Innovation and Entrepreneurship: Key Strategy for Poverty Alleviation

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Abstract: The current study investigates the role of private sector as a poverty reduction strategy. Itattains this objective by using data from 58 different countries, where two proxies capturing innovation and entrepreneurship (I+E) are used. Findings from the regression estimates and scatter plot indicate that the two reduce poverty significantly as hypothesized. Furthermore, poverty falls by a much larger magnitude when innovation interacts with entrepreneurship. The paper concludes by rejecting the postulated testable null hypotheses.

Keywords:enterprise, patent, entrepreneurship, private sector, innovation, poverty.

Practical Application

This article provides insights on the role I+E can play in public policy in promoting economic growth and reducing poverty. Empirical evidence from the sample confirms that countries that lead in innovation and enterprise development are the least poor.

The study findings have important bearing to the conference theme that countries should promote I+E since the two play a leading role in stimulating economic growth and poverty alleviation.

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Innovation and Entrepreneurship (I+E): Key Strategy for Poverty Alleviation

I. Introduction

Public policy over time has focused on poverty reduction strategies as a way to improve the living standards of the poor and promote their welfare. Estimates show that, of the world's 6 billion people, 2.8 billion live on less than $2 a day and 1.2 billion on less than $1 a day at 2005 purchasing power parity (PPP) (World Bank, 2000/2001) and (Ravallion, Martin and Chen, Shaohua, 2008).

However, an updated recent report (Marcio Cruz, James Foster, Bryce Quillin and Philip Schellekens, October, 2015) paints a different picture; but with similar results. That, poverty globally has decreased in general terms with the poorest people found in same global regions. It reveals that under the new world poverty line of $1.90 a day using 2011 world purchasing power parity. South Asia and Sub-Saharan Africa tops it with staggering numbers of 362.3 and 393.5 in 2011 declining to 309.2 and 388.5 (millions) in 2012 respectively of their people living in extreme poverty.

Table 1 Global Poverty Trend (1990 - 2015) Using Poverty Line of $ 1.90 a Day (at 2011 PPP)

	Historical						Headline		Projection	
Region	1990		1999		2011		2012		2015	
Population share* and Millions of People** under $ 1.90 a day (2011 PPP)										
East Asia and Pacific	60.8	999.3	37.5	689.7	8.5	173.1	7.2	147.2	4.1	82.6
Europe and Central Asia	1.9	9	7.8	36.6	2.7	12.7	2.5	12	1.7	4.4
Latin America and Caribbean	17.7	78	14.1	72.2	6.5	37.1	6.2	37.1	5.6	29.7
Middle East and North Africa	-	-	-	-	-	-	-	-	-	-
South Asia	50.6	574.5	41.2	560.1	22.2	362.3	18.8	309.2	13.5	231.3
Sub - Saharan Africa	56	284	58.1	375.4	44.3	393.5	42.6	388.5	32.2	347.1
Developing World	44.3	-	34.2	-	16.6	-	15	-	11.9	-
World	37.1	1958.5	29	1746.6	14.2	987.4	12.8	902	9.6	702.1

Source: **PovcalNetDatabase2015 available at** (World Bank , 2015)

Notes: *The <u>underlined and bolded</u>** figures indicate the **<u>Population share*</u>** under $1.90 a day (2011 PPP).
**The *italicized* and *shaded cells* figures capture the *Millions of People under $ 1.90 a day (2011 PPP)*.

The figures for 2015 in the table above are statistical projections based on various growth scenarios and distributional assumptions as such they should be treated with considerable circumspections Marcio et al (2015).

However, several studies show that these numbers have neither increased nor decreased in some regions; in aggregate poverty globally is increasing (Ravallion, Martin and Chen, Shaohua, 2008). The decrease in poverty rates may be due to increased inflow of development aid from the developed countries, growth in exports from these countries, especially of the natural resources such as minerals; and individual government efforts to improving social services such as education and health. There are mixed feelings on the outcomes of the foreign direct investment (FDI) and international trade as an engine of economic growth and therefore poverty reduction.

A new poverty reduction strategy paradigm provides a shift towards policies that focus more on private sector initiatives. This led to a growing body of literature that emphasize innovation and entrepreneurial(I+E)[1] solutions to global poverty, which argues that there are a number of advantages over the traditional public sector initiatives (Eversole, Undated). Others went further, suggesting a policy sandwich that involves the now famous Private-Public-Partnership initiative. These private sector initiatives are less centered on philanthropic donations, which have thus far ultimately failed to effectively combat global poverty.

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[1] This abbreviation is a creation of this paper signifying the idea that innovation and entrepreneurship synergizing, which results into a compounded effect to the response variable.

Instead, enterprise-based solutions to end poverty are engineered to focus on developing small business or enterprises and innovations, which spur increased total factor productivity (TFP)[2] and overall economic growth (Chu, 2010). In doing so, private sector strategies are supplying poorer nations with much more sustainable resources than capital donations; gaining an understanding of new markets that provide these nations with the tools to generate their own wealth on an ongoing basis (Chu, 2009).

The current study aims at shading new light on the role that can be played by I+Ein mitigating poverty in developing countries. It intends to show that I+Eskills augment the conventional policy framework; the two are complementary rather than substitute.

The organization of the paper is as follows: Section 2 provides a literature review that includes theoretical as well as empirical studieson the thesis. In section 3, the study details the methodological approach, states the testable hypotheses and it specifies themathematical model used for analysis. Next, section 4 expounds data issues. The section details the sample constructs and mentions data sources. The penultimate section promulgates the paper findings. Finally, section 6 is more speculative because caveats are drawn and conclusions advanced.

II.   Literature review

Poverty rate measures

Poverty is multidimensional; it affects the society in various ways, robs people of their dignity and limits their ability to improve their lives. It is useful to mention that the study used a poverty line[3]pegged at $ 1.25 a day at 2005 purchasing-power parity (PPP) from research work(Ravallion, Martin and Chen, Shaohua, 2008). Recent work by the World Bank Research Group (World Bank, 2015) provided an updateEarlier studies distinguish two types of poverty (Marx & Bosch., Unknown). First, relative poverty explains the cost of social inclusion and equality of opportunity in a specific time and space (Adamson, 2012; Bradshaw, et al., 2012).Second, absolute poverty or extreme poverty means the absence of enough resources to secure basic life necessities.
In this research paper, it means not having access to basic human needs – such as food and clean water (Shirima 2001). Despite the colossalamount of economic funding that has been invested in combating the world poverty crisis, global poverty rates remain high; this is evidence of the ineffectiveness of the top-down government funding as a strategy to reduce global poverty.

Other solutions to ending international poverty have relied on grassroots and humanitarian efforts, all of which are predominantly aid-based initiatives (Wheeler III, 2010). The inefficiency of these aid-based approaches has engendered a different type of strategy to ending global poverty, one that strays from the traditional structure and governing authority.

Innovation and Entrepreneurship (I+E)

This paper reviews some theory and evidence about the role of entrepreneurial activity in economic development and poverty alleviation. Possible explanations of the role of entrepreneurship in economic development are discussed in (Richardson, 2004), whose findings were indeterminate and were left for further future research. The main thesis of the paper is that, entrepreneurs by setting up enterprises enhance economic growth by generating incomes, creating employment opportunities, paying state taxes, making available varieties of goods and services and at competitive prices. These views are shared by other studies; see for instance, (Bhattacharya M & Bloch H, 2004), (Clark, 2002) and (Porter, 1990). Entrepreneurs facilitate innovations and therefore improve productivity. This study aims at investigating the role plaid by I+E in poverty reduction.

This strategy relies on *innovationand enterprise*based solutions to foster social change and *bottom-up* economic growth(Wheeler III, et al. 2010).Thecurrent study recognizes at the heart of entrepreneurship, are the entrepreneurs responsible for opportunity spotting and accumulating the factors of production (Robson and Obeng, 2008)necessary for the creation of new ventures.

They are also responsible for decisions concerning *strategy* and *innovation*. In Small Medium Enterprises (SMEs), the entrepreneur is likely to have an exaggerated impact on the strategy of the firm; thus, any attempt to investigate innovation ought to include analysis of the characteristics of the entrepreneur (Donckels R & Froehlich

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[2] TFP is a variable that accounts for effects in total output not caused by inputs. For instance, in Cobb–Douglas function given as $= A * K^{\alpha} * L^{\beta}$; (Y) Represents total output as a function of total-factor productivity (A), capital input (K), labor input (L), where α and β are the input share contribution for K and L respectively.

[3]The Poverty line is also known as poverty threshold or poverty limit refers to the minimum level of income deemed adequate in a particular country.[1]

E, 1991). Unlike aid-based and/or public sector efforts, which are primarily government funded and supply aid in the form of capital to under-developed nations, this study examinesa new solution that is private sectorbased.

In another study,(Ans & Tulder, 2006), focused on international perspective expounding how Multinational Corporations (MNC), international organizations, Non-Governmental Organizations (NGOs), and business associationscan contribute in combating poverty. One such effort used by these organizations is the CSR[4], which has attracted huge debate in literature recently.

The contribution of the study to knowledge

The current study is the first of its kind in three main ways. Now, there is no other study that has treated or modeled I+E as a policy strategy towards poverty alleviation. Secondly, a world sample dataset construct has been developed covering about 58 countries for the period between 2001 and 2008 with a potential for expansion in future research.

Finally, a simple ordinary least squares (OLS) econometric model is specified to establish statistical association between defined proxies of *poverty levels*;*innovation*(that is captured by worldwide patent applications submitted for registration); and *entrepreneurship* depicted by the global business registration database. Both proxies cover our study period of interest.

Limitations to the Study

The study aims at testing theory as postulated in the hypotheses. Comparable recent data was not available for the proxies or variables of interest and for the seven sub-continental regional coverage. As such, the study resorted to the use of data for the period 2001 to 2008. Moreover, the newer world poverty line of $ 1.90 at 2011 PPP seems to be disputable and unrealistic for several reasons, which are beyond the scope of this study. Thus, the selected period for this study remains technically and statistically appropriate.

III.   Methodological Approach

The study explores the advancement of I+E as a policy alternative to reduce poverty,using data for the period stretching between 2001 to 2008[5]. The reason being that data is simultaneously available for the three proxies of interest.

It covers a sample of low and middle-incomedeveloping countries where data is available for allproxies and postulates that, I+E jointly reduce poverty. Further, it argues that entrepreneurship increases the production and varieties of goods and services available at any given time at competitive prices.For complete discussions on this topic,see(Porter, 1990). This widens individual choices of the consumers' basket; improving their welfare and hence reducing poverty(Chipika S & Wilson G, 2006).

To attain its objectives, the study used world poverty measures[6] imputed by the World Bank, obtained from PovcalNetwebsite[7](Shaohua Chen and Martin Ravallion, 2008). Data on innovation comes from World Intellectual Property Organization (WIPO), while data on entrepreneurship comes from the Global Entrepreneurship Monitoring (GEM)[8] and from the World Bank,specifically from the World Bank Global Entrepreneurship Survey (WBGES). In the next two sub-sections a description of the study hypotheses and the applied mathematical models are given.

Testable Hypotheses

The study advanced two testable hypotheses postulated commonly as H0 and H1 like in any scientific research[9]:

> *H0: As the numberof enterprises increase, poverty rates do not decline.*
> *H1: As the number of enterprises increase, poverty rates decline significantly.*

This is shown by the negative association of the estimated variables using OLS regression analysis.
Nonetheless, the study turns into innovation where:

> *H0: An increasednumber of patents registrationsimply that the influence of the entrepreneurship proxy is not magnified and therefore poverty rates do not fall drastically.*
> *H1:An increased number of patents registrationsimply that the influence of the entrepreneurship proxy is magnified and therefore poverty rates fall drastically.*

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[4] This is an acronym for Corporate Social Responsibility.

[5]The study period of interest does not matter; rather the underlying theory is what matters.

[6]These measures are namely *head count, poverty gap ratio or incidence,* and *sum squared poverty measures* see for instance (Shirima, et al., 2009).

[7]<http://econ.worldbank.org/povcalnet>

[8] GEM begun in 1999 as a joint project between Babson College (USA) and London Business School (UK).

[9] These are the null and alternative hypotheses respectively.

This is achieved byestimating two regressions (models 1 and 2) with and controlling for the impact of innovation. Then the study compares the size and magnitudeof the coefficients.

Poverty Model Specification

Mathematically,the three poverty measures take the form:

$$P_{\alpha,i} = \left[\max\left((1 - \chi_i / \upsilon), 0\right)\right]^{\alpha} \text{ and } \alpha \geq 0 \qquad \text{.........(1)}$$

where χ_i is the per capita consumption expenditure for household i and υ stands for poverty line. Hence α is a non-negative parameter that may take the values of 0, 1 and 2. The implication being, P_0 gives estimates for headcount index, P_1 denotes the poverty gap ratio and P_2 provides for sum squared poverty gap index (Shirima 2009).Thus equation (1) above gives the individual level poverty measures and aggregate poverty measure is attained by taking the mean across all individuals such that:

$$P_{\alpha} = \sum_{i=1}^{n} P_{\alpha,i} / \eta \qquad \text{..............(2)}$$

Where η is the sample population size.

Econometric Model Specification

An OLS econometric model specification given in (3)below is invoked to estimate the degree of association between the various variables. The model functional form is linearized by adopting double log formulation to allow the resulting coefficients to be interpreted as coefficients of elasticity.

Theestimation model specification allows poverty measures to enter the equation asdependent variable while the I+Eproxies are treated as explanatory variables. The innovation proxy enters the model exponentially. The implication is that advancement in entrepreneurship relies on the rate of innovation.

Let us denote innovation and entrepreneurship in country i at time$t$symbolically as E_{it} and β_{it} respectively. In addition, the section introduces two parameters $\phi \text{ and } \lambda$ thataretheintercept andcoefficients estimated accordingly.

Whence, model 1 may be written as:

$$P_{\alpha,i} = \phi + \lambda \left[E_{it}\right]^{\beta_{it}} + \varepsilon_{it} \qquad \text{.......................(3)}$$

ε is the error term with all the necessary properties.[10]

Thus, taking the double log of (3) above we can write:

$$In[P_{\alpha,i}] = \phi + \lambda \beta_{it} \, In[E_{it}] + \varepsilon_{it} \qquad \text{...(4)}$$

It follows from (4) above that the estimated results can be interpreted as coefficients of elasticity.

Analogously, Model 2 involves controlling for the innovation parameter looks like:

$$In[P_{\alpha,i}] = \phi + \lambda \, In[E_{it}] + \varepsilon_{it} \qquad \text{.......................................(5)}$$

In the final analysis, the size and signs of the coefficients of the two models are compared to ascertain the significance of how they differ from one another.

Scatter Plot Analysis

The first level of analysis, involvesexamining the association of the dependent (poverty rates) and independent (I+E) variables using econometric analysis.Where the main findings aim at validatingthe study's testable hypotheses that with increased entrepreneurship with and without controlling for innovation poverty levels decline significantly.[11]At

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[10] That is they are identically independently distributed (i.i.d).

[11]Results confirm that, poverty falls by even larger magnitudes when innovation interacts with entrepreneurship.

the second level of analysis, scatter plots are presented usingthe two explanatory variables against the dependent variable for all the seven disaggregated geographical regions.

IV.   Data Issues

Data Sources

The study uses different sources of data as explained elsewhere in this study. Secondary data[12]constitute our mainsource.To attain its objectives, the study ascertains the interaction between the three proxies used herewith:

(i)   *Poverty Rates(2001 - 2008)*: Data on poverty rates come from the Shaohua Chen and Martin Ravallion (2008) report. This dataset is the only comprehensive data source that gives the state of the world poverty todate. The updated report of 2015 has some ommisions and coverage is limited; e.g. Middle East and North Africa is not included in the analysis (see table 1 above). It includes estimates drawn from 675 household budget surveys (HHBS) for 116 developing countries, representing 96% of the developing world population.

(ii) *Increasednumber of Patents (2001 - 2008):* The number of patent applicationssubmitted for registration available at World Intellectual Property Organization(WIPO) is used to proxy innovation. It is available for the period starting from 1996, which covers about 192 countries world over.

(iii) *New enterprises registered (2001 - 2008):* Finally, data on entrepreneurship is sourced partly from the World Bank Global Entrepreneurship Survey (WBGES) and Global Entrepreneurship Monitoring (GEM). The data file contains over 72 different variables including proxy on annualbusiness registration from about 108 countries covering the period of our study interest.

Therefore, the study managed to use the sampled annual data covering the periodfrom 2001 to 2008only as mentioned above.

Dataset Development

The three files are merged into a single portable dataset file and used to carry out the analysis.Using data from different sources econometrically serves as instrumental variables to avoid potential bias. Nontheless, larger dataset of this magnitude and from various sources, missing observation cases are ubiquitous. The said annomally is corrected by inputing mean values of the neigbouring observations. This is likely with the poverty data which is imputed from the countrys' Household Budget Surveys (HHBS) that are implemented after three year intervals.

Similarly, inspection on the patent application shows that in most countries there are several missing values not uncommon for developing countries. It is mainly due to the fact that not in every country each year an invention occurs and patent application is submitted. The data properties were corrected for stationarity, heteroskedasticity, and outliers.

Then to capture the impact of I+E on poverty across the globe, the data was disagregated regionally to cover a total of 58 countries:

(i)   *Sub-Saharan Africa*(SSA) - Burkina Faso, Central African Republic, Ghana, Kenya, Madagasca, Malawi, Morocco, Senegal, South Africa, Tanzania, Tunisia, Uganda and Zambia;

(ii) *South America*-Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador and Peru;

(iii) *Caribbean*-Dominican Republic, Haiti, Jamaica;

(iv) *Central America*-Costa Rica, Mexico and Nicaragua;

(v)   *Asian Countries*-Azerbaijan, Bangladesh, India, Indonesia, Kazakhstan, Kyrgyz Republic, Malaysia, Pakistan, Philippines, Sri Lanka, Tajikistan, Thailand and Uzbekistan;

(vi) *Eastern Europe*-Armenia, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Latvia, Moldova, Poland, Romania, Russian Federation, Slovenia and Ukraine and

(vii) *Middle East*- Jordan, Turkey and Yemen.

The above sample selection is highly representative since it covers countries from the developing countries; and none from the USA, Continental Europe and Australia where poverty is a less pressing issue.

V.   Regression Results

Manipulation of the Variables

The paper develops the following variables for estimation:

(i)   Log of headcount poverty measure denoted by L_P,

(ii) Entrepreneurship denoted by E,

(iii) Log of Entrepreneurship denoted by L_E,

(iv) Innovation advancement captured by the number of annual patents applied for registration as β, and

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[12] This refers to the use of data that is available.

(v) Finally, we combined L_E and β multiplicatively that is written as βL_E.

Estimated Results

Results from the doubled-log OLS for both models rejectedthe null hypothesis. It reveals that a 1 percentage increases in both the number of new enterprises (L_E) and patents applied and submitted for registration (βL_E) lowers poverty rates significantly. The findings summarized in tables2 to 8 below depicts that all the variables are inversely related as expected.

Furthermore,the size and magnitude of the βL_E coefficients of elasticities in descending order regional-wise in parentheses are as follows: Caribbeanis (0.866), Central America(0.754), Middle East(0.592), Sub-Saharan Africa (0.295), Asia (0.268), Eastern Europe (0.243), and South America (0.208).They appear to be of larger size and magnitude to those of the second model.

Whence fromtheabove analysis, with innovationcontrolled i.e. using model 2 the inverse association of the variables still holds. Nevertheless, the size and magnitude of the coefficients of elasticities turn out to be much lower. Respecting the above order and for comparability purposes results appear to be Caribbean is (0.697), Central America (0.077), Middle East (0.111), Sub-Saharan Africa (0.223), Asia (0.137), Eastern Europe (0.205), and South America (0.026). This says that, when innovations are translated into new enterprises they tend to reduce poverty substantially.

Specifically, promoting I+Elowers poverty significantly. Nevertheless, when innovation is controlled the estimated coefficients carry the expected signs and all are significant but with a lower influence on the poverty rates. Finally, results of the full model that accounts for the cumulative impact of innovation on entrepreneurship indicates that poverty declines substantially with a much larger magnitude.

Table 2 South America Region

Variables Names	Dependent	
Independent	Model 1	Model 2
	L_P	L_P
βL_E	-0.208 (0.093)*	-
L_E	-	-0.026 (0.000)*
CONST	3.376	1.932
R_SQUARED	0.043	0.001
NO. OBS	55	55

Table 3 SSA Region

Variables Names	Dependent	
Independent	Model 1	Model 2
	L_P	L_P
βL_E	-0.295(0.046)*	-
L_E	-	-0.223 (0.000)*
CONST	4.725	3.637
R_SQUARED	0.087	0.050
NO. OBS	103	103

Table 4 Middle East Region

Variables Names	Dependent	
Independent	Model 1	Model 2
	L_P	L_P
βL_E	-0.592 (0.074) *	-
L_E	-	-0.111 (0.000) *
CONST	3.021	1.234
R_SQUARED	0.350	0.012
NO. OBS	23	23

Table 5 Eastern Europe Region

Variables Names	Dependent	
Independent	Model 1	Model 2
	L_P	L_P
βL_E	-0.243* (0.098)	-
L_E	-	-0.205 (000)*
CONST	2.089	-0.197
R_SQUARED	0.59	0.042
NO. OBS	113	113

Table 6 Central America Region

Variables Names	Dependent	
Independent	Model 1	Model 2
	L_P	L_P
βL_E	-0.754 (0.069) *	
L_E	-	-0.077 (000) *
CONST	5.058	1.638
R_SQUARED	0.568	0.006
NO. OBS	23	23

Table 7 Caribbean Region

Variables Names	Dependent	
Independent	Model 1	Model 2
	L_P	L_P
βL_E	-0.866 (0.096) *	-
L_E	-	-0.697 (0.007) *
CONST	5.209	2.709
R_SQUARED	0.75	0.486
NO. OBS	19	19

Table 8 Asia Region

Variables Names	Dependent	
Independent	Model 1	Model 2
	L_P	L_P
βL_E	-0.268 (0.144)*	-
L_E	-	-0.137 (000)*
CONST	6.465	2.357
R_SQUARED	0.072	0.019
NO. OBS	126	126

[a]Standard errors are given in the parentheses
*Significant at 10% levels

Scatter Plot Schematic Representations

The scatter plot analysis isat two levels. First, it captures the association between poverty rates and patent registration as a proxy for innovation. Second, it explores the relationship between poverty and new enterprises registered proxingentrepreneurship. In both cases, results are very intuitive. They confirmand validate the regression results discussed above. That is, countries with higher poverty rates are associated with lower numbers of patent applications submitted.

Moreover, for countries with higher levels of business registration, representing proxy for entrepreneurship means lower levels of poverty rates. This is because,I+E has a myriad of advantages to the poor such as: creates employment opportunities, generates incomes to the poor, increases output, expands choices of goods and services available, leads to competitive prices, broadens the tax base and enhances government revenues that could allow governments to spend more on social service delivery.

In both scatter plot results depicted in figures 1 and 2 for South America they confirm that, as the predictors (I+E) are fewer in numbers, then the responsevariable (poverty rates) are in the higher range between 10 and 25 percentage points. These results are repetitive in the entire panels from figures 1 through 14.For instance, panels figure 5 and 6;additionally 7 and 8 offers salient examples of how larger numbers of I+Ejointlycould lower poverty rates to the magnitude of a single digit. These results leads to the rejection of the null hypotheses.

Figure 1 Scatter Plot South America Poverty vs Entrepreneurship	**Figure 2 Scatter Plot South America Poverty vs Innovation**
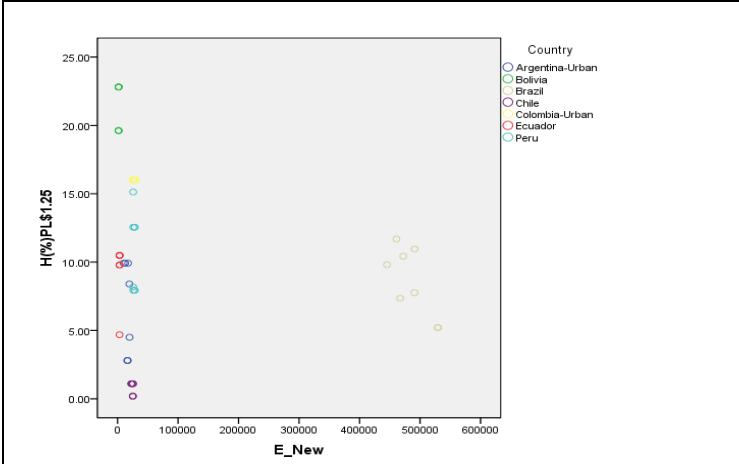
Figure 1 Scatter Plot South America Poverty vs Entrepreneurship

Figure 2 Scatter Plot South America Poverty vs Innovation

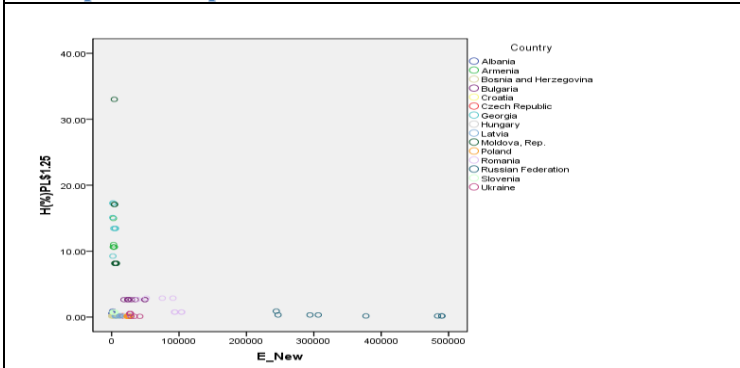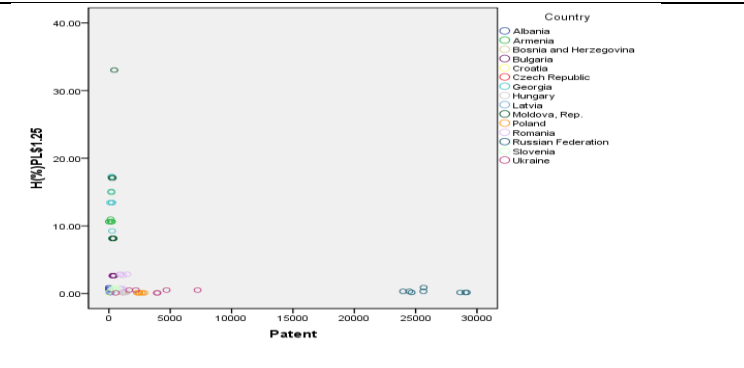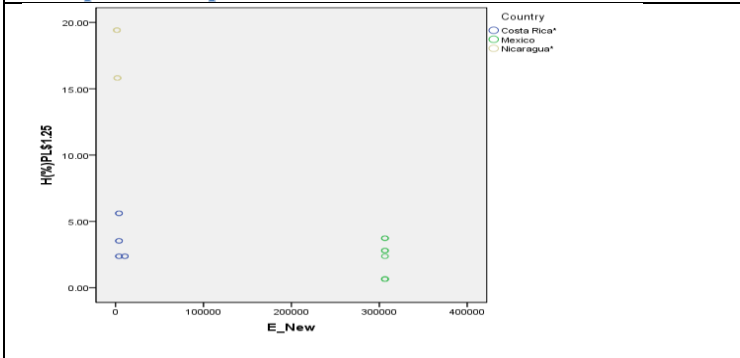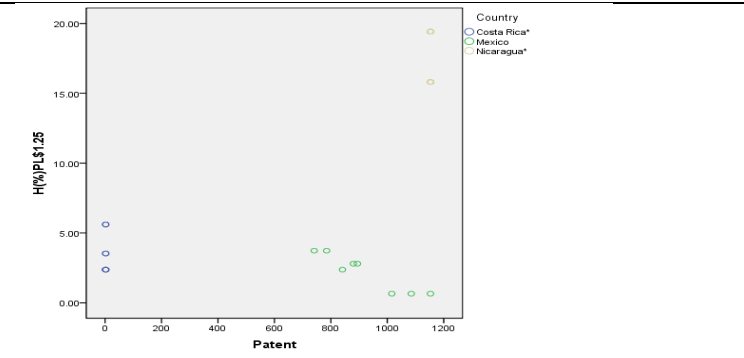|	
Figure 3 Scatter Plot Sub- Saharan Africa Poverty vs Entrepreneurship	**Figure 4 Scatter Plot Sub- Saharan Africa Poverty vs Innovation**

Figure 3 Scatter Plot Sub- Saharan Africa Poverty vs Entrepreneurship

Figure 4 Scatter Plot Sub- Saharan Africa Poverty vs Innovation
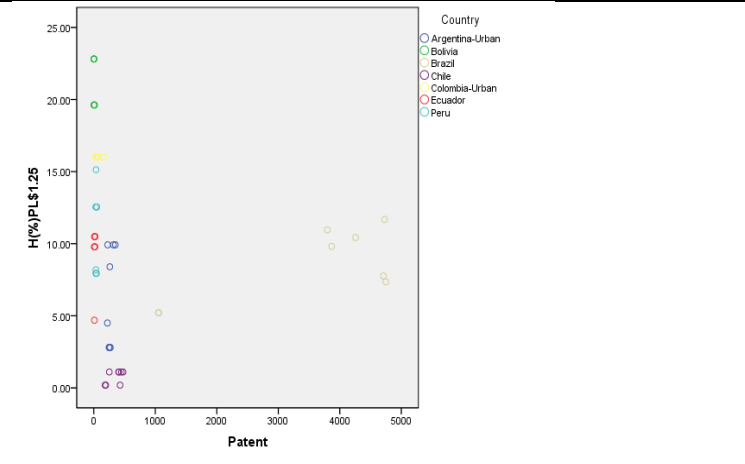
Figure 5 Scatter Plot Middle East Poverty vs Entrepreneurship	**Figure 6 Scatter Plot Middle East Poverty vs Innovation**
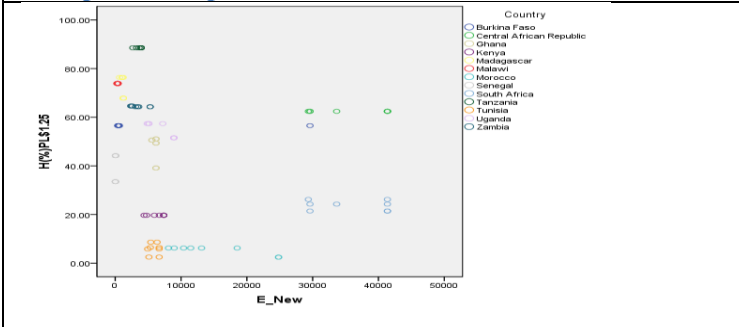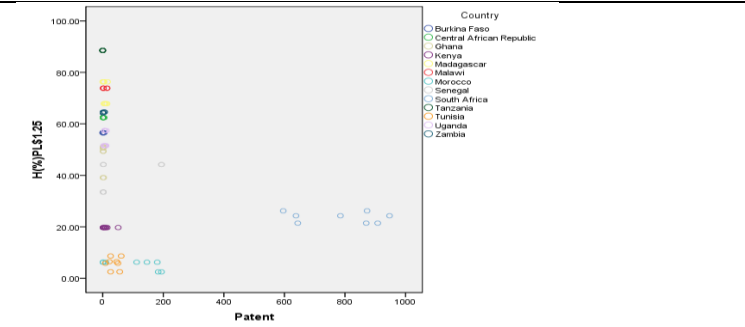
Figure 5 Scatter Plot Middle East Poverty vs Entrepreneurship
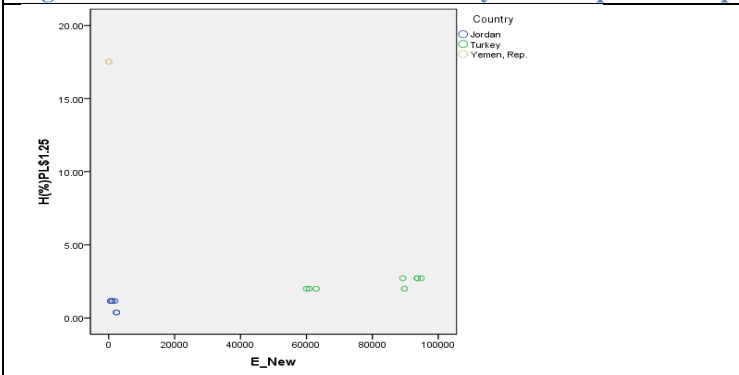
Figure 6 Scatter Plot Middle East Poverty vs Innovation
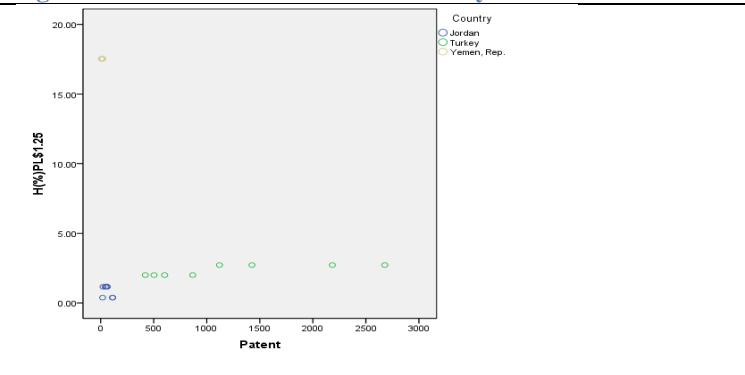
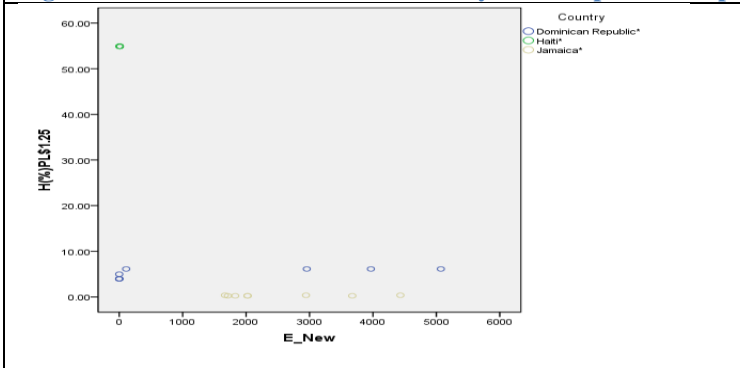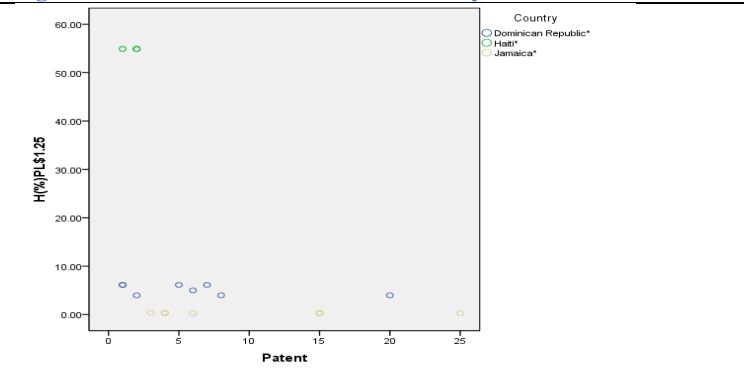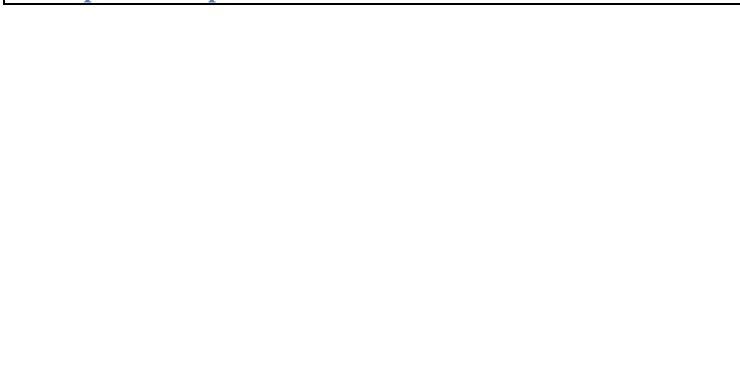|	
Figure 7 Scatter Plot Eastern Europe Poverty vs Entrepreneurship	**Figure 8 Scatter Plot Eastern Europe Poverty vs Innovation**
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Figure 13 Scatter Plot Asia Region Poverty vs Entrepreneurship	**Figure 14 Scatter Plot Asia Region Poverty vs Innovation**
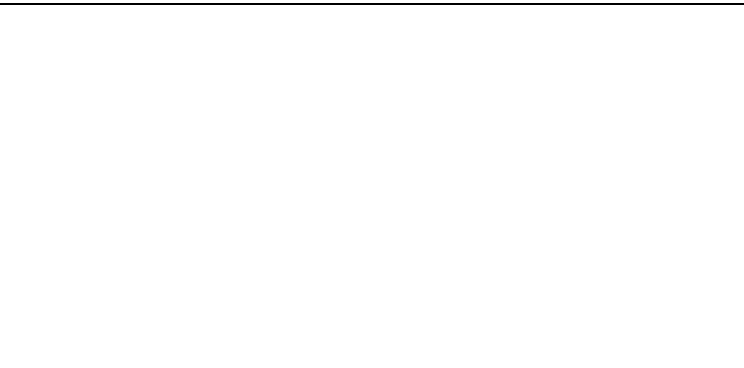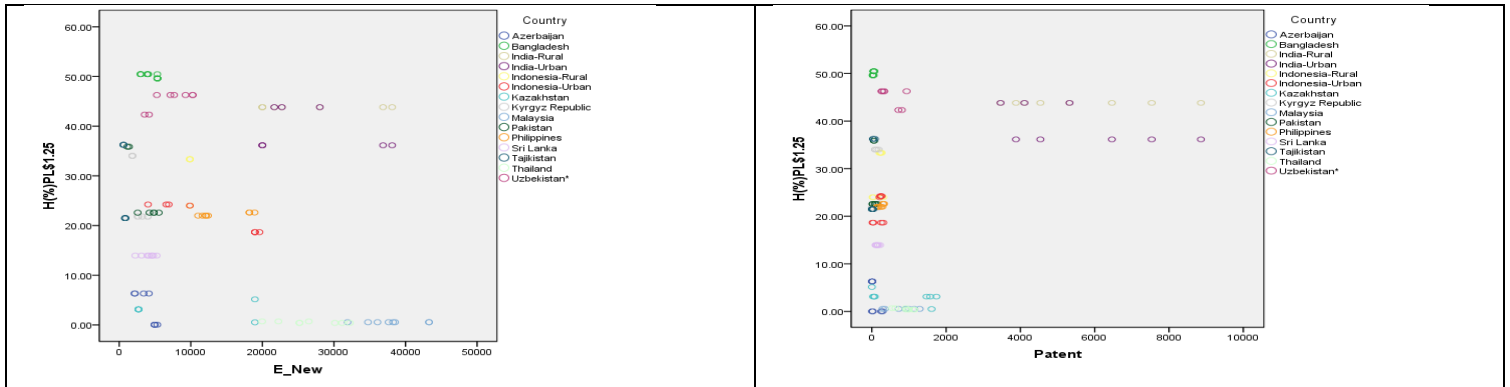
VI.   Conclusion

In summary, the study findings rejected the postulated null hypotheses. Firstly, it managed to construct a portable dataset from four different secondary sources covering the period 2001 to 2008. It accomplished this by visual inspection of the four raw data sources and identified a common period that data is available in both.

The paper appliesheadcount poverty rates derived from HHBS imputed using predetermined poverty line of $ 1.25 a dayat 2005 PPP. These poverty rates are the study dependent variable. Aside, number of patents applied for registration and that ofnew enterprises registered annually are used to proxy innovation and entrepreneurship development respectively for the period of interest.

Results from the double log OLS regressions showed that increased entrepreneurship reduces poverty in the seven sub-continental regional areas considered in this study. More even so, the rates of decline are highly significant with lager magnitude when innovation interacts with entrepreneurship exponentially.

Lastly, findings from the scatter plots reaffirms the earlier regression result that both poverty rates and I+E are inversely correlated. The study concludes by ascertaining that pro-poor strategies that engage the private sector could play a leading role in reducing poverty substantially. Policy efforts directed towards promoting I+E might stimulate economic activity and generate incomes for the poor. This is true in the seven sub-continental regional areas covered in the study.

Bibliography

(n.d.).

[1]. World Bank . (2015). *PovcalNet*. Retrieved from World Bank PovcalNet database: http://iresearch.worldbank.org/PovcalNet.

[2]. Adamson, P. (2012). *Peter Adamson; UNICEF Innocenti Research Centre. Measuring child poverty: New league tables of child poverty in the world's rich countries (PDF).* Florence, Italy: UNICEF Innocenti Research Centre Report Card.

[3]. Ans, K., & Tulder, R. V. (2006). Poverty Alleviation as Business Strategy? Evaluating Commitments of Frontrunner Multinational Corporations. *World Development, 34*(5), 789–801.

[4]. Bhattacharya M & Bloch H. (2004). Determinants of innovation. *Small Business Economics, 22*(2), 155–162.

[5]. Bradshaw, J., Chzhen, Y., Main, G., Martorano, B., Menchini, L., & Neubourg, C. d. (2012). *Relative Income Poverty among Children in Rich Countries. Innocenti Working Paper. Innocenti Research Centre. ISSN 1014-7837.* Florence, Italy: UNICEF.

[6]. Chipika S & Wilson G. (2006). Enabling technological learning among light engineering SMEs in Zimbabwe through networking. *Technovation, 26*(8), 969-979.

[7]. Chu, ,. M. (2009, April 22). Getting Microfinance Right: Loaning to the very poorest gives reason for optimism. *Forbes.com:http://www.forbes.com/2009/04/22/poverty-microfinance-world-bank-opinions-contributors-latin-america.html.*

[8]. Chu, M. (2010, April 30). Microfinance Goes Public: How capital markets can help fight poverty. *Forbes.com:http://www.forbes.com/2010/04/30/india-microfinance-sks-ipo-markets-emerging-markets-accion.html?partner=relatedstoriesbox.*

[9]. Clark, N. (2002). Innovation systems, institutional change and the new knowledge market: Implications for third world agricultural development. Economics of Innovation and New Technology. *11*(4–5), 353–368.

[10]. Donckels R & Froehlich E. (1991). Are family businesses really different? European experiences from STRATOS. *Family Business Review, 4*(2), 149–161.

[11]. Eversole, R. (Undated). Solving Poverty for Yourself. *Microenterprise Development, Microfinance and Migration.* Retrieved April 2010, from Eversole, R. (n.d.). Solving Poverty for Yourself: Microenterprise Development, Microfinance and Migration. http://www.crsi.mq.edu.au/documents/mobile_boundaries_rigid_worlds/eversole.pdf.: Eversole, R. (n.d.). Solving Poverty for Yourself: Microenterprise http://www.crsi.mq.edu.au/documents/mobile_boundaries_rigid_worlds/eversole.pdf.

[12]. Lodge, G. (2002). The Corporate Key. Using Big Business to Fight Global Poverty. *Foreign Affairs, 81*(4), 13-18.

[13]. Marcio Cruz, James Foster, Bryce Quillin and Philip Schellekens. (October, 2015). *Ending Extreme Poverty and Sharing Prosperity: Progress and Policies.* World Bank, Development Prospects Group). Washington, DC: World Bank.

[14]. Marx, I., & Bosch., K. v. (Unknown). *How poverty differs from inequality on poverty management in an enlarged EU context: Conventional and alternate approaches*. Retrieved from permanent dead link

[15]. Porter, M. E. (1990). *The competitive advantage of nations.* New York: The Free Press.

[16]. Ravallion, Martin and Chen, Shaohua. (2008). The developing world is poorer than we thought, but no less successful in the fight against poverty. *Policy Research Working Paper, World Bank*.

[17]. Richardson, J. (2004). Entrepreneurship and Development in Asia. *International Journal of Entrepreneurship and Innovation Management, 4*(5), 469 - 484.

[18]. Robson and Obeng. (2008). The barriers to growth in Ghana. *Small Business Economics, 30*, 385–403.

[19]. Schumpeter, J. (1961). *Theory of Economic Development.* New York: Oxford University Press.

[20]. Shaohua Chen and Martin Ravallion. (2008). *The developing world is poorer than we thought, but no less successful in the fight against poverty.* Washington, DC: World Bank.

[21]. Shirima, L. L. (2001). *The Micro Impacts of the Expanded Oil Production in Angola: Simulation 2001 to 2010*. (W. Bank, Editor, W. Bank, Producer, & World Bank) Retrieved from World Bank: http://info.worldbank.org/etools/docs/Angola%20Project.pdf

[22]. Shirima, L. L. (2009). *War Aggravating Poverty: A case of Angola.* Dudweiler Landstr: LAMBERT Academic Publishing AG & Co. KG.

[23]. UNDP. (2004). Unleashing entrepreneurship. Making business work for the poor.

[24].   WBSCD. (2004). Doing business with the poor, a field guide. Learning journeys of leading companies on the road to sustainable livelihoods business. *World Business Council for Sustainable Develop*.

[25].   Wheeler III, T. L. (2010). Global Poverty Solutions Based Entrepreneurship and Innovation. *Alleviating Poverty Through Entrepreneurship (APTE)*. Ohio: Ohio State University.

[26].   World Bank. (2000/2001). *World Development Report*. Washington, DC. USA: Oxford University Press , World Bank ISBN: 0-19-521129-4.

[27].   World Bank. (2015). *World Bank Forecasts Global Poverty to Fall Below 10% for First Time; Major Hurdles Remain in Goal to End Poverty by 2030"*. *www.worldbank.org. Retrieved 6 October 2015.* Washington, DC: World Bank.