Foreign direct investment into BRICS: an empirical analysis

Javeria Maryam\textsuperscript{a} and Ashok Mittal\textsuperscript{b}

\textsuperscript{a}Centre for WTO Studies, IIFT, New Delhi, India; \textsuperscript{b}Department of Economics, Aligarh Muslim University, Aligarh, India

ABSTRACT
This paper examines empirically the role of selected macro-economic variables in determining FDI inflows in the context of BRICS countries. The study employed the Pooled Mean Group (PMG) Auto-Regressive Distributive Lag (ARDL) method for annual dataset over the period 1994 to 2018. The findings of the study indicate that factors like GDP, trade openness, exchange rate, gross capital formation and availability of infrastructure facilities are significant in long run. The country-specific analysis for short run indicates that among BRICS, the FDI determining variables differ in each country. Among BRICS, China is the finest country with the significant and positive effects of examined variables in stimulating FDI inflows. As BRICS economies are facing challenges at the global level, the study suggested the need of adoption of liberal policies to attract more FDI along with growth promotion.

1. Introduction
The robust flow of direct investments, either inward or outward, reflects the increasing integration of an economy with the world. By ensuring the integration of an economy with the world economy, Foreign Direct Investment (FDI) acts as a driving force for globalisation and is a key identifying and defining element of the modern world economy (Paswan, 2013). While inward FDI portrays the country as an attractive destination for foreign investors, outward FDI showcases the country's appetite and its capability to venture beyond the domestic shores (Outward Direct Investment from India: Trends, Objectives and Policy Perspectives, 2014). FDI has a multi-dimensional role that supports overall economic development for the host economies. FDI brings along with additional benefits such as managerial skills and technological know-how (Meyer & Sinani, 2009). For foreign investors, developing countries are a lucrative destination for investments as they provide opportunities for more efficient production; while for developing countries FDI serves as a channel of the foreign fund (Arita, 2013). Hence 1990s onwards, most of the developing countries are looking towards reforming the policies to upsurge foreign investments. FDI inflows are one of the prominent features of emerging economies, like BRICS (Brazil, Russia, India, China, and South Africa). BRICS members collectively represent more than a quarter of the world's land area, forty-one percent of the world's demography. BRICS has the potential of strong domestic demand, which embellished global FDI. For the successful and rapid economic growth, several factors are responsible, of which one is attracting and utilising FDI. However, FDI inflows could contribute to economic growth depending on the availability of the absorptive capability of technologies in the host country (Borensztein, Gregorio, & Lee, 1998). With the policy reforms, better infrastructure and dynamic financial sector, the magnitude of BRICS economies in the global FDI flows has increased significantly.

In 2000 the share of BRICS in global FDI flows was 6 percent, which kept increasing reaching 19 percent in 2018. From 2000 onwards, the FDI inflows to BRICS have increased remarkably from USD 84,402 million to USD 261,219 million in 2018. The BRICS members are performing well in the Ease of doing business. As per the World Bank Group's Doing Business 2019 report, except South Africa, all remaining BRICS economies have jumped up in the rank. The world bank ranks 190 countries based on different parameters which help investors to make a comparison while making cross-border investments. These ranks are of significant help for decision-making by investors (Table 1).
Higher global inflows highlight that BRICS economies have become an attractive destination of FDI because of the adoption of more liberal policies towards investment, and promotion of economic and political stability. BRICS countries have unique features that act as a catalyst in attracting FDI inflows. For instance, Brazil has extensive natural resources, with the large-sized domestic market, on the other Russia has political stability, availability of skilled labour class and abundance of natural resources. Similarly, for India’s availability of the large consumer market, developed infrastructure, the initiatives of the government like ‘Make in India’, “Skill India” have pulled major FDI inflows. The attributes of the Chinese economy like the well-developed production sector, strong export sector, high economic stability and largest populous have acted as stimulators for FDI inflows. South Africa has a potential market for investors, with the developed infrastructure, natural resources availability and economic reforms adoption facilitate FDI inflows (Figure 1).

Among the BRICS, China has got the highest share in FDI flows, followed by Brazil, Russia, India, and South Africa. The aggregate FDI inflows for the period 2001 to 2018 in BRICS region shows China’s share 49 percent, Brazil’s share 22 percent, Russia’s share 14 percent, followed closely by India at 13 percent, and South Africa’s share was 2 percent. Though the share of these economies in global FDI inflows escalated, there was a dip in Brazil, Russia, and India as the recipient of global FDI due to the global financial recession of the period of 2008–2009. However, post-2009 BRICS countries revived their share in FDI inflows significantly. FDI outflows from BRICS started slightly later at a slower pace than the inflows, reaching USD 168,828 million in the year 2018. BRICS countries corporations are active investors in the global arena and they are contributing towards shaping the South-South FDI landscape (WIR [World Investment Report], 2017) (Figure 2).

The major share of BRICS outward FDI in developed economies is driven by market-seeking motives and cross-border Mergers and Acquisitions (M&As). However, the FDI outflows from BRICS to other transitional and

| Table 1. BRICS doing business rank. |
|---|---|
| Countries | Rank 2017 | Rank 2018 |
| Brazil | 125 | 109 |
| Russia | 35 | 31 |
| India | 100 | 77 |
| China | 78 | 46 |
| South Africa | 82 | 82 |

Source: Doing business database, 2019.

![Figure 1. BRICS FDI inflows (2001–2018).](source)

Source: Compiled by Author from UNCTAD statistics, 2019.

![Figure 2. BRICS FDI outflows (2001–2018).](source)

Source: Compiled by Author from UNCTAD statistics, 2019.
developing economies are also significant, with a share of 25 percent in Africa. In terms of FDI outflows, among BRICS China holds the top position followed by Russia, India South Africa and lowest from Brazil. In recent years, the interest of BRICS MNEs has increased to invest within the group. Chinese and Indians companies are the leading investors in the group. For instance, to produce motor vehicles, the Beijing Automobile International Corporation is building USD 823 million assembly facility in South Africa. Chinese initiative of “One Belt One Road” has created a framework to boost South-South economic cooperation among members. The aggregate data for the period 2001–2018 shows the share of China in BRICS total FDI outflows was 60 percent, Russia with 27 percent, India with 8 percent, Brazil with 3 percent and South Africa with 2 percent.

The FDI inflows and outflows pattern highlights that among BRICS economies, China has outperformed other members in terms of FDI recipient, but for the overall performance of the group each member is required to buildup capacity to diminish the gap. As discussed, FDI is considered as one of the vital elements for an economy’s growth, but the FDI inflows also depend on the number of determinants that influence the FDI quantum in an economy. So, in regard to BRICS economies, as one of the most favourable recipients of FDI, it is crucial to understand the factors that are enhancing the inflows and can influence the future FDI inflows too. With this background, in this paper, the objective is to empirically examine the factors determining the FDI inflows into BRICS countries for the period 1994 to 2018. In Section 2, brief reviews of the literature are given followed by a description of methodology and data sources in Section 3. Section 4 discusses the empirical findings and the last section comes out with a brief conclusion and some suggestions.

2. Review of literature

A large number of studies have been conducted to examine the FDI’s relationship with the macro-economic variable in a different set of countries, mainly focussing on to examine the association between FDI and GDP of an economy. Studies by Blomstrom, Lipsey, and Zejan (1994); Zhang (2001) found a positive relationship between FDI and economic growth rates in developing economies. Similarly, Frenkel, Funke, & Stadtman (2004) examined FDI factors from the home and host country’s view. The study observed in the home country the cyclical factors as significant factors for FDI inflows, while in the host country GDP is a major pull factor. To examine the FDI determinants various methodological tools are applied. Grohand and Wich (2012) examined the FDI inflows to emerging countries and used the composite index to summarise a number of socio-economic variables and found that the FDI inflows were concentrated in developed countries while in the emerging economies FDI is less attracted due to the poor political, legal system and meagre infrastructure. Some studies have dug-in deeper by undertaking the influence of macro-economic variables on FDI inflows (Bevan & Saul, 2000; Banik, 2003; Cevis & Camurdan, 2007; Khachoo & Khan, 2012; Kumari & Sharma, 2017) and suggested market size, total reserves, infrastructure, trade openness, interest rate human capital yield, and labour costs are the main variables responsible for attracting inflows of FDI in emerging economies. Chakraborty and Basu (2002) found unidirectional causality between FDI and economic growth and bi-directional causality from economic growth to FDI only for India. In the context of BRICS countries, recent studies are undertaken to get a deeper understanding of FDI inflows or outflows determinants. Studies (Haydariuglu, 2016; Kishor & Singh, 2015; Labes, 2015; Popa & Carp, 2013; Ranjan & Agrawal, 2011; Vijaykumar, Sridharan, & Rao, 2010) observed market size, labour cost, infrastructure, currency value, and gross capital formation work as the catalyst to attract FDI inflows in BRICS, while trade openness and inflation turns out insignificant. In a study by Jadhav (2012) to test the determinants of FDI in BRICS, confirmed that traditional economic factors are more significant than the institutional and political factors in promoting FDI into BRICS countries. Agrawal (2015) investigated the relation between FDI and economic growth among BRICS and revealed the presence of a long-run relationship between FDI and economic growth and bi-directional causality between these two variables. Bose and Kohli (2018) while examining the trends and patterns of FDI inflows in BRICS found the inclined share of BRICS in global FDI inflows. The study highlighted high-performing emerging and frontier markets can lure more FDI inflows if investors’ preference markets policies are adopted.

As the topic of FDI inflows and its stimulants in the economies have gained attention from a large number of researchers. However, the extant literature provides the determinants of FDI for a different period and a different set of countries, mainly focussing on FDI, GDP and trade openness relationship. In the context of BRICS countries, some studies have attempted to incorporate the effects of macro-economic variables on FDI inflows. The main
contribution of the present study to the existing literature is that it deals majorly with the presence of a long-term relationship between FDI and selected macro-economic variables for data set stretched approximately for 25 years in BRICS. The methodology Pooled Mean Group (PMG) ARDL model adopted in this study has used the latest data i.e. for period 1994–2018. This study has focussed first to examine the relationship of FDI inflows with selected macro-economic variables, and secondly to understand the long-term relationship between the dependent and independent variable.

3. Data sources and methodology

To establish the relationship between FDI inflows and selected macroeconomic variables, the present study has used a multivariate panel data framework for BRICS countries (Brazil, Russia, India, China, South Africa) for the period 1994–2018. Based on the available literature a set of potential variables Gross Domestic Product (GDP), Electric power consumption (kWh per capita) as proxy of infrastructure availability (INFRA), Gross Capital Formation (GCF), Trade Openness (TRDO) and Real Effective Exchange Rate (REER) are selected as the determinants of Foreign Direct Investment (FDI) inflows in BRICS countries.

3.1. Description of variables

**Dependent Variable:** In this study, FDI inflows are considered as the dependent variable. As per OECD (2008) “FDI is made to establish a lasting interest in or effective management control over an enterprise in another country”.

**Independent Variables:** As the large size market should receive more inflows due to the large potential of consumption as compared to the smaller economies. In this study we used GDP as the proxy of market size, with expectations of positive impact on FDI inflows (Cheng & Kwan, 2000; Sahoo, 2006). The well-established and quality infrastructure is also an essential variable as a determinant of FDI inflows. Various scholars have measured infrastructure by different proxies (Kinoshita & Campos, 2003; Sahoo & Dash, 2009; Singhania & Gupta, 2011). In this study, the electric power consumption (kWh per capita) is undertaken as a proxy of infrastructure because it is an important instrument for economic growth. With the rise in Gross Capital Formation, it is expected to improve the investment climate which is one of the prominent factors leading to higher economic growth. With the expansion of the volume of trade, it is expected that trade openness has a significant and positive relationship with economic growth. Trade openness is one of the key determinants of FDI, the volume of trade and trade openness is supposed to have an important role in attracting FDI (Asideu & Lien, 2004; Tintin, 2013) (Table 2).

Similarly, exchange rate stability is expected to have a positive impact on foreign capital inflows in the economy by influencing the trade expansions and economic growth (Kishor & Singh, 2015; Vijaykumar et al., 2010). The strength of the currency is used as a proxy for the purchasing power of the investing firm. The currency value is proxied by the Real Effective Exchange Rate (REER).

| Variable name                  | Definition/ proxy                                      | Data sources                                                                 | Expected sign |
|-------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------|---------------|
| FDI Inflows (FDI)             | Log of Foreign Direct Investment in the current USD     | United Nations Service Trade Statistics Database (UNCTADStat)                 |               |
| Market Size (GDP)             | Log of the Gross Domestic Product in the current USD    | World Development Indicators (WDI)                                           | +             |
| Infrastructure (INFRA)        | Log of electric power consumption (kWh per capita) in the current USD | World Development Indicators (WDI)                                           | +             |
| Gross Capital Formation (GCF) | Gross Capital Formation to the percent of GDP           | World Development Indicators (WDI)                                           | +, -          |
| Trade Openness (TRDO)         | Trade openness as a ratio of import of goods and services plus export of goods and services divided by GDP | World Development Indicators (WDI)                                           | +             |
| Real Effective Exchange Rate (REER) | Real effective exchange rate                          | World Development Indicators (WDI) and Bank of International Settlements (BIS) | +             |
3.2. Model specifications

In this study, we try to explore the relationship between stated variables by employing the given empirical model form:

\[
LN_{FDI_{it}} = a_0 + a_1 LN_{GDP_{it}} + a_2 LN_{INFRA_{it}} + a_3 GCF_{it} + a_4 TRDO_{it} + a_5 REER_{it} + u_{it}
\]

Where,

- \(LN_{FDI_{it}}\) is the log of Foreign Direct Investment in the current USD for country \(i\) at time \(t\)
- \(LN_{GDP_{it}}\) is the log of the Gross Domestic Product in the current USD for country \(i\) at time \(t\)
- \(LN_{INFRA_{it}}\) is the log of electric power consumption (kWh per capita) in the current USD for country \(i\) at time \(t\)
- \(GCF_{it}\) is the Gross Capital Formation to the percent of GDP for country \(i\) at time \(t\)
- \(TRDO_{it}\) is the trade openness for country \(i\) at time \(t\) and is expressed as a ratio of import of goods and services divided by GDP
- \(REER_{it}\) is the real effective exchange rate for a country \(i\) at time \(t\)
- \(u_{it}\) is the error term for a country \(i\) at time \(t\)

Most of the empirical work has shown that FDI can lead to economic growth depending upon a set of conditions in the host country. Our analysis has adopted two steps, in the first, panel unit root test for the variables was investigated. Based on the results, the study has employed the Pooled Mean Group Autoregressive Distribution Model (ARDL) to capture short-run and long-run effects.

3.2.1. Panel unit root tests

To choose the appropriate model, the analysis required to examine the order of the integration of the variables. To avoid the spurious regression problem, numerous panel unit root tests have been performed. For the analysis, in order to assess the integration and unit root among the variables, different panel unit root tests have been performed based on individual effects and combined effects. The panel unit root test based on ADF proposed by Levin, Lin, and Chu (LLC) \(t\)-test (2002) which assumes homogeneity in the dynamic panel of autoregression in all panel units. Im, Pesaran, and Shin (2003) test allows for individual unit root process. All the tests are characterised by the combining of individual unit root tests to derive a panel-specific result and have the advantage of allowing much heterogeneity across all panel units.

The LLC (2002) basic regression model is:

\[
\Delta y_{it} = \mu_i + \rho y_{it-1} + \sum_{j=1}^{m} \alpha_j \Delta y_{it-j} + \delta i + \theta it + \epsilon_{it}
\]

where, \(\Delta\), denotes the first difference operator, \(m\) represents the lag length, \(\mu_i\), and \(\theta it\) are unit-specific respective fixed effects and time effects. The Null hypothesis is that for all \(i\), \(\rho_i = 0\), i.e. the time series are all independent random walks, in contrast to the alternative, \(\rho_i < 0\) for all \(i\).

The IPS test which is based on the well-known Dickey-Fuller procedure, test for the presence of unit root in panels that combines information from the time series dimension with that from the cross-section dimension, such that fewer time observations are required for the test to have power. The IPS test takes the following form:

\[
\Delta y_{it} = \alpha_i + \rho y_{it-1} + \sum_{j=1}^{m_i} (\beta_j \Delta y_{it-j}) + \epsilon_{i,t}
\]

The above equation is based on IPS defined as \(H_0 : \rho_i = 0\) for all \(i = 1, \ldots , N\) against the alternative hypothesis \(H_1 : \rho_i < 0\) for \(i = 1, \ldots , N_i\) and \(\rho_i = 0\) for \(i = N_i+1, \ldots , N\), with \(O < N_i \leq N\).

3.2.2. Pooled Mean Group (PMG) panel ARDL model

In this study, once the data is tested for the presence of unit root, we proceed with the specification of the dynamic panel model. When few variables are stationary at levels and some of the first difference, Panel Auto-Regressive-Distributed Lag (ARDL) is most appropriate to apply. The panel ARDL model expects homogeneous long-run coefficients. PMG assumes that the error terms are distributed independent of the regressors and are serially uncorrelated. The dynamic panel of large sample size (\(N\)) and shorter time (\(T\)) are different from the large sample size (\(N\)) and large time (\(T\)). Panel estimation based on small \(T\) is dependent on fixed-or random effect model or fixed-effect estimators and instrumental-variable estimators, for example, the Arellano and Bond (1991) generalised method-of-moments (GMM) method. These techniques require pooling singular groups and
permitting just the intercept to differ over the groups. Important findings from the large N and large T, in any case, are that the presumption of homogeneity of slope parameters is frequently improper. This point has been made by Pesaran and Smith (1995); Im et al. (2003) and Phillips and Moon (2000). To overcome this problem, an alternative Pooled Mean Group (PMG) estimator was given by Pesaran, Shin, and Smith (1999). The model takes the simple form of ARDL and advanced panel settings include an intercept, short-run coefficients, and co-integration term. In the ARDL model chances of endogeneity are minimum as each of the variables stands as a single equation.

PMG ARDL model can be written as:

$$ FDI_{it} = \sum_{j=0}^{\gamma_i} \beta_i FDI_{i,t-j} + \sum_{j=0}^{\gamma_i} \beta_i GDP_{i,t-j} + \sum_{j=0}^{\gamma_i} \beta_i INFRA_{i,t-j} + \sum_{j=0}^{\gamma_i} \beta_i GCF_{i,t-j} + \sum_{j=0}^{\gamma_i} \beta_i TRDO_{i,t-j} + \sum_{j=0}^{\gamma_i} \beta_i REER_{i,t-j} + \epsilon_{i,t} $$

(3)

The above Equation (4) is reformulated as below based on the argument of Pesaran et al. (1999):

$$ \Delta FDI_{it} = \alpha_i + \phi_i FDI_{i,t-1} + \sum_{j=0}^{\gamma_i} \beta_i GDP_{i,t-j} + \sum_{j=0}^{\gamma_i} \beta_i INFRA_{i,t-j} + \gamma_i GCF_{i,t-j} + \lambda_i TRDO_{i,t-j} + \phi_i REER_{i,t-j} $$

(4)

where, \( FDI \) is the log of Foreign Direct Investment, GDP is the log of the Gross Domestic Product, INFRA is the log of electric power consumption (kWh per capita) as proxy of infrastructure availability, GCF is the Gross Capital Formation to the percent of GDP, \( TRDO \) is the trade openness for country and is expressed as a ratio of import of goods and services plus export of goods and services divided by GDP and \( REER \) is the real effective exchange rate. Further \( i = 1, 2, \ldots, 5 \), \( t = 1994, \ldots, 2018 \) and \( \epsilon_{i,t} \) is the error term and assumed to independently distributed across the country \( i \) and over time \( t \). The terms \( \delta_i, \phi_i, \gamma_i, \lambda_i, \phi_i, \alpha_i, \beta_i, \gamma_i, \lambda_i, \phi_i, \alpha_i \) are the long run and short-run coefficients. where \( \phi_i \) represents the error correction coefficient which is expected to be negative and statistically significant. Besides, \( \phi_i = -1 = \sum_{j=0}^{\gamma_i} \beta_i \), \( \delta_i = \sum_{j=0}^{\gamma_i} \beta_i \), \( \phi_i = \sum_{j=0}^{\gamma_i} \phi_i \), \( \alpha_i = \sum_{j=0}^{\gamma_i} \phi_i \).

4. Empirical findings and discussion

The first step in ascertaining the order of integration is to perform LLC and IPS unit root tests for the combined unit root test as given in Table 3. The findings of the LLC and IPS tests based on intercept and intercept-trend variable FDI is found stationary at I(0) and other variables GDP, INFRA, REER, TRDO and GCF are stationary at I(1).

The findings unit root suggested to proceed with the Pooled Mean Group Autoregressive Distribution Model (ARDL) methodology. The results of the PMG-ARDL model are reported in Table 4. The panel results for long-run confirmed that all the independent variables i.e. economic growth (GDP), infrastructure (INFRA), an exchange rate (REER), trade openness (TRDO) and Gross Capital Formation (GCF) are statistically significant in BRICS countries. The long-run coefficients of GDP, REER, TRDO, and GCF are positive as expected. The positive coefficients of the analysed variables suggest that with the increment in the economic growth, exchange rate stability, trade openness and gross capital formation, the share of BRICS countries in FDI inflows will be higher. However, the

| Variable | Intercept | Intercept-trend | Intercept | Intercept-Trend |
|----------|-----------|-----------------|-----------|-----------------|
| LN_FDI(l0) | 0.007* | 0.3639 | 0.004* | 0.012* |
| LN_FDI(l1) | 0.000* | 0.000* | 0.000* | 0.000* |
| LN_GDP(l0) | 0.560 | 0.069 | 0.982 | 0.027 |
| LN_GDP(l1) | 0.000* | 0.000* | 0.000* | 0.001* |
| LN_INFRA (l0) | 0.616 | 0.395 | 0.998 | 0.586 |
| LN_INFRA (l1) | 0.000* | 0.000* | 0.000* | 0.000* |
| REER(l0) | 0.2132 | 0.589 | 0.373 | 0.340 |
| REER(l1) | 0.000* | 0.000* | 0.000* | 0.000* |
| TRDO(l0) | 0.076 | 0.551 | 0.171 | 0.600 |
| TRDO(l1) | 0.000* | 0.000* | 0.000* | 0.000* |
| GCF(l0) | 0.248 | 0.623 | 0.229 | 0.512 |
| GCF(l1) | 0.000* | 0.000* | 0.000* | 0.001* |

Source: Computed by authors.

Note: Critical value at the 1% significance level denoted by * with intercept and intercept-trend.
infrastructure variable came out to be significant but with the negative coefficients in the long run, which is opposite to our expectations. In this analysis, we have used the “electric power consumption” as a proxy for infrastructure availability. One of the plausible explanations of the negative coefficient of infrastructure availability can be that as in the BRICS countries the infrastructure sector is not well-developed so it might fail in attracting FDI inflows.

The long-run findings of the analysis are as per the study's assumptions. At the present time, with the rising competition for FDI inflows among the economies of developing and emerging world, the BRICS economies need to focus on more policies that can attract more FDI in the region. In the wake of rising protectionism at the global level, still, the role of openness of an economy is undoubtedly one of the main factors to integrate an economy with other economies. As the long run results also highlighted the importance of trade openness in influencing positively FDI inflows. Similarly, the exchange rate stability is one of the dominating factors for attracting foreign capital inflows. From the PMG ARDL model, the short-run results are also gained. In our study, for the short-run, it was found that none of the variables is statistically significant in attracting more capital inflows to BRICS countries. The short-run results highlight that it is in the long-run that with improvements in the selected macro-economic variables BRICS countries can attract more FDI inflows to enhance economic development.

5. Conclusion and suggestions

The challenge for the BRICS countries is how to sustain their future share and trend in FDI inflows to optimise their economic development. This paper aimed to identify the variables responsible for attracting FDI inflows in BRICS countries for the period 1994 to 2018. The findings of PMG ARDL find evidences of long-run relationship between Foreign Direct Investment (FDI) inflows, economic growth (GDP), availability of infrastructure facilities (INFRA), exchange rate stability (REER), Trade Openness (TRDO) and Gross capital formation (GCF) highlighting that with the improvement in these variables, the share of BRICS countries in FDI inflows will improve more. The empirical findings for the long-run confirmed the significance of GDP and Trade Openness (TRDO) as potential factors in attracting FDI inflows in BRICS along with variables like the infrastructure availability, exchange rate stability, and Gross Capital Formation. The implications of the results seem to be consistent with the perception that the market size, stable exchange rates, higher capital formation, and economic openness attract more FDI inflows in emerging economies. Though, the short-run results are disturbing as in the short-run all variables are statistically insignificant. However, from the short-run findings one can understand that as the benefits of FDI majority can be reaped in long run, so in short-run the impacts of selected variables might not be to a large extent on FDI inflows in BRICS countries. The overarching of the study underlines that aside from embracing liberal measures there is a necessity to adopt policies towards improving the macro-economic conditions and promoting stability of political institutions to encourage more FDI inflows. It is also vital to bring more changes in the external sector to pull in more FDI to buzz and augment both the trade and economic growth of BRICS. The adoption of these changes not only will promote economic growth alone but also will improve technological advancements. As no study is free from its own limitations, this study also has some limitations. The study has not checked for

| Table 4. Result from pooled mean group ARDL model. |
|---------------------------------------------------|
| Long-run                                         |
| Coefficient | Prob   |
| LN_GDP      | 0.924  | 0.000*  |
| LN_INFRA    | -1.141 | 0.000*  |
| REER        | 0.013  | 0.002*  |
| TRDO        | 0.014  | 0.000*  |
| GCF         | 0.019  | 0.034*  |
| Short-Run                                          |
| Coefficient | Prob   |
| COINTEQ(01) | -0.647 | 0.000*  |
| D(LN_GDP)   | 0.153  | 0.767   |
| D(LN_INFRA) | 1.844  | 0.462   |
| D(REER)     | -0.007 | 0.475   |
| D(TRDO)     | 0.007  | 0.499   |
| D(GCF)      | -0.062 | 0.352   |
| C           | 2.175  | 0.000*  |

Source: Computed by Authors.
Note: Critical value at the 1% significance level denoted by *. 

TRANSNATIONAL CORPORATIONS REVIEW 7
endogeneity between GDP and FDI, it is probable that that GDP may influence FDI or vice-versa. As this study is focussed on the BRICS as the whole group, a recommendation for further research is to examine the FDI inflows country-specific determinants in the BRICS. In this study, we have considered only selected macro-economic variables, however along with macro-economic variables the institutional factors also matter. There is scope for future studies to examine both the macro-economic and institutional factors influence on FDI inflows as well as outflows for BRICS.

Disclosure statement
No potential conflict of interest was reported by the authors.

Notes on contributors
Dr. Maryam, has recently got her doctorate in Economics, from Aligarh Muslim University. At present, she is working as Senior Research Fellow (Economics) at Center for WTO Studies, (IIFT), a think-tank of Ministry of Commerce, Government of India. Her areas of specialization are issues related to International trade, regional integration, services and investment policies.

Prof. Mittal is working as professor of Economics (Econometrics), in Aligarh Muslim University. Along with the teaching experience, he has long experience of research in economics, with focus on Macroeconomics, Public Finance and International Economics. His research papers have been published in various national and international journals.

References
Agrawal, G. (2015). Foreign direct investment and economic growth in BRICS economies: A panel data analysis. Journal of Economics Business, and Management, 3, 2301–3567.
Arellano, M., Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. The Review of Economic Studies, 58, 277.
Arita, S. (2013). Do emerging multinational enterprises posses south-south FDI advantages? International Journal of Emerging Markets, 4, 329–353.
Asideu, E., & Lien, D. (2004). Capital controls and foreign direct investments. World Development, 32, 479–490. doi:10.1016/j.worlddev.2003.06.016
Banik, A. (2003). Foreign direct investment inflows to India and China: Trends, assessments and determinants. Savings & Development, 27, 5–22.
Bevan, AA., & Saul, E. (2000). The determinants of foreign direct investment in transition economies. Working Paper No. 342. William Davidson Institute.
Blomstrom, M., Lipsey, R.E., & Zejan, M. (1994). What explains developing country growth? In W.J. Baumol (Ed.), Convergence of productivity: Cross-national studies and historical evidence (9th ed.) New York: Oxford University Press, Incorporated.
Borensztein, E., Gregorio, J.D., & Lee, J.W. (1998). How does foreign direct investment affect economic growth? Journal of International Economics, 45, 115–135. doi:10.1016/0022-1996(97)00033-0
Bose, S., & Kohli, B. (2018). Study of FDI trends and patterns in BRICS economies during the period 1995–2015. Emerging Economy Studies, 4, 78–101. doi:10.1177/2394901518769225
Cevis, I., & Camurdan, B. (2007). The economic determinants of foreign direct investment in developing countries and transition economies. The Pakistan Development Review, 46, 285–299. doi:10.30541/v46i3pp.285-299
Chakraborty, C., & Basu, P. (2002). Foreign direct investment and growth in India: a cointegration approach. Applied Economics, 34, 1061–1073. doi:10.1080/00036840110074079
Cheng, L.K., & Kwan, Y.K. (2000). What are the determinants of the location of foreign direct investment? The Chinese experience. Journal of International Economics, 22, 222–234. doi:10.1016/S0022-1996(99)00032-X
Frenkel, M., Funke, K., & Stadtman, G. (2004). A panel analysis of bilateral FDI inflows to emerging economies. Economic Systems, 28, 281–300. doi:10.1016/j.ecosys.2004.01.005
Grohand, A.P., & Wich, M. (2012). Emerging economies attraction of foreign direct investment. Emerging Markets Review, 13, 210–229. doi:10.1016/j.ememar.2012.03.005
Haydariuglu, C. (2016). The effect of foreign direct investment and economic freedom on economic growth: The case of BRICS countries. Research in World Economy, 7, 1–10.
Im, K.S., Pesaran, M.H., & Shin, Y.C. (2003). Testing for unit roots in heterogeneous panels. Journal of Econometrics, 115, 53–446. doi:10.1016/S0304-4076(03)00092-7
Jadhav, P. (2012). Determinants of foreign direct investment in BRICS economies: Analysis of economic, institutional and political factors. Procedia - Social and Behavioral Sciences, 37, 5–14. doi:10.1016/j.sbspro.2012.03.270
Khachoo, A.Q., & Khan, M.I. (2012). Determinants of FDI Inflows to developing countries: A panel data analysis. MPRA Paper, (No.37278).Munich Personal RePEc Archive
Kinoshita, Y., & Campos, N.F. (2003). Why does FDI go where it goes? New evidence from the transition economies (Working Paper No 573). William Davidson Institute: United Kingdom.

Kishor, N., & Singh, R.P. (2015). Determinants of FDI and its impact on BRICS countries: A panel data approach. *Transnational Corporations Review, 7*, 269–278. doi:10.5148/tncr.2015.7302

Kumari, R., & Sharma, A. (2017). Determinant of foreign direct investment in developing countries: A panel data study. *International Journal of Emerging Markets, 12*, 658–682. doi:10.1108/IJeEM-10-2014-0169

Labes, S.A. (2015). *FDI determinants in BRICS* (CES Working Papers, Centre for European Studies, Alexandru Ioan Cuza University, VII (2)).

Meyer, K.E., & Sinani, E. (2009). When and where does foreign direct investment generate positive spillovers & quest; A meta-analysis. *Journal of International Business Studies, 40*, 1075–1094. doi:10.1057/jibs.2008.111

OECD. (2008). *Benchmark definition foreign direct investment* (4th ed.). Paris, France: Organisation of Economic Cooperation and Development.

Outward Direct Investment from India: Trends, Objectives and Policy Perspectives. (2014). *Export-Import Bank of India, New Delhi* (Occasional Paper No (165)).

Paswan, N.K. (2013). Investment cooperation in Central Asia: Prospects and challenges. *India Quarterly: A Journal of International Affairs, 69*, 13–33. doi:10.1177/0974928412472101

Pesaran, M.H., Shin, Y.C., & Smith, R.J. (1999). Pooled mean group estimation of dynamic heterogeneous panel. *Journal of American Statistical Association, 94*, 79–113.

Pesaran, M.H., & Smith, R.J. (1995). Estimating long-run relationships from dynamic heterogeneous panels. *Journal of Econometrics, 68*, 79–113. doi:10.1016/0304-4076(94)01644-F

Phillips, P., & Moon, H. (2000). Non-stationary panel data analysis: An overview of some recent developments. *Econometric Reviews, 19*, 263–286. doi:10.1080/07474930008800473

Popa, D., & Carp, L. (2013). The influence of foreign trade and foreign direct investment on brics economic growth. Paper presented at the Global Virtual Conference, Romania.

Ranjan, V., & Agrawal, G. (2011). FDI inflow determinants in BRIC countries: A panel data analysis. *International Business Research, 4*, 255–263. doi:10.5539/ibr.v4n4p255

Sahoo, P. (2006). *Foreign direct investment in South Asia: Policy, trends, impact and determinants* (Discussion Paper No. 56). ADB Institute, Asian Development Bank, Manila.

Sahoo, P., & Dash, R.K. (2009). Infrastructure development and economic growth in India. *Journal of the Asia Pacific Economy, 14*, 351–365. doi:10.1080/13547860903169340

Singhania, M., & Gupta, A. (2011). Determinants of foreign direct investment in India. *Journal of International Trade Law and Policy, 10*, 64–82. doi:10.1108/14770021111116142

Tintin, C. (2013). The impact of import competition on Japanese manufacturing employment. *Journal of the Japanese an International Economies, 17*, 118–133.

VijayKumar, N., Sridharan, P., & Rao, K.C. (2010). Determinants of FDI in BRICS countries: A panel analysis. *International Journal of Business Science and Applied Management, 5*, 1–13.

World Development Indicators, World Bank. Retrieved from [https://datacatalog.worldbank.org/dataset/world-development-indicators](https://datacatalog.worldbank.org/dataset/world-development-indicators)

World Investment Report. (2017). *Investment and digital economy*. UNCTAD, Geneva.

Zhang, K.H. (2001). Does foreign direct investment promote economic growth? Evidence from East Asia and Latin America. *Contemporary Economic Policy, 19*, 175–185. doi:10.1111/j.1465-7287.2001.tb00059.x