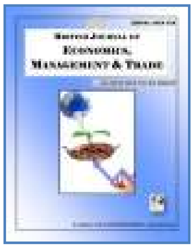

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Bootstrap Causality among Foreign Direct Investment, Exports and Economic Growth in Burundi

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Author's contribution

Author AN is the sole author of this study. He wrote the introductory part, highlighted the methodology to be used, performed the empirical analysis and concluded the study. He read and approved the final manuscript.

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ABSTRACT

Aims: This paper examines the causal links among Foreign Direct Investment (FDI), exports and economic growth in Burundi.
Methodology: The paper applies bootstrap causality tests to account for non-normality in error terms and the presence of ARCH effects in which case the Wald statistic does not follow the usual distribution thus biasing causality tests.
Results: The findings reveal that there is no causality whatsoever among FDI, exports and economic growth in Burundi, rejecting FDI-led export, export-led growth and FDI-led growth hypotheses.

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Conclusion: The results imply that FDI and exports are not engines of growth for Burundi. Sources of growth which are desperately needed should be sought for elsewhere.

Keywords: Exports; FDI; economic growth; Burundi; bootstrap causality test.

1. INTRODUCTION

Burundi is a small landlocked economy recovering from a civil war which tore the country apart for nearly a decade (1993-2003) and left its economic system paralyzed. With a real GDP per capita of 140 USD (in 2011) notably among the lowest in the world, Burundi is one of the world's poorest countries. In fact, according to Human Development Index classification, Burundi was ranked 178 out of 186 in 2012. Although in this post-conflict period, Burundi is trying to boost its economy, the performances achieved remain far below the 7 percent target required for meeting the Millennium Development Goals (MDGs). Burundi's real GDP growth was -0.85% in 2000, 0.9% in 2005, 3.78% in 2010 and 4.2% in 2011 (WDI[1], 2013). And while real GDP grew on average by 3.06% for 2000-2011, real GDP per capita grew only by 0.42% (WDI, 2013). With this situation, strategies and policies need to be put in place in Burundi so as to accelerate growth and alleviate poverty. The New Partnership for Africa's Development (NEPAD), launched in 2001 by the United Nations advocates for promoting foreign direct investment (FDI) and trade, with particular emphasis on exports, as a rapid growth strategy. However, it is not clear whether these policies are a panacea to economic growth issue in Burundi or not.

Besides, the relationship among FDI, exports and economic growth remains controversial in the literature. On the basis of the FDI-export nexus for instance, the literature suggests that FDI can promote or discourage exports in the host country. [1] provides two ways through which FDI affects the host country's export performance, directly from the export activities of foreign affiliates or indirectly from the expansion of exports by domestically-owned firms. Indirect effects of FDI here are through the transfer and diffusion of technologies, management know-how, entrepreneurial skills and labour. [2] adds that Multinational Companies (MNCs) boost exports in the host countries through additional capital, technology and managerial know-how they bring with them, along with access to global, regional, and especially home-country markets. However, according to [3], FDI may also reduce local firms' exports if Multinational foreign affiliates increase their purchase of inputs locally. In addition, [4] suggest that the impact of FDI on exports can be neutral or positive depending on the motives of Multinational companies when undertaking investment in a foreign country. If MNCs have an objective of capturing the local market (market-seeking FDI), FDI will increase imports and have no effects on exports in the host country. On the contrary, if FDI is resource-seeking or efficiency-seeking, it will increase exports in the host country [5]. The reverse causality is also possible in the literature; according to [6], more trade would encourage foreign direct investments when more markets are available for exporters. The direction of causality from FDI to exports is known as FDI-led export and the reverse causality is known as export-driven FDI.

Concerning the nexus between exports and economic growth, scholars who support the export-led growth hypothesis argue that exports boost economic growth by creating employment, increasing labour productivity, bringing about technological progress,

[1] World Development Indicators, World Bank online database

improving allocation of resources in the economy, and allowing exploitation of economies of scale through an expanded market base. In addition, they argue that exports provide foreign exchange which permits the importation of intermediate goods and technologies which stimulate economic growth [7,8,9,10,11]. However, [12] point out that the impact of exports on growth depends on the level of primary export dependence and the level of absorptive capacity. They argue that for developing countries whose exports are heavily depend on primary commodities, "export-led growth hypothesis", might not occur since the export sector does not have many linkages with the economy and does not create spillovers into the economy. They further argue that in most developing countries, the absorptive capacity is low, making it difficult for potential knowledge from the export sector to spill-over to the non-export sector. This is because firms in the non-export sector use very backward production technology and low skilled workers and, therefore are unable to effectively use the knowledge spillovers. Furthermore, [13] argues that in most developing countries, the level of technology and human capital in the export sector is very low which makes it difficult to acquire foreign technology. The opposite causality from economic growth to exports exists also in the literature; it is the so-called "growth-driven export hypothesis" [14,15].

In reference to the link between FDI and economic growth, the literature provides two hypotheses, namely, FDI-led growth hypothesis and Growth-driven FDI hypothesis [16,17]. The proponents of the first hypothesis suggest that FDI promotes economic growth in host countries. They argue that FDI increases not only the volume of investments but also its efficiency. Moreover, FDI promotes economic growth in the host country through technology transfer, diffusion, and spillover effects [18]. Furthermore, [19] in its report indicates that FDI boosts host countries' economic growth through its impact on their financial resources and investment, by enhancing their technological capabilities, by boosting their export competitiveness and by generating employment and strengthening their skills base. However as [20,21] point out, the impact of FDI on growth is dependent on the host countries' absorptive capacity, determined by factors such as the level of technology used in domestic production in the host country, the extent to which the financial sector is developed, the host country's human capital quality, the degree of openness etc. Thus, countries with low absorptive capacity might not enjoy the potential FDI growth effects.

To justify the reverse causality from economic growth to FDI, known as "Growth-driven FDI hypothesis", scholars argue that an increase in economic growth creates large markets and businesses, hence attracting market-seeking FDI [22].

Despite the controversial literature, in this post conflict period, as Burundi becomes more politically stable and hopefully attracts more FDI, can the country rely on FDI and exports to boost its economic growth? The objective of this study is therefore to examine how FDI, Exports and Economic growth are interrelated in Burundi.

Although the nexus among FDI, exports and economic growth has been the subject of considerable empirical research in the last decades [17,23,24,25], empirical investigations in that area in Burundi remain scanty; this study therefore sheds some light on the nexus among FDI, exports and economic growth in Burundi.

Following [26], the novelty of this paper is the application of bootstrap causality testing which accounts for non-normality in error terms and the presence of ARCH effects but also to avoid inferential bias since our sample size is small.

The rest of the paper is organized as follows. Section 2 highlights the trend of FDI, Exports and Economic Growth in Burundi. Section 3 presents the methodology used. Section 4 presents the data and empirical findings and section 4 concludes the study.

2. TREND OF FDI, EXPORTS AND ECONOMIC GROWTH IN BURUNDI

Table 1 highlights the trend of FDI, exports and economic growth in Burundi. It indicates that the ratio of FDI to GDP has increased decade by decade. The ratio of FDI to GDP was on average 1.43% in the 1980s, rose to 2.38% in the 1990s and stood at 2.62% during the period 2000-2011. Contrary to FDI, exports seem to have followed a different trend; the ratio of exports to GDP has decreased decade by decade; it was 10.35% in the 1980s, reduced to 9.03% in the 1990s and further reduced to 6.24% during the period 2000-2011. With regard to real GDP growth rate, it was 4.29% in the 1980s, decreased to -1.43% in the 1990s and then increased to 3.07% for the period 2000-2011. For the whole period 1980-2011, the ratio of FDI to GDP was on average 2.18%, exports to GDP was 8.47% while the real GDP growth rate was 2.04%.

Table 1. Trend of FDI, exports and economic growth in Burundi

Period	FDI (% GDP)	Exports (% GDP)	Real GDP growth rate
1980-1989	1.43	10.35	4.29
1990-1999	2.38	9.03	-1.43
2000-2011	2.62	6.24	3.07
1980-2011	2.18	8.47	2.04

Source: Author using data from UNCTAD and World Bank

It should be noted that the negative real GDP growth rate in the 1990s was due to the civil war which prevailed during that period, a civil war that started in 1993 went on up to 2003. In fact, Burundi experienced negative real GDP growth rates from 1993 to 2000 (See Fig. 1). The fall in the ratio of exports decade by decade can be explained by the fall in prices at the international markets but also by the civil war which devastated the country for nearly a decade and brought most forms of economic activities to a halt.

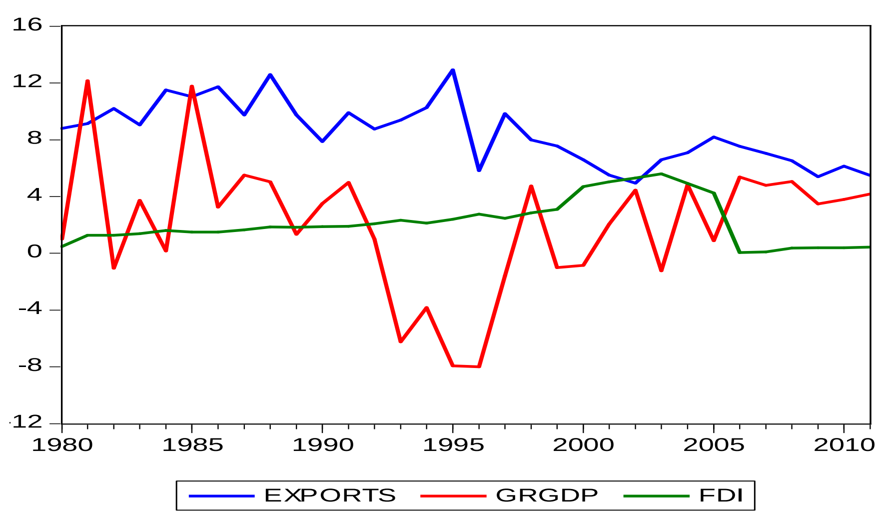

Fig. 1. Trend of FDI, exports and economic growth in Burundi (1980-2011)

In addition, Fig. 1 shows that while the ratio of exports to GDP and real GDP growth rate have been fluctuating much, increasing for some years whereas decreasing for others, the ratio of FDI to GDP has not fluctuated much. FDI-GDP ratio seems to have followed an upward trend from 1980 up to 2003 and then dropped from 4.24% in 2005 to 0.05% in 2006 and remained less than 0.5% up to 2011 probably due to the recent international financial crisis.

3. ECONOMETRIC METHODOLOGY

To examine how FDI, exports and economic growth are interrelated in Burundi, we follow [26] and use bootstrap causality tests. As [26] point out, when error terms are not normally distributed and ARCH effects are present which is the case in this study (see Table 2), the Wald statistic of no Granger causality does not follow the assumed asymptotic distribution, therefore leading to an over-rejection of the null hypothesis of no causality. The proposed solution which is bootstrap causality testing is presented hereafter.

Suppose we are examining the causal link between the variable (x_t) and the variable (y_t) in Granger's sense. This would involve estimating a vector autoregressive model, *VAR (k)* which can be specified in a matrix form as follows:

$$\begin{bmatrix} x_t \\ y_t \end{bmatrix} = \begin{bmatrix} c_1 \\ c_2 \end{bmatrix} + \sum_{i=1}^{k} \begin{bmatrix} \alpha_{11,i} & \alpha_{12,i} \\ \alpha_{21,i} & \alpha_{22,i} \end{bmatrix} \begin{bmatrix} x_{t-i} \\ y_{t-i} \end{bmatrix} + \begin{bmatrix} \mu_{1,t} \\ \mu_{2,t} \end{bmatrix} \qquad (1)$$

This equation (1) can also be written as:

$$z_t = C + A_1 z_{t-1} + A_2 z_{t-2} + ... + A_k z_{t-k} + \varepsilon_t \qquad (2)$$

where $z_t = \begin{bmatrix} x_t \\ y_t \end{bmatrix}, C = \begin{bmatrix} c_1 \\ c_2 \end{bmatrix}, \begin{bmatrix} A_1 & A_2 & ... & A_k \end{bmatrix} = \sum_{i=1}^{k} \begin{bmatrix} \alpha_{11,i} & \alpha_{12,i} \\ \alpha_{21,i} & \alpha_{22,i} \end{bmatrix}, \varepsilon_t = \begin{bmatrix} \mu_{1,t} \\ \mu_{2,t} \end{bmatrix}$

To test for Granger causality, restrictions are put on *A* coefficients, depending on which direction of causality one is interested. If for instance, we want to test if y_t Granger-causes x_t, in other words, if y_t is the cause of x_t and x_t the effect of y_t, we can set the null hypothesis as follows:

$$H0: \alpha_{12,1} = \alpha_{12,2} = ... = \alpha_{12,k} = 0 \qquad (3)$$

However, as [27] pointed out, this coefficient restriction on the VAR model in (3) would be biased in case the variables are integrated, since the test statistic would not follow the standard asymptotic distribution. To solve this problem, [28] propose to use an augmented VAR model, that is, $VAR(k+d)$ where *d* is the augmented lag, which is zero (0) if the variables are stationary and one (1) if the variables are integrated of order 1.

The augmented VAR model, $VAR(k+d)$ would be:

$$z_t = C + A_1 z_{t-1} + A_2 z_{t-2} + ... + A_k z_{t-k} + A_{k+d} z_{t-(k+d)} + \varepsilon_t \quad (4)$$

To test for causality in this setting, restrictions are put on the first *k* coefficients only, ignoring the extra *d* lags.

The augmented VAR model can also be written as:

$$Z = \Gamma \varpi + \mu, \quad (5)$$

where $Z = \begin{bmatrix} z_1 & z_2 & \dots & z_T \end{bmatrix}$; $\varpi_t = \begin{bmatrix} 1 \\ z_t \\ z_{t-1} \\ \vdots \\ z_{t-(k+d-1)} \end{bmatrix}$; $\varpi = [\varpi_0, \varpi_1, ..., \varpi_{T-1}]$; $\Gamma = [C, A_1, A_2, ..., A_k, A_{k+d}]$

and $\mu = [\varepsilon_1, \varepsilon_2, ..., \varepsilon_T]$

The modified Wald Statistic proposed by [28] for the null hypothesis of no causality is as follows:

$$MWALD = (\mathfrak{M}\hat{\lambda})'[\mathfrak{M}(\varpi'\varpi)^{-1} \otimes \Psi_E)\mathfrak{M}']^{-1}(\mathfrak{M}\hat{\lambda}) \sim \chi_k^2 \quad (6)$$

where $\mathfrak{M}$ is an indicator function which serves to identify restrictions under the null hypothesis; $\hat{\lambda} = vec(\Gamma)$; $\otimes$ is the Kronecker product; and Ψ_E is the estimated residuals variance-covariance matrix from equation (5) before imposing restrictions of the null hypothesis.

According to [26], in case the error terms are normally distributed, the Modified Wald test statistic in expression (6) follows a chi-square distribution with *k* degrees of freedom. However, according to them, when error terms are not normally distributed and ARCH effects are present in the data, there will be to a bias in statistical inference causing the Wald statistic not to follow the assumed asymptotic distribution, therefore leading to an over-rejection of the null hypothesis of no causality [26]. According to the authors, the same problem occurs when the sample size is small.

The solution proposed by [26] is to use Bootstrap causality tests which give precise critical values in that case. The aim of bootstrapping is to approximate the distribution of the Wald test statistic which has been biased by non-normal error terms and the presence of ARCH effects in the data, by using data resampling procedure.

According to [26], bootstrap causality testing is conducted in the following steps:

Step 1: Estimating equation (5)

Step 2: Next step consists of simulating bootstrapped residuals $\mu *$ via resampling with replacement,

$$\mu * = \left\{ \mu_1^*, \mu_2^*, ..., \mu_n^* \right\}, \mu_i^* \in \mu \ \forall i, i = 1, ..., n, \text{ where n is the bootstrap sample}$$

Step 3: $Y *$ is generated using the coefficients estimated in step 1, that is, $Z^* = \hat{\Gamma}\varpi + \mu^*$, where $\hat{\Gamma} = (\varpi'\varpi)^{-1}\varpi' X$, ϖ is the original data and μ^* are bootstrapped residuals which are original residuals adjusted with leverages in such a way that non-normality and ARCH effects are corrected.

Step 4: Estimate the vector parameter $\Gamma *$ using the generated $Y *$ in step 3.

Step 5: Using the bootstrapped data, the Wald test statistic is computed, that is,

$$WALD^* = (\mathfrak{M}\hat{\lambda})'[\mathfrak{M}(\varpi^{*}{}'\varpi^*)^{-1} \otimes \Psi^*{}_E)\mathfrak{M}']^{-1}(\mathfrak{M}\hat{\lambda})$$

Step 6: Steps 2 to 5 are repeated N times and the estimated Wald statistics $WALD^*$ are ranked so as to create its bootstrap distribution.

Step 7: The bootstrap critical values at $\alpha\%$ level of significance (c_α^*) are obtained by taking the $(\alpha)^{th}$ upper quantile of the distribution of bootstrapped Wald test statistics, $WALD^*$

Step 8: In the final step, the Wald statistic is computed using the original data. The null hypothesis of no Granger causality is rejected if the Wald statistic WALD is greater than the bootstrap critical value (c_α^*) at $\alpha\%$ level of significance.

In this study, ten thousand (10000) bootstrap simulations are conducted and the Wald statistic is computed for each simulation. The set of these bootstrapped Wald statistics computed form the bootstrapped Wald distribution. The bootstrap critical value for a given level of significance (1%, 5% or 10%) corresponds then to the lower boundary of the upper quantile of the generated bootstrapped Wald distribution for the specific level of significance.

4. RESULTS AND DISCUSSION

This study uses annual data on growth rate of Real GDP (GDPGR), percentage ratio of inward FDI to GDP (FDIR) and percentage ratio of Exports of goods and services to GDP (EXR) for Burundi for the period 1980-2011.

Data on Growth rate of Real GDP and Exports of goods and services ratio (percentage of GDP) are collected from the World Development Indicators (WDI, 2012) and inward FDI is from UNCTAD statistics, online database available on UNCTAD website.

We initially begin our empirical analysis by checking the order of integration of the variables in order to establish the number of extra lags to include in the VAR model as suggested by [28]. The following sub-section presents unit root tests results. In this study, two unit root testing procedures are used; a unit root test with structural breaks of [29] and a non parametric unit root test of [30]. The test suggested by [29] is used to account for structural breaks which are likely to have occurred in Burundi given the period of civil war and political instability, and [30] test, to avoid the problem of misspecification.

4.1 Unit Root Tests Results

As [31] points out, one well-known shortcoming of the “Dickey–Fuller” style unit root test with *I* (1) as a null hypothesis is its potential confusion of structural breaks in the series as evidence of non-stationarity. The study therefore proposes to use a unit root test with structural breaks and a non-parametric unit root test which is robust against misspecification. Table 2 presents unit root test results. They indicate that the breaks detected by Lanne, Saikkonen and Lutkepohl test are in 1993 for real GDP growth, in 1996 for exports and in 2006 for FDI. 1993 corresponds to the year when the civil war started in Burundi, 1996 corresponds to a military coup which was followed by an embargo declared by the neighbouring countries, and 2006 corresponds to the post-conflict period after elections of 2005.

After taking into account these breaks, Lanne, Saikkonen and Lutkepohl test fails to reject the null hypothesis of unit root in real GDP growth, exports ratio and FDI ratio. However, when the variables are differenced once, the same test rejects the null hypothesis of unit root. The non-parametric unit root test of [30] seems also to agree with Lanne, Saikkonen and Lutkepohl test. The simulated p-values indicate that the presence of a unit root in the levels of real GDP growth, exports ratio and FDI ratio cannot be rejected at 5% level, and when differenced once, the presence of a unit root is rejected at 1% level for real GDP growth and exports ratio and at 10% level for FDI ratio.

The two unit root tests considered seem to suggest that the variables used become stationary when differenced once, implying that they are integrated of order one.

These results mean that one extra lag is to be included in the VAR model to account for one unit root in the variables as [28] suggested.

Table 2. Unit root test results

	Lanne, saikkonen and lutkepohl test		**Breitung test**	
Variables	**S.I stat**	**Break date**	**B(n)/n**	**Simulated p-value**
GDPGR	-0.578[3]	1993	0.009	0.091
Δ GDPGR	-8.859***[0]	1993	0.0008	0.000
EXR	-2.749[1]	1996	0.056	0.538
Δ EXR	-5.612***[0]	1996	0.001	0.001
FDIR	-1.156[5]	2006	0.016	0.081
Δ FDIR	-5.841***[5]	2006	0.0078	0.064

Notes: (1) GDPGR stands for the real GDP growth rate; (2) EXR stands for the percentage ratio of exports to GDP; (3) FDIR stands for the percentage ratio of foreign direct investment to GDP; (4) Δ is the operator of difference; (5) S.L stands for Lanne, Saikkonen and Lutkepohl; (6) critical values for S.L test are: C.V (1%) = -3.48; C.V (5%) = -2.88; C.V (10%) = -2.58 (when the deterministic part considered is intercept), C.V (1%) = -3.55; C.V (5%) = -3.03; C.V (10%) = -2.76 (when a time trend is considered); (7) between the brackets [.] are the number of lags used for S.L test, determined by the usual criteria. (8) The critical values for Breitung Test are, C.V (5%) = 0.010; C.V (10%) = 0.014]; (9) the simulated p. values for Breitung test are from 1000 simulations

4.2 Diagnostic Tests Results on the VAR Model

Table 3 presents the results of the diagnostic tests used on the estimated VAR model from which causality tests are conducted, namely, the multivariate normality test of [32] and the multivariate ARCH test of [33]. The diagnostic tests results indicate that the multivariate normality test of [32] rejects the null hypothesis of normality in error terms for the VAR model of exports and FDI and the estimated VAR model of real GDP growth and FDI at 1% level, but fails to reject the null hypothesis of normality in error terms for the VAR model of real GDP growth and exports. However, multivariate ARCH test of [33] rejects the null hypothesis of no ARCH effects for all the estimated VAR models.

Table 3. Diagnostic test results on the VAR model

		Multivariate normality	**Multivariate arch**
Variables in the var model	**Optimal lag**	**Test statistic**	**Bootstrapped p-value**
(EXR, FDIR)	2	215.54 [0.000]	0.000
(GDPGR, EXR)	3	5.743[0.219]	0.000
(GDPGR, FDIR)	1	231.56[0.000]	0.000

Notes: (1) Optimal lag is obtained using Akaike Information Criterion; (2) for multivariate normality test, [32] test is applied and for multivariate ARCH test, [33] test is applied; (3) multivariate normality test is conducted in JMuLti software, version 4.23 and multivariate ARCH test is conducted using a GAUSS code written by [34], available in the Statistical Software Components archive; (4) bootstrapped p-values are obtained using 500 simulations; (5) between brackets [.] are the asymptotic p-values for [32] test

According to [26] however, when error terms are not normally distributed and ARCH effects are present in the data, this leads to a bias in causality testing since the Wald statistic no longer follows the assumed asymptotic distribution.

In this case, coupled with the fact that we have a small sample (32 observations only), the solution is to use bootstrap causality tests as [26] suggested. The next sub-section presents bootstrap causality tests results among FDI, exports and economic growth for Burundi.

4.3 Bootstrap Causality Tests Results

Bootstrap causality tests results presented in Table 4 indicate that the null hypothesis of no causality could not be rejected even at 10% level for all the directions of causality considered. The findings therefore suggest that there is no causality whatsoever among FDI, Exports and economic growth in Burundi. The results show that FDI does not affect exports and that export performance does not affect the inward FDI in Burundi. This can be explained by the fact that the few multinational companies which are present in Burundi are market-seeking FDI, mainly in beverages and banking sector and do not therefore affect exports of the host country since their main objective is to capture the local market.

Moreover, the findings suggest that exports performance does not boost economic growth and that economic growth does not affect export performance in Burundi. This is because Burundi exports mainly agricultural primary products, coffee and tea, which do not generate greater capacity utilization. They neither bring about technological progress nor create employment. They also do not increase labour productivity, all of which are advantages exports are supposed to bring to the economy and boost economic growth.

Table 4. Bootstrap causality tests results

Null hypothesis	Optimal lag	Test value	Bootstrap c.v (1%)	Bootstrap c.v (5%)	Bootstrap c.v (10%)
FDIR $\mapsto$ EXR	2	0.407[+]	12.473	7.157	5.275
EXR $\mapsto$ FDIR	2	0.702[-]	13.126	7.770	5.739
EXR $\mapsto$ GDPGR	3	4.744[+]	16.005	9.982	7.667
GDPGR $\mapsto$ EXR	3	6.023[+]	15.286	9.596	7.549
FDIR $\mapsto$ GDPGR	1	0.436[-]	8.136	4.622	3.010
GDPGR $\mapsto$ FDIR	1	0.001[+]	8.469	4.519	3.015

Notes: (1) $\mapsto$ stands for "does not Granger cause". (2) Optimal lag is obtained using Akaike Information Criterion. (3) Bootstrap C.V are obtained after 10000 simulations. (4) The results of bootstrap causality tests are obtained using a GAUSS code written by [35]. (5) Between the brackets [.] is the sign of the sum of the estimated causal coefficients

Finally, the results indicate that foreign direct investment does not impact economic growth in Burundi, which is not surprising. Apart from the fact that the amount of FDI attracted is insignificant, Burundi does not have enough absorptive capacity for FDI to affect growth. The level of a country's absorptive capacity depends among other factors on the level of technology used in domestic production, the level of financial sector development and the human capital quality [20], which are all low for Burundi. Furthermore, the findings indicate that economic growth is not a determinant of FDI which flows to Burundi. This is also not surprising. A country's market size which rises with economic growth attracts FDI and Burundi is a very small economy.

5. CONCLUSION

The objective of this study was to examine how FDI, Exports and economic growth interrelate in Burundi using bootstrap causality tests for the period 1980-2011. Bootstrap causality tests were used to account for non-normality in error terms and the presence of ARCH effects which cause biases in the Wald statistic. Apart from that, bootstrap method was applied because our sample size was small (T=32). The empirical findings indicate that there is no causality whatsoever among FDI, exports and economic growth in Burundi; FDI-led exports, export-led growth and FDI-led growth hypotheses could not be supported by the data in Burundi.

The findings imply that FDI and exports are not engines of growth in Burundi and that sources of growth in Burundi are therefore to be sought elsewhere. Moreover, being a small economy, if Burundi intends to attract more FDI, it should rely rather on improving its governance, political and economic stability to attract some other type of FDI such as resource-seeking FDI and efficiency-seeking FDI.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Shao-Wei L. Foreign direct investment and export performance: The case of Taiwan, M. Econ-Res. Thesis, Economics and Information Systems, University of Wollongong; 2007.

2. UNCTAD. Transnational corporations and export competitiveness. World Investment Report; 2002.
3. Gu W, Awokuse TO, Yuan Y. The contribution of foreign direct investment to China's export performance: Evidence from disaggregated sectors. Annual Meeting, Agricultural and Applied Economics Association. July 27-29; 2008.
4. Dunning J. Location and the multinational enterprise: A neglected factor? Journal of International Business Studies. 1998;29(1):45-66.
5. Kutan AM, Vukšić G. Foreign direct investment and export performance: Empirical evidence. Comparative Economic Studies. 2007;49(3):430-445.
6. Ponce AF. Openness and foreign direct investment: The role of free trade agreements in Latin America. Munich Personal RePEc Archive Paper. 2006;4187.
7. Medina-Smith EJ. Is the export-led growth hypothesis valid for developing countries? A Case Study of Costa Rica, UNCTAD, Policy Issues in International Trade and Commodities Study Series. 2001;7.
8. Awokuse TO. Is the export-led growth hypothesis valid for Canada? Canadian Journal of Economics. 2003;36(10):126-136.
9. Kónya L. Export-led growth, growth-driven export, both or none? Granger causality analysis on OECD countries. Applied Econometrics and International Development, Euro-American Association of Economic Development. 2004;4(1).
10. Yenteshwar R. An empirical examination of the export-led growth hypothesis in Fiji, Economics Department, Reserve Bank of Fiji, Working paper. 2003;01.
11. Sharma A, Panagiotidis T. An analysis of exports and growth in India: Cointegration and causality evidence (1971-2001). Review of Development Economics. 2005;9(2):232-248.
12. Dreger C, Herzer D. A further examination of the export-led growth hypothesis. Empirical Economics. 2013;45(1):39-60.
13. Edwards S. Openness, trade liberalization, and growth in developing countries. Journal of Economic Literature. 1993;31(3):1358-1393.
14. Baharumshah AZ, Rashid S. Exports, imports and economic growth in Malaysia: Empirical evidence based on multivariate time series. Asian Economic Journal. 1999;13(4):389-406
15. Mahadevan R. New evidence on the export-led growth nexus: A case study of Malaysia. The World Economy. 2007;30(7):1068-1083.
16. Pradhan RP. The FDI- led- growth hypothesis in ASEAN- 5 countries: Evidence from cointegrated panel analysis. International Journal of Business and Management. 2009;4(12):153-164.
17. Klarsa MA. Foreign direct investment, trade openness and economic growth in Pakistan and Turkey: An investigation using bounds test. Qual Quant. 2011;45(1):223-231.
18. Nair-Reichert U, Weinhold D. Causality tests for cross-country panels: A new look at FDI and economic growth in developing countries. Oxford Bulletin of Economics and Statistics. 2001;63(2):153-171.
19. UNCTAD. Foreign direct investment and the challenge of development. World Investment Report; 1999.
20. UNECA. Economic report on Africa: Accelerating Africa's development through diversification. ECA Publications and Conference Management Section (PCMS). ; 2007.
21. Farkas B. Absorptive capacities and the impact of FDI on economic growth. Discussion papers no.1202, DIW Berlin, German Institute for Economic Research; 2012.

22. Agiomirgianakis GM, Asteriou D, Papathoma K. The determinants of foreign direct investment: A panel data study for the OECD countries. Working papers 03/06, Department of economics, City University London; 2003.
23. Mohan R, Nandwa B. Testing export-led growth hypothesis in Kenya: An ARDL bounds test approach, MPRA Paper 5582, University Library of Munich, Germany; 2007.
24. Ahmadi R, Mojtaba G. Openness, economic growth and FDI: Evidence from Iran, Middle-East. Journal of Scientific Research. 2011;10(2):168-173.
25. Ray S. Impact of foreign direct investment on economic growth in India: A Co integration analysis. Advances in Information Technology and Management. 2012;2(1).
26. Hacker S, Hatemi-J A. A bootstrap test for causality with endogenous lag length choice: Theory and application in finance. Journal of Economic Studies. 2012;39(2):144-160.
27. Sims CA, Stock JH, Watson MW. Inference in linear time series models with some unit roots. Econometrica. 1990;58(1):113-144.
28. Toda HY, Yamamoto T. Statistical inference in vector autoregressions with possibly integrated processes. Journal of Econometrics. 1995;66:225–250.
29. Lanne M, Lutkepohl H, Saikkonen P. Test procedures for unit roots in time series with level shifts at unknown time. Oxford Bulletin of Economics and Statistics. 2003;65(1):91-115.
30. Breitung J. Nonparametric tests for unit roots and cointegration. Journal of Econometrics. 2002;108:343-363.
31. Baum CF. Stata: The language of choice for time series analysis? The Stata Journal. 2001;1(1):1-16.
32. Doornik JA, Hansen H. An omnibus test for univariate and multivariate normality. Oxford Bulletin of Economics and Statistics. 2008;70:927-939.
33. Hacker RS, Hatemi-J A. A multivariate test for ARCH effects. Applied Economics Letters. 2005;12:411–417.
34. Hacker RS, Hatemi-J A. MV-ARCH: GAUSS Module to implement the multivariate ARCH test. Statistical Software Components G00009, Boston College Department of Economics; 2009. Available: http://ideas.repec.org/s/boc/bocode.html.
35. Hacker S, Hatemi-J A. HHcte: GAUSS module to apply a bootstrap test for causality with endogenous lag order. Statistical Software Components G00012, Boston College Department of Economics; 2010.
Available: http://ideas.repec.org/s/boc/bocode.html.

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