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An Analysis of Long and Short Run Relationship between Economic Growth and Entrepreneurship Financing in Pre and Post Deregulated Nigerian Economy (1962-2010)

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Abstract:
The aim of this study is to investigate the short and long run relationship between entrepreneurship financing (from financial intermediation) and economic growth during the pre-deregulation period and aggregate period in Nigeria. This enables us assess the impact of deregulation on economic growth via entrepreneurship financing in Nigeria. Johansen co-integration method with vector error correction and Granger causality technique were adopted. The results reveal that entrepreneurship financing during the above periods both in short and long run period did not improve economic growth in Nigeria. Financial institutions as well as government should monitor entrepreneurs when loans are granted to ensure they are invested on economic activity to boost economic growth in Nigeria.

1. Introduction

Deregulation policy eliminates and reduces government regulation of business activities, permits investors and competition which in turn increases economic growth (Maduabuchi 2010). Deregulation policy relies on privatisation and requires government to concentrate on governance as well as providing guidelines for the operation of businesses (Odeh 2011).Consequently the adoption of deregulation in 1986 in Nigeria is to accomplish the aforementioned advantages. According to Ogundipe and Aworinde (2011) neo-liberal policies support the attraction of foreign direct investment to improve economic growth. However, its crowding out effects and transfer pricing practices have made some supporters of foreign direct investment to have cold feet (Manuel and Ricardo 2000, Grimwade 2000).

Due to the problems derive from foreign direct investment, investing in entrepreneurship has significantly improved economic growth in Asia and some countries in Africa, thereby supports the need to grant credit to entrepreneurs to boost economic growth. Consequently, USA, UK, Germany and japan have been reviewing their policies on promoting entrepreneurship in their countries to ensure its contribution is unabated (Olutunla and Obamuyi 2008).To realise positive and significant impact of entrepreneurship on economic growth, Kilby(1988) opines that small and medium scale enterprises should be encouraged to help build entrepreneurial skills. Kayanula and Quartey (2000) emphasize on the importance of entrepreneurship on the economy by creating jobs for 22 percent of the adult population in the developing countries.

South Korea (a country in South pacific region) entrepreneurs employ 64 percent of the labour force and the linkages that exist among companies in the global world can instigate strategic alliance which in turn brings domestic entrepreneurships into global market via sub-contracting with foreign companies (OECD, 1996).According to United Nations (2006) an increase in credit to entrepreneurs improves significantly their contributions in Malaysia, Indonesia and Bangladesh. The key success to the positive impact of entrepreneurship, finance on economic growth in Asia is the monitoring of the credit granted to them by the "peer group" (Somoye, 2011).The importance of entrepreneurship and its financing as well as deregulation has been argued to improve economic growth. Thus, as a new study in Nigeria, it ascertains their impacts on economic growth by investigating the relationship between entrepreneurship financing and economic growth in Nigeria before (1962-1985) and after deregulation period (1986-2010).

2. Theoretical Framework

The importance of entrepreneurship financing to economic growth is connected to the work of Schumpeter (1912) quoted in Peter (2000) which reveals the importance of financial intermediation to economic growth (via the credits it lends to investors). As a fellow up, Peter (2000) opines that the demand (by granting financial assistance). Audratsch and Kielback (2004) indicates that entrepreneurship financing have a positive influence on economic growth as a result of its knowledge spill over which comes from competition among enterprises. Entrepreneurship financing is a factor excluded from the neo-classical growth theory which provides financial assistance to entrepreneurs and helps to improve economic growth in an endogenous framework.

The need for financial restructuring in the developing economies could be traced to the seminar work of Mc Kinnon(1973) and motivated by Shaw (1973).On the issue of choosing between financial regulation and financial liberalisation (deregulation),Mc Kinnon (1973) prefers the latter.

In furtherance of the debate, the monetarist-structuralist school of thought as adopted in the work of Taylor (1983) indicates that there exists positive and significant relationship between financial management policy and economic growth. Consequently, it has been argued that financial liberalisation (deregulation) policy implementation improves economic growth (Owolabi, 2010,p.2).Deregulation as a government policy is linked to traditional neo-classical growth theory (George et al. 2007).The difference between the traditional neoclassical theory (deregulation) and endogenous growth theory (entrepreneurship) is that government policy plays major role in improving economic growth in the long run in the former than in the latter (Romer 1999).The relationship between entrepreneurship financing and deregulation policy is that both tend to increase output.

3. Literature Review

Zank (1991,P.71) comments on the relationship between financial policy (deregulation), privatisation and economic growth in Asia, Latin America and the Caribbean. It opines that both deregulation and privatisation improves the stability of the banking system and economic performance. It further posits that privatisation boosts confidence in the financial system which in turn increases savings, entrepreneurship financing and investment. It concludes that all these exert positive influence on economic growth. Galbis (1995, p.3) use qualitative method to examine the impact of deregulation on the economy of Argentina, Bulgaria, Ecuador, Egypt, India, Kenya and Tanzania. The findings indicates that deregulation improves financial sector deepening with low operating costs which increases credit granted to entrepreneurs and in the long run increases economic growth.

Grabel (1995, p.903) uses qualitative techniques to assess the impact of financial liberalisation (deregulation) on the economy of five countries comprising Argentina, Columbia, Venezuela, Korea and Philippines) and found that it increases volatility in the stock market. Volatility discourages investors, which in turn has negative influence on economic growth.

Schull and Hanweck (2001, p.203) found that deregulation increases mergers, improves banks profit with no reduction in costs in United States of America. The study argues that deregulation policy increases and develop banks, especially the large ones which in turn improve banks profit, funds for entrepreneurs for investment and economic growth.

Dalla and Khatkhate (1995) investigate the impact of financial liberalisation (deregulation) on Korea economy. Results reveal that deregulation increases interest rates, banks competition, credit programmes and banking efficiency. The study argues that the entrepreneurship accessibility of credit is improved as a result of the banking efficiency and in the long run has an expansionary effect on economic growth.

It has been argued that if deregulation policy induces more risk taking in the practising country, it could have a negative effect on economic growth both in the short and long run. Thus, to ensure consistent entrepreneurship financing and improve economic growth, it becomes imperative for the government to fashion or put in place an institutional setting to check the negative impact of deregulation on the stability of financial institutions (Demirguc-Kunt and Detragiache 1999).

4. Methodology

This section of the research comprises method of data collection, operationalisation /definitions of variables and method of data analysis.

4.1. Method of Data Collection

This study utilized time series data from Central Bank of Nigeria statistical Bulletin for the year 1962-2010. E-View software Version 8 is used to analyse the time series data from Central Bank of Nigeria covering the period of 1962-1985 (pre-deregulation period),1986-2010 (post-deregulation period) and 1962-2010 to enable us ascertain the impact of entrepreneurship financing on economic growth during the era of deregulation policy in Nigeria. The observation period started 1962 because there were no data for economic growth and foreign direct investment in 1960 and 1961. Again, there were no data for all the variables in 2011 till date

Variables	Definition of Variables	How the variables are measured
GDP	Gross domestic product at current prices divided by implicit price deflator.	GDP/IPD
FDI	Total foreign direct investment divided by implicit price deflator	FDI/IPD
EF	Entrepreneurship financing divided by implicit price deflator	EF/IPD

Table 1: Operationalisation and Definition of Variables.

4.2. Method of Data Analysis

There are various ways of investigating the effect of independent variable (s) on the dependent variable. Examples of such ways are ordinary least square, 2 stage least square (2SLS), 3 stage square (3SLS), Grangeralised method of the moment (GMM) Engel and Yoo co-integration test, Granger causality test and Johansen co-integration test to mention just but few. Ordinary least square as a method of investigating is extended by adopting two steps or three stages least square technique. According to Bryon (1984) the setback of ordinary least square is that variances of error terms are taken to be homoscedastic and conveyed to readers that heteroscedasticity exist without providing g panacea for it. The 2 stage least square (2SLS) and 3 stage least square (3SLS) are mostly used in a model where there is an endogenous effect of the explanatory variables on the explained variable. However, in this research the case of endogeneity does not exist, making the adoption of the methods inconsequential. Engel and Yoo on the other hand does not

take into account where there exist more than one co-integrating variables. However, Johansen co-integration test suits the case where there exist two or more co-integrating variables with vector error correction that takes care of the short run dynamics (Bent, 2005). The more the co-integrating variables co –integrate; the greater the long run equilibrium relationship exists among them. Granger causality test as a short run relationship is also adopted because it indicates the direction of causality between entrepreneurship financing and economic growth both in the pre and post deregulation periods in Nigeria.

Before Johansen co-integration and granger causality tests are conducted unit root tests are first carried out to test the stationary of the variables used. In testing the stationarity of variables, this research adopted Augmented Dickey-Fuller test and Philip Perron test because of the pitfalls observed in Engel-Granger and Dickey-Fullers test. Engel Granger for example, does not have deterministic components. However, Dickey-Fuller test has deterministic components, but like the former error terms are assumed to be homoscedastic and do not provide solution for serial correlation. Thus, Augmented Dickey-Fuller (ADF) is used and settles the serial correlation problem by adding lags as shown in Equation 1 below (James 2010). Philip Perron (PP) test on the other hand is also adopted and settles heteroscedasticity by reducing errors in y_{t-1} (Lavan and Paul 2004).

$$y_t = \alpha_0 + \alpha_1 t + y_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta y_{t-k} + \varepsilon_t \qquad (1)$$

$$\Delta y_t = \beta' D_t + y_{t-1} + u_t \qquad (2)$$

In unit root tests, some variables could be stationary at level, but the test should proceed until all the variables become stationary and this could be in the be first or second difference (Juan et al 1999).The variables are integrated at order zero 1 (0) if they are stationary at level and at order one 1 (1) if stationary at first difference.

Unit root test is followed by optional lag length selection. Most of the Vector autoregressive models adopt symmetric lags selected frequently by statistical criteria like Akaike Information Criteria (AIC) or Schwartz Information Criteria (SIC). The merit of these criteria is that they provide same specification of all the equations in a model (Omer 1997). Thus, this research uses symmetric lag because of the aforementioned advantage. If variables in a model co-integrate, it means long run relationship exists among the variables. Co-integration could be trace to Engel and Granger (1987) and when the equilibrium relationship that exists among the co-integrating variables deviates, short run dynamics occurs. Consequently, Vector error correction is used to settle the short run dynamics to enable us realise long run equilibrium. The null hypothesis of r co-integrating Vectors is tested with the aid of Trace and Eigen value statistics and if their T-statistics are greater than the critical value the null hypothesis would be rejected and vice versa.

When variables in the co-integrated relationship integrate at the same order with K co-integrating relation of r=0, (co-integration does not exists). But, if r<k, r is taken to be equal to -1, (at least one co-integration relationship exists) (Abdulmumini and Tukur 2012). Eigen value is important in checking the stability of VAR process (Stable when less than one). On the other hand, trace statistics is good at testing skewness and kutosis. When there are exists differences between maximal Eigen value and trace test, the later would be chosen (Spyridis et al 2010). In line with the objective of the study below is the specification of the estimated co-integration regression of the model adopted.

$LGDP_t = \beta_0 + \beta_1 LEF_{t-i} + \beta_2 LFDI_{t-i} + \mu_t$ (3)

Where$LGDP_t$ = Natural log value of economic growth

LEF_t = Natural log of Entrepreneurship financing

$LFDI_t$ = Natural log of foreign direct investment

$t - i$ = Lag values of co-integrating variables

μ_t = Estimated error terms assumed to have constant variances and normally distributed

There will be a linear combination in the co-integration regression such that:

$\mu_t = LGDP_t - \beta_1 LEF_{t-i} - \beta_2 LFDI_{t-i} - \beta_0$ …… (4) Will be stationary

In Equation 3 above, LRGDP is the dependent variable and the regression of the model normalises on it. The a priori expectation of the variable of the variables used in our model of investigation are that coefficients β_1>0,β_2>0 of Entrepreneurship Financing (LEF) and foreign direct investment (LFDI) respectively are expected to have positive and significant impact on economic growth (LGDP). The objective of the aforementioned model is to estimate the impact of entrepreneurship financing on economic growth in pre and post deregulation period in Nigeria. The equation below is Vector error correction model of the study.

$$\Delta GDP_t = \delta_0 + \sum_{i=1}^{n} \delta_{1i} \Delta LGDP_{t-i} + \sum_{i=1}^{n} \delta_{2i} \Delta LEF_{t-i} + \sum_{i=1}^{n} \delta_{3i} \Delta LFDI_{t-i} + \lambda_1 ECM_{t-i} + \varepsilon_{1t} \qquad (5)$$

In Equation 5, δ is the coefficients, t represents the time variants,$\varepsilon_{1t}$is the residual for the time series, the ECM_{t-i} stands for error correction term. λ_1Stands for established relationship among the co-integrating variables in the short run dynamics and the t-1 are the combinations of the co-integrating variables that yield the largest relationship of the difference operators (Δ). The model normalised on economic growth (in natural log LRGDP) which captures the short run dynamics. After the short run dynamics correction, normalised at economic growth, the co-integration regression will be:

$ECM_{t-i} = LGDP_t + \beta_1 LEF_{t-i} - \beta_2 LFDI_{t-i} - \beta_0$ …… (6)

After normalisation the economic will be 1. Equation 6 above suggests that the results of error correction model (ECM) should be negative because it crosses the sign of equality (Abdulmumini and Tukur 2012).This study also carried out Granger causality test to ascertain the direction of causality between entrepreneurship financing (EF) and economic growth (LGDP). In Granger causality test,

cause is influenced by actions in the past. Granger causality tests the lag values of the independent variables whether it plays a significant role in explaining the dependent variables with its lag values. In Granger causality test, movement could be unidirectional or bidirectional. The causality regression of the two variables (dependent=GDP and independent =EF) are presented in Equation 7 and 8 below.

$GDP_t = \alpha_1 GDP_{t-1} + \alpha_2 GDP_{t-2} + \alpha_3 GDP_{t-3} + \ldots + \beta_1 EF_{t-1} + \beta_2 EF_{t-2} + \beta_3 EF_{t-3} \ldots + \varepsilon_{1t}$ …… (7)

$EF_t = \emptyset_1 GDP_{t-1} + \emptyset_2 GDP_{t-2} + \emptyset_3 GDP_{t-3} + \ldots + \delta_1 EF_{t-1} + \delta_2 EF_{t-2} + \delta_3 EF_{t-3} \ldots + \varepsilon_{2t}$ …….. (8)

If the lag values of entrepreneurship financing play a significant role in explaining economic growth, then EF is said to "Granger cause" RGDP determined by F-test and P-value of the causality test.

5. Results and Discussion

In this section of the research, results of the empirical study on unit root tests, VAR lag length selection, co-integration test, Vector error correction estimates and Granger causality test in pre-deregulation period and the aggregate periods are discussed.

The null hypothesis for the unit root test state that "the variables are not stationary at the same level", whereas the alternative states that "the variables are stationary at the same level".

AUGMENTED DICKEY FULLER TEST (ADF)			PHILIP PERRON TEST (PP)	
Variables	t-statistics (Prob.) at level	t-statistics (Prob.) at 1st diff.	t-statistics (Prob.) at level	t-statistics (Prob.) at 1st diff.
LGDP	-0.036636 (0.9455)	-4.426285 (0.0023)	0.153369 (0.9630)	-4.443328 (0.0022)
LEF	0.013508 (0.9506)	-4.188446 (0.0039)	0.029756 (0.9522)	-4.170143 (0.0041)
LFDI	3.521285 (1.0000)	-4.691860 (0.0023)	-0.259046 (0.9170)	-4.175297 (0.0041)

Table 2: Unit root test in pre-deregulation period
Source: Author's calculation using E-View 8.0

AUGMENTED DICKEY FULLER TEST (ADF)				PHILIP PERRON TEST (PP)		
Variables	t-statistics (Prob.) at level	t-statistics (Prob.) at 1st diff.	t-statistics (Prob.) 2nd diff	t-statistics (Prob.) at level	t-statistics (Prob.) 1st diff	t-statistics (Prob.) 2nd diff.
LGDP	0.473298(0.9818)	-3.249200(0.0298)	-6.839281(0.0000)	1.120074(0.9965)	-3.340606(0.0246)	-6.948152(0.0000)
LEF	-0.136475(0.9334)	-2.140990(0.2324)	-5.348448(0.0005)	-2.103741(0.2449)	-12.01212(0.0000)	-26.39613(0.0000)
LFDI	-5.179207(0.0003)	-7.764468(0.0000)	-7.764468(0.0000)	-5.530993(0.0001)	-21.27228(0.0000)	-26.24367(0.0000)

Table 3: Unit root test in post-deregulation period
Source: Author's calculation using E-View 8.0

AUGMENTED DICKEY FULLER TEST (ADF)			PHILIP PERRON TEST (PP)	
Variables	t-statistics (Prob.) at level	t-statistics (Prob.) at 1st diff.	t-statistics (Prob.) at level	t-statistics (Prob.) at 1st diff.
LGDP	-1.664977(0.4423)	-6.071784(0.0000)	-1.677157(0.4362)	-6.036641(0.0000)
LEF	-1.828129(0.3628)	-6.359574(0.0000)	-1.963542(0.3015)	-6.359574(0.0000)
LFDI	-2.073870(0.2558)	-9.244126(0.0000)	-1.955765(0.3049)	-10.27557(0.0000)

Table 4: Unit root test for post de-regulation periods
Source: Author's calculation using E-View 8.0

Table 2 presents the results of Augmented Dickey-Fuller (ADF) test and Philip Perron (PP) test conducted in the unit root during the pre-deregulation period with variables at levels and at first difference. From Table 2 above, all the variables are non-stationary in their levels with the likelihood of not reverting to their mean value both in the Augmented Dickey Fuller (ADF) test and in Philip Perron (PP) test. However, at first difference, the variables (gross domestic product (LGDP), entrepreneurship financing (LEF) and foreign direct investment are stationary when both Augmented Dickey-Fuller (ADF) test and Philip Perron test were conducted. This means that the variables are integrated at order one, 1 (1). Thus, the null hypothesis which states that the variables are not stationary at the same level is rejected and the alternative which states that all the variables are stationary at the same level is accepted.

Table 3 on the other hand shows the results of Augmented Dickey-Fuller (ADF) test and Philip Perron (PP) test conducted in the unit root during the post-deregulation period with variables at levels, first difference and second difference. It shows that all the variables are non-stationary in their levels at first difference both in the Augmented Dickey Fuller (ADF) test and in Philip Perron (PP) test. However, at second difference, the variables (real gross domestic product LRGDP), entrepreneurship financing (LEF) and foreign direct investment are stationary when both Augmented Dickey-Fuller (ADF) test and Philip Perrontest were carried out. This indicates that the variables are integrated at order two, I (2). Again, the null hypothesis is rejected and the alternative accepted.

Lastly, Table 4 above presents the results of Augmented Dickey-Fuller (ADF) test and Philip Perron (PP) test conducted in the unit root test of the aggregate periods, covering the period of 1962-2010 with variables at levels and at first difference. The table shows that all the variables are non-stationary in their levels both in the Augmented Dickey Fuller (ADF) test and Philip Perron (PP) test. However, like in Table 2 all the variables are stationary at first difference both in the Augmented Dickey Fuller test and Philip Perron test, thereby integrated at order one, I (1). Thus, the null hypothesis is rejected and the alternative is accepted.

VAR Lag Length Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: LGDP LEF LFDI
Exogenous variables: C
Date: 10/26/15 Time: 14:57
Sample: 1962 1985
Included observations: 20

Lag	LogL	LR	FPE	AIC	SC
0	8.845700	NA	0.000112	-0.584570	-0.435210
1	56.58322	76.38004*	2.36e-06	-4.458322	-3.860883*
2	62.04445	7.099597	3.63e-06	-4.104445	-3.058926
3	69.04962	7.005172	5.43e-06	-3.904962	-2.411364
4	92.24183	16.23455	2.07e-06*	-5.324183*	-3.382505
* indicates lag order selected by the criterion					

Table 5: VAR Lag Length Selection Criterion for Pre-deregulation Period 1962-85

VAR Lag Order Selection Criteria
Endogenous variables: LGDP LEF LFDI
Exogenous variables: C
Date: 10/26/15 Time: 16:55
Sample: 1962 1985
Included observations: 21

Lag	LogL	LR	FPE	AIC	SC
0	11.84570	NA	0.000337	-0.584570	-0.535210
1	58.74826	71.38012*	1.14e-04	-4.458322	-3.960777*
2	72.37346	7.099597	2.44e-04	-4.104445	-2.233926
3	78.24206	7.003211	3.32e-04	-3.904962	-2.622332
4	93.40138	11.24456	1.50e-04*	-5.324183*	-2.472303

Table 6: VAR Lag Length Selection Criterion for post-deregulation period 1986-2010

VAR Lag Order Selection Criteria
Endogenous variables: LGDP LEF LFDI
Exogenous variables: C
Date: 10/26/15 Time: 18:40
Sample: 1962 2010
Included observations: 45

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-79.78741	NA	0.007953	3.679440	3.799884	3.724341
1	34.48538	208.2304*	7.40e-05*	-0.999350*	-0.517573*	-0.819749*
2	36.20138	2.898141	0.000103	-0.675617	0.167492	-0.361314
3	39.86665	5.701533	0.000132	-0.438518	0.765924	0.010486
4	46.51913	9.461302	0.000151	-0.334184	1.231590	0.249521
* indicates lag order selected by the criterion						

Table 7: VAR Lag Length Selection Criterion for the aggregate periods 1962-2010

An essential aspect in the specification of vector auto-regression models is the determination of their lag length (Venus 2004). With reference to Table 5,6 and 7 above, the lag length's selected to investigate into the long run relationship between entrepreneurship financing and economic growth in the pre-deregulation and post deregulation periods as well as in the aggregate periods are 4 respectively.

Date: 10/26/15 Time: 14:53
Sample (adjusted): 1967 1985
Included observations: 19 after adjustments
Trend assumption: Linear deterministic trend
Series: LGDP LEF LFDI
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.998602	144.0618	29.79707	0.0001
At most 1 *	0.604434	19.18564	15.49471	0.0132
At most 2	0.079035	1.564341	3.841466	0.2110

Trace test indicates 2 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.998602	124.8762	21.13162	0.0001
At most 1 *	0.604434	17.62130	14.26460	0.0142
At most 2	0.079035	1.564341	3.841466	0.2110

Max-eigenvalue test indicates 2 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):				
LGDP	LEF	LFDI		
78.95898	-84.53139	39.24015		
47.47038	-21.74879	-25.01056		
-6.363152	-6.841808	26.86446		
Unrestricted Adjustment Coefficients (alpha):				
D(LGDP)	-0.024444	0.009446	0.015111	
D(LEF)	-0.057800	0.038128	0.007840	
D(LFDI)	-0.089499	0.024838	0.003810	
1 Cointegrating Equation(s):		Log likelihood	152.8586	
Normalized cointegrating coefficients (standard error in parentheses)				
LGDP	LEF	LFDI		
1.000000	-1.106094	0.559868		
	(0.0028)	(0.00500)		

Table 8: Johansen Co-integration Test for pre-deregulation period

Date: 10/26/15 Time: 14:53
Sample (adjusted): 1967 1985
Included observations: 19 after adjustments
Trend assumption: Linear deterministic trend
Series: LGDP LEF LFDI
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.937820	74.68546	29.79707	0.0000
At most 1 *	0.600439	19.13090	15.49471	0.0135
At most 2	0.038399	0.783104	3.841466	0.3762

Trace test indicates 2 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.937820	15.55456	21.13162	0.0000
At most 1 *	0.600439	18.34780	14.26460	0.0107
At most 2	0.038399	0.783104	3.841466	0.3762

Max-eigenvalue test indicates 2 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):				
LGDP	LEF	LFDI		
78.95898	-84.53139	39.24015		
47.47038	-21.74879	-25.01056		
-6.363152	-6.841808	26.86446		

Unrestricted Adjustment Coefficients (alpha):				
D(LGDP)	-0.033222	0.008435	0.013122	
D(LEF)	-0.046111	0.037117	0.005821	
D(LFDI)	-0.079466	0.024726	0.001832	

1 Cointegrating Equation(s):	Log likelihood	152.8586	

Normalized cointegrating coefficients (standard error in parentheses)				
LGDP	LEF	LFDI		
1.000000	-0.467060	-1.386778		
	(0.01883)	(0.04630)		

Table 9: Johansen Co-integration test for post deregulation

Date: 10/26/15 Time: 18:23
Sample (adjusted): 1967 2010
Included observations: 44 after adjustments
Trend assumption: Linear deterministic trend
Series: LGDP LEF LFDI
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.609419	60.85209	29.79707	0.0000
At most 1 *	0.297949	19.48687	15.49471	0.0118
At most 2 *	0.085278	3.921934	3.841466	0.0477
Trace test indicates 3 cointegratingeqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.609419	41.36522	21.13162	0.0000
At most 1 *	0.297949	15.56493	14.26460	0.0310
At most 2 *	0.085278	3.921934	3.841466	0.0477
Max-eigenvalue test indicates 3 cointegratingeqn(s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):				
LGDP	LEF	LFDI		
-5.271695	2.321667	6.593405		
8.325705	0.755684	-12.31814		
-4.142241	-0.095611	3.746567		
Unrestricted Adjustment Coefficients (alpha):				
D(LGDP)	0.012277	0.056761	0.026343	
D(LEF)	-0.222370	0.078657	0.037497	
D(LFDI)	0.020799	0.107844	-0.022258	
1 Cointegrating Equation(s):		Log likelihood	46.39996	
Normalized cointegrating coefficients (standard error in parentheses)				
LGDP	LEF	LFDI		
1.000000	-0.440279	-1.252531		
	(0.06673)	(0.06139)		

Table 10: Johansen Co-integration test for the aggregate periods

Table 8-10 show that the null hypothesis which states that there exists no co-integration among the variables is rejected as observed in the trace test and the maximum-eigen value test. Trace test comprises trace statistics and critical value which indicates that the values of trace statistics are greater than that of the critical values with P values less than 0.05 in the three tables. Furthermore, the columns for hypothesised number of co-integrating equations in the three tables indicate two co-integrating equations because both the trace statistics and eigen statistics are significant. Thus, the null hypothesis which states that there exists no co-integration among LRGDP, LEF and LFDI in the three periods are rejected as observed in the trace and maximum Eigen value tests.

Long run Equations derived from Table 8,9 and 10 Johansen co-integration results

$LGDP_t$ = -1.106094 LEF_t + 0.559868 $LFDI_t$ (8)
(SE) (0.00280) (0.00500)
(T-ratios) [-395.03357] [111.9736]

$LGDP_t$ = -0.467060 LEF_t + -1.386778 $LFDI_t$ (9)
(SE) (0.01883) (0.04630)
(T-ratios) [-24.804036] [-29.952009]

$LGDP_t$ = -0.440279 LEF_t + -1.252531 $LFDI_t$ (10)
(SE) (0.06673) (0.06139)
(T-ratios) [-6.597917] [-20.402851]

With reference to long run Equation 8, 9 and 10 above, entrepreneurship financing in the three periods (pre-deregulation period, post-deregulation period and aggregate period) exert negative impact on economic growth. Precisely, entrepreneurship financing in the three periods have negative and significant influence on economic growth. However, foreign direct investment has positive and significant impact on economic during the pre-deregulation period, but exerts negative and significant impact both in the post deregulation and aggregate periods. In summary, it explains that there exist long run co-integration relationships between the explained (LGDP) and the explanatory variables (LFEP, LFDI). Further, the results from the long run relationship in the pre-deregulation period show that one percent increase in entrepreneurship financing (LEF) and foreign direct investment (LFDI) will cause economic growth to decline by -1.11.47% and increase by 0.56% respectively. In the post deregulation period, one percent increase in entrepreneurship financing and foreign direct investment brought about a reduction in economic growth by -0.46% and -1.39% respectively, whereas in the aggregate period they reduced economic growth by -0.44 and -1.25 respectively. The results show that entrepreneurship financing has not contributed to economic growth in Nigeria. According to Akingunola (2011, p.85) the reason why entrepreneurship financing has not improved economic growth in Nigeria is that the funds are not invested in economic activity by the entrepreneurs but squandered. In summary, it shows that de-regulation policy did not help improve the long run relationship also shows that the relationship between the variables mentioned above are normalised on LRGDP. Thus, null hypothesis that entrepreneurship financing has no positive influence on economic growth is accepted. Equations 8, 9 and derived from the estimatedco-integration equation, Table 8, 9 and 10.

Variable	Coefficient	Std. Error	t-statistics
Constant	0.079401	0.05190	1.53001
$\Delta LFDI$	-0.609516	0.69240	-0.88029
ΔLEF	0.2521330	0.78692	0.32041
$\Delta LGDP(-1)$	0.714077	0.71346	1.00087
$\Delta LFDI\ (-1)$	-0.780886	0.72385	-1.07880
$\Delta LEF\ (-1)$	0.031090	0.59544	0.05221
$ECM(1)$	-0.206122	0.09363	-2.20156

R-squared	0.523875	Mean dependent	0.084174
Adj. R-squared	-0.125273	S.D.dependent	0.198731
S.E equation	0.210812	Akaike AIC	-0.078982
Sum sq. resid.	0.755510	Schwarz SC	0.168982
Log likelihood	5.868805		

Table 11: VEC Results for pre-deregulation period

Author's calculation using E-View 8.0

Variable	Coefficient	Std. Error	t-statistics
Constant	0.013845	0.00843	1.64198
LFDI	1.090629	0.44957	2.42596
LEF	1.047272	0.50329	2.08083
LGDP(-1)	0.468925	0.29650	1.58154
LFDI(-1)	-0.016179	0.03654	-0.44282
LEF(-1)	0.006465	0.02092	0.30910
ECM(1)	-0.204128	0.06735	-3.03154

R-squared	0.227168	Mean dependent	0.025137
Adj.R-squared	-0.159249	S.D. dependent	0.020363
S.E equation	0.021925	Akaike AIC	-4.527103
Sum sq. resid.	0.006730	Schwarz SC	-4.130360
Log likelihood	57.79813		

Table 12: VEC Results for post-deregulation period

Author's calculation using E-View 8.0

Variable	Coefficient	Std. Error	t-statistics
Constant	0.057290	0.03307	1.73240
LFDI	1.153519	0.44104	2.61543
LEF	1.730698	0.41816	4.13883
LGDP(-1)	-0.451027	0.37672	-1.19726
LFDI(-1)	0.640290	0.39713	1.61231
LEF(-1)	-0.054089	0.08844	-0.61157
ECM(1)	-0.188422	0.10399	-1.81224

R-squared	0.196182	Mean dependent	0.044200
Adj. R-squared	-0.298474	S.D. dependent	0.145845
S.E equation	0.166191	Akaike	-0.463766
Sum sq. resid.	0.718104	Schwarz SC	0.232522
Log likelihood	0.396603		

Table 13: VEC Results for aggregate period

Author's calculation using E-View 8.0

The results from the vector error correction model in Table 11 above show that the error correction coefficient of economic growth (LRGDP) during the pre-deregulation period is pro properly signed at -0.206122. The t-statistic is significant at -2.20156 and the coefficient of the ECM suggests that the disequilibrium in the economic growth during the pre-deregulation period cause by short run shocks are corrected by 21% in each year. The short run dynamics support the co-integration relationship that exists between the explained and the explanatory variables. The coefficient of determination (R^2) shows that 52% of variation in economic growth during the pre-deregulation period is explained by the variation in entrepreneurship financing and foreign direct investment.

Furthermore, the results from a vector error correction model in Table 12 above show that the error correction coefficient of economic growth (LGDP) during the post-deregulation period is properly signed at -0.204128. The t-statistics is significant at 3.03154 and the coefficient of the ECM indicates that the disequilibrium in the economic growth during the post-deregulation period cause by short run shocks are corrected by 20% in each year. The coefficient of determination (R^2) shows that 22% of variation in economic growth during the post-deregulation period is explained by the variation in entrepreneurship financing and foreign direct investment.

Finally, the results from vector error correction model in Table 13 above reveal that the error correction coefficient of economic growth (LGDP) in the aggregate period is properly signed at -0.188422. The t-statistics is significant at -1.81224 and the coefficient of the ECM implies that the disequilibrium in the economic growth in the aggregate period cause by short run shocks are corrected by 19% in each year. The coefficient of determination (R^2) shows that 20% of variation in economic growth in the aggregate period is explained by the variation in entrepreneurship financing and foreign direct investment.

Pairwise Granger Causality Tests
Date: 10/26/15 Time: 17:23
Sample: 1962 1985
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
LEF does not Granger Cause LGDP	23	0.20178	0.6581
LGDP does not Granger Cause LEF		2.66802	0.1180
LFDI does not Granger Cause LGDP	23	2.02379	0.1703
LGDP does not Granger Cause LFDI		4.06714	0.0574
LFDI does not Granger Cause LEF	23	3.81461	0.0649
LEF does not Granger Cause LFDI		4.95907	0.0376

Table 14: Granger Causality Test Result for pre-deregulation period

Pairwise Granger Causality Tests Date: 10/26/15 Time: 17:59 Sample: 1986 2010 Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
LEF does not Granger Cause LGDP	24	0.02929	0.8657
LGDP does not Granger Cause LEF		14.3922	0.0011
LFDI does not Granger Cause LGDP	24	0.03007	0.8640
LGDP does not Granger Cause LFDI		0.04394	0.8360
LFDI does not Granger Cause LEF	24	0.355663	0.5573
LEF does not Granger Cause LFDI		0.58956	0.4511

Table 15: Granger Causality Test Result for post-deregulation period

Pairwise Granger Causality Tests Date: 10/26/15 Time: 18:50 Sample: 1 49 Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
LEF does not Granger Cause LGDP	48	1.04836	0.3114
LGDP does not Granger Cause LEF		1.06751	0.3070
LFDI does not Granger Cause LGDP	48	1.30649	0.2591
LGDP does not Granger Cause LFDI		26.2473	6.E-06
LFDI does not Granger Cause LEF	48	1.97895	0.1664
LEF does not Granger Cause LFDI		1.64523	0.2062

Table 16: Granger Causality Test for the aggregate period

With reference to Table 14 above, the causality test for the short run relation between economic growth (LGDP) and entrepreneurship financing (LEF) during the pre-deregulation period indicates that no causality relationship exists between entrepreneurship financing and economic growth. Further, foreign direct investment (LFDI) which has positive impact on economic growth (LGDP) during the pre-deregulation period in the long run relationship does not Granger cause economic growth in the short run. With reference to Table 15 and 16 above no causal relationship exists between entrepreneurship financing and economic growth in one hand and foreign direct investment and economic growth in the other.

	LGDP	LEF	LFDI
LGDP	1.000000	0.592496	0.470198
LEF	0.592496	1.000000	0.679075
LFDI	0.470198	0.679075	1.000000

Table 17: Correlation matrix for pre-deregulation period

	LGDP	LEF	LFDI
LGDP	1.000000	0.472474	0.250176
LEF	0.472474	1.000000	0.457053
LFDI	0.250176	0.457053	1.000000

Table 18: Correlation matrix for post-deregulation period

	LGDP	LEF	LFDI
LGDP	1.000000	0.414272	0.434117
LEF	0.414272	1.000000	0.002973
LFDI	0.434117	0.002973	1.000000

Table 19: Correlation matrix for aggregate period

The values in the correlation matrix results for correlation are low in the three periods (not up to 0.8) which shows that our long run and Granger causality results are not spurious.

6. Conclusion and Policy Implication

This study investigated the short run and long run relationship between entrepreneurship financing and economic growth during the pre-deregulation period, post-deregulation period and the aggregate period in Nigeria. Johansen co-integration method with vector error correction and Granger causality technique were adopted. The results reveal that entrepreneurship financing during the above periods both in short and long run period did not improve economic growth in Nigeria. According to Ogujiuba et al. (2004) the failure of entrepreneurship financing to improve economic growth is due to banks (major financier of entrepreneurs) mainly grant short term loans to friends or relations and those who offer bribe instead of granting loans to the active entrepreneurs.

Therefore, measures to ensure that active entrepreneurs are granted loans should be adopted.

Further, financial institutions as well as government should monitor entrepreneurs when loans are granted to ensure they invest it in economic activity. This will check the rate of squandering of loan by the entrepreneurs and in long run have meaningful impact on economic growth.

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