Effect of knowledge-based entrepreneurship on sustainable development in emerging economies

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Abstract: The study investigated the relationship between knowledge-based entrepreneurship and economic development in emerging economies Brazil and Malaysia covering 25 years (1989 – 2013). The study employed co-integration technique and ordinary least square regression technique on to do country-specific analyses. The results showed that there are cointegrating relationship between Knowledge-Based Entrepreneurship and sustainable development in emerging economies. Further results from OLS analysis indicated overall significant of the model for Brazil and not statistically significant for Nigeria and Malaysia. The study thus concluded that there is mixed finding on the effect of entrepreneurial education on sustainable development in emerging economies.

Keywords: *Entrepreneurial knowledge, Knowledge-Management, entrepreneurship, sustainability, emerging economies, self-employment.*

INTRODUCTION

The evolution of Knowledge-Based Development (KBD) is an emerging discipline and reflects the widening horizons of knowledge and management. Both knowledge-management and knowledge- based-development are based on fundamental characteristics of knowledge as a resource distinct from physical resources (Alvarez, 2005). Drucker (1985) propounded the concept of knowledge-based innovation as the key role of an entrepreneur-based innovation. Knowledge-based innovation requires a careful analysis of all the necessary missing factors (if any). A clear focus on its strategic position and the need to learn and practice entrepreneurial management. Knowledge-based entrepreneurship has a long lead-time span between the emergence of new knowledge and same becoming applicable to technology and subsequently getting converted into product processes or services in the market place.

Entrepreneurial knowledge is viewed as forming an inseparable component of the trait of the 'competence' of an individual and other components such as skills and attitude. Entrepreneurial knowledge is the ability to take conceptual abstract actionable information and information of where and how to obtain undervalued resources, explicit and tactic and how to deploy and exploit such resources. Knowledge is a key resource available to humans, organizations and societies (economies) in order to secure power and competitive advantage.

Knowledge-Management (KM) positions knowledge towards the upper end of the data. Entrepreneurial – knowledge-based, knowledge-management and information-knowledge wisdom (DIKW) highlight the leverage of information Technology (IT) in acquiring, storing knowledge across geographical boundaries. Entrepreneurship knowledge-based is categorized into theoretical, scientific, conceptual knowledge common to all stakeholders, while the second category is dispersed knowledge of what to produce and how to produce it, which is scattered across different economic factors (Butra, 2007; Kloppan&Minniti, 2005).

Audretsch and Keclbach (2005) reveal that entrepreneurship consists of two criteria ; the first criteria involves the state of knowledge which is the ability of economic agents to recognize economic opportunities (through environmental scanning and

analysis) that can only or best be realized through the creation of a new enterprise. The second involves economic behavior and specifically the creation of a new enterprise in order to appreciate the economic value of that knowledge. The authors stated that knowledge accumulation requires higher levels of innovation which results in more complex production methods and the increasing production of specialized intermediate inputs (Ciccone& Matsuyama, 1996), and an increase in technological intensity of a country's economic structure (Pereira, 2007).

The transformation from a low-income, traditional economy to a modern economy also involves significant changes to production methods, a process of change where entrepreneurs perform essential roles; first, in creating new firms outside of the household which offer new products, second role involves growing firms/wage employment by making use of scale of economies. Such large firms tend to specialize and the clustering of specialized firms can give rise to localization economies, thereby further encouraging innovation and specialization. At the stage where growth and productivity is driven by knowledge accumulation, countries must generate and also commercialize new knowledge. This requires amongst others, cooperation between researchers, entrepreneurs (integration among emerging economies). Researches and inventors need in many cases to be marched with suitable entrepreneurs. One way of improving this cooperation is through linkages between universities (researchers), private firms (entrepreneurs) and government subsidizing (R&D), (Michelacci, 2003).

Although in many developing countries, governments are spending substantial amounts on innovations and research and development subsidies and also in establishing university-private sector cooperation through, for example, establishment of science parks/center for entrepreneurship studies, little research has studied these attempts. Suggestions from available related literature are that poor economies should not be focusing their attention on R&D and

new knowledge generation, but rather in imitation and technological catch-up (Estrin, Meyer &Bytchkova, 2006). The importance of imitation by entrepreneurs may be more important for the majority of developing countries to imitate than new-knowledge-generation. A model in which entrepreneurs imitate and implement existing technology and learn by imitation was advocated. Assumption in the model is that technology is easily observable and commonly available (Schmitz, 1989). Disagreeing, (Nelson & Pack, 1999) opined that it is not always the case and that there is uncertainty in the adoption of foreign technology and a measure of the ability of entrepreneurs is how well, they shoulder this risk. In addition, not all imitation is costless as there are new innovations that are costly to imitate such as locating or managing a firm.

The pre-eminence of knowledge as a key resource for economic and social development has been widely recognized. Knowledge based development as a discipline emerged on the premise that knowledge-based processes are pre-requisite for sustainable development. The distinct perspectives of KBD exists which are - transition and radical perspectives. **The transitional view c**onsiders knowledge as a resource suited to leverage economic development. The **radical perspective** considers knowledge as an instrument for balanced, equitable and sustainable development. Entrepreneurship and innovation are strongly linked with knowledge, which along with capital is regarded as the modern knowledge-based economy. Innovation is the action or process of innovation. To innovate comes from Latin, means "to make changes in something established especially by introducing new methods, ideas or products". Most scholars agreed that innovation is important to companies, societies and individuals, but the field of innovation research is large and are sometimes remote. Beside the traditional factors of production – labour, land and capital, knowledge is a key input factor for fostering entrepreneurial culture through entrepreneurial education (Shavinina, 2003).

Economic theory viewed the decision of an individual to start-up a firm as an occupational choice between self-employment and wage-employment following important combinations. The factors that affect this occupational choice depend broadly on an individual's entrepreneurial ability, the relative rates of return to entrepreneurship, as well as obstacles such as capital constraints, entry start-up costs and the factors that influence the opportunity costs of becoming self-employed. The returns from being self-employed may depend on the way in which the entrepreneur enters the market, either through creation of new firm or by purchasing an existing firm. The latter option may be more profitable, if failures in the market can be overcome. Market failures can also be due to informational mismatches (Akerlof, 1970; Shavinina, 2003).

The variables of interest for measuring sustainable development in this study are Start-up costs, GDP, Fund, Foreign Direct Investment, Self-Employment and inflation. Start-up costs hinder entrepreneurial entry and results in lower employment in OECD countries. Start-up costs and regulations are efforts required to begin a firm. Such costs differ in duration and content from country to country. These costs, number of procedure and time it takes to obtain a permit to generate a business, cost of setting up a business (fixed cost or sunk cost) element and the regulations that need to be adhered to in terms of labour and prediction and organization standards may be barriers. The motivation for positive entry costs and regulations are to protect the public and workers from potential fraud and exploitation by unscrupulous agents, weed out low quality entrepreneurs and to improve tax collection on firm. There is evidence that higher entry costs and more regulation are associated with higher levels of corruption, suggesting that entry costs and regulations may also be imposed by rent-seeking officials. Incumbent entrepreneurs may drive an increase in the regulation of business entry as a way of creating barriers to entry for new firms. Countries with high entry costs and regulations, the size of the informal sector is higher, indicating the existence of "evasive entrepreneurship". (Fonseca, Michaud &Sopraseuth, 2007; Parker 2007:703; DjankovPorta, Lopez &Schleifer, 2002).

According to a survey result by the National Knowledge Commission, India (2008), 50 percent of the entrepreneurs experienced difficulties while seeking clearance and licenses, two thirds face hassle while filling taxes and 60 percent claimed to have encountered corruption. (National Knowledge Commission-India, 2008; Gunjan&Kushagra, 2014). Other hurdles to start-up procedures include tax burden, poor infrastructure, low investment in education and skill development, inflation, conflict and insurgencies, (bad governance and misplaced priorities), (Ezekwesili, 2013). Gries, wood and Meintjies (2008) revealed that main determinants of start-up rates were educational levels, access to bank financing and profit expectations etcera. Haven acknowledged that a plethora of factors could influence startup of businesses and eventual success, this study aims to investigate the extent to which knowledge-based entrepreneurship lead to sustainable development in emerging economies.

The null hypotheses tested at 0.05 level of significance is thus: Knowledge-based entrepreneurship has significant positive effect on economic development in emerging economies.

THEORETICAL REVIEW

The theoretical framework for this study is hinged on cognitive approach to entrepreneurship. Cognitiveapproachtry to explain behavior by individuals perceiving and interpreting the information around them. Cognitive theories are better able to explain the complexity inherent in entrepreneurial behavior and these theories assume that individuals do not possess a perfect knowledge of the world (environment) as there are too much information to grapple with. As a result, these information have to be

selected, sieved, analyzed and interpreted based on previous experience. Example, a situation that is perceived as business opportunity for one person may be seen as an enormous problem. Taylor (1998) observe that individuals are actively involved in the construction of their own realities.

Cognitive theories enable a better understanding of why people engage in an entrepreneurial behavior and this may lead to understanding of the interaction between characteristics of the situation and characteristics of the entrepreneur. Behavioural patterns are the product of two psychological processes – selection of environments and through the production of environment. The available related literature summarized that the question of who is an entrepreneur and what drives the individual to be entrepreneurial should be addressed using complex model called cognitive motivation theories. These theories provide a good support to understand the choices made by entrepreneurs, such theories are easy to operationalize and have proven validity. Entrepreneurial behavior should be regarded as the consequences of Person-situation interactions.

EMPIRICAL REVIEW

Greenchie (2011) and Griee 2008) employed a survey design to investigate the effect of human capital on enterprise survival for economic development in EU countries. The independent variables for the study were education, knowledge and business strategy while entrepreneurship development was the dependent. The findings indicated that the relationship between the dependent and independent of the research were inconsistent.

Djankov, La Porta, Lopez de Silanes, and Schleifer (2002) adopted a panal data from a sample of EU countries to study the market gaps for entrepreneurial venture for development. The variables of the study include Access to capital, monitoring speed of delivery, start-up procedures and the resulted indicated

that size of informal economy is higher in unregulated informal economy.

Cares and Thurick (2003) investigated the relationship between economic development and business ownership in 23 OECD countries in a period between 1976 and 1996. The Panel data analysis was used. The variables of the study were Self-employment, start-up procedures, GDP, types of entrepreneurs. The findings showed that business ownership increases GDP, improves standard of living, and increases nascent entrepreneurship.

However, the relationship between entrepreneurship and economic development is embedded in several strands of theoretical, empirical and conceptual literature based on advanced economies. The review has shown that available related literature on the effect of Entrepreneurship on sustainable economic development is sparse and fragmented and has not been adequately researched in the context of emerging economies. The existing literature on entrepreneurship and economic development are based on affluent/wealthy economies (Ciccone& Matsuyama, 1996; Pereira, 2007). This study aimed to bridge the gap and extend the frontiers of knowledge by studying entrepreneurship for sustainable economic development in emerging economies using quantitative tools to investigate country-specifics of economic variables in Nigeria, Malaysia and Brazil.

METHODOLOGY

Nature and Sources of Data Collection

This study employed the secondary data sources from the World Development Indicators (WDI, 2013). The data covered macroeconomic variables for Nigeria, Brazil and Malaysia covering 25 years (1989 – 2013). This period was used because the data on the selected variables are available for all the countries from 1989 till 2013.The series are expressed in US dollar currency.

The variables used in this study included the variables of entrepreneurship education which served as the dependent variable and the variables of sustainable development as the explanatory (independent) variables. As all the data (variables) were collected from the World Development Indicator (WDI), the description to these variables is in line with those of the WDI metadata indicator source notes.

MODEL SPECIFICATION

The **model** was used to address hypothesis two using the following relationship function:

$$KBE = f(GDP_{1-t}, FUND, FDI, SE, INFLR) \quad (1)$$

In this relationship, KBE is the dependent variable while GPD_{1-t}, FUND, FDI, SE, INFLR are the independent variables of sustainable development. The relationship represented in this function is based on the theoretical proposition on which this study is based. The model that captured this relationship is adapted from the work of (Djalkov et al, 2002; Curran &Storey, 2002). The equation from the model becomes

$$KBE_i = b_{0i} + b_1 GPD_{1-ti} + b_2 FUND_i + b_3 FDI_i + b_4 SE_i + b_5 INFLR_i + \mu_i \quad (2)$$

Where:

KBE = Knowledge-Base Entrepreneurship is measured with cost of business start-up procedures (% of GNI per capita).

GDP = Gross Domestic Product as proxy for economic development and is measured as the annual percentage growth rate of GDP at market prices based on constant local currency.

FUND = Assess to Fund proxied by credit to private sector as a ratio of GDP.

FDI = Foreign Direct Investment proxied by foreign direct investment net outflows as % of GDP.

SE = Self Employment measured as percentage of total employed.

INFLR = Inflation rate proxied by annual percentage rise in consumer prices.

The (i) in each coefficient represents the individual countries included in the study, viz, Nigeria, Brazil and Malaysia. μ is the error term. The coefficients are represented with b_0, b_1, b_2, b_3, b_4, and b_5 which capture the relationships that exist between the dependent and the independent variables. b_0 is the constant. The appriori expectation of the model is that knowledge-based entrepreneurship should have positive relationship with sustainable development.

Techniques for Data Analysis

The analytical tools used were co-integration technique and ordinary least square regression technique. The analyses involved country-specific study. The study employed country by country analyses for comparison of the country situations.

DATA PRESENTATION AND ANALYSIS

Statistical Properties

The variables of Knowledge-Base Entrepreneurship (KBE) have mean of 71.40 for Nigeria, 12.89 for Brazil and 21.70 for Malaysia. The results indicate that Nigeria has higher knowledge-base in entrepreneurship activities. The standard deviations of the KBE, 11.56, 4.62, 7.45 for Nigeria, Brazil and Malaysia respectively are lower than the mean. This is an indication of absence of excessive outliers and stability of the variables employed, which are essential for the analyses carried out in this study. This similarly applies the variables of (KBE), for Malaysia will tend to be higher. There is long run relationship between

entrepreneurship and infrastructure development in Nigeria, Brazil and Malaysia.

The GDP of the countries under study have the following mean and standard deviations: Nigeria (mean = 3.07, SD = 6.49), Brazil (mean = 2.69, SD = 2.57) and Malaysia (mean = 6.09, SD = 3.97). Nigerian GDP has higher spread as shown by the SD above the GDP. Malaysian GDP has higher mean. The result indicates that Nigeria has higher volatile growth rate in her economic development which implies lack of economic stability.

Table 1: Summary Statistics Properties of the Variables Employed

	KBE	GDP_{-1}	FUND	FDI	SE	INFLR
	Nigeria					
Mean	71.40	3.07	14.70	3.75	30.93	20.98
Median	73.80	2.02	13.02	3.17	31.00	12.88
Maximum	90.80	30.34	38.34	10.83	32.40	72.84
Minimum	52.00	-3.12	8.69	1.07	28.90	5.38
Std. Dev.	11.56	6.49	7.18	2.27	1.15	19.21
Jarque-Bera	1.06	158.7	42.71	19.07	1.98	9.97
Probability	0.59	0.00	0.00	0.00	0.37	0.01
	Brazil					
Mean	12.89	2.69	51.74	2.25	37.54	398.22
Median	14.00	2.73	42.08	2.26	37.90	6.87
Maximum	18.70	7.53	133.8	5.08	44.60	2947.7
Minimum	4.70	-4.30	27.98	0.21	29.40	3.20
Std. Dev.	4.62	2.57	28.09	1.48	4.64	813.84
Jarque-Bera	2.22	1.44	20.52	1.15	1.07	23.67
Probability	0.33	0.49	0.00	0.56	0.58	0.00
	Malaysia					

Mean	21.70	6.09	114.4	4.33	26.36	2.79
Median	18.90	6.29	111.5	4.39	25.70	2.74
Maximum	33.10	10.00	154.8	8.76	31.90	5.44
Minimum	7.60	-7.36	69.41	0.06	23.30	0.58
Std. Dev.	7.45	3.97	20.31	1.99	2.41	1.29
Jarque-Bera	1.46	28.60	0.12	0.32	7.79	0.95
Probability	0.48	0.00	0.94	0.85	0.02	0.62
Observations	25	25	25	25	25	25

The mean FUND for Nigeria is 14.70, Brazil is 51.74 and Malaysia is 114.47 with standard deviations of 7.18, 28.09 and 20.31 respectively. The result showed that Malaysian entrepreneurs have better access to fund than Brazil and Nigeria. The median confirms the results.

The mean FDI indicate that Malaysia (4.33) has a higher FDI than Nigeria (3.75) and Brazil (2.25). The result of the mean SE showed that Brazil (37.54) has higher self-employment level and Nigeria (30.93) and Malaysia (26.36).

The statistical properties also indicate that Brazil highly inflationary with mean INFLR of 398.22 and standard deviation of 813.84. For Nigeria, the mean INFLR is 20.98 with standard deviation of 19.21. Malaysia has more stable inflation at mean of 2.79 and standard deviation of 1.29.

However, the probability values of the Jarque-Bera Statistics as presented in the table show probability less than 5% level which indicate that they are normally distributed. This suggests that the variables employed in this study are normally distributed. All

the employed variables have 25 data point observations which means that the paper is a long term study.

Unit Root/ Stationarity Test

The variables employed in the analysis are tested for stationarity using two unit root tests, namely, Augmented Dickey-Fuller test and Phillips-Perron test, to determine whether they are stationary or non-stationary series. The two tests are employed to reinforce one another, to ensure their robustness and boost confidence in their reliability. The tested null hypotheses for both unit root tests are the presence of a unit root. The results of the unit root tests as presented in Table 2. All the variables for Nigeria are stationary at 5% at level (for KBE and GDP$_{-1}$), first difference (FUND, FDU, SE, and INFLR). For Brazil, the variables are stationary at 5% in their levels for GDP$_{-1}$, first difference for KBE, FUND, FDI, SE, and INFLR. For variables in Malaysia, GDP$_{-1}$ are stationary at level; KBE, FUND, FDI, SE, INFLR, are stationary at first difference. As most of the variables are stationary at first differences, this implies that the variables do

not have unit roots at least, in their first differences and at 5% level of significance. Having established that, at most, all the variables in all cases of Nigeria, Brazil and Malaysia were stationary at first difference or 1(1).

We then applied the Johansson co-integration to determine presence of long run relationship in the models.

Table 2: The Unit Root Test Results for the Selected Variables

Variables		Augmented Dickey-Fuller test	Phillips-Perron test	Conclusion
Nigeria				
KBE	Level	-4.206089*	-3.835421*	1(0)
GDP_{-1}	Level	-2.882699	-4.079678*	1(0)
	First Diff	-5.311104*	-8.573730*	
FUND	Level	-2.747244	-2.384595	1(1)
	First Diff	-3.521011**	-4.206016*	
FDI	Level	-2.610187	-3.502361**	1(1)
	First Diff	-4.563427*	-6.414050*	
SE	Level	-0.575381	-0.606253	1(1)
	First Diff	-16.63468*	-4.487122*	
INFLR	Level	-2.129933	-2.623410	1(1)
	First Diff	-4.042440*	-5.064713*	
Brazil				
KBE	Level	1.014811	1.648826	1(1)
	First Diff	-5.508488*	-5.352637*	
GDP_{-1}	Level	-3.385261**	-4.793148*	1(0)
FUND	Level	-2.272668	-3.835982*	1(1)
	First Diff	-5.609751*	-6.251961*	
FDI	Level	-1.929402	-1.654186	1(1)
	First Diff	-2.888725***	-3.766467*	

SE	Level	-1.757541	-2.222485	1(1)
	First Diff	-3.909739*	-6.228871*	
INFLR	Level	-3.774986*	-2.516853	1(1)
	First Diff	-6.751302*	-7.900621*	
Malaysia				
KBE	Level	-1.584758	-1.618537	1(1)
	First Diff	-3.772316	-4.351077*	
GDP_{-1}	Level	-3.220902**	-4.086680*	1(0)
FUND	Level	-3.029085**	-1.661495	1(1)
	First Diff	-3.536359**	-4.373893*	
FDI	Level	-2.123168	-2.496830	1(1)
	First Diff	-5.211185*	-6.269438*	
SE	Level	-3.075164**	-2.733817	1(1)
	First Diff	-3.703295**	-6.404870*	
INFLR	Level	-2.396073	-3.986592*	1(1)
	First Diff	-5.716091*	-9.407547*	
	First Diff	-3.718617**	-6.435705*	

Notes: (1)The null Hypothesis is the presence of unit root. All unit roots analyses included a constant (no linear trend). (2) *, **, *** denotes significance at 1%, 5% and 10% respectively. **(3)** For ADF test (Lags were selected based on Modified Schwartz Information Criterion for all variables); for PP test (The Bandwith was chosen using Newey-West method with Barttlet Kernel spectral estimation.) **(4)** The Critical values for ADF test are -3.7497 (1%); -2.9969 (5%) and -2.6381 (10%) at level; and -3.7667 (1%); --3.0038 (5%) and -2.6417 (10%) at first differences (5) The Critical values for PP test are -3.7343 (1%); -2.9907 (5%) and -2.6348 (10%) at level; and -3.7667 (1%); -3.0038 (5%) and -2.6417 (10%) at first differences **(6)** Decision rule -The critical value should be larger than the test statistical value for unit root to exist

Tests for Co-Integration

Co-integration tests are carried out to ascertain the existence of long run relationship among the variables employed for each model. The results of the cointegration analyses were validated using the Johansen (1991, 1995) approach. The Johansen's framework provides a number of cointegrating equations and estimates of all cointegrating vectors in the multivariate cases.

To investigate long run relationship between Knowledge-Based Entrepreneurship and sustainable development, the Johansson Cointegration Technique was adopted. The variables of the model are KBE, GPD_{1-t}, FUND, FDI, SE, INFLR. Table 4.3 shows the result of the cointegration test for Nigeria, Brazil and Malaysia respectively. From the results, the Likelihood Ratio statistic indicates 2 (for Nigeria), 3 (for Brazil) and 2 (for Malaysia) cointegration at 5 percent level of significance, suggesting that there is cointegrating relationship between Knowledge-Based Entrepreneurship and sustainable development in emerging economies.

Table 3: Test of Co-integration among KBE, GPD_{1-t}, FUND, FDI, SE, and INFLR for

Hypothesized No. of CE(s)	Likelihood Ratio			Critical Values	
	Nigeria	**Brazil**	**Malaysia**	5 Percent	1 Percent
None	176.5024**	129.0913**	130.9907**	94.15	103.18
At most 1	90.97469**	76.06257**	81.16666**	68.52	76.07
At most 2	45.39190	47.41435*	39.95269	47.21	54.46
At most 3	23.07475	27.12099	22.86613	29.68	35.65
At most 4	11.21535	10.75801	8.318677	15.41	20.04
At most 5	0.042111	0.037104	1.299428	3.76	6.65

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
For Nigeria: L.R. test indicates 2 cointegrating equation(s) at 5% significance level
For Brazil: L.R. test indicates 3 cointegrating equation(s) at 5% significance level
For Malaysia: L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Table 4: Estimated Results of the OLS Regression for Knowledge-Base Entrepreneurship and Sustainable Development Model in Nigeria, Brazil and Malaysia

Variable	Nigeria	Brazil	Malaysia
	Coefficient	Coefficient	Coefficient
GDP_{-1}	0.902717**	0.177425	0.085647
FUND	0.263601	-0.028198	-0.171761
FDI	0.281487	-0.774860	-0.626272
SE	2.589551	0.444084*	0.254384
INFLR	0.000704	0.002398	-0.591654
C	143.7965	-1.061485	38.50769
R^2	0.222578	0.563928	0.260512
F-stat.	1.087949	4.914163**	1.338690
D-W stat.	1.937192	1.857309	1.700130

Dependent Variable: KBE

Note: * denotes significant at 1%, ** denotes significant at 5%; *** denote significant at 10%

Table 4 estimated effect of Knowledge-Base Entrepreneurship and sustainable development in emerging economies of Nigeria, Brazil and Malaysia. The result of the model as presented in the table show that, in Nigeria, GDP_{-1} has positive effect on sustainable development in Nigeria ($0.90GDP_{-1}$), Brazil ($0.18GDP_{-1}$) and Malaysia ($0.09GDP_{-1}$), with Nigerian having significant effect at 5% level. This indicate that a one (1) percent increase in GDP growth rate will lead to 90%, 18% and 9% increase in Knowledge-Base Entrepreneurship in Nigeria, Brazil and Malaysia respectively.

Moreover, only in Nigeria (0.26FUND) that FUND has positive effect on Knowledge-Base Entrepreneurship. In Brazil (-0.028FUND) and Malaysia (-0.17FUND), FUND has inverse effect on Knowledge-Base Entrepreneurship. This means that a one (1) percent increase in FUND will result in 26% increase in Knowledge-Base Entrepreneurship in Nigeria; and 2.8% and 17% decrease in level of Knowledge-Base Entrepreneurship in Brazil and Malaysia. Besides, FUND does not have significant effect on all the countries (Nigeria, Brazil and Malaysia).

Similarly, only in Nigeria (0.28FDI) that FDI has positive effect on Knowledge-Base Entrepreneurship. In Brazil (-0.77FDI) and Malaysia (-0.63FDI), FDI has inverse effect on Knowledge-Base Entrepreneurship. This means that a one (1) percent increase in FUND will result in 28% increase in Knowledge-Base Entrepreneurship in Nigeria; and 77% and 63% decrease in level of Knowledge-Base Entrepreneurship in Brazil and Malaysia. Besides, FDI does not have

significant effect on all the countries (Nigeria, Brazil and Malaysia).

On the other hand, in all the countries, Nigeria (2.59SE), Brazil (0.44SE) and Malaysia (0.25SE), SE has positive effect on Knowledge-Base Entrepreneurship. This indicate that a one (1) increase in SE (self employment) leads to 259%, 44%, and 25% increase in Knowledge-Based Entrepreneurship in Nigeria, Brazil and Malaysia respectively. Of all the countries of the study, only in Brazil that SE has significant effect on Knowledge-Base Entrepreneurship.

Also, in Nigeria (0.000704INFLR) and Brazil (0.002398INFLR) INFLR has positive effect on Knowledge-Base Entrepreneurship. On the other hand, INFLR has negative effect in Malaysia (-0.591654INFLR). This indicate that a one (1) increase in SE (self employment) leads to 0.007% and 0.02% increase in Knowledge-Base Entrepreneurship in Nigeria and Brazil respectively. In Malaysia, a one (1) percent increase in INFLR leads to 59% decrease in Knowledge-Base Entrepreneurship. None of the countries records significant effect on Knowledge-Base Entrepreneurship.

On the overall, the R^2 coefficient is 0.22 for Nigeria, 0.56 for Brazil and 0.26 for Malaysia. The results suggests that about 22%, 56% and 26% of the total variations in the Entrepreneurial Education and Sustainable Developmentare explained by the variables included in the model, which are KBE, GPD_{1-t}, FUND, FDI, SE, and INFLR for Nigeria, Brazil and Malaysia respectively. This suggests that sustainable development does not explain greater portion of the changes in Entrepreneurial Education in Nigeria and Malaysia.

Similarly, the F-statistic of the model that shows the overall significant of the model shows that the model is not statistically significant for Nigeria and Malaysia. This implies that there is mixed finding on the effect of entrepreneurial education on sustainable development

in emerging economies. The Durbin-Waston statistics indicate absence of autocorrelation in the model for Nigeria, Brazil and Malaysia.

Summary, Conclusion and Recommendations

Knowledge-based entrepreneurship has significant negative effect for sustainable development in Brazil, insignificant negative effect in Malaysia and has insignificant positive effect in Nigeria. This implies that there is mixed findings among sampled economies.There is cointegrating relationship between Knowledge-Based Entrepreneurship and sustainable development in emerging economies. The OLS analysis indicated overall significant of the model for Brazil and not statistically significant for Nigeria and Malaysia which implies that there is mixed finding on the effect of entrepreneurial education on sustainable development in emerging economies. Lingelbach (2005) revealed that entrepreneurship for economic development can have conflicting results in developing economies. There have been a number of attempts to analyze effects of entrepreneurship on some economic development indicators but the results of the studies have thrown up an interesting inconsistency (Carter & Jones-Evans, 2000).

The study thus conclude thatknowledge-based innovation is the key role of an entrepreneur-based innovation. Knowledge-based entrepreneurship has a long lead time span between emergence of new knowledge and are becoming applicable to technology and subsequently getting converted into product processes or services in the market place (Drucker, 1985). Beside the traditional factors of production which are land, labour, and capital, knowledge is a key input factor for encouraging entrepreneurial culture through entrepreneurial education (Encyclopedia, 2009). Attraction of foreign direct investment (FDI) in emerging economies is dependent on creating a favourable environment which comes through economic stability. Global competition for Foreign

Direct investments has necessitated "running faster than others to survive".

Knowledge is power and a key resource available to humans, organizations and economies in order to secure power and competitive advantage. It is the knowledge of global business that can encourage home-based entrepreneurs to invest in other countries. There is need for knowledge-campaign activities to get the citizens well-informed on exporting potentials, that FDI accrues benefits to both the entrepreneur and the host country and also open new markets.

For knowledge-based entrepreneurship, emerging economies must imitate, generate and commercialize new knowledge through integration and cooperation between researchers and entrepreneurs. There is need to have linkages between universities and private firms/entrepreneurs as universities and research centres play multi-dimensional role in generating new ideas and supporting new enterprise development through research findings. Knowledge of economic trends such as inflation/ environmental changes would better equip entrepreneurs for sustainable economic activities.

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