Does Entrepreneurship Drive Economic Growth? Evidence from the BRICS

Vikramsing Gungah
Open University of Mauritius
Reduit
Mauritius
vikramsing.gungah@telfair.ac.mu

Vishal Chandr Jaunky
J&R Institute of Research Ltd.
Curepipe
Mauritius
vishal.jaunky@ltu.se

Abstract—**Empirical studies on the impact of entrepreneurship in boosting economic growth for panel datasets have been quite scanty in the literature. Entrepreneurs are considered to be educated, ambitious and incentive-driven. Entrepreneurial ventures relatively have greater avenue for generating new revenue. Current businesses may remain confined to the scope of prevailing market conditions and hit the glass ceiling in terms of returns. New and upgraded products or technologies from entrepreneurs enable new markets to be developed and new wealth created [1]. This study analyzes the contribution of entrepreneurship to economic growth for the BRICS countries over the period 2001-2014. Using the generalized least squares (GLS) method, evidence of a positive and statistically significant impact of entrepreneurship on economic growth is found. Policies aiming at boosting entrepreneurial activity should hence be encouraged by the BRICS**

Keywords- Entrepreneuship, Economic Growth, BRICS; **JEL Code**

I. INTRODUCTION

The current paper aims to understand the correlation between the established business ownership (BOR) and the economic growth in the BRICS group of nations (Brazil, Russia, India, China and South Africa). The importance of this research is to establish whether in this group of nations characterized by high economic growth potential the prevalence of entrepreneurial activities is having an effect on this growth trend. Even though research linking entrepreneurship and economic growth as proxy the Gross Domestic Product (GDP) abounds, this particular group has not been studied under this angle. This paper differs to and contributes to previous research initiatives in two important ways. First, the focus is on the BRICS nations and second, an econometric application is used to understand the nexus between the BOR and the GDP growth trends in these countries.

This study aims to fill the gap by investigating the causal nexus between BOR and GDP growth in the BRICS and tries to explore further the causes for the type of linkage with the help of fitting a regression model. This study proceeds upon and extends the Global Entrepreneurship Monitor (GEM) research. The World Bank database was also use to source the real GDP per capita (LGDP) and the real GDP data from 2001 to 2014.

II. LITERATURE REVIEW

There is a recognized praxis that entrepreneurship contains comprehensive capacities to stimulate socio-economic progress. Per se, numerous studies established the momentous relationship between entrepreneurship and socio-economic progress [2-8]. In fact, Hafer (2013) [9] stated that the various economic growth models extended and integrated measures of entrepreneurship. Romer (1986) [10] and Lucas (1988) [11] models of endogenous growth posited that bases for growth is reflected through the sentient and sensible economic actions of the various economic actors. However, empirical studies have disclosed evidences for convergence in growth rates [12-14]. This corroboration hints towards exogenous growth model of Solow (1956) [15]. The basic Solow Growth Model (1956) [16] has been distended to include numerous factors that could accord theoretical understanding to empirical economic growth observed [9]. Accordingly, the integration of entrepreneurship in the neo-classical growth model has steered the understanding of the active process, by which the factors of production forgather and interacts, to generate economic growth [16].

Schumpeter (1947) [17] reasoned that economic growth is not self-determining and self-sufficient and is reliant on exogenous factors and he acknowledged the importance of entrepreneurship as a factor of economic growth. Moreover, Howitt and Aghion (1992) [18] demonstrated that there is a link between profit-seeking initiatives and investments and the entrepreneurs. On the other hand, Arc and Audretsch (2003) [19] contended that the entrepreneur thus may impact growth through these profit-seeking initiatives which usually take the form of innovation and the phasing in of new production processes and market offerings. Audretsch and Keilbach (2004) [20] claim that entrepreneurship bestow to economic growth through an enhanced competition and diversity as well as knowledge transfer.

Wong *et al*. (2005) researched from the GEM index and proposed that only "*high-potential entrepreneurship*" has a substantial and positive impact on economic growth – they

argued that fast growing firms do account for job creation and thus economic growth [21]. On the other hand, van Stel et al. (2005) [22] confirm that entrepreneurship directly impacts on the national growth in high income nations while an increase entrepreneurship in developing countries has been found to negatively affect economy.

On other hand, Acs and Armington (2006) [23] put forward that the link between entrepreneurship and economic activity should be considered and apprehended on the subnational level. Their argument is that regions are homogenous and thus enable mobility of capital and knowledge. Their study focused on the states of the USA. Hobbs *et al.* (2011) [24] investigated the effect of institutional differences on entrepreneurial activity using creation and dissolution of businesses across 288 US urban areas during the period 1990-2003. They found that greater entrepreneurial freedom is engendered by smaller government and larger sphere of economic freedom.

Entrepreneurship, is the process by which the conception and creation of new ventures [25]. In the academic literature, entrepreneurship has been described as a complex and protean phenomenon thus generating an overabundance of definition. The working definition as per the GEM: "… *any attempt at new business or new venture creation, such as self-employment, a new business organization, or the expansion of an existing business, by an individual, a team of individuals, or an established business* [26]".

This definition adopts a broad view on what is understood to be business activity and captures the occupational as well as the behavioral perspectives and corporate entrepreneurship. The measure for the definition is the established business ownership (BOR). The BOR index provides as per GEM the Established Business Ownership Rate (BOR) is the percentage of 18-64 population who are currently owner-manager of an established business i.e. owning and managing a running business that has paid salaries, wages or any other payments to the owners for more than 42 months. [26].

Entrepreneurship had been studied to have a positive effect on innovation [27] through the initiation of novel production forms and rescinding prevailing economic established structures. It has also been studied that innovation has a direct relationship with economic growth. However, there exist a feedback between economic growth and innovation thus creating a virtuous cycle. It has been further argued that a robust enterprise culture and vibrant small business sector is essential to restoring strong growth. Enterprise reinforces economic growth through its bearing on employment and productivity. Innovative and small businesses effort motivate economic growth by encouraging innovation, generating a competitive incentive to standing businesses to move on the intensification of their productivity and making a noticeable contribution to job creation.

III. DATA AND METHODLOGY

The BRICS is group of five nations host more than 2.8 Billion people. Geographically they span over three continents and economically they contribute to more than 25 percent of global GDP [28]. In term of performance the BRICS has been above average global economic performance since the 1990. In fact, the World Average Growth Rate of GDP was 3.35% but the BRICS performance was 4.71% [28]. It was predicted that the BRICS will be grander than the collective economies of G6 by 2050 [31]. The BRICS nations can be expected to turn into the world's primary driver of new demand progress and expenditure [31]. It would be interesting and insightful to understand the role and contribution of entrepreneurship in the predicted development of the BRICS.

	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Gross domestic product (GDP) - Current Prices/Billion US$)												
Brazil	657	892	1108	1396	1695	1666	2209	2613	2412	2391	2346	1775
Russia	260	764	990	1300	1661	1223	1525	1525	2001	2080	1881	1326
India	477	834	948	1239	1226	1366	1708	1708	1836	1875	2069	2074
China	1205	2269	2730	3525	4561	5060	6040	6040	8461	9495	10361	10866
South Africa	136	258	272	299	287	297	375	375	397	366	350	313

Table 1: GDP Current Prices US$ 2000-2015(Source IMF 2016)

		2001	2002	2003	2004	2005	2006	2007
Brazil	GDP Trend	15.60	16.08	16.26	17.20	17.75	18.45	19.57
	BOR	3.79	7.76	7.62	10.11	10.11	12.09	9.94
Russia	GDP Trend	10.00	10.47	11.24	12.05	12.86	13.86	15.04
	BOR	1.10	1.11	1.22	1.34	1.57	1.57	1.68
India	GDP Trend	8.77	9.11	9.82	10.60	12.66	12.66	13.75
	BOR	8.76	12.15	10.51	8.88	5.60	5.60	5.53
China	GDP Trend	73.71	81.16	88.78	93.92	102.89	111.91	116.09
	BOR	10.50	10.58	13.82	13.24	12.92	12.92	8.39
S.Africa	GDP Trend	16.22	15.29	20.54	24.25	25.19	24.57	22.56
	BOR	0.83	1.12	1.08	1.44	1.30	1.72	2.01
		2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Brazil	GDP Trend	20.57	20.54	22.09	22.95	23.39	24.10	24.12
	BOR	14.59	11.84	15.26	12.23	15.19	15.44	17.51
Russia	GDP Trend	15.83	14.59	15.25	15.90	16.46	16.67	16.79
	BOR	1.11	2.28	2.79	2.84	2.05	3.41	3.95
India	GDP Trend	14.28	15.49	17.08	18.22	19.24	20.52	22.01
	BOR	16.50	15.33	14.16	13.00	11.83	10.66	3.73
China	GDP Trend	109.94	119.08	123.59	121.88	127.61	134.08	143.78
	BOR	12.77	17.16	13.77	12.67	12.45	11.04	11.59
S.Africa	GDP Trend	21.93	20.27	21.59	22.84	21.94	20.02	17.72
	BOR	2.31	1.42	2.05	2.34	2.32	2.86	2.68

Table 2: GDP Trend and Established Business Ownership

Entrepreneurship has been researched to be instrumental in both industrialized and emerging economies [32]. Babson College (USA) and London Business School (UK) started a joint project which aimed to consider the reasons behind some

countries are more entrepreneurial when compared other [34]. The GEM's methodology has been labelled to be tried-and-tested and hinges on a network of local experts to GEM is considered to be the foremost study of entrepreneurship and is a trusted resource on entrepreneurship for international organizations like the UN and World Bank. [35]

Follows is the graphical representation between the GDP trends of the different BRICS nations and the Established Business Ownership Rate.

As can be observed from the figures below, there seem to be a relationship between the GDP trends and the Established Business Ownership in Brazil, Russia, China and Africa. However, the case of India shows a sheer difference between these two components. Further investigation will be required to understand this particular situation.

Several models are to be applied, namely, the pooled ordinary least squares (OLS), fixed-effects, random-effects and generalized least squares (GLS) methods. The fixed-effects model assumes that the individual specific effects are correlated with the independent variables while the random-effects model assumes that the individual specific effects are correlated with the independent variables. The Hausman test can be used to discriminate between the fixed- and random-effects models. The GLS can be applied in case residuals are heteroskedastic and autocorrelated.
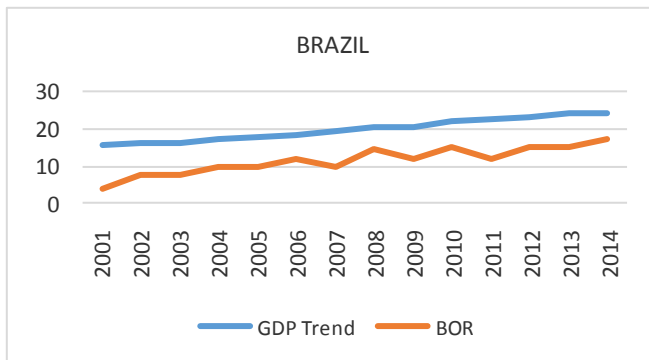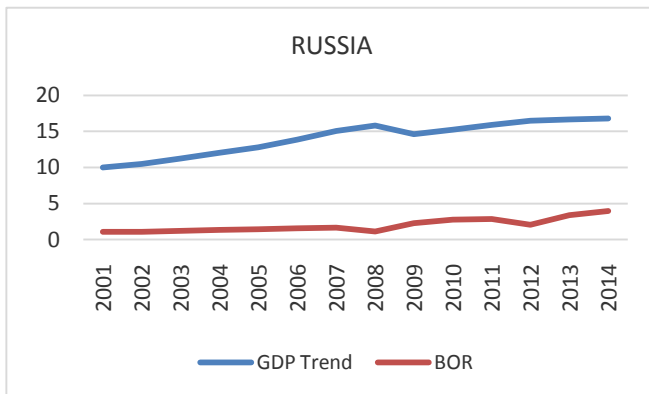

Figure 1: GDP Trend / BOR – Brazil

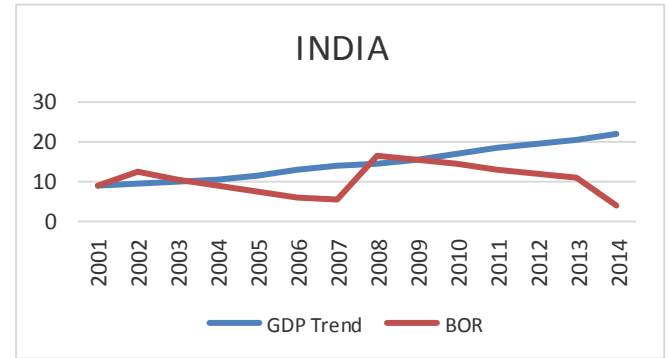Figure 2: GDP Trend / BOR – Russia
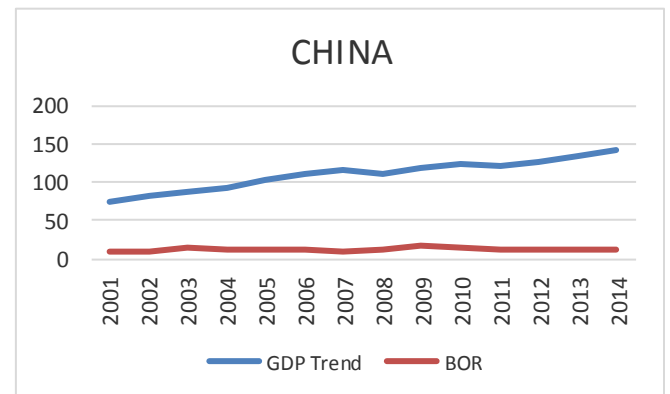

Figure 3: GDP Trend / BOR – India
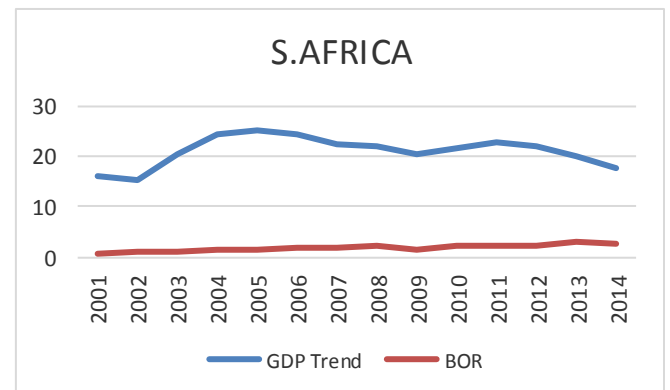

Figure 4: GDP Trend / BOR – China

Figure 5: GDP Trend / BOR – S. Africa

IV.   RESULTS

This paper uses an econometric framework by the specifying a Cobb-Douglas production function as follows:

$$Q_{it} = A_{it} L_{it}^{\beta 1} K_{it}^{\beta 2} E_{it}^{\beta 3} U_{it} \tag{1}$$

where Q is total output, A is total factor productivity, K is total physical capital of the country, L is labour, E is entrepreneurship activity and U is an error term. Note that i is used to index countries and t time.

Equation 1 can be transformed into linear form by taking the natural logarithmic on both sides. The respective coefficients can then represent the output elasticity with respect to each dependent variable.

$$q_{it} = a_{it} + \beta_1 l_{it} + \beta_2 k_{it} + \beta_3 e_{it} + u_{it} \qquad (2)$$

The small letters denotes that the variables are in natural logarithmic terms. The dependent variable, the output level of the country, has been measured by GDP (constant 2010). The physical output k has been proxied by the investment to GDP ratio (27) and we use labour force to capture the effect of L. The three variables have been made available from the World Development Indicators while variable e is the BOR as compiled by the GEM (29). The descriptive statistics is given in Table 1.

TABLE I.   SUMMARY STATISTICS

Variable	Mean	Std. Dev.	Maximum	Minimum
q	28.547	00.794	27.537	30.297
l	5.7856	0.2558	5.4092	6.2269
k	18.740	1.3586	16.618	20.508
e	1.5105	0.7331	.29120	2.6499

Equation 2 is run using several methods and the estimates are reported in Table 2.

TABLE II.   COBB-DOUBLAS ESTIMATES

Coefficient	Pooled OLS	Fixed-Effects	Random-Effects	GLS
β_1	1.5255 (0.2211)***	0.7901 (0.2210)***	1.0492 (0.1820)***	0.5718 (0.1090)***
β_2	-0.04288 (0.0625)	1.4703 (0.5562)**	0.5118 (0.2896)*	0.1845 (0.1019)*
β_3	0.5167 (0.1026)***	-0.1368 (0.0734)*	-0.08192 (0.0698)	0.12954 (0.0407)***
a	23.439 (0.9744)***	-1.4581 (9.8740)	15.5495 (5.1539)***	22.923 (1.7931)***
R^2	0.6395	0.2958	0.3800	-
CRS $\chi^2 (1)$	20.51 [0.000]***	7.61 [0.0078]***	3.69 [0.0548]*	0.76 [0.3848]
Observations	65	65	65	65
Countries	5	5	5	5

Note: ***, **, * denote 1%, 5% and 10% respectively. The standard error is in brackets while the P-value is in square brackets.

Some preliminary tests are conducted. The mean variance inflation factor (VIF) is computed to be 1.60 which is less than 5. This reveals that multicollinearity is not a serious issue. The F-test of the joint significance of the fixed effects intercepts is computed as $F (4, 57) = 195.08$ [0.000]. The null hypothesis that all of the fixed effect intercepts are zero is clearly rejected. Thus the fixed-effects model is better suited than the pooled regression model. The Hausman test statistic is equal to 4.70 [0.1952] which signifies that the null of difference in coefficients not systematic cannot be rejected. Therefore the random-effects model is better suited than the fixed-effects model. The Cobb-Douglas production function imposes the restrictive assumption of $\beta_1 + \beta_2 + \beta_3 = 1$ i.e. constant returns to scale (CRS). As exposed in Table II, the CRS assumption

does not hold for the pooled OLS, fixed-effects and random-effects models. The Wooldridge test for autocorrelation is F $(1, 4) = 96.858$ [0.0006]*. The null of no autocorrelation is clearly rejected. The Modified Wald test for groupwise heteroscedasticity in fixed effect regression model is $\chi^2 (5) = 1923.62$ [0.0000]*. The null of homoscedasticity is rejected. The GLS model is run assuming there is first-order autocorrelation and the coefficient of the AR (1) process is specific to each panel while controlling for heteroskedasticity. The CRS assumption holds for the GLS model.

The unrelenting growth displayed by these large emerging countries over the last decade, have led them to growth rates considerably above the global average. The coefficient as computed by the GLS reflects that established business ownership does have a positive and statistically significant at 1%. The statistics reveals a direct and strong relationship between business ownership rate and economic growth in the BRICS. This is confirmed by other authors in other contexts [30]. All other variables are statistically significant at conventional levels and have the expected sign.

V.   CONCLUSION AND POLICY IMPLICATIONS

The relationship between the entrepreneurship and economic growth is complex, as it involves a variety of different economic aspects. This study attempted to analyze single proxy variable for each economic concept. For this purpose, the GEM dataset and World Bank Datasets were studied, collated and yielded a final dataset for the BRICS countries for the analysis. This database comprises several entrepreneurial measures constructed on the basis of studies of at least 2,000 respondents per nation [34] The GLS was exploited to investigate the determinants of possible economic growth relationship and the established business ownership rate of these nations.

The results have important policy implications for the BRICS. The fact that the BRICS countries is recalibrating the world economy and house 3.6 Billion people i.e. half the world population, developing an entrepreneurial society will enhance the structural economic canvas of these nations [35]. Government and economists studies and reflections on governance indicators such as freedoms are necessary for competition. Thus, developing an economic environment conducive to developing small business and enterprises will enable a sustainable economic growth pattern to drive and lead the economic and social performance.

The fact that all the BRICS nations are factor-driven economies implies that developing their entrepreneurial base may result in the steady shift towards an efficiency-driven economy. Entrepreneurial firms have been research extensively to enable economic transitioning [5, 22]. Thus, establishing economic guidelines and policies to enhance business ownership within these economies will drive the evolution of these massive economic systems.

Porter [36] established that entrepreneurship is at the core of creating national advantage. Referring to the strong

statistical relationship between the established business ownership and economic growth it can be posited that through entrepreneurship innovation is generated.

Acs and Szerb [37] studied and reported that the entrepreneur has fulfilled diverse role. As such, taking the Schumpeterian perspective [38, 39] on the entrepreneur it can be understood that the entrepreneur redefine novel combinations of resources. On the other hand Kirznerian [40] view is that the entrepreneur is one who can perceive profitable opportunities and on the Knightian [41] view is that the entrepreneur assumes the risk accompanying with uncertainty. Begley et al [42] contended that different business environment circumstances may impact the appearance of diverse forms of entrepreneurs. Thus these different nations having different economic set ups will enable the generation of different typologies of entrepreneurial ventures.

Relating the above to the aggregate level of entrepreneurial activity seems to reflect general macro-economic conditions. This activity modulates itself with the shifts in GDP. The GEM [35] study also establish that entrepreneurial activity may be structural in its core. The implications for the BRICS set of nation is diverse and carries relevance to sustain their growth trajectory.

Thus the policies pertaining to the development of sustainable entrepreneurial firms should be engineered to encourage the establishment of entrepreneurial firms.

REFERENCES

[1] Seth S (2015) "Why Entrepreneurs Are Important for the Economy" http://www.investopedia.com/articles/personal-finance/101414/why-entrepreneurs-are-important-economy.asp accessed 18 Dec 2016.J.

[2] Schumpeter, J. (1934).The Theory of Economic Development, Harvard University Press, Cambridge, MA.

[3] McClelland, D., Atkinson, J.W., Clark, R.A. and Lowell, E.L. (1953), The Achievement Motive, The Free Press, New York, NY..

[4] Kirzner, I.M. (1973), Competition and Entrepreneurship, The University of Chicago Press, Chicago, IL

[5] Casson, M. (1982), The Entrepreneur: An Economic Theory, Martin Robertson, Oxford

[6] Low, M.B. and MacMillan, I.C. (1988), "Entrepreneurship: past research and future challenges", Journal of Management, Vol. 14 No. 2, pp. 139-61.

[7] Kirchhoff, B.A. (1989), "Creative destruction among industrial firms in the United States", Small Business Economics, Vol. 1, pp. 161-73.

[8] Baldwin, J.R. (1995), The Dynamics of Industrial Competition, University Press, Cambridge.

[9] Hafer R.W, (2013),"Entrepreneurship and state economic growth", Journal of Entrepreneurship and Public Policy, Vol. 2 Iss 1 pp. 67 – 79

[10] Romer, P.M. (1986), ''Increasing returns and long-run growth'', Journal of Political Economy, Vol. 94, pp. 1002-37.

[11] Lucas, Jr. R.E. (1988), ''On the mechanics of economic development'', Journal of Monetary Economics, Vol. 22, pp. 3-42.

[12] Kormendi, R. and Mequire, P. (1985), ''Macroeconomic determinants of growth: cross-country evidence'', Journal of Political Economy, Vol. 101, pp. 485-517

[13] Baumol, W. (1986), ''Productivity growth, convergence and welfare'', American Economic Review, Vol. 76, pp. 1072-85.

[14] Alesina, A. and Roderik, D. (1994), ''Distributive policies and economic growth'', Quarterly Journal of Economics, Vol. 109, pp. 465-90.

[15] Solow, R. (1956), "A contribution to the theory of economic growth", Quarterly Journal of Economics, Vol. 70 No. 1, pp. 65-94.

[16] Holcombe, R.G. (1998), "Entrepreneurship and economic growth", The Quarterly Journal of Austrian Economics, Vol. 1 No. 2, pp. 45-62

[17] Schumpeter, J.A. (1947), "Theoretical problems of economic growth", Journal of Economic History Supplement, Vol. 7, Supplement 1, pp. 1-9

[18] Howitt P and Aghion P. A Model of Growth Through Creative Destruction Econometrica, Vol. 60, No. 2 (1992), pp. 323-351

[19] Acs, Z.J. and Audretsch, D. (Eds) (2003), International Handbook of Entrepreneurial Research, Kluwer Academic Publishers, Dordrecht.

[20] Audretsch, D.B. and Keilbach, M.C. (2004), "Entrepreneurship and regional growth: an evolutionary interpretation", Journal of Evolutionary Economics, Vol. 14 No. 5, pp. 605-616.

[21] Wong, P.K., Ho, Y.P. and Autio, E. (2005), "Entrepreneurship, innovation and economic growth: evidence from GEM data", Small Business Economics, Vol. 24 No. 3, pp. 335-350.

[22] van Stel, A., Caree, M. and Thurik, A.R. (2005), "The effect of entrepreneurial activity on national economic growth", working paper, Max Planck Institute of Economics, Jena.

[23] Acs, Z.J. and Armington, C. (2006), Entrepreneurship, Geography, and American Economic Growth, Cambridge University Press, New York, NY.

[24] Hobbs, B.K., Stansel, D. and Gohmann, S. (2011), "Local government finance and entrepreneurial activity in US metropolitan areas", working paper

[25] Gartner, W. B. (1985). A framework for describing and classifying the phenomenon of new venture creation. Academy of Management Review, Vol. 10 No.4, pp. 696–706.

[26] Hobbs, B.K., Stansel, D. and Gohmann, S. (2011), "Local government finance and entrepreneurial activity in US metropolitan areas", working paper

[27] Gartner, W. B. (1985). A framework for describing and classifying the phenomenon of new venture creation. Academy of Management Review, Vol. 10 No.4, pp. 696–706.

[28] GEM Wiki. Internet access: http://www.gemconsortium. org/about/wiki, [accessed Dec 16, 2016].

[29] Gary Madden Scott J. Savage, (2000),"Telecommunications and economic growth", International Journal of Social Economics, Vol. 27 Iss 7/8/9/10 pp. 893 – 906

[30] Galindo Miguel-Ángel and Méndez-Picazo María-Teresa (2013), Innovation, entrepreneurship and economic growth", Management Decision, Vol. 51 Iss 3 pp. 501 – 514.

[31] Lakshmi P., Visalakshmi S. and Shanmugam K , (2015)," Intensity of shock transmission amid USBRICS markets ", International Journal of Emerging Markets, Vol. 10 Iss 3 pp. 311 – 328

[32] Wennekers, ARM and Thurik A.R (1999) Linking entrepreneurship and economic growth, Small Business Economic 13.P27-55 [30] O'Neill, J. (2007). BRICs and beyond. Goldman Sachs Economic Research Group, New York, NY. Retrieved from http://www.goldmansachs.com/our-thinking/archive/ archive-pdfs/brics-book/brics-full-book.pdf

[33] Wilson, D., & Purushothaman, R. (2003). Dreaming with BRICs: The path to 2050 (Vol. 99). New York, NY: Goldman Sachs & Company.

[34] Mengsha, T. (2010). The development prospects of the BRICs countries. Commodity and Quality, 6, 30

[35] Reynolds, P., Bosma, N., Autio, E., Hunt, S., De Bono, N., Servais, I., Lopez-Garcia. P., Chin, N. (2005). Global Entrepreneurship Monitor: Data Collection Design and Implementation 1998–2003 // Small Business Economics. Vol. 24, No. 3, p. 205–231.

[36] GEM (2014), Global Entrepreneurship Monitor, GEM.

[37] Porter, M. E. (1990), The Competitive Advantage of Nations, New York: Free Press.

[38] Acs, A.J. and Szerb, L. (2007), "Entrepreneurship, economic growth and public policy", Small Business Economics, Vol. 28 No. 2, pp. 109-122.

[39] Schumpeter, J.A. (1934), The Theory of Economic Development, Cambridge, MA: Harvard University Press.

[40] Schumpeter, J.A. (1950), Capitalism, Socialism and Democracy, New York: Harper and Row.

[41] Kirzner, I.M. (1997), Entrepreneurial discovery and the competitive market process: an austrian approach, Journal of Economic Literature 35, 60-85.

[42] Shane, S. (2000), Prior knowledge and the discovery of entrepreneurial opportunities, Organization Science 11, 448-469.

[43] Begley, T.M., Tan, W.L. and Schoch, H. (2005), "Politico-economic factors associated with the interest in starting a business: a multi-country study", Entrepreneurship Theory and Practice, Vol. 29 No. 1, pp. 35-55.