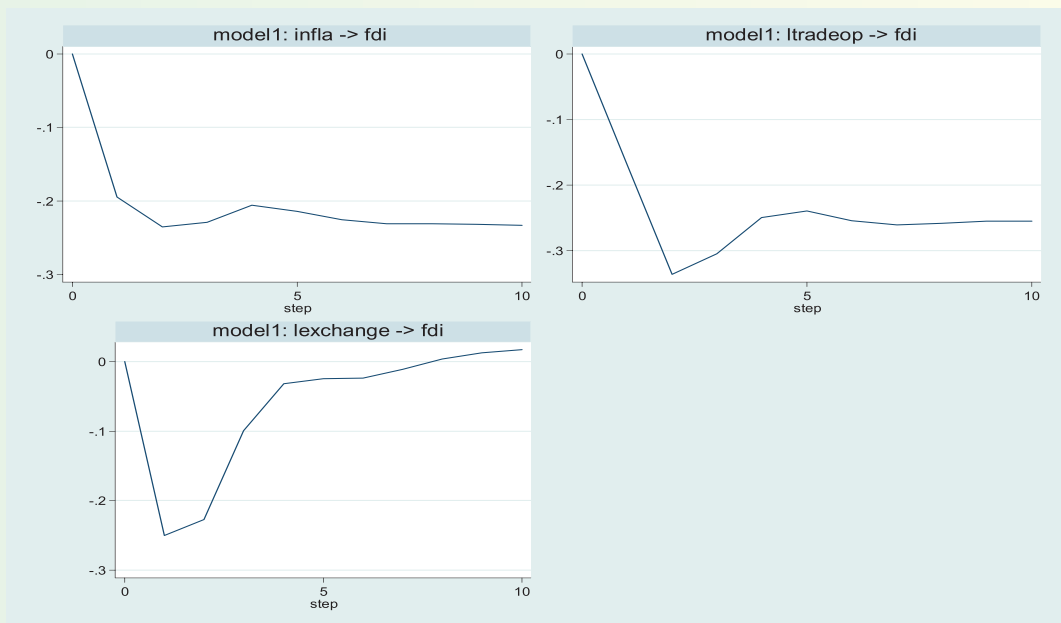
For Turkey, when there is an initial shock in inflation and trade openness, FDI will have a volatile response. As regard exchange rate, if there is an initial shock then there will be a slight decline in FDI. After that, FDI will go up and reach its peak at the 5th time period. After that, it starts to decline.

Bangladesh

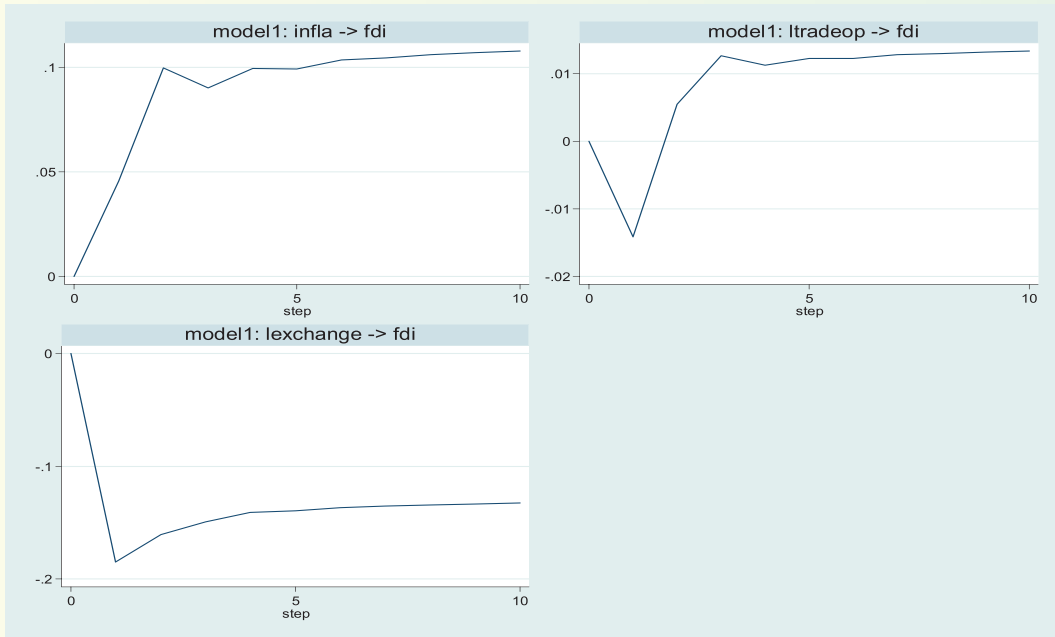
FIGURE 2: IMPULSE RESPONSE FUNCTIONS



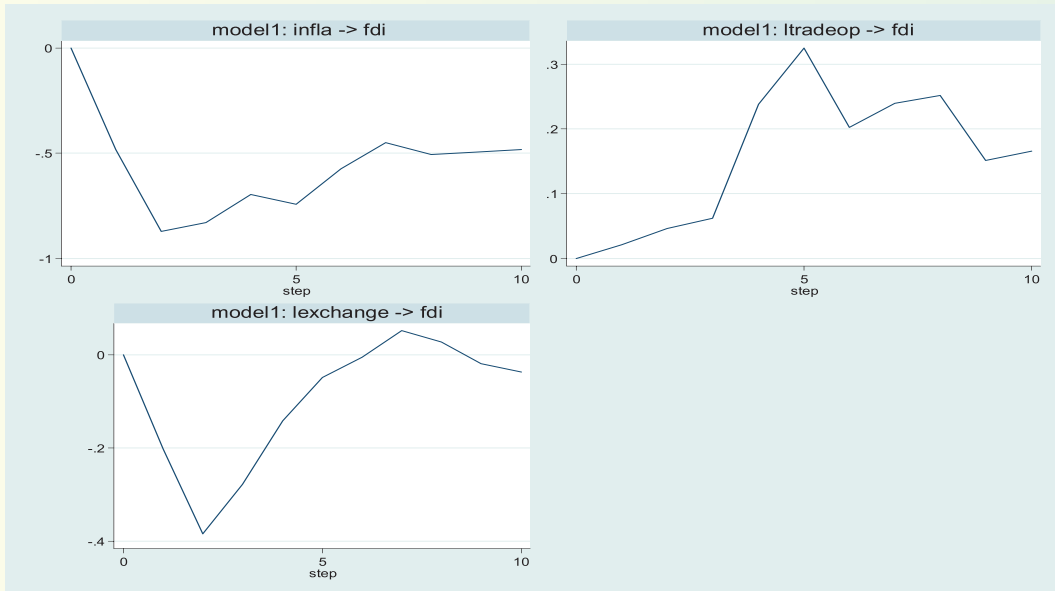
Colombia



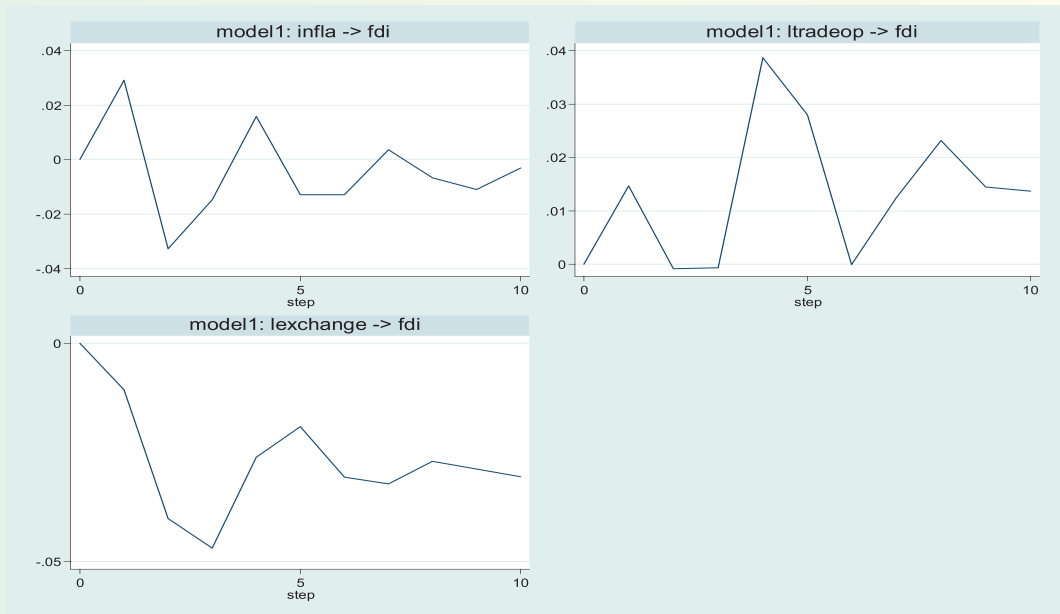
India



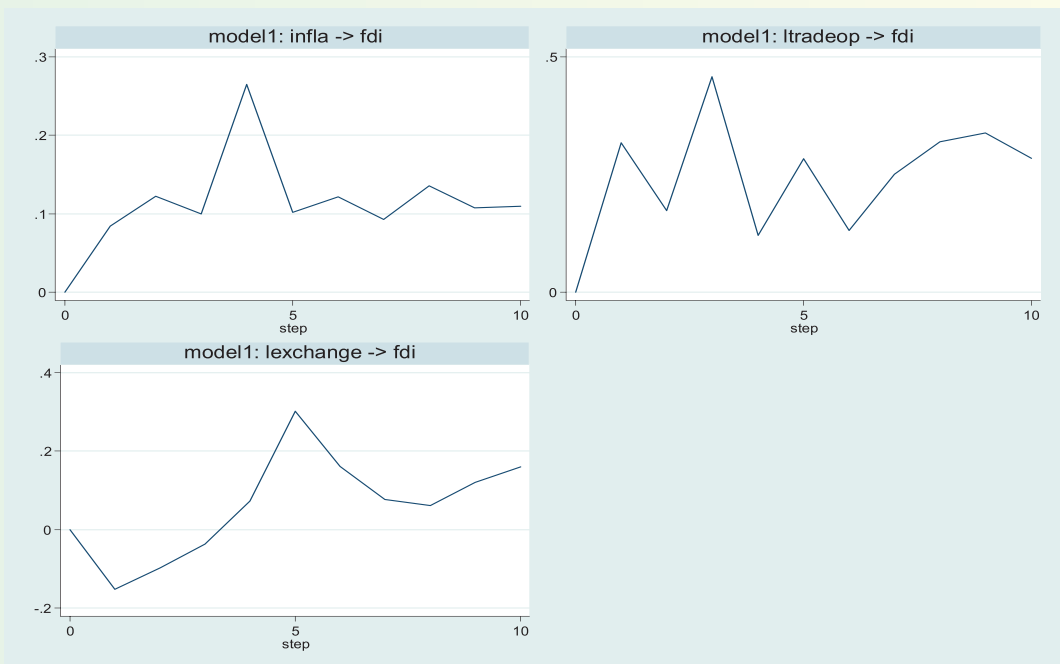
Indonesia



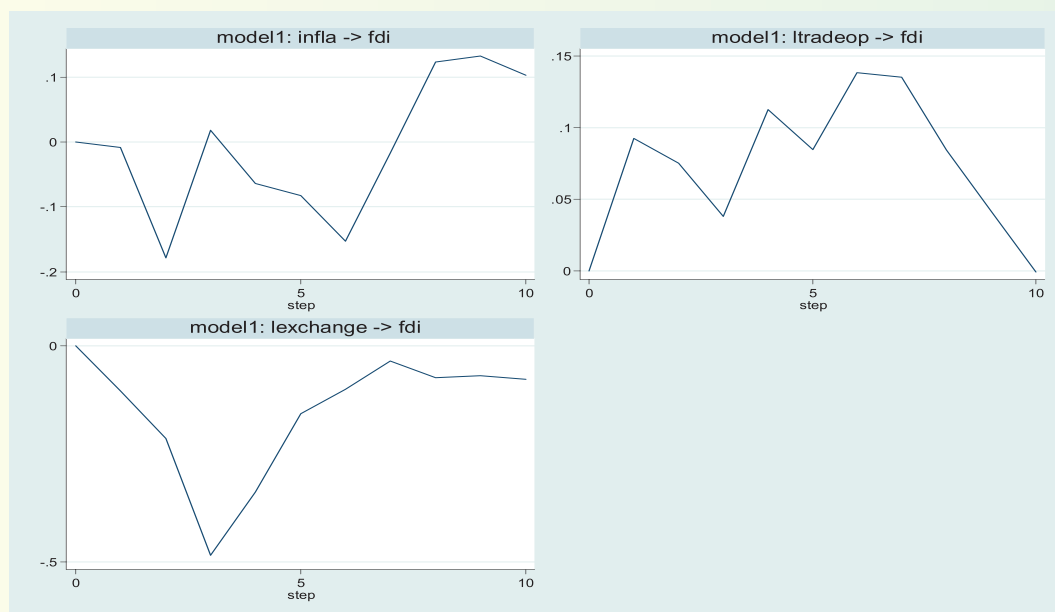
Mexico



Philippines



Turkey

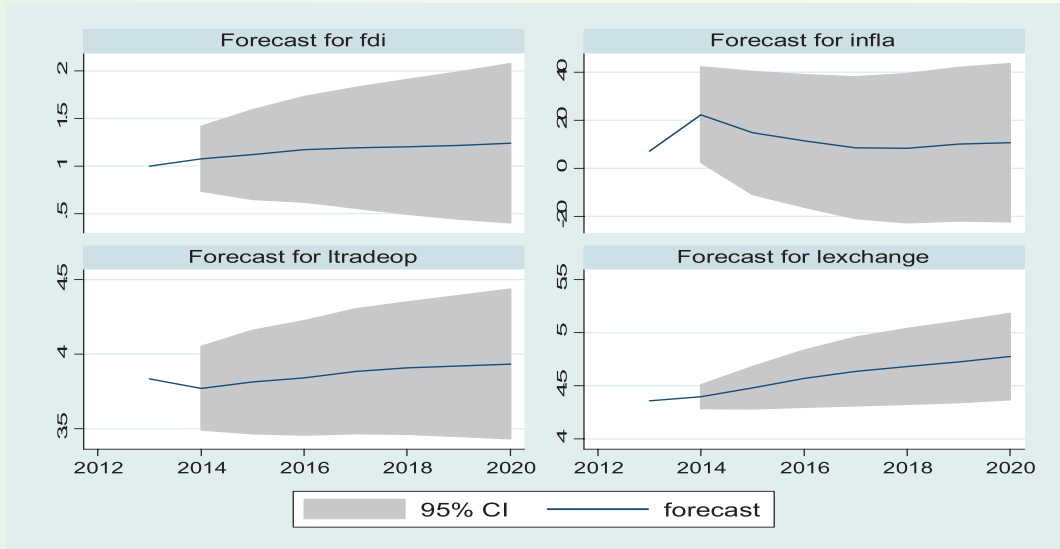


Forecasting

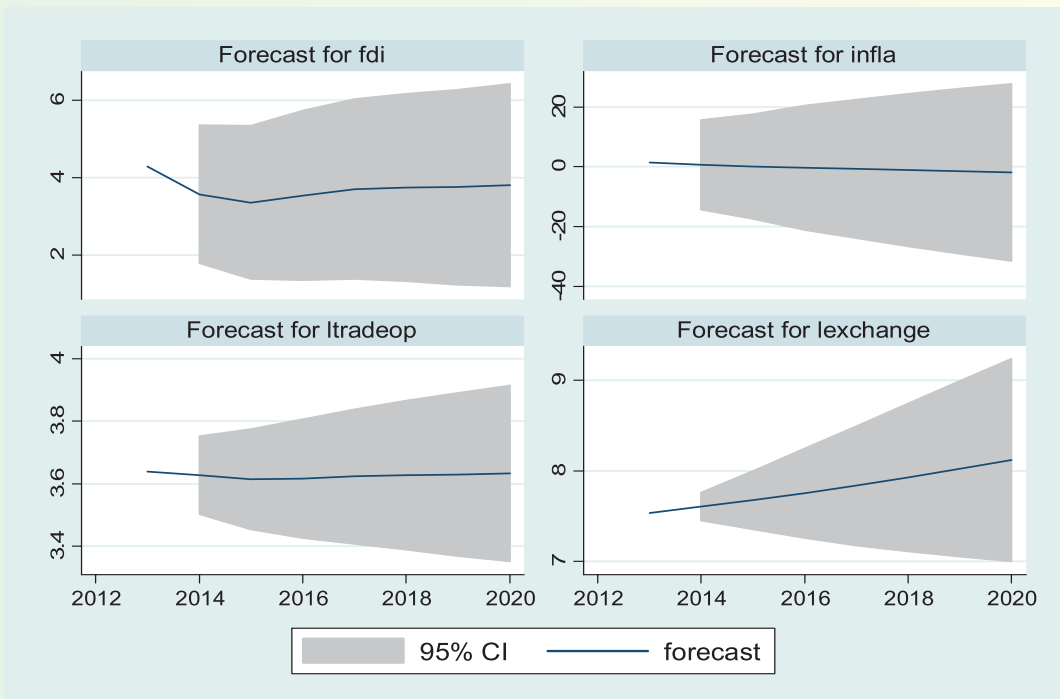
This study also tries to forecast FDI for Bangladesh and selected six emerging countries for the next seven years. From the Figures, it is observed that countries such as Bangladesh and India will have an upward trend in FDI inflows in the coming years. Indonesia will have an almost stable FDI. For countries like Colombia, Mexico, Philippines and Turkey FDI will have a bit fluctuating trend.

FIGURE 3: FDI FORECASTING

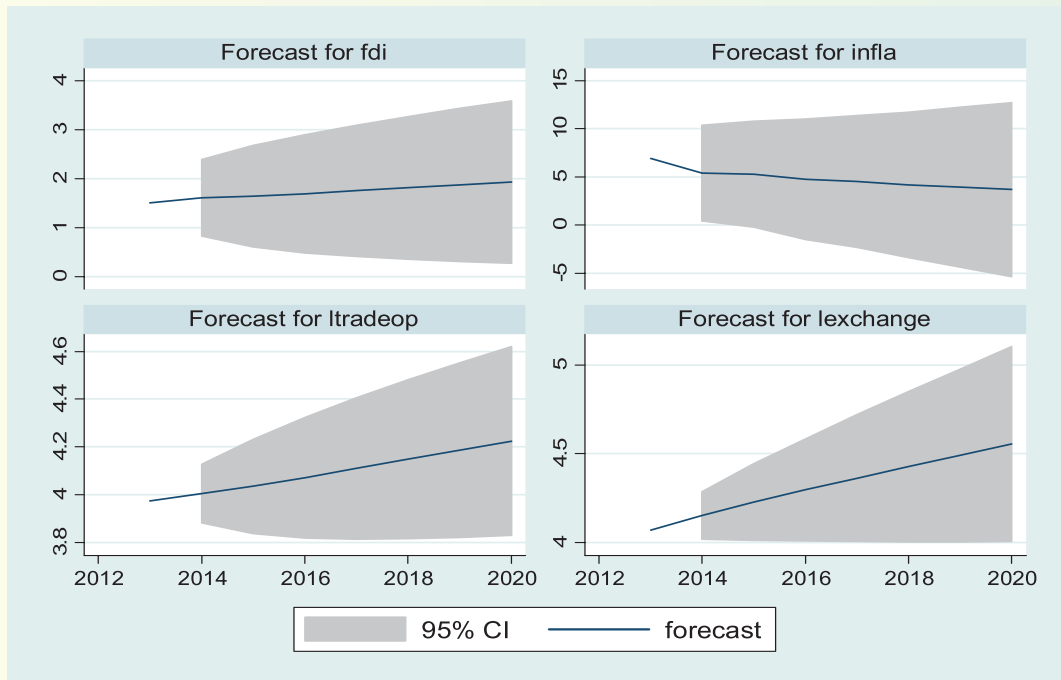
Bangladesh



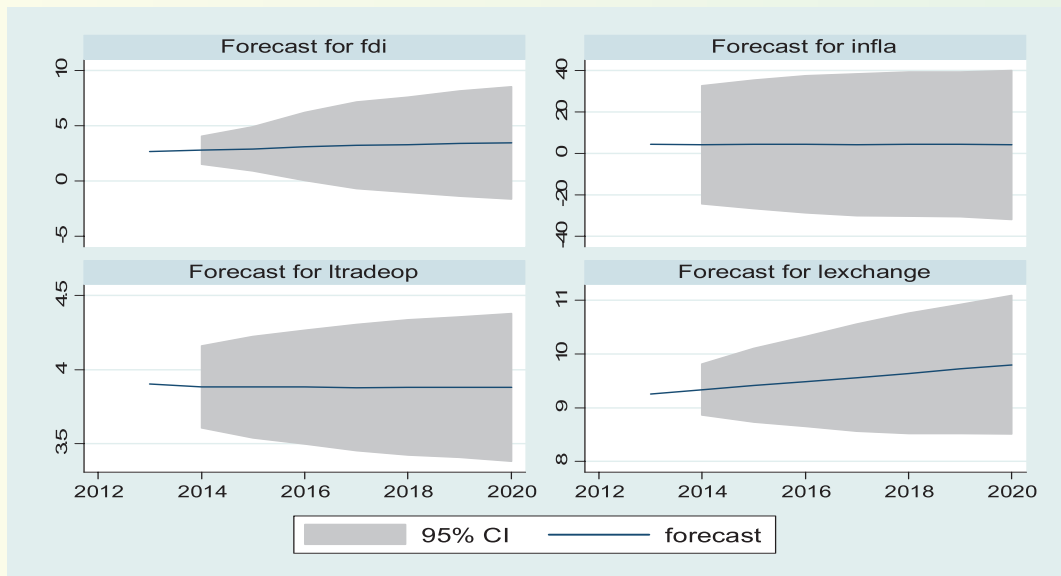
Colombia



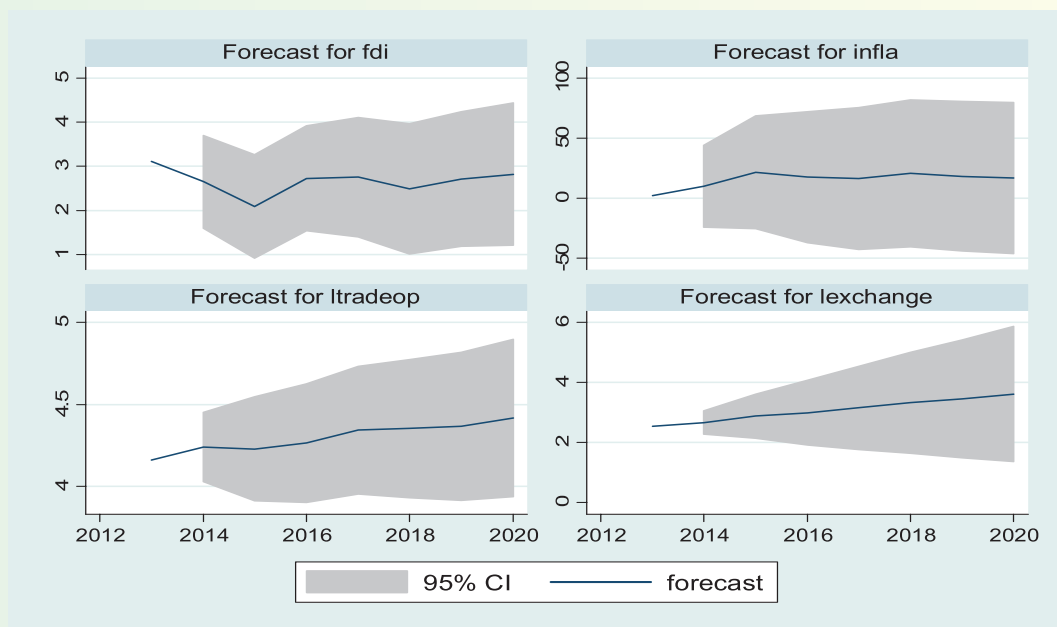
India



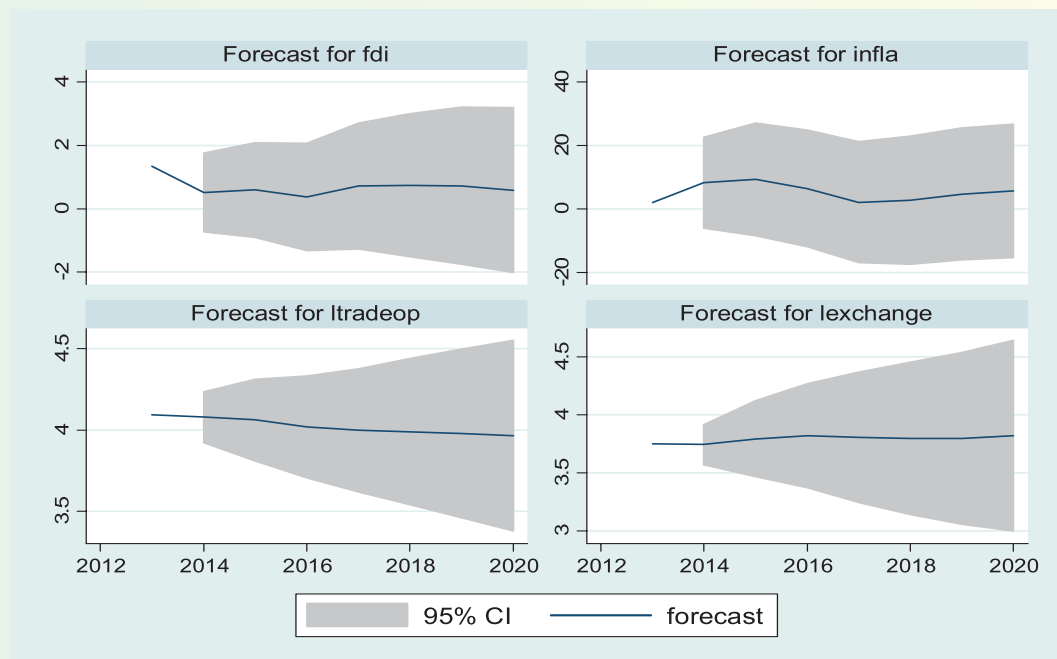
Indonesia



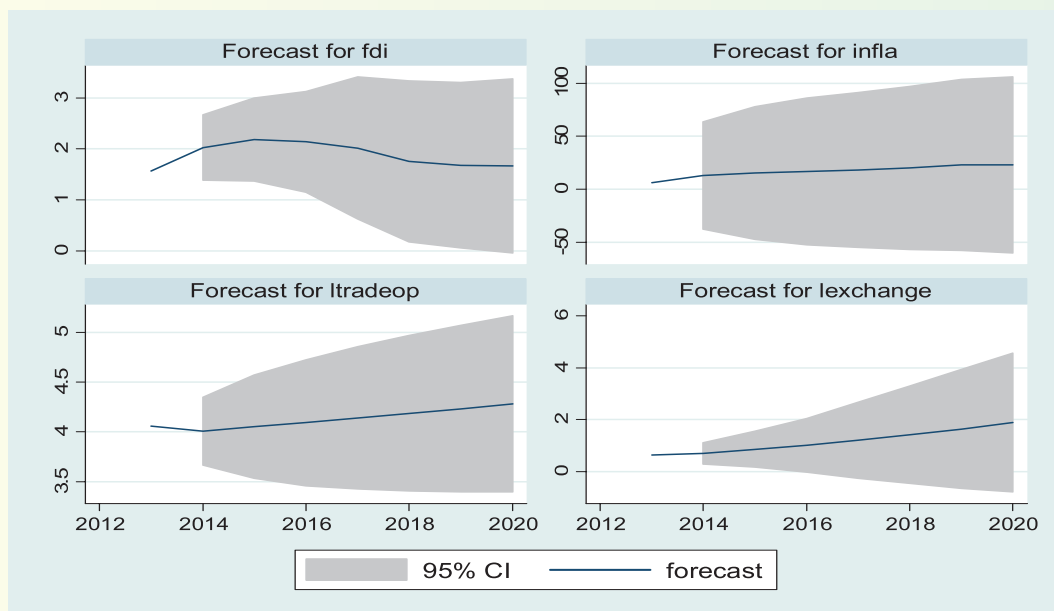
Mexico



Philippines



Turkey



Conclusion and Recommendations

This study investigated the impacts of inflation, trade openness and exchange rate on the FDI inflows in Bangladesh and six other emerging countries (Colombia, India, Indonesia, Mexico, Philippines and Turkey) under study by applying a vector error correction model. Results of the unit root tests such as ADF, ADG-GLS, PP and KPSS indicated that all variables in the study were integrated into order one. The test statistics (trace and eigenvalue) of the Johansen Co-integration test indicated the presence of a co-integration relationship among the variables. In addition, a negative parameter of the error correction term confirmed that a long-run equilibrium relationship exist among the variables. The study has found that among three independent variables of the study, inflation and exchange rate are important factors to explain the changes in FDI inflows in both short run and long-run for Bangladesh and six other emerging countries. However, this study has found the impact of trade openness as not so dominant factor for FDI inflow in the countries under study.

Therefore based on the results this study provides following recommendation:

As FDI depends on price stability of host country to a great extent, monetary and fiscal stances of the country should be designed in a prudent manner to maintain price stability and to keep inflation at a low level in order to attract more FDI inflows. In this context, it is imperative to make effective co-ordination between monetary and fiscal policy to maintain price stability.

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Colombia

Lag Selection

Selection-order criteria
 Sample: 1974 - 2013
 Number of obs = 40

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-228.946				1.34426	11.6473	11.7084	11.8162
1	-84.6523	288.59	16	0.000	.002212	5.23261	5.53794*	6.07705*
2	-66.3374	36.63*	16	0.002	.002023*	5.11687*	5.66645	6.63686
3	-56.2282	20.218	16	0.211	.002902	5.41141	6.20525	7.60696
4	-45.1636	22.129	16	0.139	.00424	5.65818	6.69628	8.52928

Endogenous: fdi infla ltradeop lexchange
 Exogenous: _cons

Test for Autocorrelation

Lagrange-multiplier test

lag	chi2	df	Prob > chi2
1	14.9312	16	0.52969
2	17.1603	16	0.37530

H0: no autocorrelation at lag order

Test for Normality

Jarque-Bera test

Equation	chi2	df	Prob > chi2
D_fdi	17.337	2	0.00017
D_infla	4.817	2	0.08995
D_ltradeop	0.440	2	0.80256
D_lexchange	7.282	2	0.02623
ALL	29.876	8	0.00022

Philippines

Lag Selection

Selection-order criteria
 Sample: 1974 - 2013
 Number of obs = 40

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-115.867				.00471	5.99334	6.05441	6.16223*
1	-95.4433	40.847	16	0.001	.003795	5.77216	6.07749	6.6166
2	-72.3473	46.192	16	0.000	.002732*	5.41737*	5.96695*	6.93736
3	-60.5598	23.575	16	0.099	.003604	5.62799	6.42183	7.82353
4	-40.4495	40.22*	16	0.001	.00335	5.42248	6.46057	8.29357

Endogenous: fdi difinfla diftradeop difexchange
 Exogenous: _cons

Test for Autocorrelation

Lagrange-multiplier test

lag	chi2	df	Prob > chi2
1	16.5486	16	0.41537
2	14.6517	16	0.55028

H0: no autocorrelation at lag order

Test for Normality

Jarque-Bera test

Equation	chi2	df	Prob > chi2
D_fdi	0.324	2	0.85042
D_infla	16.948	2	0.00021
D_ltradeop	2.628	2	0.26872
D_lexchange	5.803	2	0.05493
ALL	25.703	8	0.00118

