Journal of Economic Growth and Entrepreneurship JEGE
Spatial and entrepreneurial development studies laboratory
Year : 2023 Vol.6 No.1 pp:1-9

Effect of Entrepreneurial Activity on Gross Domestic Product and selected Variables in Brazil

MEZOURI ettayib [1],

University of relizane, Laboratory of GMFAMI, (Algeria), ettayib.mezouri@univ-relizane.dz.

ARTICLE INFO

Article history:
Received:18/12/2021
Accepted:12/02/2023
Online:07/03/2023

Keywords:
Entrepreneurial Activity;Gross Domestic Product; ARDL/ bounds test; Brazil
JEL Code: M53, C52, L23

ABSTRACT

The study aimed to examine the impact of Entrepreneurial Activity and selected Variables on Gross Domestic Product in Brazil for the period (2001-2020) by employing the ARDL/ bounds test approach the has been applied in this study to capture both the short-run and long-run impact of Entrepreneurial Activity on Gross Domestic Product. The results show that Gross Domestic Product is positively correlated with the Entrepreneurial Activity, this indicate that an increase in Entrepreneurial Activity can enhance Gross Domestic Product, Meaning that an increase in the Entrepreneurial Activity raises the Gross Domestic Product in the Brazil in the short-run and long-run. The results also show that the Gross Domestic Product is negatively correlated with the selected Variables.

1. Introduction*(Heading 1)*

The knowledgespillover theory establishes that entrepreneurship provides a crucial mechanism in the process of economicgrowth by serving as a conduit for knowledge spillovers of a country So the entrepreneurship become an independent research issue and motivated a bulky number of studies. Accordind to ((Kaiser, 1990) ; (Schumpeter, 1942)) provide evidence that the key to the success of markets lies in the spirits of entrepreneurs who persist in developing new products and technologies, and succeed at ultimately reducing production costsAlso, characteristics of the entrepreneur—innovator, risktaker, and resource allocator—are complementary and inseparable facets of entrepreneurship and Entrepreneurship is increasingly becoming recognized as akey factor contributing to economicgrowth.

However, several scholars have arguedthat the impact of entrepreneurship might be even negative, especially, when the institutions are not workingwell. This mightbea case of developing countries.From the abovetry, This study examine the relationship between a set of demographic variables, entrepreneurial activity, and economicgrowth in Brazil.

Accordind to (OECD, 2020) SMEs play an important role for economic growth and social inclusion in Brazil, accounting for 62% of total employment and 50% of national value added.This study attempts to answer two research questions related to Entrepreneurship and economic growth in the context of Brazil : (a) can Entrepreneurship increase or decrease economic growth? (b) is it possible to empirically verify the existence of the Relationship between entrepreneurial activity and economic growth in the case of Brazil?

- The hypotheses of the study:

Entrepreneurship increases or decreases Gross Domestic Product in Brazil

*Corresponding Author :*MEZOURI ettayib*

-The approach and objectives of the study:

This study examines the impact of Entrepreneurship on Gross Domestic Product and selected Variables in Brazilfor the period 2001-2020 using using the Autoregressive distributed lag (ARDL) bounds approach for co- integration in order to test the long run relationship between the variables subject of study.

The rest of the paper is organized as follows. Section 2 provides a brief review of the literature. Section 3 explains the model specification, data and methodology. Section 4 discusses the empirical results. Section 5 concludes the research paper.

2. Literature Review

The empiricalstudies ((Minniti, 1999); (Henderson, 2002); (André & Erik, 2009)) demonstrate that the entrepreneurs are the catalysts for economic growth because they create a networking externality that promotes the creation of new ideas and new market formations. Moreover, the entrepreneurs significantly impact economic activity at a more local level through fostering localized job creation, increasing wealth and local incomes, and connecting local economies to the larger, global economy.We now provide a brief review of the growing body of literature investigating this topic. According to (Kreft & Sobel, 2007, p. 2),employed the Granger causality tests to investigate the correlation between annual GSP growth, sole proprietorships, and patent activity in the United States between 1980-2000.The results show that there exists a one-way causal relationship between entrepreneurship and economic grow that the state level. Other results the presence of entrepreneurial activity that draws venture funding to an area, and not vice versa. Thus, enacting policies consistent with economic freedom, which provide a good environment for attracting or developing individual entrepreneurs, are the appropriate economic development policies.

(Niels & al, 2018, p. 12) employed the panel regressions to investigate to what extent and how institutional quality drives productive entrepreneurship that in turn promotes economic growth for a sample of 25 European countries covering for period 2003–2014.The results have shown that increasing the perceived skills by 10% couldresult in an increase in GDP per capita growth of 0.5% points and improving the regulations around credit, labor, and business by 10% couldresult in additional growth of 1.1% points. Increasing these institutional scores by 10% iscertainly not trivial and willrequire a sustained and targeted institutional reform strategy.Thus, institutional quality, financial stability, small government, and perceived start-up skills are the most important predictors of such productive entrepreneurship. In hisstudy, (Procházka & al, 2018) employed the Panel-data cointegration tests to tinvestigate the relationship between the established business ownership rate (obtainedfrom Global Entrepreneurship Monitor) and a set of country's economic indicators (Gross Domestic Product, Gross National Income, and HumanDevelopment Index) for 48 countries classified according to U.N. as developing for period 2000–2015.The results show that a negative impact of entrepreneurial activity on country's GDP and GNI, both initially and with a time-lag. Never the less, wefailed to proveany impact of entrepreneurship on HDI.

In the same line of research, (Manuel A.-G. , 2020, p. 5) employed the econometric models to investigate the relationship among entrepreneurship and economic growth will be analyzed for 74 economies in a period of 6 years. We use two dependent variables. Fist, entrepreneurial activity, measured by the Total Early-stage Entrepreneurial Activity (TEA) from GEM, whichis an aggregate variable at national level that reflects the percentage of the population between 18–64 years that claims to beinvolved in an entrepreneurial initiative of anykind, which does not exceed 42 months of activity. The results of the study suggest the existence of a relationship between entrepreneurship and economic growth, and on the other hand, differentiated behaviour between developed economies and developing economies. (Manuel A. G., 2019) using the Econometric Methods to determine the relationship between a set of demographic variables, entrepreneurial activity, and economic growth, This research included all countries for which data wasavailable for a time frame of six years. Each statistical case referred to a country in a particular year. There were therefore 248 cases, consisting of data from all the countries that participated in the GEM project between 2004 and 2009. The results of the study suggest the existence the relationships between demographic factors, entrepreneurship, and economic growth depend on the stage of a country'seconomic cycle.

This study is distinguished from previous studies because it is exposed to the experience of a country that has achieved great success in the field of entrepreneurship and is considered a rising power in Latin America. According to Global Entrepreneurship Monitor, Brazil is one of the most entrepreneurial countries in the planet, with about 36 million individuals engaged in some venture activity. Therefore, we utilize the brazil country experience. we study examines the impact of Entrepreneurship on Gross Domestic Product and selected Variables in Brazilfor the period 2001-2020

using using the Autoregressive distributed lag (ARDL) bounds approach for co- integration in order to test the long run relationship between the variables subject of study.

3. Methods and Materials

3.1 Data Set :

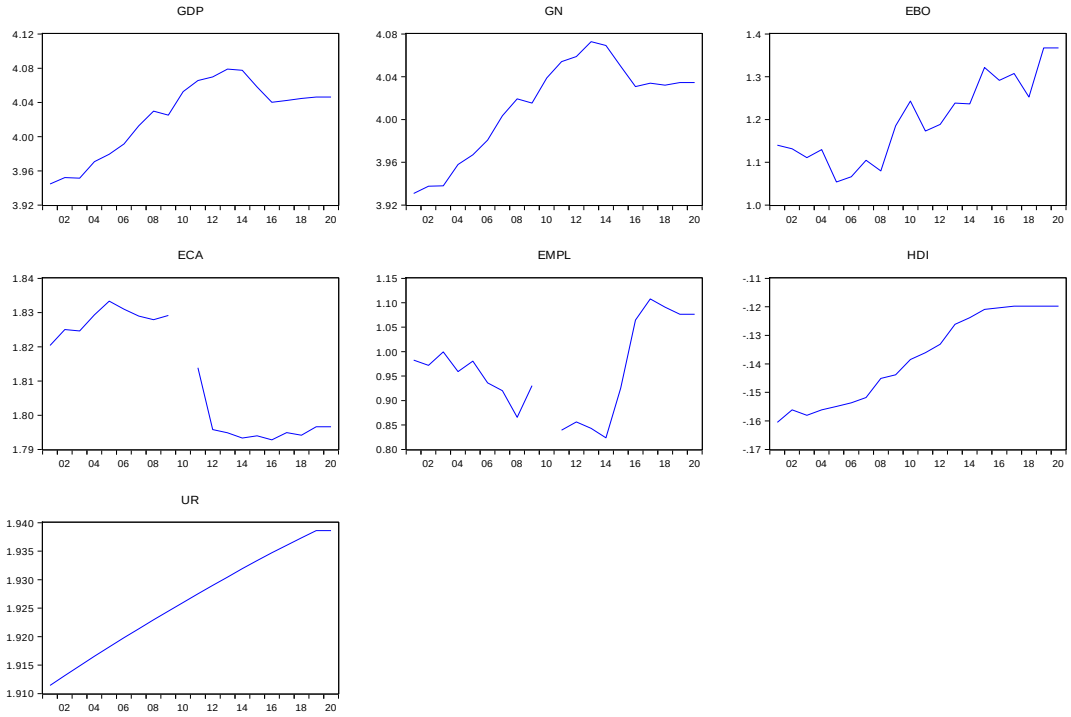
This research aims at estimating the impact of Entrepreneurship on Gross Domestic Product inBrazil for the period 2001-2020 .Therefore, we use Gross Domestic Product (GDP) as the dependent variable in our study. We use Entrepreneurial Activity (EBO), Human Development (HDI), Unemployment Rate (EMPL), Urban Population (UR) and Economically Active Population (ECA), Gross National Income (GN). Definitions and sources for all variables can be found in Table 01. and Fig 01

Table 01 : presents a schematic overview of the variables of this study

Variable	Description	Source
GDP per Capita (GDP)	GDP per capita isgrossdomesticproductdivided by midyear population. Data are in constant 2010 U.S. dollars.	The World Bank Database
GNI per Capita (GN).	GNI isgross national incomeconverted to international dollars usingpurchasing power parity rates. Data are in constant 2010 U.S. dollars.	The World Bank Database
HumanDevelopment Index (HDI)	"The HumanDevelopment Index (HDI) is a summarymeasure of averageachievement in key dimensions of humandevelopment: a long and healthy life, beingknowledgeable and have a decent standard of living. The HDI is the geometricmean of normalized indices for each of the three dimensions."	The World Bank Database
Established Business Ownership Rate (EBO)	The variable represents "percentage of 18–64 population who are currently an owner-manager of an established business, i.e., owning and managing a running business that has paid salaries, wages, or anyotherpayments to the owners for more than 42 months." (The EBO variable used in the study is collected from Global Entrepreneurship Research Association databases.)	Global Entrepreneurship Monitor
Unemployment Rate (EMPL)	Unemployment, total (% of total labour force, national estimate)	The World Bank Database
Urban Population (% Share) (UR)	Urban population refers to % of people living in urban areas as defined by national statistical offices.	The World Bank Database
Economically Active Population (% Share) (ECA)	Labour force participation rate (%) is the proportion of the population ages 15 and olderthatiseconomically active.	The World Bank Database

Source : The World Bank Database, Global Entrepreneurship, 2020.

Figure. 01.presents a schematic overview of the variables of this study



Source :Eviews 09 output

3.2. Method :

The Literature Review employed to explore the connection that exists between Entrepreneurial Activity (EBO), Human Development (HDI), Unemployment Rate (EMPL), Urban Population (UP) and Economically Active Population (ECA), Gross National Income (GN) and Gross Domestic Product (GDP) is combination of theoretical and empirical . Accordingly, the model specification will be as follows:

$$GDP = f(EBO, HDI, EMPL, UR, GN, ECA) \quad (01)$$

To reduce the variation and induce stationary in the variance-covariance matrix, the natural logarithmic form (Ln) is applied to all the variables. The log linear (1) equation to examine the long run relationship between variables is given as follow:

$$\text{LnGDP} = \alpha_0 + \alpha_1 \text{LnEBO} + \alpha_2 \text{LnHDI} + \alpha_3 \text{LnEMPL} + \alpha_4 \text{LnUR} + \alpha_5 \text{LnGN} + \alpha_6 \text{LnECA}\varepsilon_t$$

To estimate equation (2) in the long run, we will use the ARDL model used by Pesaran and Shin (1999) and then extended by Pesaran et al. (2001), as the ARDL methodology does not require that the time series of the variables under study are not of the same rank, ie, both the I (0) and the I (1) Provided that the time series of the variables under study are not in the second difference I (2). The ARDL methodology is characterized by a set of characteristics that distinguish it from other standard methods.,All variables of the model are assumed to be endogenous. (Jonas, 2018, p. 6); (Davidescu, 2015, p. 40)

- ✓ Bounds test method for cointegration is being applied irrespectively the order of integration of the variable.
- ✓ There may be either integrated first order I(1) or I(0).
- ✓ The short-run and long-run coefficients of the model are estimated simultaneously. An ARDL representation of equation (1) isformulated as follows:

$$\Delta LnGDP_t = \propto_0 + \sum_{i=1}^{m} \propto_{1i} \Delta LnGDP_{t-i} + \sum_{i=0}^{m} \propto_{2i} \Delta LnEBO_{t-i} + \sum_{i=0}^{m} \propto_{3i} \Delta LnHDI_{t-i} + \sum_{i=0}^{m} \propto_{4i} \Delta LnEMLP_{t-i} + \sum_{i=0}^{m} \propto_{5i} \Delta LnUR_{t-i} + \sum_{i=0}^{m} \propto_{6i} \Delta LnGN_{t-i} + \sum_{i=0}^{m} \propto_{7i} \Delta LnECA_{t-i} + \propto_8 LnGDP_{t-1} + \propto_9 LnEBO_{t-1} + \propto_{10} LnHDI_{t-1} + \propto_{11} LnEMPL_{t-1} + \propto_{12} LnUR_{t-1} + \propto_{13} LnUR_{t-1} + \propto_{14} LnECA_{t-1} + \varepsilon_t \ldots\ldots (03)$$

Finally,To ascertain the goodness of fit of the ARDL model, diagnostic . The diagnostic test examines the serial correlation, functional form, normality, and heteroscedasticity associated with the model.

4.Results and discussion:

4.1.Result of Descriptive Statistics :

Table 01 ; Shows the descriptive statistics of the variables used in ourstudy, the mean of Gross Domestic Product (GDP) is a amounted to 4.041148 with the standard deviation 0.043803 over the period (2001-2020), the Domestic Product (GDP) canachieve as high as 4.078945 or as low as 3.944696 throughoutthese 20 year. The statistic of Skewnessrevealsthat Entrepreneurial Activity (EBO), Economically Active Population (ECA), Unemployment Rate (EMPL),. are skewed to right while, Gross National Income (GN) and Gross Domestic Product (GDP),Urban Population (UR), Human Development (HDI), has the left side skewness. Furthermore the natural logarithmic form (Ln) is applied to all the variables to reduce the variation and induce stationarity in the variance covariance matrix.

Table 02: Descriptive Statistics

	GDP	GN	EBO	ECA	EMPL	UR	HDI
Mean	4.02	4.012	1.199	1.81	0.96	1.92	-0.137
Median	4.04	4.031	1.186	1.81	0.95	1.92	-0.137
Maximum	4.07	4.072	1.367	1.833	1.10	1.93	-0.119
Minimum	3.94	3.930	1.053	1.792	0.82	1.91	-0.160
Std. Dev.	0.04	0.045	0.0989	0.016	0.09	0.0084	0.015
Skewness	-0.59	-0.601	0.233	0.034	0.12	-0.140	-0.072
Kurtosis	2.02	2.071	1.910	1.151	1.85	1.770	1.375
Jarque-Bera	1.99	1.925	1.171	2.709	1.094	1.31	2.217
Probability	0.36	0.381	0.556	0.258	0.57	0.517	0.329
Sum	80.4	80.25	23.98	34.41	18.2	38.5	-2.757
Sum Sq. Dev.	0.036	0.038	0.183	0.005	0.15	0.001	0.004
Observations	20	20	20	20	20	20	20

Source :Eviews 09 output

4.2. Result of Unit Root Test :

Table 03; shows the test of stationary result, from the table we see that Human Development (HDI) and Urban Population (UR) are stationary at level and variable Entrepreneurial Activity (EBO),Unemployment Rate (EMPL) and Economically Active Population (ECA), Gross National Income (GN) and Gross Domestic Product (GDP) are non stationary at level but stationary at 1erdifference. As all the variables are found to have the order of I(0) and I(1), we choose to employ ARDL bound test in order to determine the long-run cointegration.

Table 03 : Unit root test (ADF)

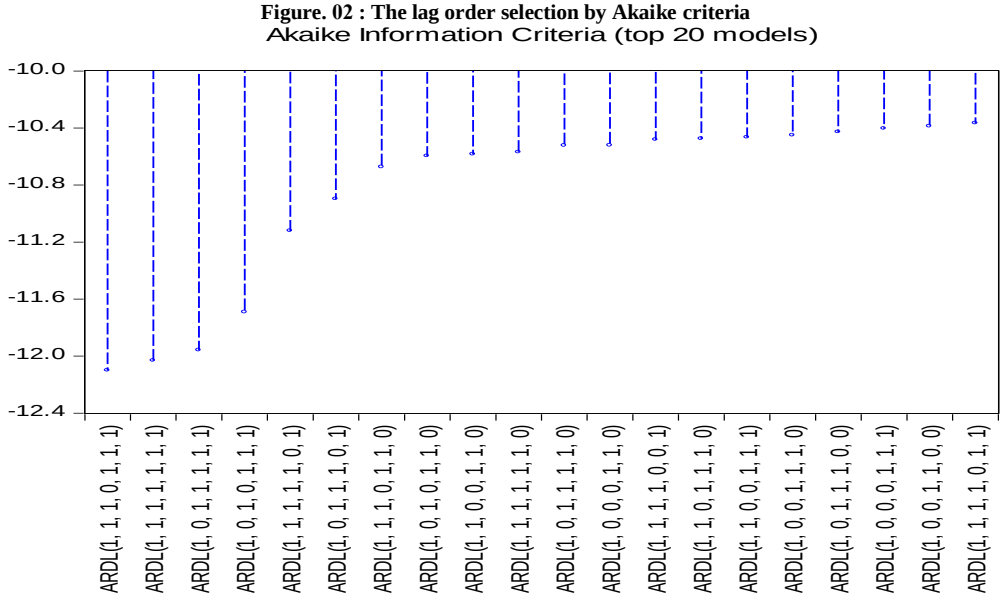
Variable	Test statistics	Probability test statistics	Order of integration
GDP	-2.529509	0.0147	I(1)
EBO	-5.391449	0.0000	I(1)
EMPL	-2.601606	0.0132	I(1)
UR	2.601606	0.0000	I(0)
ECA	-2.953172	0.0072	I(1)
HDI	-4.134746	0.0003	I(0)
GN	-2.403928	0.0195	I(1)

Source : Eviews 09 output

4.3. Optimal Lag :

According to the akaike information criteria the optimal of ARDL is ARDL(1, 1, 1, 0, 1, 1, 1)

Figure. 02 : The lag order selection by Akaike criteria



Source : Eviews 09 output

4.4.Result of ARDL Bound Test

In Table 04 ; the results of the bounds cointegration test demonstrate that the null hypothesis of against its alternative is easily rejected at the 5% significance level, the computed F-statistic of 4.638842is greater than the lower critical bound value of 2.56 thus indicationg the existence of a steady state long-run relationship among GDP and its determinats.

Table 04 :Bounds Test Result

ARDL Bounds Test

Test Statistic	Value	k
F-statistic	4.638842	6
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

Source : Eviews 09 output

4.5.Long and Short-Run estimates of Ardl Approach :

In Table 05; shows the long run coefficient of ardl model, from the we can see that the according to long run coefficients of variables of this study of Brazil are statically significant in levels at 1%, 5%, 10%. On the other hand, the results show that Entrepreneurial Activity (EBO) is positively correlated with the Gross Domestic Product (GDP), this indicate that an increase in Entrepreneurial Activity (EBO) can enhance Gross Domestic Product (GDP). The results also show that Gross Domestic Product (GDP) is negatively correlated with the Human Development (HDI),

Unemployment Rate (EMPL), Urban Population (UP) and Economically Active Population (ECA), Gross National Income (GN).

Iin Table 05; shows the Short run coefficient of ARDL model, with the table we can see that the sign of lagged error correction representation (ecmt-1) is negative and statistically significant. On the other hand, the (ecmt-1) shows the speed of adjustment toward equilibrium, approximately, -0.938367disequilibria from the previous year"s shock converge on the long run equilibriumin the current year. also are statically significant in levels at 1%, 5%, 10%.

Table 05 :ARDL Cointegrating And Long Run Form

ARDL Cointegrating And Long Run Form
Dependent Variable: GDP
Selected Model: ARDL(1, 1, 1, 0, 1, 1, 1)

CointegratingForm

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GN)	0.776243	0.034218	22.685202	0.0000
D(EBO)	0.027630	0.008221	3.360953	0.0283
D(ECA)	-0.140927	0.060974	-2.311259	0.0119
D(EMPL)	-0.017109	0.007130	-2.399504	0.0044
D(HDI)	-0.707453	0.154949	-4.565709	0.0103
D(UR)	5.392180	1.290386	4.178733	0.0139
CointEq(-1)	-0.938367	0.173379	-5.412227	0.0056

Long Run Coefficients

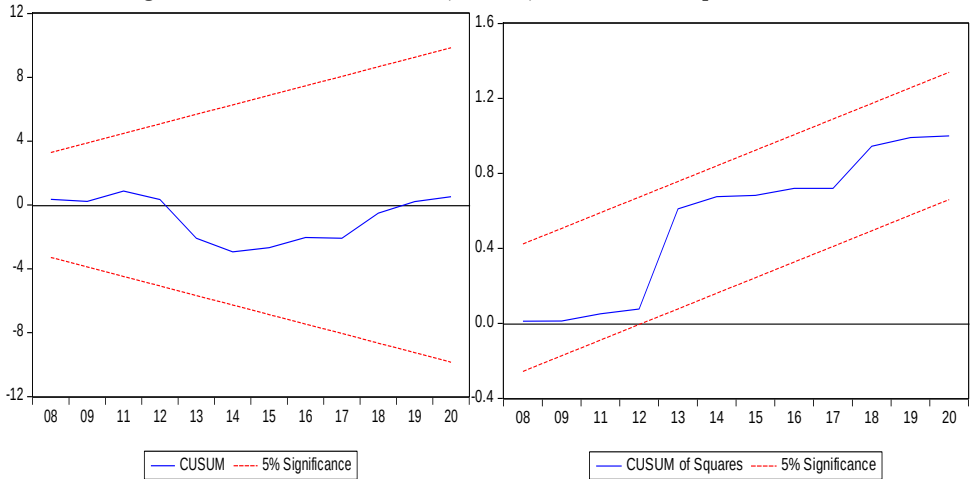
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GN	1.160828	0.066896	17.352615	0.0001
EBO	0.080987	0.022393	3.616579	0.0224
ECA	-0.150183	0.049104	-3.058485	0.0377
EMPL	0.042414	0.015025	2.822986	0.0477
HDI	-1.646659	0.290605	-5.666308	0.0048
UR	0.958216	0.321888	2.976864	0.0109
C	-2.578573	0.633742	-4.068806	0.0152

Source : Eviews 09 output

4.6.Result of Stability and Diagnostic Test

-The plots of both CUSUM statistics are provided in Figure 03. As it is clear from Figure.03, the plots of both the CUSUMand CUSUMSQ statistics within the boundaries and hence these statistics confirm the stability of the long run coefficients of regressors.

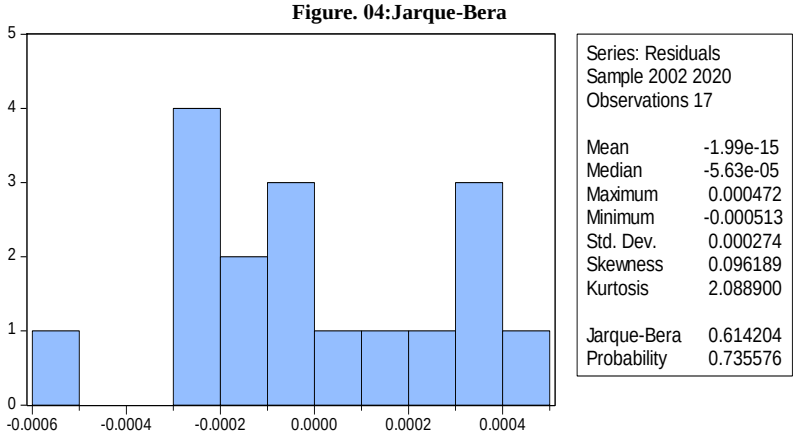
Figure. 03: Plot of cumulative sum (CUSUM) and CUSUM of squares tests



Source : Eviews 09 output

-Normality test : to examine the normality of the model we used Jarque-Bera test the result of this test is shown in Figure 04; the result of JarqueBera test shows that the value of the test is 0.61 and p-value is 0.73 which is greater that 0.05 that means we cannot reject the null hypothesis that sates the model is normally distributed Hence the estimated model is normally.

Figure. 04:Jarque-Bera



Source : Eviews 09 output

Test for serial correlation the existence of serial correlation is tested by Breusch-Godfrey Serail Correlation LM test the result of this test is shown in table 06; the result indicates that the p-value is greater than 0.05 that is no serial correlation.Also shows that the result of heteroskedasticity test. From the result we can see that the p-value of the Breusch-Pagan-Godfrey test exceeds 0.05, hence we cannot reject the null hypothesis. Thus there is no heteroskedasticity problem.

Table 06 :DiagnosticTest

Breusch-Godfrey Serial Correlation LM Test		
F-statistic	1.378154	Prob. F(2,9)0.4205
Obs*R-squared	9.851598	Prob. Chi-Square(2)0.1273
Heteroskedasticity Test: Breusch-Pagan-Godfrey		
F-statistic	5.809114	Prob. F(12,4)0.0515
Obs*R-squared	16.07746	Prob. Chi-Square(12)0.1877
Scaledexplained SS	0.484616	Prob. Chi-Square(12)1.0000

Source :Eviews 09 output

5.Conclusion

This paper has estimated the Entrepreneurial Activity on Gross Domestic Product and selected Variables in Brazil by using time series data from 2001-2020 by employing ARDL. The results show that :

- the literature indicating that the Entrepreneurship is a reality not only for developed economies, but also for developing economies. And Entrepreneurship may affect economic growth in many distinct ways such as introduction of essential innovations which result in production processes or new products.
- the variables are found to have the order of I(0) and I(1), we choose to employ ARDL bound test in order to determine the long-run cointegration.
- There existe a long run equilibrium relationship between the Entrepreneurship and GDP.
- Entrepreneurshipis posittively correlated with the Gross Domestic Product, also selected Variables is negatively correlated with the Gross Domestic Productthe .

References

[1] André, v. S., & Erik, S. (2009). **"**Entrepreneurship and Economic Growth**"**. *Research Paper No. 2009/47* , 1-12.

[2] Davidescu, A. A. (2015). "Bounds Test Approach for the long run relationship between shadow economy and official economy : An empirical Analysis for Romania". *Journal of Applied Quantitative Methods vol 10(01)*, 40-42.

[3] Fredrick, o. A., & al. (2019). "Economic Growth and public expenditure : country specific test of the curve hypothesis in nigeria and ghana". *Advances in social sciences research journal vol 6(01)*, 503-505.

[4] Henderson, J. (2002). "Building the Rural Economy with High-Growth Entrepreneurs". *Federal Reserve Bank of Kansas City Economic Review vol 87(03)*, 45-70.

[5] Jonas, K. K. (2018). "Modélisation ARDL, Test de cointégration aux bornes et Approche de Toda-Yamamoto : éléments de théorie et pratiques sur logiciels". *Licence. Congo-Kinshasa (file:///C:/Users/POSTE-01/Downloads/ARDL.Ass%20jonas1.pdf)*, 4-11.

[6] Kaiser, C. P. (1990). "Entrepreneurship and Re source Allocation". *Eastern Economic Journalvol 16 (01)*, 9-10.

[7] Kreft, S. F., & Sobel, R. S. (2007). "Public Policy Entrepreneurship and Economic Growth". *Small Business Economics* , 1-33.

[8] Manuel, A. G. (2019). "Linking demographics, entrepreneurial activity, and economic growth". *Revista ESPACIOSvol 40(28)*, 1-11.

[9] Manuel, A.-G. (2020). "Entrepreneurial activity and economic growth. A multi-country analysis". *European Research on Management and Business Economicsvol 26(01)*, 9-17.

[10] Minniti, M. (1999). "Entrepreneurial Activity and Economic Growth" . *Global Business and Economics Review vol 01(01)*, 31-42.

[11] Murat, Cetin. (2017). "Does Government Size Affect Economic Growth in Developing Countries? " Evidence from Non-stationary Panel Data. *European Journal of Economic Studies 6(2)*, 87-93.

[12] Niels, B., & al. (2018). "Institutions, entrepreneurship, and economic growth in Europe". *Small Business Economics vol51(4)*, 1-17.

[13] OECD. (2020). "*SME and Entrepreneurship Policy in Brazil*" *2020.* Washington.

[14] Procházka, D. A., & al. (2018). "Investigating the relationship between entrepreneurship and regional development: case of developing countries". *Journal of Global Entrepreneurship Research vol 8(16)*, 1.

[15] Schumpeter, J. A. (1942). "*Capitalism Socialism and Democracy*". New York: Harper.

[16] Vedder, R. K., & Gallaway, L. E. (1998). "Government size and economic growth". *paper prepared for the Joint Economic Committee, Retrieved September 11*, 01.