

The Impact of Finance on Entrepreneurship Growth in Nigeria: A Cointegration Framework

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Abstract. *This paper evaluates the impact of finance on entrepreneurship growth in Nigeria using endogenous growth framework. The results show that the normalised long-run co-integrating equation supported by the short-run dynamics indicates that finance, interest rate, real gross domestic product, unemployment and industrial productivity are significant to entrepreneurship in Nigeria. The results also show a uni-directional Granger causal relationship and suggest that access to finance by entrepreneurship has significant relationship with economic growth in Nigeria. The paper therefore recommends the formulation of effective macroeconomic policy targeted to entrepreneurship financing and growth. The paper also recommends that monetary authorities should intervene indirectly by reducing Monetary Policy Rates (MPR) which will directly reduce the transaction costs of funds to entrepreneurship and industrial sectors.*

Keywords: *Finance, Entrepreneurship, Economic Growth, Sustainability, Cointegration, Banking, SMEs*

Introduction

The role of finance is very important in the development of entrepreneurship and Micro, Small and Medium Scale Enterprises (MSMEs). There is no also generally accepted definition of entrepreneurship (OECD, 1998a; Van Praag, 1999; Bull and Willard, 1993). As indicated by Drucker (2005), the definition of entrepreneurship spills over into many areas in the literature. Herbert and Link (1989) observe that an entrepreneur encompasses various functions.

The financial classification and definitions of entrepreneurship, entrepreneur and Micro, Small and Medium scale enterprises (MSMEs) vary across nations and continents (OECD, 2006; Drucker, 2005; Somoye, 2011). Each definition, in terms of size and capital, is related to the entrepreneurial characteristics of the nation or environment being studied. Thus, the paper defines entrepreneurship and the entrepreneur as “An act of possessing an inclination for self-development, ability to innovate, nurtures an enterprise and having means of and access to finance in both formal and informal financial sub-sectors to achieve a successful investment towards sustainable economic growth”(Somoye, 2011, p. 9).

Access to finance has been the major constraint on entrepreneurship in contributing adequately to economic growth and has also been described as the major constraint on the growth of entrepreneurship and MSMEs (Boháček, 2006, pp. 2195-2212; Beck and Demirguc-Kunt, 2006) and the ACGA-Canada (2009, p. 6) sums up the constraints of small firms in one word: access. Schumpeter (1934), suggests that capital is nothing but the level by which the entrepreneur subjects to his control the concrete goods which he needs, nothing but a means of diverting the factors of production to new uses, or of dictating a new direction of production.

In Nigeria, the level of finance for entrepreneurship is one of the lowest in the world. However, while the World Bank (2010) report indicates that Nigeria's financial system is highly capitalized and vibrant, her contribution to entrepreneurship and MSMEs sector is only about 1.6% of the total loans and advances to the private sector as of 2009 (CBN, 2009). Nigeria's MSMEs are estimated to contribute 10% of the employment level in Nigeria well below that of the UK's 54%; USA's 50.3%; Bangladesh's 80%; India's 80%; Belgium's 66.6%; South Africa' 60%; Malaysia's 57.7%, Ireland's 66.5% and China's 58.8% (Vision, 2020, 2009).

The contribution of entrepreneurship and MSMEs to the Nigerian Gross Domestic Product (GDP) also is 10% compared to the USA's 50%: UK's 50%; Belgium's 60%; India's 36%; Hong Kong's 52% and Japan's 50%, South Africa's 57% (SMEDAN, 2006; Vision 2020, 2009, p. 29; UNTAD, 2005; Rahman, 2010). This situation has been of great concern to the government, citizenry, operators, practitioners and organized private sector groups and is being redressed by the policy of the government (Vision 2020, 2009).

The preceding introductory discussion indicates that the level of finance to entrepreneurship is weak in Nigeria. The paper therefore seeks to examine the empirical impact of this phenomenon on economic growth. The rest of the paper is organised as follows. Section 2 reviews the literature, while section 2 focuses the methodology. Section 3 is on the data analysis, while section 5 is on the discussion of the empirical results. Section 6 concludes the paper with some recommendations.

Literature Review

There is sufficient evidence in the literature which indicates that financing of entrepreneurship may lead to high growth in employment, productivity and consequently have positive impact on economic growth.

The study of the impact of finance in entrepreneurship has been captured by Shackle (1982), that a choice among several alternatives lead to entrepreneurial action that is expected to yield profitability in a world of uncertainty. To deal with *uncertainty*, Shackle (1982) creates the concept of potential surprise to replace the probability distribution of known possible outcome, and uses that concept to analyze the thought process with decision-making process in a world of uncertainty. Lachmann (1976) submits that the theory of co-ordination of the entrepreneurs with a view to achieving the expectations of market participants in the market economy in both the flow of goods and services.

For example, Neren (2006) conducts research on entrepreneurship access to capital in Sub-Saharan African countries, including Nigeria and the results show that lower, middle-income, and wealthier consumers are typically served by the mainstream informal financial sector and contribute positively to employment and economic growth. Klapper, Sarria-Allende and Sulla (2002) review the pattern of access to finance in the context of the financing of small businesses in Eastern Europe and conclude that access to finance could lead to economic growth.

Entrepreneurship is also essential for the continued dynamism of the modern market economy for a greater entry rate of new businesses that can foster competition and economic growth (Harper, 2003; Klapper and Love, 2011; OECD, 2009). The entrepreneur has been a fundamental agent in most production, distribution and growth theories (Sanyang and Huang, 2010). Hermert (2008, p. 52) submits that over time, different economic theories have supported the idea that entrepreneurship and innovation are essential for spurring economic

growth and indeed both the past and current literature emphasize the interrelationship between entrepreneurship, innovation and economic growth.

Naudé (2011, p. 1) submits that the field of development economics and entrepreneurship has developed over the past 50 years as sub-disciplines within the respected fields of economics and management did so in relative isolation. The study of King and Levine (1993, pp. 513) using endogenous growth framework suggests that finance has positive impact on prospective entrepreneurship, its productivity, risk diversification, profitability, and successful innovation for sustainable economic growth. This view is also supported by Cheng (2007, p. 1) that finance promotes entrepreneurship and this will have a positive effect on economic growth.

Wennekers and Thurik (1999, p. 32) also observe that the neo-classical model, with its production functions, rational choice, and perfect information, has no interest in entrepreneurship participation in the production process. As neo-classical economics became more formalized, and the concept of market equilibrium becomes more relevant in the price mechanism, and with noticeable importance of entrepreneurship in the areas of employment generation and poverty reduction, a new growth theory known as the *endogenous growth model* emerges (Wennekers and Thurik, 1999, p. 32; Naude, 2011, p. 4).

Wennekers and Thurik (1999, p. 45) argue that to move to the aggregate level of industries, regions and national economies, many individual entrepreneurial actions compose a mosaic of new experiments. A process of competition ensues between the small and large firms in micro and macro environments leading to market equilibrium. Viewed from the perspectives of openness of the economy as a whole as indicated in an endogenous theoretical framework, it could be argued that the additional productive potential in a competitive environment would create its own demand. Consequently, the outcome of this chain of interactions among the variables at the individual levels in the micro and the macro environments could result in economic growth as shown in Figure 1.

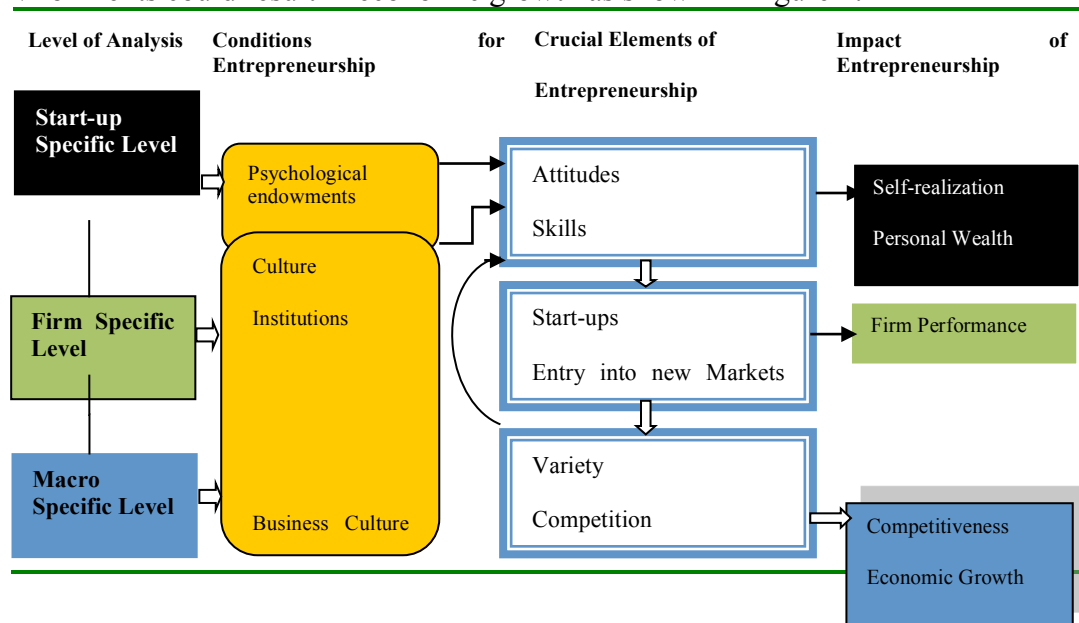


Figure 1: Linking Entrepreneurship with Economic Growth

Sources: Wennekers and Thurik, (1999, p.51); Somoye (2011)

Gries and Naudé (2009, p. 310) also submit that real GNP growth, expenditure on equipment (investment), real interest rates, the unemployment rate, and inflation are all significant in affecting start-up rates. The industry-level results reveal that Belgium, Germany, Korea,

Norway, Portugal, and the United Kingdom, show a mixed pattern of real GNP growth, expenditure on equipment (investment), interest rates, the unemployment rate, and inflation as determinant of growth in start-up rates (p. 311).

Lammers, Willebrands and Hartog (2010, pp. 1-36) also conducted an empirical studies on Nigeria employing econometric techniques (Ordinary Least Square methods) with respect to attitude towards risk and profits among small enterprises in Nigeria using Lagos State as a case study. The measurement and determinants of the study cover the personal demographics characteristics of the owner (age, and gender); firm characteristics (hired employees, firm age in years, young firms, months' open); sector characteristics (trade cloths, tailoring, trade stuff, other services, other trade); and education.

The results of the empirical analyses show that the propensity to take risk is negatively related to profit. When *risk perception* is included, risk propensity no longer appears significant (p. 25). They added that the perception of risk appears to be the most important risk attitude characteristic, with a positive effect on profit. On firms with only positive profits, the results indicate that the number of employees, the sector in which they operate, the number of months in business, and owner characteristics such as education, age, gender, are significant and consistent with the previous literature.

On employment generation, ACCA (2009, pp. 4-5) submits that small and medium-sized enterprises constitute 98% of all Canadian businesses and employ nearly half of the private sector labour force. Measured on the basis of employment, the results show that businesses with less than 50 employees employ almost half of the labour force in Canada. Medium sized firms employ a further 16% of the labour force bringing the total MSMEs employment to almost two-third of all Canadian employees while MEMEs contribution to gross domestic product (GDP) accounts for 26%.

On access to finance, Kounouwewa and Chao (2011, p. 30) conduct a survey on financing constraint determinants in 16 African countries including Nigeria. The results indicate that the sizes of firm and ownership structure are factors responsible for small and medium enterprises growth. These factors also limit their access to capital and consequently financial constraints. They conclude that there must be efficient financial institutions to tackle problems of financing constraints in entrepreneurship and MSMEs.

Evidences in the literature have also suggested that finance can contribute to Growth is also essential in entrepreneurship and MSMEs to enable them contribute to the economy. This is because entrepreneurship and MSMEs must have resources, mobilize them and deploy them efficiently before they can generate growth and contribute to overall economic growth (King and Levine, 2993b; Naude, 2007; OECD, 2010; Hemert, 2008) . Anderson and Tell (2009, p. 586) citing Birch (1979) and Davidson *et al.* (2001) also submitted that fast-growing entrepreneurship and MSMEs contribute significantly to job creation and fast growing firms survive better than firms that do not grow. He argues further that “high-growth firms are heterogeneous groups, and there are number of factors and definitions that characterise the growth of this phenomenon” (citing Delmar *et al.*, 2003).

Goedhuys and Sleuwaegen (2009, p. 219) too examine the growth performance of a large set of entrepreneurial firms in ten manufacturing sectors of 11 Sub-Sahara African countries including Nigeria and the results show that the growth of entrepreneurship is being constrained by poor infrastructure, insecurity, transportation deficiencies, and financial constraints.

From the preceding discussion, it can be argued that finance can provide significant impetus to the growth of entrepreneurship and this can lead to economic growth. The question that arises which the paper seeks to investigate is “what are the level of access to finance

provided by the banking sector to entrepreneurship and the impact of this phenomenon on economic growth in Nigeria? This is the subject of the next discussion.

Finance and Entrepreneurship in Nigeria

Fry (1997, p. 757), observes that financial systems in developing countries are dominated by commercial banks and the performance of entrepreneurship could be measured through them. In Nigeria, the impact of the financial intermediaries (banks) in financing entrepreneurship development has been very weak as can be seen in Table 1.

Table 1: Effect of Financial Intermediaries in Entrepreneurship and MSMEs in Nigeria

Item	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009
Total Loans by DMBs to MSMEs (₦'M)	1,637.50	17,193.80	94,864.00	275,114.70	432,055.00	452,617.80
Credits to the Private Sector by DBMs (₦'M)	53,872.80	109,447.80	404,004.50	1,619,263.60	5,153,204.10	27,980,533.80
% of MSMEs Loans to Credit to Private Sector	3.0%	1.6%	23.0%	17.0%	8.3%	1.62%
Average GDP (₦'M)	51,810.20	119,632.2	539,207.3	2,668,069.8	7,223,538.6	20,560,630.1
% of Loans to Average GDP	0.6%	2.9.0%	3.5%	2.1%	1.1%	0.4%
Average Unemployment (%)	6.3%	5.6%	2.9%	5.0%	13.5%	14.3%

Source: CBN (2010), Somoye (2011)

Table 1 shows that the effect of monetary policy on entrepreneurship and MSMEs financing is not significant when compared to total credits to the private sector as it can be seen that total loans to MSMEs by the DMBs increased significantly from ₦1,637.0 million between 1980 and 1984 to ₦452,617.80 million between 2005 and 2009, but this is not comparable to total credits to the private sectors by the DMBs (CBN, 2009).

Also, the percentage of entrepreneurship and MSMEs loans to credits to the private sector increased from 3.0% between 1980 and 1984 to 23% between 2005 and 2009. The big jump in loans to MSMEs between 1990 and 1994 could be linked to the period when entrepreneurship policy was being focused by the government. The DMBs loans to entrepreneurship and MSMEs nosedived to 1.6% between 2005 and 2009 (CBN, 2009). This can be seen in Figure 2.

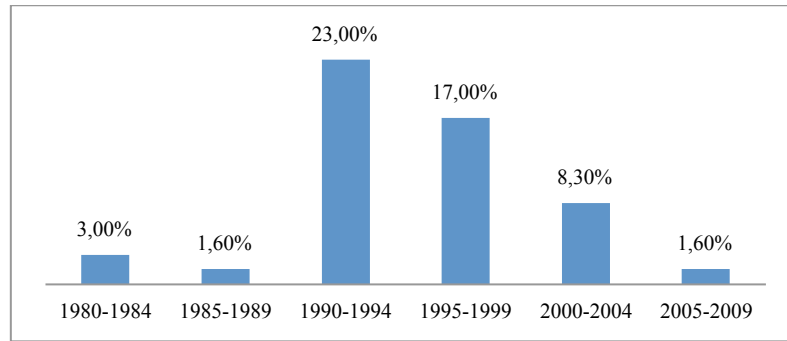


Figure 2: % Entrepreneurship & MSMEs Loans to Private Sector in Nigeria
Source: CBN (2009)

The percentage of loans to GDP and unemployment appears poor and presents a shallow access to finance by entrepreneurship. This empirical evidence is however consistent with the study by the IFC (2010, p. 23) that SME loans as a percentage of total loans to the private sector is generally smaller in developing countries. This will reduce the development of entrepreneurship sector in Nigeria. As submitted by Audretsch and Kielbach (2007, p. 1243), the promotion of entrepreneurship financing appears to be the main pillar of European economic growth policy and the field of entrepreneurship needs to be taken seriously because there is mounting evidence that the key to economic growth and productivity improvements lie in the entrepreneurial capacity of an economy. Thus, the Nigerian government needs to direct its attention to sustain the level of entrepreneurship financing so as to enable it to generate employment and increased innovation for sustainable economic growth.

Problems and Prospects of MSMEs in Nigeria

It should be noted that despite the myriads of problems of MSMEs, various governments have been making efforts to ameliorate their problems. Although, the infrastructure is weak in terms of electric power and transportation, the human population could form a very big market if MSMEs are substantially developed. According to Ojo (1992), Levy (1993), and Anyanwu (2001), Micro, Small and Medium scale Enterprises are known to exist in Nigeria, the majority of which were established in the mid-1980s and during the Structural Adjustment Programme (SAP). All these indicate great potential for the emergence of a vibrant industrial sector, particularly the small-scale segment, if properly developed.

According to Ojo (1992), Anyanwu (2001), and IFC (2010), the problems of entrepreneurship and MSMEs, though not exhaustive, can be categorised as inaccessibility to finance, inadequate private wealth for start-up, poor infrastructure, and high mortality rates of enterprises. Others are: restricted market access, lack of skills in international trade, lack of formal education and access to information, and lack of cross country data on the level of financing and development.

To reduce the problems as highlighted above, certain measures must be taken. These measures include: fiscal incentives and protective fiscal policies, specialized financial institutions and funding schemes for entrepreneurship and MSMEs, favourable tariff structure, the restructuring of the SMEEIS funding scheme and selective exemption and preferential treatment in excise duties, among others.

The overall implication of the preceding discussion is that the deplorable state of Nigeria's infrastructure and lack of access to finance by entrepreneurship will deprive the nation of the immense benefit of entrepreneurship growth in its economy. Thus, the nation

must focus on how to reduce these problems for sustainable growth of entrepreneurship and MSMEs.

Impact of Finance in Entrepreneurship in Other Economies

Since the late 1970s, there has been a growing interest in the impact of finance on small and medium sized enterprises (SMEs) in both local and national economies. Olutunla and Obamuyi (2008) observes that most developed countries (such as the United States of America, Great Britain, Japan, and Germany) are constantly reviewing their existing programmes designed to promote and develop the MSME sub-sector. Kilby (1988) says that MSMEs help in building entrepreneurial and managerial skills as a basis for efficient indigenous investment in the management of businesses in Nigeria. Kayanula and Quartey (2000) estimate that MSMEs employ 22% of the adult population in developing nations and provide more employment per unit of capital investment than large-scale enterprises (Olutunla and Obamuyi, 2008).

The financing of entrepreneurship and MSMEs are noted for their job creation prowess. This has performed miracles in Asia, the USA, Great Britain, and Africa. The economic success of the South Pacific region was based on the development of entrepreneurship and MSMEs and account for as high as 64% of employment in South Korea. Interdependence and inter-linkages among manufacturing companies in the global village could induce gradual replacement of the traditional forms of direct foreign investment with non-equity strategic alliances. The globalization process has fostered the integration of MSMEs into the global markets through networking and sub-contracting with the multinational companies and the development of collective efficiency in the industrial estate (OECD, 1996, 1998a).

Also, in the developed economies of Germany and the USA, entrepreneurship and MSMEs account for as high as 64% of industrial employment; a comparative figure in Nigeria is around 10%, less than 20% of those in developed countries. The 31% of MSME contribution to industrial growth is rather disturbing given the high degree of unemployment in Nigeria as well as the poverty level in the country as measured by Nigeria's Human Development Indicators (World Bank, 2008; Vision, 2020, 2009).

In Asia, an innovative approach of "peer-group monitoring" by Grameen Bank's credit delivery system has been used successfully, thus, the growth of entrepreneurs in small and medium scale enterprises has increased tremendously. Thailand's Bank of Agriculture and Agricultural Cooperatives serve approximately 1 million micro-borrowers and 3.6 million micro-savers. In Bangladesh, Malaysia, and Indonesia, there is tremendous growth in micro savers and micro-lending which has increased the level of entrepreneurships (Grameen Bank, 2009; United Nations Organisation, 2006). In Ethiopia, the microfinance system has provided credit facilities to more than 2.4 million people with a significant reduction in poverty (MixMarket, 2009).

Nigeria needs to adopt some of the initiatives of these countries or institutions (i.e. Malaysian Model, Grammen Bank Model) for sustainable entrepreneurship financing policy. Thus, efficient financial policy and the establishment of a strong institutional structure to strengthen the financial institutions process that will bring informal financial institutions into the mainstream of the financial system are suggested. This will not only enhance monetary stability, but also expand the financial infrastructure of the country to meet the financial requirements of entrepreneurship and MSMEs in Nigeria.

Measurement of Entrepreneurship and MSMEs

Measuring entrepreneurship could also be in terms of the relative share of economic activity accounted for by small firms (Sanyang and Huang, 2010, p. 321). It could also be in terms of the level of self-employment, the number of market participants (competition) or firm start-ups as an indicator of entrepreneurial activities (Carree and Thurik 2002; Drucker, 2005; OECD 2008).

Gartner and Shane (1995, p. 283), also explain that understanding how and what is being measured in studies of changes in entrepreneurship over time is an important issue for academic research and public policy. For example, using an entrepreneurial performance advantage over the other firms is not a sufficient measure of entrepreneurial performance, because a performance advantage may be insufficient to compensate for the opportunity cost of other alternatives, a liquid premium for time and capital, and a premium for uncertainty bearing (Shane and Venkataraman, 2000, p. 171-172).

Wennekers and Thurik (1999, pp. 47-48), submit that in measuring entrepreneurship, it is necessary to distinguish the level of entrepreneur: in terms of being sole proprietors, or in partnership, industry type, firm size, regions, education, environment and national economies. The managerial capability in terms of organizing and coordination must be operationalised as well. Further, a distinction must be made between business owners or self-employed and employee.

Desai (2009, 1-14) citing Storey (1991) observes that measuring entrepreneurship in developing nations requires a deliberate degree of segmentation because one measure may not capture all types of entrepreneurship in that country. He added that using the employment variable is equally important in measuring entrepreneurship and cautions that indicators used to measure entrepreneurship in one country may not be appropriate for another country so as to avoid spurious results.

Methodology and Model Specification

Research Methodology

The paper employs time series data covering 30 years (1980-2009) to estimate the long-run and causal relationships between finance and entrepreneurship. The data was sourced from the Central Bank of Nigeria publications (CBN, 2009, 2010), Commercial Banks and some other related publications. The econometric software used was Econometric View (E-View) Technique Version 5.

The paper also adopted the following endogenous macroeconomic variables: Entrepreneurship (E_{nt}), Finance (F_{in}), the Industrial Production Index (IPDX), Interest Rate (Int), Unemployment (UNEMP), and Real Gross Domestic Products (RGDP). These variables have been sufficiently documented in the literature (OECD, 2009; Mpuga, 2004; Okpara and Wynn, 2007; Chong, Lu and Ongena, 2011; Korosteleva and Mickiewicz, 2008; Arestis and Demetriades, 1997; Audretsch and Kielbach, 2004) and will be operationalised and justified in our subsequent discussions.

The model to be used for estimation is the subject of the next discussion.

The Models

There is an extensive literature on the modelling of finance and entrepreneurship within an endogenous growth framework (Acs *et al.*, 2005; Audretsch and Kielbach, 2007; Arestis *et al.*, 2002; King and Levine, 1993a; 1993b; Mpuga, 2004; Atindehou *et al.*, 2009; Bettignies and Brander, 2007, Somoye, 2011). The structure of the models is linear in an endogenous framework as stated in Equation 1.

$$Ent_t = \beta_0 + \beta_1 Fin_t + \beta_2 Int_t + \beta_3 IPDX_t + \beta_4 LOGRGDP_t + \beta_5 UNEMP_t + \mu_t \quad (1)$$

where	Ent_t	=	Entrepreneurship
	Fin_t	=	Financial Intermediation at the macro level
	$IPDX_t$	=	Industrial Production Index
	Int_t	=	Interest Rates
	$LOGRGDP_t$	=	Real Gross Domestic Products
	$UNEMP_t$	=	Openness to the Economy
	β_0	=	Constant term
	β_1, \dots, β_5	=	Coefficients
	μ	=	Error terms assumed to be normally distributed with constant variances respectively.

where Entrepreneurship (Ent) is the dependent variable and on which the regression will be normalised. The theoretical *a priori* expectations of the variables are that coefficients $\beta_1 > 0$, $\beta_3 > 0$, $\beta_4 > 0$, $\beta_5 > 0$ of Finance (Fin), Industrial Production Index (IPDX), Real Gross Domestic Products (LOGRGDP), and Unemployment (UNEMP) respectively are expected to be positively significant to Entrepreneurship (Ent), while coefficient $\beta_2 < 0$ of Interest Rate (Int) is expected to be negatively significant to Entrepreneurship (Ent) in the long-run. The error term in Equation 1 is μ and well-behaved, while t is the time variant.

The economic implication of the *a priori* expectation is that the level of financial intermediation deepening will significantly improve entrepreneurship financing in the financial market in both the long-run and short run (CBN, 2009; Korosteleva and Mickiewicz, 2008; Zapalska's *et al.* 2007; Bettignies, and Brander, 2007). Similarly, increase in productivity ought to have been influenced by entrepreneurship activities, while the low level rates of interest will improve the investment capacity of the entrepreneurs and allow them to borrow at low transaction costs in the capital market (Lammers, Willebrands and Hartog, 2010, Keynes, 1936; Hirshleifer, 1980; Watkins, 2009).

In addition, increase in real gross domestic production (RGDP) is expected to influence entrepreneurship activities and this will in turn allow it to contribute positively to economic growth (Wennekers and Thurik, 1999). Unemployment (UNEMP) is also expected to influence the growth of entrepreneurship. This is because, as the level of unemployment increases, there is the probability of the level of entrepreneurship spread increasing in the same direction. Unemployment (UNEMP) may also exert pressure on the Nigerian government to formulate effective policy on entrepreneurship development in Nigeria (OECD, 2009).

Operationalisation of the Variables

The literature provides significant evidences that in using or combining economic variables, it is important to determine the level of collinearity among the variables in order to avoid the problem of multicollinearity. Consequently, a diagnostic correlation matrix analysis was conducted and presented in Table 2.

Table 2: Correlation Matrix on Operationalised Variables

	Ent	Fin	Int	IPDX	LOGRGDP	UNEMP
Ent	1					
Fin	-0.01077	1				
Int	-0.33574	0.25730	1			
IPDX	-0.54119	0.38984	0.62728	1		
LOGRGDP	-0.36795	0.10569	0.30390	0.35635	1	
UNEMP	-0.54501	-0.65438	0.04139	0.19120	0.14964	1

The correlation (r) coefficients of the variables in Table 2 are within the acceptable limits of correlation (r) coefficient $\{-1 < r < 1\}$ as indicated in the literature (Eastman. 1984, p. 98). Evidence from the correlation matrix also indicates that they are no perfectly co-linear variables using the classification by Manson, Linda, and Marshal (1991). Hence, it can be concluded that there is no high degree of co-linearity among the variables. These variables are operationalised in Table 3.

Table 3: Operationalised of Variables

Type	Variable	Definition of Variable	Variable Type	Operationalisation
Macroeconomic and Financial Specifics	Ent	Entrepreneurship is defined as the ratio of total loans approved for entrepreneurship and MSMEs from formal sources to Total Credits to the private sector between 1980-2009.	Endogenous	Ratio of total loans to MSMEs to Total credits to the private sector.
	Fin	Finance defined as the ratio of total money outside the banking system and money supply (M2).	Endogenous	FNI/M2
	IPDX	Industrial Production Index (IPDX) as measured by the Central Bank of Nigeria.	Endogenous	IPDX
	Int	The financial market rate of interest from 1980 to 2009.	Endogenous	Actual market interest rate in %
	UNEMP	Unemployment rates from 1980 to 2009.	Endogenous	UNEMP
	LOGRGDP	It is measured as a ratio of Gross Domestic Products (GDP) at current market prices to Implicit Price Deflator (IPD)	Endogenous	GDP/IPD

Sources: CBN (2009); Somoye (2011)

Justification of the Variables

The variables indicated in Tables 3 are important in estimating the relationship between entrepreneurship and finance. Entrepreneurship represents the missing factor in the traditional production function of the neoclassical framework (Solow, 1961) that generates new firms resulting from knowledge spill-over and innovation into a new economy (Romer, 1986) as indicated by Audretsch and Kielbach (2004). This factor, capital, will finance new firms which will have capacity to generate new economy in the long-run. Bencivenga and Smith (1991, pp. 195) also explain that the role of financial intermediation in channelling savings in an endogenous growth framework towards entrepreneurial activities has positive and significant effect on the real growth rate of the economy.

Hesse (2007, pp. 1-36) too examines the role of financial system in the pre-consolidated banking sector in Nigeria using finance as a proxy for the process of channelling savings to productive investments. The results suggest that a stable macroeconomic environment helps to mobilize finance (Fin) (savings or capital) for productive investment of which Entrepreneurship (Ent) takes prominence. However, high Interest (Int) rate discourages investment in entrepreneurship and increases the level of inflation and unemployment. To avoid this situation, monetary authorities need to design financial infrastructures that will accommodate the peculiar characteristics of entrepreneurship business.

Korosteleva and Mickiewicz (2008, pp. 1-41) investigate the determinants of both the level and sources of finance for Entrepreneurship (Ent) in 41 countries using the Global Entrepreneurship Monitor (GEM) surveys for 1998-2003. The results indicate that informal finance forms the bulk of initial Finance (Fin) for Entrepreneurship (Ent) associated with the higher share of external sources in start-up finance and the size of the formal financial sector appears to play a more important role in terms of the volume of entrepreneurial self-finance.

Unemployment (UNEMP) could be a motivation for entrepreneurship (Hall, 1987, p. 567). Neren's (2006) research on entrepreneurship in Sub-Saharan African countries (including Nigeria), and Vision 2020 (2009) also on Nigeria indicate that entrepreneurship and MSMEs contribute more to employment rather than any other economic factors. This is further supported by the OECD (2009) and World Economic Forum (2010) reports that the fundamental objective of entrepreneurship (Ent) and development is to create employment for sustainable economic growth (GDP).

From the above discussion, the significance of the variables adopted to measure entrepreneurship in the context of endogenous framework has been established. The next discussion is on the cointegration framework.

Cointegration Frameworks

The cointegration framework in the context of endogenous framework defines the order of integration in series and explores the long-run relationships between the variables by using unit root tests and cointegration tests respectively. The paper also conducts long-run and causal relationships between financial intermediation and entrepreneurship financing in the context of endogenous framework in a vector error correction model (VECM) or VAR (vector autoregression) to estimate the model (Equation 86) adopted. The theoretical analysis of the cointegration frameworks are treated as follows.

Unit root tests

Many macroeconomic time series contain unit roots dominated by stochastic trends as developed by Nelson and Plosser (1982). Unit roots are important in examining the stationarity of a time series, because a non-stationary regressors invalidate many standard empirical results. The presence of a stochastic trend is determined by testing the presence of unit roots in time series. The unit root test as measured by the Augmented Dick-Fuller (ADF) (1979) test examines the stationarity of variables. The regression forms of the ADF unit root test are specified as follows:

$$\Delta y_t = a_o + \gamma y_{t-1} + a_2 t + \sum_{i=1}^k \alpha_i \Delta y_{t-i} + \varepsilon_t \quad (2)$$

where a_o is the intercept, t is linear trend, the variables Δy_{t-i} expresses the first differences with i lags and final ε_t is the variable that adjust errors of autocorrelation. The null hypothesis is that the series contains unit root of $I(1)$, while the alternative is that it is stationary at the level $I(0)$. The λ , λ_{μ} λ_T statistics are all used to test the hypotheses $\gamma = 0$. Dickey (1976) provides three additional F-statistics called (δ_1 , δ_2 , and δ_3) to test joint hypotheses ($\gamma = a_o = 0$, $a_o = \gamma = a_2 = 0$, and $\gamma = a_2 = 0$ respectively) on coefficients (Becker, Enders and Hurn, 2004). If the coefficient of the lag of y_{t-1} (γ) is significantly different from zero, then the null hypothesis is rejected. The appropriate order of integration is to be determined by computing a series of equations that cannot be rejected at a 5% level of significance in the variable levels until they are integrated of order $I(d)$ (Engle and Granger, 1987, p. 252).

Cointegration and Granger Causality Tests

If the variables are non-stationary in their levels, they can be integrated with integration of order 1, $I(1)$, when their first differences are stationary. It could also be of order, $I(2)$. These variables can be cointegrated as well, if there are one or more linear combinations among the variables that are stationary. If these variables are cointegrated, then there exists a long-run linear relationship among the variables. Granger (1977) argued that a test for cointegration can thus be thought of as a pre-test to avoid spurious regression results. The Johansen (1988) multivariate cointegration model is based on the error correction representation given by:

$$\Delta X_t = \mu + \sum_{i=1}^{\rho-1} \Gamma_i \Delta X_{t-i} + \Pi X_{t-1} + \varepsilon_t \quad (3)$$

where X_t is an $(nx1)$ column vector of ρ variables, μ is an $(nx1)$ vector of constant terms, Γ and Π represent coefficient matrices, Δ is a difference operator, and $\varepsilon_t \sim N(0, \Sigma)$. The coefficient matrix Π is known as the impact of matrix, and contains information about the long-run relationships. Johansen's methodology requires the estimation of the VAR equation and the residuals are then used to compute two likelihood ratios (LR) test statistics that can be used in the determination of the unique cointegration vectors of X_t . The cointegration rank can be tested with two statistics: the Trace and maximal Eigenvalue tests.

Applying error correction models as applicable to the Entrepreneurship (Ent) and Finance (Fin) at the micro and macro levels, which are two main variables adopted in the model produces equations 4 and 5.

$$\begin{aligned} \Delta Ent_t = & \delta_o + \sum_{i=1}^n \delta_{1i} \Delta Ent_{t-i} + \sum_{i=1}^n \delta_{2i} \Delta InF_{t-i} + \sum_{i=1}^n \delta_{3i} \Delta IPDX_{t-i} + \sum_{i=1}^n \delta_{4i} \Delta Int_{t-i} \\ & + \sum_{i=1}^n \delta_{5i} \Delta UNEMP_{t-i} + \sum_{i=1}^n \delta_{6i} \Delta RGDP_{t-i} + \lambda_1 ECM_{t-i} + \varepsilon_{1t} \end{aligned} \quad (4)$$

$$\begin{aligned} \Delta Fin_t = & \gamma_o + \sum_{i=1}^n \gamma_{1i} \Delta Fin_{t-i} + \sum_{i=1}^n \gamma_{2i} \Delta Ent_{t-i} + \sum_{i=1}^n \gamma_{3i} \Delta IPDX_{t-i} + \sum_{i=1}^n \gamma_{4i} \Delta Int_{t-i} \\ & + \sum_{i=1}^n \gamma_{5i} \Delta UNEMP_{t-i} + \sum_{i=1}^n \gamma_{6i} \Delta RGDP_{t-i} + \lambda_2 ECM_{t-i} + \varepsilon_{2t} \end{aligned} \quad (5)$$

where δ and γ are the coefficients of the models, Entrepreneurship (Ent) and Finance (Fin), t is the time variants and ε_{1t} , and ε_{2t} are residuals for each time series. The ECM_{t-i} is the error correction term. The size and statistical significance of the coefficients of the error term in each of the ECM models measure the tendencies of each variable to return to the equilibrium. A statistically significant coefficient implies that past equilibrium errors play a role in determining the current outcome. The short run dynamics are captured through the coefficient of the normalised variable which is Entrepreneurship (Ent) in this research. However, if other variables, i.e., IPDX, UNEMP, Int and RGDP adopted in the model are introduced into the error correction model, the results of the time series will look like equations 4 and 5.

The Granger Causality Test

The conventional Granger causality tests are valid in a level of VAR framework. The most celebrated test for Granger causality in time series models are based on the work of Granger (1969). Granger begins with the point that it is often difficult to determine the direction of Granger causality in time series regressions because of the inherent correlation of the variables (Brown, 1999, p. 339). The basic idea behind the Granger causality test is that the future cannot cause the past. This involves testing the lagged values of X_t if it plays a significant role in explaining Y_t in a model with several lagged values of Y_t on the right side. If so, then X is said to “Granger-cause” Y . Also, the direction of Granger causality between variables could be *unidirectional*, *bidirectional* and *independence* of the variables being considered. For example, the formal regression of two variables Y and X for Granger causality can be written as equations 6 and 7 as follows:

$$Y_t = \alpha_1 Y_{t-1} + \alpha_2 Y_{t-2} + \alpha_3 Y_{t-3} + \dots + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \beta_3 X_{t-3} + \dots + \varepsilon_{1t} \quad (6)$$

$$X_t = \phi_1 Y_{t-1} + \phi_2 Y_{t-2} + \phi_3 Y_{t-3} + \dots + \partial_1 X_{t-1} + \partial_2 X_{t-2} + \partial_3 X_{t-3} + \dots + \varepsilon_{2t} \quad (7)$$

If the X_{t-1} terms in equation (6) play a significant role in explaining Y_t (as determined by F-test), X is said to “Granger-cause” Y . Applying Granger causality framework to the two major variables (Ent –Entrepreneurship and Fin –Finance) in the model will produce equations 8 and 9 as follows.

$$Ent_t = \alpha_1 Ent_{t-1} + \alpha_2 Ent_{t-2} + \alpha_3 Ent_{t-3} + \dots + \beta_1 Fin_{t-1} + \beta_2 Fin_{t-2} + \beta_3 Fin_{t-3} + \dots + \varepsilon_{1t} \quad (8)$$

$$Fin_t = \phi_1 Ent_{t-1} + \phi_2 Ent_{t-2} + \phi_3 Ent_{t-3} + \dots + \partial_1 Fin_{t-1} + \partial_2 Fin_{t-2} + \partial_3 Fin_{t-3} + \dots + \varepsilon_{2t} \quad (9)$$

Empirical Results

The Unit Root Tests

In a time series test, the first thing to do is to determine if there are common stochastic trends present among the variables. In other words, the test is to determine the stationarity and the degree of integration of the dataset. According to Granger and Newbold (1974), integrated data is capable of producing spurious regressions which can be generally misleading. Thus, the research deploys Augmented Dick-Fuller (ADF) (1979) and Phillip-Perron (1988) techniques to test for the presence of unit roots in the data shown in Table 4.

Table 4: Unit Root Test for Augmented Dick-Fuller and Phillip-Perron

Variable	Augmented Dick-Fuller Test						Phillip- Perron Test					
	Level		First Difference		Second Difference		Level		First Difference		Second Difference	
	Test Statistics	Lag	Test Statistics	Lag	Test Statistics	Lag	Test Statistics	Lag	Test Statistics	Lag	Test Statistics	Lag
<i>Ent</i>	-0.75190	2	-4.30406*	4	-5.96311*	2	-1.54125	2	-7.02463*	0	-24.14867*	11
<i>Fin</i>	-1.47195	3	-1.38112	2	-6.72785*	1	-0.48073	4	-3.71193*	4	-11.54974*	13
<i>Int</i>	-2.67232	0	-5.883767*	1	-9.07978*	1	-2.56020	3	-6.95522*	1	-23.41245*	9
<i>IPDX</i>	-1.85889	0	-5.91665*	0	-9.70091*	0	-1.83528	1	-35.94501*	3	-25.26515*	18
LOGRGDP	-3.82644*	0	-2.98493*	0	-3.24403*	0	-3.85843*	1	-2.98493*	0	-3.24403*	0
<i>UNEMP</i>	0.68629	0	-3.644407*	0	-8.73028*	0	0.14549	3	-3.82792*	3	-9.08648*	3

The unit root test results from Table 4 show that the null hypothesis that each of the variables has a unit root (non-stationary) against the alternative cannot be rejected for all the series in their levels, so they are affected by time trend and can become too large or small with little or no tendency to revert to their mean value. The unit root test, however, indicates that all the variables are completely stationary after the second difference using Augmented Dick—Fuller and first difference using Phillip Peron tests. It can then be concluded that ADF and Philip-Perron tests suggest that all the six variables are completely integrated of order-two $I(2)$ and are candidates for cointegration. Although many of the variables are however integrated of the order-one $I(1)$ as indicated in Table 4.

Selection of Optimal Lag Length in the VAR

An important requirement in the conduct of a cointegration test and estimation of a VAR system is the selection of the optimal lag length (Johansen, 1992, 1995). This study therefore examines the lag structure in an unrestricted VAR originally specified using a combination of VAR lag order selection criteria and examination of the roots of the characteristics' polynomial to verify if the VAR is stable. The VAR length estimation in Table 5 provides evidence based on VAR lag order selection criteria.

Table 5: Results of VAR Lag Order Selected Criteria

Lag order selection criteria (1 lag)

VAR Lag Order Selection Criteria

Endogenous variables: EF FNI IPDX INTR LOGRGDP UNEMP

Exogenous variables: C

Sample: 1980 2009

Included observations: 29

Lag	LogL	LR	FPE	AIC	SC	HQ
0	39.28473	NA	4.6e-09	-2.29550	-2.01261	-2.20690
1	147.6651	164.439*	2.92e-11*	-7.28725*	-5.30703*	-6.66707*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

The lag order selection criteria are based on Log-Likelihood (LR), Akaike information criteria (AIC) and Schwarz information criteria (SIC), Final Prediction Error (FPE) and Hanna-Quinn Information criterion HQ). These are standard criteria built into the E-Views econometric package subroutine. Table 46 shows that the *LR*, *FPE*, *AIC*, *SC* and *HQ* criteria consistently select a lag-order length **ONE** as being suitable for the data series indicating that the VAR model adopted will be stable at lag-length one.

Deterministic Specification and Cointegration Test

The objective of this test is to determine a choice of how the constant, the trend and the deterministic terms should be accommodated in the Vector Error Correction (VEC) model having determined the optimal lag length. This is in line with the Johansen (1992, 1995)

system based on co-integration tests and the application of the Pantula principle (Pantula, Gonzales-Farias and Fuller, 1994) which requires that the selection of the least restrictive specification among those specifications having the lowest number of co-integrating equations if more than one equation exists in the cointegration test. Table 6 presents the summary statistics of the number of cointegration equations in all the five possible specifications.

Table 6: Cointegration Test Summary

Sample: 1980 2009

Included observations: 27

Series: EF FNI IPDX INTR UNEMP RGDP

Lags interval: 1 to 1

Test Type	No Intercept	Intercept	Intercept	Intercept	Intercept
	No Trend	No Trend	No Trend	Trend	Trend
Trace	3	5	3	4	4
Max-Eig	2	2	2	2	2

*Critical values based on MacKinnon-Haug-Michelis (1999)

Selected (0.05 level*) Number of Cointegrating Relations by Model

Based on the Pantula principle (Johansen, 1992, 1995), an examination of Table 48, based on the Trace statistics suggests that the cointegration test should be based on the assumption of no-trend in the data series, and thus allowing no constant (no trend) in the CE and the VAR. This same decision is reached if the maximum-Eigen value test is adopted too. The analysis instead opted for the next least restrictive specification having a linear trend in data, thus having an intercept (no trend). The trace test and max-Eigen value test are consistent in their value of the latter specification. The detail of the cointegration test is presented in Table 7.

Table 7: Results of Co-integration Tests

Hypothesised No of co-integrating Equations (CE)	Trace Test		Maximum-Eigen value Test	
	<i>Trace Statistics</i>	<i>Critical value (p<0.05)</i>	<i>Max-Eigen Statistics</i>	<i>Critical value (p<0.05)</i>
None	171.3761*	95.75366	69.35392*	40.07757
At most 1	102.0221*	69.81889	41.14941*	33.87687
At most 2	60.87274*	47.85613	27.28697	27.58434

Hypothesised No of co-integrating Equations (CE)	Trace Test		Maximum-Eigen value Test	
	Trace Statistics	Critical value ($p<0.05$)	Max-Eigen Statistics	Critical value ($p<0.05$)
At most 3	33.58576*	29.79707	15.89390	21.13162
At most 4	17.69186*	15.49471	13.11652	14.26460
At most 5	4.575342*	3.841466	4.575342*	3.841466

Note: *implies that the statistics are significant at $p<0.05$

The results from Table 7 indicate that the null hypothesis of no co-integration is rejected by both the Trace test and Maximum-Eigen value test. Both tests indicate that at least three co-integrating equations exist among linear combinations of Entrepreneurship (Ent) in Nigeria and its hypothesised determinants at 5% level of significance. These results suggest that even though the Entrepreneurship (Ent) and its hypothesised determinants are generally $I(1)$ series, some stable long-run equilibrium relationship exists among the series which could be given some error correction representations VECM (Engle and Granger, 1987). It also shows that there exists Granger causality between these variables (Granger, 1969) and it equally rules out the possibility of spurious relationship (Granger and Newbold, 1974).

Long-run Equilibrium

The estimated long-run equilibrium obtained from the coefficients of the cointegration results of the model normalised on Entrepreneurship (Ent) is presented as equation 10.

$$\begin{aligned}
 Ent_{t-1} = & -1.6898 + 1.5730Fin_t + 4.5835Int_t - 0.0080IPDX_t + 0.2373LOGRGDP_t + 1.72441UNEMP_t \\
 & (0.7589) \quad (0.50641) \quad (0.0031) \quad (0.0384) \quad (0.9832) \\
 & [2.0728]** \quad [9.0509]* \quad [-2.5796]* \quad [6.1724]* \quad [1.7314]**
 \end{aligned}
 \tag{10}$$

[] = t -statistics; * = indicates significant at $p<0.01$; $R^2=0.306162$

Evidence from Equation 10, shows that Finance (Fin), Interest rate (Int), Real Domestic Product ($RGDP$) and Unemployment ($UNEMP$), exert positive and significant influence on Entrepreneurship (Ent) in Nigeria. On the other hand, only the industrial production index ($IPDX$) exerts negative and significant influence.

Evidence from equation 10 also shows the long-run equilibrium relationship between Entrepreneurship (Ent) and Finance (Fin) on the one hand and other hypothesised determinants on the other. It shows that Finance (Fin), Interest Rate (Int), the log of Real GDP ($LOGRGDP$) and Unemployment ($UNEMP$) have positive and significant impact on Entrepreneurship (Ent).

However, Industrial Productivity Index ($IPDX$) has a negative and significant impact. The R^2 of about 31% indicates that the variation in Entrepreneurship (Ent) is explained by the variations in the other determinant variables in the model. The issue of autocorrelation has been subsumed by the cointegration mechanism which has eliminated the problem of autocorrelation during the stages of unit root and cointegration tests.

These results also show that that a one (1) per cent increase in Finance (Fin), Interest Rate (Int) and the real GDP (RGDP), Unemployment (UNEMP) would cause Entrepreneurship (Ent) to improve by 1.60%, 4.6%, 1.2% and 0.24% respectively in the long run. Entrepreneurship (Ent) is however less responsive (inelastic) to changes in the real gross domestic products with an elastic coefficient of 0.24. The results also confirm some of the *a priori* expectations that Finance (Fin), the Real Gross Domestic Product (RGDP) and Unemployment (UNEMP) will be positively related to entrepreneurship. The *a priori* expectations of the industrial production index and the level of interest rates did not hold.

However, the negative influence of the industrial production index on entrepreneurship suggests that financial institutions do not respond positively to industrial productivity. Thus, government must focus and provide measures on how to finance productive firms, including entrepreneurship and MSMEs in Nigeria. The rising and positive influence of the level of interest rates, though contrary to *a priori* expectation and deleterious to entrepreneurship growth, would encourage financial intermediaries at the formal financial markets to increase their financing of entrepreneurship. Nevertheless, government must intervene in reducing interest rates to small businesses to enable them grow.

On the positive relationship between entrepreneurship and unemployment, it can be argued that as the level of unemployment worsens, entrepreneurship financiers would respond positively by increasing the funding of enterprises in order to stem the rising unemployment level. Also, it is important to note that while financial institutions respond positively to increases in the level of unemployment by increasing their level of entrepreneurship financing, the micro level analysis provides a contrary result that employment is not significant. This however negates the foundation of entrepreneurship philosophy as the engine of employment generation (OECD, 2006, 2009).

The broad implication is that policy measures aimed at stimulating Entrepreneurship (E_{nt}) through the promotion of Finance (F_{in}) must be accompanied by measures to reduce the interest rate on credits and promote unemployment ($UNEMP$). The conclusion of the analysis is that the long run relationship as indicated by the long-run normalised on entrepreneurship financing shown as Equation 106, indicates that financial intermediation has a positive and significant influence on entrepreneurship financing. The null hypothesis that finance has no significant influence on entrepreneurship is therefore rejected against the alternative. The overall result indicates that improvement in financial intermediation activities will bring a significant improvement to entrepreneurship in the long-run.

Hypothesis and Results

We state the hypothesis as follows:

- H_0 = There is no long run and Granger causal relationships between Entrepreneurship Growth (Ent) and Finance (Fin) in Nigeria
- H_1 = There is long run and Granger causal relationships between Entrepreneurship Growth (Ent) and Finance (Fin) in Nigeria.

The results of the *t*-statistics in Financel (Fin) in the long-run of Equation 106 indicate that the estimated *t*-statistics is 2.0728 at 24 degree of freedom at $p < 0.01$ for Finance (Fin) at the

macro level. Thus, since $t^{\text{calculated}}$ of 2.0728 is greater than $t^{\text{tabulated}}$ of 1.645, the null hypothesis which states that “there is no relationship between entrepreneurship and finance” is rejected, while the alternative hypothesis which states that “there is relationship between entrepreneurship and finance” is accepted.

Short-run Dynamics: Vector Error Correction Model Results

The Vector Error Correction Model (VECM) results indicate that the short run components of the relationship with restrictions implied the co-integrating equation is imposed. The error correction coefficient (ECM) of the Entrepreneurship (Ent) is properly signed at **-0.356820** and significant at $t=-2.07601$. This shows that the speed of adjustment of the short run equilibrium to the shocks to its equilibrium relationship with its hypothesised determinants is significant. Thus, the short-run dynamics (ECM) supports the cointegration.

An examination of short-run coefficients when compared with the long-run Entrepreneurship (Ent) equation would show that while the Finance (Fin), Interest Rate (Int), the Real Domestic Product (RGDP), Industrial Production Index (IPDX) and Unemployment (UNEMP) significantly affect Entrepreneurship (Ent) on the long-run, their short run impacts on Entrepreneurship (Ent) are also significant with Finance (Fin) and Industrial Production (IPDX).

Given the evidence from these results, government policy actions aimed at improving the Entrepreneurship (Ent) level should essentially focus on both the short-run and the long-run equilibrium implications of the changes in the levels of Finance (Fin), Industrial Production Index (IPDX), Interest Rate (Int) and Unemployment (UNEMP) to sustain entrepreneurship in Nigeria.

Pairwise Granger Causality Test

The Granger causality test establishes if there is any causality between financial intermediation and entrepreneurship financing. It will also show that causal relationship is either bi-directional or uni-directional or independent among the variables under study and either of them is acceptable. The pairwise Granger causality test as presented in Table 8 shows that the null hypothesis cannot be rejected in most cases.

However, in the case of “E does not Granger causes Fin”, the results show that “Entrepreneurship (Ent) Granger causes Finance (Fin)” under 1-lag uni-directionally. Surprisingly, Granger causality tends to run from Entrepreneurship (Ent), Finance (Fin) to Interest Rate (Int), Industrial Production Index (IPDX) to Unemployment (UNEMP) under one lag.

Table 8: Pairwise Granger Causality Test

Null Hypothesis	1 lag			2-lags		
	F-Statistics	Prob.	Decision	F-Statistics	Prob.	Decision
<i>Fin</i> does not Granger causes <i>Ent</i>	0.03577	0.85146	Accept	0.04964	0.95167	Accept
<i>Ent</i> does not Granger causes <i>Fin</i>	5.737518	0.02410*	Reject	2.18207	0.13561	Accept
<i>Int</i> does not Granger causes <i>Ent</i>	1.63054	0.21292	Accept	2.14482	0.13992	Accept
<i>Ent</i> does not Granger causes <i>Int</i>	0.01470	0.90443	Accept	0.74742	0.48474	Accept

Null Hypothesis	1 lag			2-lags		
	F-Statistics	Prob.	Decision	F-Statistics	Prob.	Decision
<i>IPDX</i> does not Granger causes <i>Ent</i>	6.11921*	0.02022	Reject	3.26758	0.05636	Accept
<i>Ent</i> does not Granger causes <i>IPDX</i>	0.08724	0.77007	Accept	2.73993	0.08564	Accept
<i>LORGDP</i> does not Granger causes <i>Ent</i>	0.17925	0.67550	Accept	3.69738	0.04052	Reject
<i>EF</i> does not Granger causes <i>LORGDP</i>	0.95606	0.33719	Accept	0.19800	0.82175	Accept
<i>UNEMP</i> does not Granger causes <i>Ent</i>	0.51701	0.47853	Accept	1.07796	0.35687	Accept
<i>Ent</i> does not Granger causes <i>UNEMP</i>	5.01273*	0.03394	Reject	0.87686	0.42954	Accept

Observations: 1 lag: 29; 2 Lags: 28, Critical Value taken at 5% significance; * Ent Granger causes.

Discussion on the Results

The cointegration analysis captured entrepreneurship characteristics, entrepreneurship firm specifics, financial specifics and macroeconomic specifics such as entrepreneurship financing, interest rate, the real gross domestic product, industrial production index, unemployment, and financial intermediation variables.

The overall results show that the model exhibits long-run cointegration, short-run dynamics and uni-directional causal relationship and consistent with the results of the work of Atindehou *et al.* (2005, p. 777) that the economies of the West African countries, including Nigeria, have a weak causal relationship between entrepreneurship and finance on the one hand, and between entrepreneurship and economic development.

The results also confirm the literature that finance, interest rates, industrial production, and unemployment are significant to entrepreneurship (Mpuga, 2004- for Uganda and Gries and Naudé's, 2009 - for Belgium, Germany, Korea, Norway, Portugal, and the United Kingdom. Agbetsiafa (2003) too confirms that there is a preponderance of 'Granger causality' from finance to growth in six African countries including Nigeria and Goedhuys and Sleuwaegen (2009, p. 219) for entrepreneurial firms in 11 Sub-Sahara African countries including Nigeria.

However, global financial crisis (World Bank, 2010) is threatening access to finance by entrepreneurship from the financial markets. As noted by the OECD (2009, p. 15), global financial crisis has exacerbated access to finance by entrepreneurship because: (i) it is more difficult for them to downsize since they are already small, (ii) they are individually less diversified in their activities, (iii) they have weaker financial structures or lower capitalisation, (iv) they have lower or no credit ratings, (v) they are heavily dependent on credit, and (f) they have fewer options for finance, especially in financial markets.

To correct the weaknesses in the Nigerian financial sector, several measures have been taken in the last decade (CBN, 2009). Thus far, there is no end in sight as the rates of interest and exchange are on the rise, while the level of employment is also on the rise - a contrasting position to the strand of the literature. The consequences of this situation and coupled with the global financial crises, access to finance by entrepreneurship and MSMEs are on the downward trend.

As a result of this, policy measures must be accompanied by a decision to reduce interest rate on credits and tariff structure. This will promote additional financial incentives towards

stimulating entrepreneurship growth which will in turn generate employment and economic growth. The growth of entrepreneurship could serve as a vehicle for innovation and change, and therefore as a conduit for knowledge. Thus, in a regime of increased globalisation, where the comparative advantage is shifting towards knowledge-based activity, not only does entrepreneurship growth plays a more important role, but the impact of that entrepreneurship will to generate economic growth (Audretsch and Kielbach, 2004).

Concluding from the above discussion, the Nigerian government must develop measures to counteract the effects of the financial crisis in entrepreneurship financing. Furthermore, any solution to stimulate the Nigerian economy should include easing SME and entrepreneurship access to finance. There is also the need for macroeconomic policy to be specifically targeted to entrepreneurship financing and growth. A multiplicity of agencies and institutions must be looked into with a view to protecting entrepreneurship and MSMEs. By this, the potentials of entrepreneurship and MSMEs in term of employment, industrial production and its impact on economic growth can be felt.

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