Accelerating economic performance through foreign direct investment: Empirical evidence from Namibia

Documented empirical studies in the literature on the impact of foreign capital, whether in the form of foreign direct investment or foreign portfolio investment on economic growth, are numerous. This article attempts to estimate the impact of foreign direct investment on economic growth using Namibia as a test centre. The Vector Autoregression method employed incorporates the following procedures: unit root tests, co-integration tests, estimation of the long-run equation and diagnostic checks for autocorrelation, heteroscedasticity, normality, causality tests as well as the forecast error variance decomposition analysis. Quarterly data covering 1990–2014 were employed. The study found cointegrating relationships amongst the four variables that were investigated. Moreover, no causality was found between net foreign direct investment and growth. Also, amongst the three explanatory variables used in the estimated model, real exchange rate and net foreign direct investment contributed more towards innovations in economic growth during the forecast horizon compared to the openness index. The study concludes by crafting possibilities for further inquiries concerning the issue under consideration.

Introduction

A burning empirical question facing development economists in today’s modern economies concerns the impact of foreign direct investment (FDI) on the economic performance of less-developed countries (LDCs). Indeed, the empirical literature succinctly acknowledges the potential benefits arising from FDI on the part of the host country. Biswas (2002) points out the following as constituting the benefits of FDI on the part of host countries: It improves the competitiveness of the host countries’ economies in the international arena, as well as better access to global markets. Further, FDI improves the quality of products and processes across sectors. Besides these, profits generated by FDI contribute to corporate tax revenues of the host country. Employment opportunities are created, especially in sectors that are heavily driven by labour-intensive technologies. The agriculture sector is a case in point. In addition, FDI in manufacturing will, in most cases, boost the level of productivity in the local economy.

Also, contributing to this discussion, the Bank of Namibia (2006) maintained that FDI allows the transfer of technology, particularly in the form of capital inputs, which cannot be achieved through financial investments or trade in goods and services. Upon the attainment of independence in 1990, the Namibia Investment Centre (NIC) was established under the Foreign Investment Act No. 27 of 1990 specifically to promote, attract, encourage and facilitate FDI to Namibia. Indeed, this investment centre has so far succeeded in attracting a number of FDIs to Namibia, especially through the export processing zones scheme of the country.

Figure 1 depicts Namibia’s FDI inflows and outflows for the period 1990–2012, whilst Figure 2 reflects net FDI in Namibia for the same period.

An examination of Figure 1 reveals that FDI outflows as a percentage of gross domestic product (GDP) were more stable compared to FDI inflows during the period under review. In particular, there was a rapid increase in FDI inflows between the periods 2000 and 2003. This was ascribed mainly to the increased borrowing on the part of subsidiaries from their parent companies abroad. The establishment of the Ramatex manufacturing company, as well as the Scorpion zinc mine, also contributed significantly to the rise in FDI inflows to Namibia between the years 2000 and 2003. In a dissimilar fashion, FDI outflows from Namibia between 1990 and 2012 in most cases were more stable compared to the inflows.

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were negative. This was principally because investors generally preferred to reinvest their profits in Namibia instead of transferring them to other destinations during the period under review. Further, net FDI in Namibia during the period under consideration, as presented in Figure 2, displays many fluctuations. In particular, the years 1993, 1998, 2000, 2001, 2004, 2005, 2006 and 2008 recorded low net FDI flows, whilst the years 1990, 1991, 1992, 1994, 1995, 1996, 1997, 1999, 2000, 2003, 2007, 2009, including 2011 and 2012, registered high net FDI flows. A combination of developments on the domestic and international fronts contributed to these fluctuations in net FDI in Namibia during the period under scrutiny (Government of Namibia 2012).

Despite the huge amount of FDI that Namibia has been receiving since its independence in March 1990, the exact impact of these capital flows on the country’s economic performance is still open to speculation. Therefore, this study sets to investigate whether FDI has made any impact on economic growth in Namibia for the period 1990 to 2012. The Vector Autoregression method employed incorporates the following procedures: unit root tests, co-integration tests, estimation of the long-run equation and diagnostic checks for autocorrelation, heteroscedasticity, normality, causality tests as well as the forecast error variance decomposition analysis-econometric time series met. This article unfolds as follows: the literature review presents the empirical literature, whilst Data sources, model specification and
definition of variables, details data sources. The ‘Discussion of the econometric results’ concerns the analysis of econometric results, whilst the ‘Conclusion and policy implications’ concludes and directs on future research opportunities.

Literature review

Documented published empirical studies concerning the issue under investigation are wide ranging. A few such studies are reviewed in chronological order.

Li and Liu (2005) assessed the relationship between FDI and economic growth through the application of co-integration procedures and found firstly a direct relationship between FDI and growth. Secondly, a negative relationship was observed when FDI was regressed over an existing technological gap between the source and host economy in the face of an increased sample size.

Also, contributing to the existing literature, Blonigen and Wang (2005), using two samples drawn from developed and developing countries estimated the impact of FDI on growth. The authors found evidence of a positive connection between FDI flows and growth for developing countries, whilst the developed world presented a contrary result. This result is very surprising considering the widely acknowledged contribution of FDI in the industrialisation process of the developed countries.

In a related study, Ayanwale (2007) empirically analysed the determinants of FDI using Nigeria as a laboratory test centre. The author combined both single and simultaneous equations to carry out the inquiry. The study found market size, infrastructural development and responsive macroeconomic policies as the main inducing factors of FDI to Nigeria. The author also found a positive connection between FDI and growth in Nigeria. The use of a three stage least squares (3SLS) technique would have potentially improved upon the results obtained by the study, at least from an econometric perspective.

Vu and Noy (2009) examined the relationship between FDI and growth for selected developed countries within a sectoral framework. More elaborately, the authors attempted to ascertain whether each of the sectors identified for purposes of the study has a direct link with FDI. The study found conflicting results across countries and economic sectors. This result reinforces the outcome of the research work of Blonigen and Wang (2005).

Karimi and Zulkornain (2009) estimated the causal relationship between FDI and growth in Malaysia by employing econometric time series approaches. The study found a positive and significant relationship between these two variables. Indeed, the study found that FDI could be used to explain the growth pattern that has taken place in the economy of Malaysia over time. Therefore, the need for Malaysia to pay particular attention to FDI cannot be overstressed.

Ruxanda and Muraru (2010) investigated the possibility of an endogenous relationship between FDI and economic performance in the Romanian economy within the framework of a simultaneous equation model. The study found a bidirectional relationship between FDI and economic performance. This implies that FDI can lead to economic growth and vice versa.

Chaitanya and Tamazian (2010) assessed the causal link between FDI and growth for 22 selected Latin American countries covering the period from 1980 to 2006. The authors made use of an econometric time series approach in probing into this relationship. The findings of the study indicate a positive relationship between these two variables as suggested by the correlation coefficient value. Correspondingly, the two variables failed to pass the statistical significance test, which could be interpreted to imply a weak link between FDI and growth in the various economies used for the study.

Emin (2011) explored the possibility of a long-run relationship amongst economic growth, FDI, trade and inflation for Turkey, using macroeconomic time series datasets covering the period 1970–2006. The findings imply that FDI, trade surplus and inflation have both a positive and a statistical significant impact on economic growth.

Agrawal and Khan (2011) analysed the impact of FDI on economic growth using five selected countries. The study made use of panel data for the period 1993–2009 and obtained the following findings: Firstly, the study found that FDI indeed promotes economic growth. Secondly, a 1% rise in FDI would lead to a 7% increase in economic growth across the five countries investigated.

Farkas (2012) tested the FDI-growth nexus for selected developing countries for the period of 1975–2000 by employing co-integration methods. The result indicates that FDI had a significant, positive influence on economic growth over the period covered by the study. The study, however, maintained that the extent of the impact of FDI on economic growth would depend on the level of a country’s human capital development as well as developments occurring in its financial markets. The study also suggested that FDI should be seen as a complementary variable to other sources of growth in developing countries.

Ray (2012) attempted to measure the relationship between FDI and economic growth for India for the period 1990–2011 by applying co-integration procedures. The findings suggest a bidirectional relationship between FDI and economic growth. There is a possibility that the study would have potentially obtained a superior result from an econometric point of view, if the datasets used were increased to cover a longer period of time.

Iamsiraroj and Doucouliagos (2015) investigated the success of economic growth in attracting FDI for a number of countries cutting across developed and developing countries.
The authors applied the meta-regression technique to 946 estimates from 140 empirical studies. The study attained the following results: Firstly, a robust positive association between growth and FDI was found. In particular, significantly larger correlations were established for single country case studies in relation to cross-country analysis. Furthermore, it also seems that growth is more associated with FDI in developing countries compared to developed countries.

It is pertinent to note that, whilst most of the existing literature reviewed so far suggest a positive relationship between FDI and economic growth, a few of them did present conflicting, inconsistent, disputatious and acrimonious results. In this article, an attempt is made to investigate the FDI-growth nexus for Namibia by applying appropriate econometric time series methods.

**Data sources, model specification and definition of variables**

The following served as vital sources for the collation of macroeconomic data that were used in this study: The Bank of Namibia’s statistical publications, the Namibia Statistical Agency’s bulletins, the World Bank statistical publications as well as Namibia’s National Planning Commission bulletins. The annual macroeconomic data used in the study stretched from the period 1990–2012. All the data used in the estimation process were first converted into quarterly datasets and after that transformed into their respective natural logarithms so as to help with the process of determining the responsiveness of the dependent variable to changes in respect of the explanatory variable. Further, all the data used in the study were deflated using appropriate and relevant deflators in order to control the unwarranted effect of inflation.

The Vector Autoregression method relied upon for purposes of estimating the impact of foreign direct investment on Namibia’s economic performance incorporates the following procedures: unit root tests, co-integration tests, estimation of the long-run equation and diagnostic checks for autocorrelation, heteroscedasticity, normality, causality tests as well as the forecast error variance decomposition analysis. Based on empirical literature, theoretical economic knowledge and the driving objective of the study, the following variables are included in the econometric model for purposes of estimation: Real gross domestic product (RGDP), real exchange rates (RER), openness index (OPI) and net foreign direct investment (NFDI) are used as the explanatory variables. In consideration of this, the empirical model to be estimated can be written in its general form as:

\[ \text{RGDP}_t = (\text{RER}_t, \text{OPI}_t, \text{NFDI}_t) \]  
\[ \text{Eqn 1}. \]

In specific terms, the equation [1] can be rewritten as:

\[ \text{LnRGDP}_t = b_0 + b_1 \text{LnRER}_t + b_2 \text{LnOPI}_t + b_3 \text{LnNFDI}_t + U \]  
\[ \text{Eqn 2}. \]

Where: \( b_0 = \text{numerical constant}; b_1, b_2 \text{ and } b_3 = \text{coefficients of the regressors}; \text{RGDP}_t = \text{regressand}; \text{RER}_t, \text{OPI}_t \text{ and } \text{NFDI}_t = \text{regressors}; t = \text{time period}; \text{Ln} = \text{natural logarithm and } U = \text{disturbance term}. \)

RGDP is macroeconomic measure of the value of economic output in respect of a country for a given period adjusted for price changes. RER refers to the price, strength or value of a local currency in relation to another country’s currency adjusted for price changes, whilst NFDI is used to describe the difference between capital inflows and outflows. OPI refers to the sum of a country’s export and import of goods and services divided by its gross domestic product at a given time period.

**Discussion of econometric results**

The discussion pertaining to the estimated results followed the following pathway: Unit root tests, co-integration tests, estimation of the long-run equation and diagnostic checks for autocorrelation, heteroscedasticity, normality, causality tests as well as the forecast error variance decomposition analysis.

**Unit root tests**

The empirical estimation process regarding the study began with testing for unit roots. In this regard, the study employed the Augmented Dickey-Fuller (ADF) procedures in testing for unit roots. Table 1 summarises the unit root test results.

Upon inspection of Table 1, it was observed that net foreign direct investment attained a stationary status in levels, whilst real gross domestic product, real exchange rates and the openness index only became stationary after first differencing.

**Co-integration tests**

The study resorted to the use of the Johansen co-integration test in determining the existence of long-run relationships amongst the variables in the model. The results are reported in Table 2.

It is apparent from the results reported in Table 2 that the variables under investigation are cointegrated. Therefore, there is every reason to suspect the existence of a long-run relationship amongst the four variables under investigation.

**TABLE 1: Unit root tests: Augmented Dickey-Fuller (ADF) test.**

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF stat</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>LnRGDP</td>
<td>-0.671170</td>
<td>-3.621812</td>
</tr>
<tr>
<td>LnNFDI</td>
<td>-4.404844</td>
<td>-4.6594199</td>
</tr>
<tr>
<td>LnRER</td>
<td>-2.848827</td>
<td>-2.854002</td>
</tr>
<tr>
<td>LnOPI</td>
<td>-1.668310</td>
<td>-3.053193</td>
</tr>
</tbody>
</table>

Source: Author’s own work

*Implies rejection of the null hypothesis at the 5% level.
Estimating the long-run equation

Afterwards, the study proceeded with the estimation of the long-run equation which yielded the following result:

\[ \Delta \text{lnRGDP} = -2.385002 \times 0.051201 \Delta \text{lnNFDI} + 1.047525 \Delta \text{lnOPI} + 0.399553 \Delta \text{lnRER} \]  

[Eqn 3].

Equation 3 confirms a long-run relationship amongst the dependent and independent variables used in the study. Indeed, all the independent variables except one, namely, net foreign direct investments, were positively related to real gross domestic product. A further scrutiny of the estimated model suggests that a 1% increase in net foreign direct investment leads to approximately 0.05% decrease in economic growth. Similarly, a 1% increase in openness is also expected to lead to approximately 1% jump in economic growth. Furthermore, a 1% increase in the real exchange rate will result in an approximately 0.4% rise in economic growth.

Diagnostic checks

The study tested for serial correlation, conditional heteroscedasticity and normality. The results confirm the absence of serial correlation and heteroscedasticity. Besides, the model was also found to be normally distributed. The results are reported in Table 3.

Causality tests

Next, the study reports on the pairwise Granger-causality tests. In this context, the Granger-causality results are displayed in Table 4.

Surprisingly, none of the pairs demonstrated causality relationships amongst themselves. This is so because all the computed probability values are consistently greater than 0.05. Therefore, the study accepted all the null hypotheses of no evidence of Granger-causality as a matter of econometric necessity.

Forecast error variance decomposition analysis

Next, the study reports on the forecast error variance decomposition results. The variance decomposition results are displayed in Table 5.

Table 5 presents forecast error variance decompositions for each variable in the model over a 10-period forecast horizon. The results depict that consistently, economic growth itself accounted for most of the changes or innovations that occurred with respect to economic growth for the period under consideration. Indeed, the results show that in the first period the fluctuations in economic growth are 100% purely driven or explained by economic growth itself. This result conforms to theoretical expectations.

Amongst the three explanatory variables used in the model, real exchange rate and net foreign direct investment...
Contributed more towards innovations in economic growth during the forecast horizon. The openness variable consistently made the weakest contribution towards explaining economic growth for the forecast period.

**Conclusion and policy implications**

The study sets out to investigate the possibility of a causal relationship between FDI and growth, using Namibia as a test hub. In this context, econometric time series methods and quarterly datasets covering 1990–2014 were employed to probe into this issue. The specific time series procedures that the study made use of incorporate the unit root tests, cointegration tests, estimation of the long-run equation and diagnostic checks for autocorrelation, heteroscedasticity, normality, causality tests as well as the forecast error variance decomposition analysis.

The main findings arising from the study are presented as follows: Firstly, the study found cointegrating relationships amongst the four variables that were investigated. Secondly, the study found some degree of positive association between FDI and growth. Thirdly, no causality was found between net foreign direct investment and growth, an indication that other factors could be playing a pivotal role when it comes to the promotion of economic growth in Namibia. Fourthly, amongst the three explanatory variables used in the model, real exchange rate and net foreign direct investment contributed more towards innovations in economic growth during the forecast horizon compared to openness. Indeed, these findings are in agreement with the outcome of the studies of Chaitanya and Tamazian (2010) and Iamsiraroj and Doucouliagos (2015).

The role of FDI in the promotion of growth in Namibia seems to have been exaggerated over the years in view of the findings of this study. One apparent implication arising from the findings of the study is the need for Namibia to explore other ways of catalysing its process of economic growth, whilst correspondingly exercising caution in the selection of foreign direct investments.

Moreover, the study would like to point out that future research into the issue under examination should explore the following possibilities: Firstly, the number of explanatory variables used should be increased. Secondly, disaggregated data should be considered. In addition, sectoral impact analysis should be incorporated. Also, the need to employ other competing methods in future inquiries cannot be overstated.

**References**


