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Drivers of Entrepreneurship: Linking With Economic Growth and Employment Generation (A Panel Data Analysis)

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1. INTRODUCTION

The need for entrepreneurs for economic development has always been crucial in history because they are the leaders who invent innovative ideas that give spark to economic activities. They are responsible for the combination of factors of production by capital formation, creating employment opportunities, wealth distribution that facilitates development and growth. A well explained definition of entrepreneurship in the words of Wennekers and Thurik (1999) that successfully makes the functional roles of entrepreneurs is:

> "…the manifest ability and willingness of individuals, on their own, in teams within and outside existing organisations, to perceive and create new economic opportunities (new products, new production methods, new organisational schemes and new product-market combinations) and to introduce their ideas in the market, in the face of uncertainty and other obstacles, by making decisions on location, form and the use of resources and institutions." (46–47)

High and sustained economic growth is the fundamental objective of every developed or developing country's governmental policy. Economic growth is a long term expansion of the productive potential of the economy. It generates employment in the economy and raises the living standards of the nation. Economic growth promotes business activities in private sector, increases company profits and enhances investor confidence.

Growth process, in general, of the country is profoundly influenced by entrepreneurial activities at different levels. Entrepreneurship is a key determinant of sustainable growth in modern time. Mostly jobs are produced by small businesses started

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by entrepreneurial mind persons, many of them set up large companies. Entrepreneurship is frequently expressed in terms of higher self esteem, to exercise creative freedoms, and an overall greater sense of control over their own lives. Many economists and educators believe that these types of experienced entrepreneurs foster the robust entrepreneurial culture that exploit personal and communal economic and social success at sub-national, national, and international level.

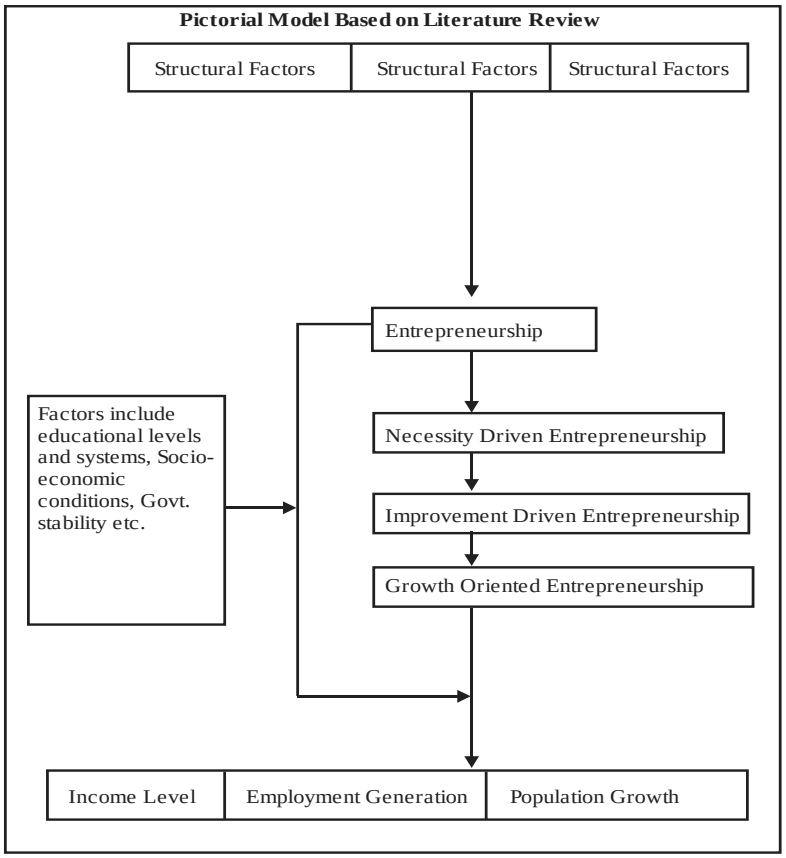
Education starting from elementary school to degree programmes and learning activities develop the standards for supporting performance indicators in students. More the challenging educational activities and experiences; more will be the discoveries, innovations ideas that enable individuals to develop the insight needed to discover and create entrepreneurial opportunities. These results in high expertise to start and manage own businesses to take advantage of these opportunities. The need for entrepreneurship for sustainable growth becomes more important for Asia as this region is the home of sixty percent of the world population with rich natural resources. Almost in all Asian economies entrepreneurial opportunities are low because of narrow industrial zones, limited export sector (except China), weak private sector and limited internal markets. So to promote the entrepreneurial education, trainings and seminars is crucial for Asia.

Entrepreneurial education can certainly impact an apprentice at all levels in a variety of manners. But there are some other factors like government stability, patent rights, institutions, research and development socioeconomic conditions, investment profile and consumption factors that can influenced the growth process.

In current years policy makers have publicised increasing interest in the role of entrepreneurship to promote economic growth and development. This has been stimulated by the rapid growth of the business sector in Asian Economies such as China, Brazil and India. As shown in the figure below, there are structural, economic, institutional and geographical factors which generate and promote entrepreneurship at its different stages: Necessity Based Entrepreneurship, Improvement Driven Entrepreneurship and Growth Led Entrepreneurship. Further, it explains the way those factors affect economic growth and employment generation indirectly through promoting entrepreneurship or directly.

The task of this study is to identify those factors along with the role of education, research and development activities which significantly explain the entrepreneurial potential and skills and at the second stage, to examine the impact of those entrepreneurial skills on economic growth and employment. To complete the task, micro panel data approach with different economic models and econometric estimation techniques (i.e. Stepwise Least Square with Forward Selection Method and Pooled Least Square without random and fixed effects) is used. The panel data includes the observations on eight upper middle and lower middle income countries over the period ranging from 2005 to 2011.

The organisation of the paper is as follows; Section 2 deals with the relevant review of literature, Section 3 explains the methodological setup, Section 4 explains data type and estimation technique, Section 5 deals with the results and interpretations, Section 6 includes conclusion and policy recommendations.



2. REVIEW OF LITERATURE

Richard Cantillion (1955) introduces the term entrepreneur first time in the pages of economic literature. According to Klundert and Smulders (1992) entrepreneurship is a "creative destruction". The different historical arguments of an economist give an expanded perspective on the term "Entrepreneurship" as it is a fundamental agent in most production, distribution and growth theories. A lot of studies have been done about connection between entrepreneurship and economic growth. The new classical economist focused that steady state equilibrium is only possible under the umbrella of strong entrepreneurship for they are the innovator and the founder of economics of innovation. Now question is that what are the forces and basic circumstances that imprint strong entrepreneurship.

Solow and Swan (1970) believed that these are the labour and capital which contribute in the process of economic expansion. Technological change remains as exogenous (Manna from Heaven). The basic idea in endogenous growth theory was that these are the endogenous variables that effect productivity growth through entrepreneurship. The new classical axioms of perfect competition are strongly restricted incentive for innovative opportunities. The models of general equilibrium do not talk

about dynamics of entrepreneurship. In Romer's (1990) version research sector is tank engine of growth by assuming increasing returns to scale as it provides the monopolist the justification of monopolistic competition. The blue prints of new varity of capital goods that are produced and used in goods producing sector [Chamberlin (1933)]. Lucas, (1978) explored the fact that education increases managerial abilities and thus the propensity to become an entrepreneur to handle with complex business environment.

Throughout intellectual history, the entrepreneur has worn many faces and fulfilled many roles. A lot of distinct roles for the entrepreneur have been identified in the economic literature [Hébert (1982)].

Shultz (1980) thought quantity and quality both need to be addressed for economic growth that are controlled through the abilities of entrepreneurs. Therefore it is the entrepreneur who is responsible for restoring equilibrium of economic growth. But endogenous growth theory is silent on the underlying conditions needed for entrepreneurship and innovation.

Peretto (1999) found that growth is driven by the process of technological advance and knowledge accumulation brought about by R&D efforts brought by owners of the firms.

Baumol (1990) has mentioned several forms of entrepreneurship. He further explains that entrepreneur is an individual who is creative enough to add his own wealth and prestige. But overall environment is tremendous importance in determination of innovative entrepreneurial process.

Different dimension of entrepreneurship has been studied by economists: Lucas is of the opinion that entrepreneurial attitude is the deterministic element between the worker and employer.

Calvo and Wellisz (1980) extended the Lucas' paper and examined the role of individual capability, age, and knowledge on entrepreneurial allocation. Gordon (1998) analysed the impact of fiscal policy especially government stability, socio-economic conditions, tax burden and incentives in the US economy. Kihlstrom and Laffont (1979) study risk aversion and Van Praag and Cramer (2001) extend it to include individual abilities, subsidies and investment strategy to the engine of entrepreneurial activity.

Eakin, *et al*. (1994) and Quadrini (2000) have mentioned the financial constraints on entrepreneurship especially liquidity and savings.

Blanchflower (2000) found that self-employment is high for those at the tail of the education distribution. Individuals with the least education have the highest probability of being self-employed which also confirm the views of Le (1999).

Acs, *et al.* (2005) using country-level data for the years 1981-1998 has empirically examined through fixed effect and a simultaneous model. They have introduced variables such as investment in research and development, self-employment rate and level of entrepreneurship. They concluded that countries with higher degree of education entrepreneurial activity and training are on higher steady state.

Audretsch and Keilbach (2005) introduced the concept of entrepreneurship capital, referring to society's capacity to create entrepreneurial activity specifically to generate new firms. Their study measured the impact of entrepreneurship on regional labour productivity and on the regional growth of labour productivity and employment generation in Germany. Entrepreneurship capital was measured using the number of

startup enterprises relative to the region's population. In additions they involve R&D as well as greater financial risks. The results revealed that entrepreneurship capital significantly affect a region's labour productivity. However, the growth of labour productivity significant effects only for R&D based industries.

Van Stel and Suddle (2005) inspect the relationship between new firm configuration and change in regional employment for the Netherlands. They have measured the time and sector wise the degree of urbanisation. The results showed the employment growth as the dependent variable regressed against the startup rate, wage growth, and population density. To check asymmetry data was divided into two time periods and that confirmed the impact of new firm's growth to employment growth has been stable and was the same in both periods.

Camp (2005) had examined the efficiency of entrepreneurial regions and least entrepreneurial regions in the U.S. and reported that the former had 109 percent higher productivity, 125 percent higher employment growth and 58 percent higher wage growth as compared to the later. This study also chains the view that entrepreneurship is the link between innovation and regional economic growth that ultimately is road map to economic development. The results exposed significant coefficients for entrepreneurship activity, and high levels of expected variation in growth.

Henderson (2006) studied the effect of entrepreneurship activity and economic growth for urban and rural areas. The empirical results imply that entrepreneurial activity is positively affecting employment growth. Considering the analysis between metropolitan and non-metropolitan areas, the study found that employment growth was stronger in urban areas rather than in rural areas. However, there is no significant difference on the relationship between high growth business startups and employment growth between urban and rural areas.

Vijverberg (2008) provides a meta-analysis of empirical studies into the impact of formal schooling on entrepreneurship selection and performance in developed countries. Five main conclusions result from this meta-analysis. First, the impact of education on selection into entrepreneurship is insignificant. Second, the effect of education on performance is positive and significant. Third, the return to a marginal year of schooling is 6.1 percent for an entrepreneur. Fourth, the effect of education on earnings is smaller for entrepreneurs than for employees in Europe, but larger in the USA. Fifth, the returns to schooling in entrepreneurship are higher in the USA than in Europe, higher for females than for males, and lower for non-whites or immigrants. The conclusion provides a number of policy implications to move the research frontier in this area of inquiry. The entrepreneurship literature on education can benefit from the technical sophistication used to estimate the returns to schooling for labour force.

Skogstrøm 2011 presents a theory on the relationship between educational choice and entrepreneurship in a labour market with asymmetric information. The model shows that, in a labour market where education is used as a signalling device, an imperfect relationship between productivity in education and in the labour market can lead to an equilibrium where a fraction of the high-ability individuals choose to quit school and become entrepreneurs. Le (1999) divided the impact of educational choice for entrepreneurship through signalling channel in the labour market. He found that people having low levels of education with high ability have higher opportunities of

entrepreneurship and self-employment. Berglann, *et al.* (2011) has also confirmed this fact that entrepreneurship rates were higher among individuals with low levels of education than among individuals with higher levels of education.

3. METHODOLOGICAL SETUP

A strand of literature explains different categories of entrepreneurship, which are of paramount importance in explaining the economic growth, employment and population. The first task is to identify those factors along with the role of education, research and development activities which significantly explain the entrepreneurial potential and skills and at the second stage, to examine the impact of those entrepreneurial skills on economic growth and employment. Eliss and William (2011) explain different types of entrepreneurship. The categories of entrepreneurship in quantifiable terms are as follows;

$$E_n = E_{1n}, E_{2n}, E_{3n}$$

Where

E_n = Total Entrepreneurial Activity
E_{1n} = Necessity Driven Entrepreneurship Activity
E_{2n} = Improvement Driven Opportunity Entrepreneurial Activity
E_{3n} = Growth Expectations of Entrepreneurial Activity

At first stage, we select those factors which explain all types of entrepreneurial activities and skills to make the analysis more policy oriented. The functional forms made below are consistent with the Eliss and William (2011). Our contribution is that we incorporated other economic and structural factors and redefined these variables.

$$E_n = E_{1n}, E_{2n}, E_{3n}$$

$$E_n = f(g, pg, PG, PR, Ins, SE, SEm, GS, R\&DE, Inv, TO) \quad \ldots \quad (1)$$

$$E_{1n} = f(g, pg, PG, PR, Ins, SE, SEm, GS, R\&DE, Inv, TO) \quad \ldots \quad (2)$$

$$E_{2n} = f(g, pg, PG, PR, Ins, SE, SEm, GS, R\&DE, Inv, TO) \quad \ldots \quad (3)$$

$$E_{3n} = f(g, pg, PG, PR, Ins, SE, SEm, GS, R\&DE, Inv, TO) \quad \ldots \quad (4)$$

Where;

PR= Socio-economic conditions and
Ins. =Institutions
SE = Secondary Education
Em = Employment Rate
GS = Govt. Consumption Expenditures
R&DE = Research and Development Expenditure
Inv = Investment Profile
TO = Government Stability
PG= Population Growth

g = GDP Growth
pg = Per capita Growth

The equation represents the general functional form of production function that exhibit constant elasticity of substitution equal unity everywhere and is linear homogeneous. The statistical forms of equations are as follows for estimation.

$$E_n = \alpha_n + \beta_n g + \delta_n pg, + \gamma_n PG + \lambda_n PR + \eta_n Ins, + \sigma_n SE, + \rho_n SEm + \zeta_n GS + \phi_n R\&DE + \chi_n Inv + \nu_n TO + \varepsilon_n \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

$$E_{1n} = \alpha_{1n} + \beta_{1n} g + \delta_{1n} pg, + \gamma_{1n} PG + \lambda_{1n} PR + \eta_{1n} Ins, + \sigma_{1n} SE, + \rho_{1n} SEm + \zeta_{1n} GS + \phi_{1n} R\&DE + \chi_{1n} Inv + \nu_{1n} TO + \varepsilon_{1n} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

$$E_{2n} = \alpha_{2n} + \beta_{2n} g + \delta_{2n} pg, + \gamma_{2n} PG + \lambda_{2n} PR + \eta_{2n} Ins, + \sigma_{2n} SE, + \rho_{2n} SEm + \zeta_{2n} GS + \phi_{2n} R\&DE + \chi_{2n} Inv + \nu_{2n} TO + \varepsilon_{2n} \quad \ldots \quad \ldots \quad \ldots \quad (7)$$

$$E_{3n} = \alpha_{3n} + \beta_{3n} g + \delta_{3n} pg, + \gamma_{3n} PG + \lambda_{3n} PR + \eta_{3n} Ins, + \sigma_{3n} SE, + \rho_{3n} SEm + \zeta_{3n} GS + \phi_{3n} R\&DE + \chi_{3n} Inv + \nu_{3n} TO + \varepsilon_{3n} \quad \ldots \quad \ldots \quad \ldots \quad (8)$$

The model used for estimation at the second stage by incorporating explained and unexplained factors of different types of entrepreneurial activities (i.e. $ESS_{En\ E1n\ E2n\ E3n}$, $RSS_{En,\ E1n,\ E2n,\ E3n}$) along with other factors which explain the changes in employment, per capita income and population while maintaining an economic relationship among population (P), employment (E), and income (I). The basic idea of incorporating ESS and RSS of entrepreneurial activities as independent variables is to separate the institutional, structural and economic impact of entrepreneurial activities from their geographical, traditional and regional specific impact on dependent variables. The model is near consistent with Deller, *et al*. (2001), Nzaku and Bukenya (2005), and Deller (2007), Mojica, *et al*. (2009). The general form of the three-equation model is:

$$P^* = f(E^*, I^*, /\Omega^{*P}) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (9)$$

$$E^* = g(P^*, I^*, /\Omega^{*E}) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (10)$$

$$I^* = h(P^*, E^*, /\Omega^{*I}) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (11)$$

Where

P^*, $E^*$and I^* represent the equilibrium levels of population, employment, and per capita income, respectively, and Ω^{*P} Ω^{*E} Ω^{*I} are a set of variables describing initial conditions, explained and unexplained variations of different types entrepreneurial activity ($ESS_{En\ E1n\ E2n\ E3n}$, $RSS_{En,\ E1n,\ E2n,\ E3n}$) for example GDP Growth, socio-economic conditions, government stability, R & D expenditures, secondary education, investment profile, per capita growth, employment and population and other variables that are traditionally linked to economic growth, employment and population. A simple linear relationship as quoted Mojica-Howell, *et al*. (2012) has been coined here. This framework explains the relationship of variables in the equilibrium setup such as.

$$P^* = \alpha_{0P} + \beta_{1P}E^* + \beta_{2P}I^* + \sum \delta_{IP}\Omega^P \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (12)$$

$$E^* = \alpha_{0E} + \beta_{1E}P^* + \beta_{2E}I^* + \sum \delta_{IE}\Omega^E \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (13)$$

$$I^* = \alpha_{0I} + \beta_{1I}P^* + \beta_{2I}E^* + \sum \delta_{IE}\Omega^I \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (14)$$

Mills and Price (1984) and Mojica Hoval (2009) narrated that by incorporating the initial conditions, the variables of the equilibrium framework (population, employment and income) will adjust accordingly. The considerations are incorporated as distributed lag adjustments and are expressed as;

$$P_t = P_{t-1} + \gamma_P(P^* - P_{t-1}) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (15)$$

$$E_t = E_{t-1} + \gamma_E(E^* - E_{t-1}) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (16)$$

$$I_t = I_{t-1} + \gamma_I(I^* - I_{t-1}) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (17)$$

Population, Employment and Per Capita Income depend on initial conditions and (P_{t-1}, E_{t-1}, and I_{t-1}) respectively and speed of change (γ_P, γ_E, and γ_I) coefficients. The larger the values the faster growth rate is claimed. As suggested by Mojica, *et al*. (2009), current employment, population and income levels are functions of their initial conditions and the change between the equilibrium values and initial conditions at their respective values of speed of adjustment (γ). Substituting Equations 15, 16, and 17 into Equations 12, 13 and 14 and rearranging the terms gives the model to be estimated and expressed as:

$$\Delta P_{it} = \alpha_{0p} + b_{1P}P_{t-1} + b_{2P}E_{t-1} + b_{3P}I_{t-1} + b_{4P}\Delta E + b_{5P}\Delta I + \sum \delta_{IP}\Omega^{*P} \quad \ldots \quad (16)$$

$$\Delta E_{it} = \alpha_{0E} + b_{1E}P_{t-1} + b_{2E}E_{t-1} + b_{3E}I_{t-1} + b_{4E}\Delta P + b_{5E}\Delta I + \sum \delta_{IE}\Omega^{*E} \quad \ldots \quad (17)$$

$$\Delta I_{it} = \alpha_{0I} + b_{1I}P_{t-1} + b_{2I}E_{t-1} + b_{3I}I_{t-1} + b_{4I}\Delta E + b_{5I}\Delta P + \sum \delta_{EP}\Omega^{*I} \quad \ldots \quad (18)$$

The regional changes in population, employment and per capita income by ΔP, ΔE, ΔI respectively. To investigate the relationship between entrepreneurship and economic growth, entrepreneurship and employment, entrepreneurship and population, the set of equations is treated as individual linear equations where changes in population, employment, and per capita income are regressed individually against explained and unexplained variations of different types entrepreneurial activity ($ESS_{En\ E1n\ E2n\ E3n}$, $RSS_{En,\ E1n,\ E2n,\ E3n}$) and other factors including socio-economic conditions, government stability, R&D expenditures, secondary education, investment profile, per capita growth, employment and population influencing change in per capita income, change in employment and change in population. These linear equations are as follows:

$$\Delta P = \alpha_{0P} + \delta_{IP}\Omega^{*P} + \varepsilon_P \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (19)$$

$$\Delta E = \alpha_E + \delta_{IE}\Omega^{*E} + \varepsilon_E \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (20)$$

$$\Delta I = \alpha_{0I} + \delta_{I\,I}\Omega^{*I} + \varepsilon_I \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (21)$$

Where

$$\alpha_P = b_{1P}P_{t-1} + b_{2P}E_{t-1} + b_{3P}I_{t-1} + b_{4P}\Delta E + b_{5P}\Delta I \quad \ldots \quad \ldots \quad \ldots \quad (22)$$

$$\alpha_E = b_{1E}P_{t-1} + b_{2E}E_{t-1} + b_{3E}I_{t-1} + b_{4E}\Delta P + b_{5E}\Delta I \quad \ldots \quad \ldots \quad \ldots \quad (23)$$

$$\alpha_I = b_{1I}P_{t-1} + b_{2I}E_{t-1} + b_{3I}I_{t-1} + b_{4I}\Delta E + b_{5I}\Delta P \quad \ldots \quad \ldots \quad \ldots \quad (24)$$

4. DATA AND ESTIMATION TECHNIQUE

The variables used in this study are explained in annexure. We used the panel data for eight Asian countries for the period of 2005-2011. The sample economies have been segregated into upper middle income ($1,006 to $3,975) and lower middle income ($1,005 or below it) grouped by World Bank Gross National Income (GNI) 2011[1] calculated by World Bank Atlas Method. Upper middle income economies include China, Thailand, Turkey and Malaysia. And the lower middle income economies include India, Indonesia, Pakistan and Philippine.

The variables used in the study have been collected by different sources such as different types of entrepreneurial activities (Necessity Driven, Opportunity/Improvement Driven and Growth Oriented), GDP growth, per capita income, population growth, R&D Secondary Education, Employment rate, Govt. Consumption Expenditures, Research and Development Expenditure have been taken from *World Development Indicators* (WDI) 2012 whereas Investment Profile and Government Stability have been taken from International Country Risk Guide (ICRG). Global Entrepreneurship Monitor, GEM has captured three types of entrepreneurial activities/self-employment in the market such as necessity driven, opportunity and growth oriented. These are the entrepreneurs of small, medium and large level enterprises. The necessity driven entrepreneurs are not by choice but by necessity based due to lack of wage employment. The opportunity driven self-employment is by choice, in order to make use of some perceived market opportunity.

We have employed the panel step-wise least square forward selection method for the estimation of Equations 5, 6, 7 and 8 and employed pooled least square method to estimate the Equations 19, 20 and 21.

5. RESULTS AND DISCUSSION

As shown in Table 1, population growth, government stability and R&D expenditures explain significantly the variation in total entrepreneurial activity while the impact of socio-economic conditions, govt. consumption expenditures, secondary education and investment profile come out to be insignificant. The impact factor of government stability is the highest. The economic rationale of it is that the government stability ensures the secured opportunities for investment and to start new ventures where the R&D expenditures play its role in garnish the potential faculty of entrepreneurship. Population growth is an important determinant of the demand side of the economy. Capital rush to the country where demand and ultimately market for the product is available. Government stability has significant and encouraging effect on institutional quality that ultimately give boost to entrepreneurial activities Qureshi, *et al*. (2010) and

[1] http://data.worldbank.org/about/country-classifications.

Table 1

Dependent Variable: Total Entrepreneurial Activity

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Constant	57.071	13.199	4.324	0.000
Population Growth	1.605	0.707	2.270	0.000
Government Stability	10.652	2.387	4.462	0.006
R & D exp. (% of GDP)	1.255	0.315	3.988	0.005
Socio-economics Conditions	1.000	0.000	1.989	0.119
Govt. Consumption Exp.	0.956	0.718	1.331	0.250
Secondary edu. Pupil	0.842	0.969	0.869	0.634
Investment Profile	0.225	0.330	0.683	0.742
R-squared	0.514087	Mean dependent var		8.557
Adjusted R-squared	0.4385	S.D. dependent var		5.740

Khan and Saqib (2011) Adnan, *et al.* (2011) where government stability means government is not in crises and there are less cabinet changes. Furthermore government expenditures have externalities that enter as a direct input in production function. If government is giving importance to more productivity enhancing expenditures it will give boost to entrepreneurial activities [Turnovsky (2004)].

As shown in Table 2, the variables like population growth, government stability, R&D expenditures, government consumption expenditures, secondary education and investment profile explain significantly the variation in Necessity Driven Entrepreneurship. The point to be noted here that along with other variables, the government consumption expenditures drive Necessity Based Entrepreneurship through meso type economic policies. While at secondary level education, most of the students involve starting their own business or involve themselves in family business at small scale. This gives the generation and spreading of household business, cottage industries and small scale enterprises—the glaring feature of upper middle and lower middle income economies.

Table 2

Dependent Variable: Necessity Driven Entrepreneurship Activity

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Constant	30.316	7.827	3.873	0.000
Population Growth	9.402	1.539	6.109	0.000
Government Stability	1.332	0.471	2.828	0.007
R & D exp. (% of GDP)	1.813	0.608	2.981	0.005
Socio-economics Conditions	0.785	0.630	1.247	0.219
Govt. Consumption Exp.	0.565	0.184	3.063	0.004
Secondary Edu. Pupil	1.000	0.000	3.073	0.004
Investment Profile	1.228	0.587	2.092	0.042
R-squared	0.668	Mean dependent var		8.557
Adjusted R-squared	0.616	S.D. dependent var		5.740

As shown in Table 3, the variables like population growth, government stability, socio-economics conditions, govt. consumption expenditures and secondary education explain significantly the variation in Improvement Driven Entrepreneurship while the impact factors of government stability, govt. consumption expenditures and secondary education are the highest respectively. This phenomenon explain that if these three crucial factors remain playing their role then it changes the necessity based entrepreneurship into improvement driven entrepreneurship which is more sustainable and plays important role in long run economic growth and stability. As shown in Table 4, the variables like socio-economic conditions and govt. stability still play their significant role to transform improvement entrepreneurship into growth oriented and employment led entrepreneurship.

Table 3

Dependent Variable: Improvement Driven Entrepreneurship Activity

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Constant	108.123	18.061	5.987	0.000
Population Growth	0.000	0.000	3.984	0.000
Government Stability	18.342	4.125	4.447	0.000
R & D exp. (% of GDP)	1.611	1.394	1.156	0.254
Socio-economics Conditions	1.343	0.490	2.742	0.009
Govt. Consumption Exp.	5.079	1.577	3.221	0.002
Secondary Edu. Pupil	4.065	1.413	2.878	0.006
Investment Profile	0.286	0.490	0.584	0.562
R-squared	0.419842	Mean dependent var		45.01852
Adjusted R-squared	0.331557	S.D. dependent var		11.72723

Table 4

Dependent Variable: Growth Oriented Entrepreneurship Activity

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Govt. Consumption	0.855	0.200	4.277	0.000
Socio-economics Conditions	1.714	0.755	2.270	0.028
Govt. Stability	1.006	0.540	1.862	0.068
R & exp (% of GDP)	0.893	0.793	1.125	0.266
GDP Growth	2.478	1.541	1.608	0.114
R-squared	0.29006	Mean dependent var		9.636364
Adjusted R-squared	0.233265	S.D. dependent var		6.337319

As shown in Table 5, the variables like explained entrepreneurial activity, R&D expenditures, socio-economic conditions explain significantly the variation in change in per capita income, where the impact factor of R &D is the highest. The results explain that R&D activities affect economic growth both by building up entrepreneurial potentials and skills and by having direct impact by increasing the value added of economic activities on large scale (i.e. large scale industries, firms etc.)

Table 5

Dependent Variable: Change in Per Capita Income

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	6893.919	11433.95	0.602934	0.55
Explained Entrepreneurial Activity Rate	91.19462	46.13344	1.976758	0.055
Unexplained Entrepreneurial Activity Rate	–37.8073	74.76522	–0.50568	0.6159
Secondary Education Pupil	1.16E–05	8.11E-06	1.426223	0.1616
R & D Exp.	1389.393	302.3845	4.594789	0
Socio-economics Conditions	813.9676	301.0349	2.703897	0.01
Population Growth	112.0886	766.1413	0.146303	0.8844
Employment Rate	–85.9998	100.1598	–0.85863	0.3957
Government Stability	–316.667	243.3225	–1.30143	0.2006
Investment Profile	103.6366	308.1218	0.33635	0.7384
R-squared	0.385882	Mean dependent var		–144.834
Adjusted R-squared	0.247706	S.D. dependent var		1915.183

As shown in Table 6, explained necessity based entrepreneurship along with R&D expenditures and socio-economic conditions explain variation in change in per capita income. The impact of improvement driven and growth oriented entrepreneurship activities have insignificant impact on change in per capita income. It explains the fact that the major economic activities in upper middle and lower middle income countries are based on necessity based entrepreneurship activities and skills, with the first objective of wining the bread for survival.

Table 6

Dependent Variable: Change in Per Capita Income

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	7191.83	11285.07	0.637287	0.5276
Explained Necessity Based Entre.	127.2231	59.02128	2.155547	0.0372
Unexplained Necessity Based Entre	–89.6379	159.7353	–0.56117	0.5778
Secondary Education Pupil	7.89E–06	8.07E-06	0.977165	0.3344
R & D Exp.	1447.226	315.5883	4.585806	0
Socio-economics Conditions	817.8054	299.0224	2.734931	0.0093
Population Growth	229.186	804.7749	0.284783	0.7773
Employment Rate	–89.0467	97.76737	–0.9108	0.3679
Government Stability	–274.453	236.3555	–1.16119	0.2524
Investment Profile	29.28781	320.5133	0.091378	0.9276
R-squared	0.40441	Mean dependent var		–144.834
Adjusted R-squared	0.270402	S.D. dependent var		1915.183

As shown in Table 7, the variables like explained entrepreneurship, and population growth affect change in employment, where the impact factor of the earlier independent variable is significantly high. While other variables like secondary education, R&D expenditures, govt. stability, per capita growth have indirect impact on change in employment through explained entrepreneurship activities.

Table 7

Dependent Variable: Change in Employment

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	–7.24038	2.646284	–2.73605	0.0089
Explained Entre. Activity	0.114165	0.055037	2.074348	0.0438
Unxplained Entre. Activity	0.118377	0.09468	1.250286	0.2177
Secondary Education, Pupil	8.97E-09	1.15E-08	0.777134	0.4411
R & D Exp.	0.013378	0.362329	0.036922	0.9707
Govt. Stability	0.342108	0.306915	1.114667	0.2709
Population Growth	1.673903	0.833021	2.009436	0.0505
Per capita Growth	0.015095	0.134503	0.11223	0.9111
R-squared	0.218566	Mean dependent var		–0.18491
Adjusted R-squared	0.09701	S.D. dependent var		2.2428

As shown in Table 8, the variable unexplained growth entrepreneurship significantly explains the variation in change in employment; while the other variables like necessity based and improvement driven entrepreneurship activities have insignificant impact on change in employment.

Table 8

Dependent Variable: Change in Employment

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	–7.52558	3.371695	–2.23199	0.0304
Explained Growth Entre.	0.049292	0.103707	0.475306	0.6368
Unexplained Growth Entre.	0.189776	0.108965	1.741619	0.0881
Secondary Education, Pupil	1.70E-08	1.15E-08	1.480515	0.1454
R & D Exp.	–0.18713	0.353052	–0.53004	0.5986
Govt. Stability	0.421205	0.319056	1.32016	0.1932
Population Growth	2.502124	0.974723	2.567009	0.0135
Per Capita Growth	–0.04365	0.113066	–0.38607	0.7012
R-squared	0.156902	Mean dependent var		–0.12364
Adjusted R-squared	0.031334	S.D. dependent var		2.22677

As shown in Table 9, the variables like explained entrepreneurial activity and govt. stability have significant impact on change in population, while in Table 10, it is shown that only explained necessity based entrepreneurship have significant impact on change in population. This fact is also backed by the general phenomenon in lower middle income and occasionally in upper middle income countries that in low paid or low earned families, the number of children is high than average.

Table 9

Dependent Variable: Change in Population

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	5.80E-13	8.85E-14	6.551954	0
Explained Entre. Activity	7.93E-16	4.16E-16	1.905551	0.0633
unexplained Entre. Activity	3.45E-16	6.89E-16	0.501154	0.6188
Secondary Education Pupil	1.36E-22	8.67E-23	1.574212	0.1226
R & D Exp.	–6.47E-16	2.64E-15	–0.24457	0.8079
Govt. Stability	3.92E-15	2.27E-15	1.728271	0.091
Per Capita Growth	–1.10E-15	9.90E-16	–1.10638	0.2746
Employment Rate	5.73E-15	8.69E-16	6.600376	0
R-squared	0.6	Mean dependent var		1.292925
Adjusted R-squared	0.57	S.D. dependent var		0.473767

Table 10

Dependent Variable: Change in Population

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	2.99E-13	4.55E-14	6.576773	0
Explained Necessity Entre.	4.96E-16	2.87E-16	1.725536	0.0914
Unexplained Necessity Entre	5.65E-16	7.20E-16	0.784072	0.4372
Secondary Education Pupil	7.93E-23	4.54E-23	1.748056	0.0874
R & D Exp.	7.12E-16	1.44E-15	0.494135	0.6237
Govt. Stability	2.98E-15	1.20E-15	2.489074	0.0167
Per capita Growth	–5.46E-16	4.98E-16	–1.09585	0.2791
Employment Rate	2.87E-15	4.46E-16	6.44645	0
R-squared	0.65	Mean dependent var		1.292925
Adjusted R-squared	0.6	S.D. dependent var		0.473767

6. CONCLUSION AND POLICY RECOMMENDATIONS

On the basis of analysis made in this study, the drivers of entrepreneurship in descending order in terms of their importance are shown in Table 11. As shown in the table, Government stability plays crucial role at all stages of entrepreneurial activity: total, need based, improvement led and growth oriented: Any country should take measures to ensure government stability because this factor builds up the confidence among the general public about the continuity of policies especially relating to small scale or large scale economic (business) activities. These policies include investment policy, tax policy, and the policy of establishment of industrial cities etc.

Table 11

Sr #	Drivers	Entrepreneurial Activity			
		Total	Need Based	Improvement Led	Growth Oriented
1	Govt. Stability				
2	Govt. Consumption Exp.				
3	R&D Expenditures				
4	Secondary Education				
5	Socio-economic condition				
6	Investment Profile				

Government consumption expenditures turn out to be the second important driver of entrepreneurial activities. This factor again plays a key role at all stages of entrepreneurial activities. The government should initiate such policies which increases govt. consumption expenditures. These policies include meso economic policies, youth entrepreneurship programme initiated recently in Pakistan, loan scheme with small amounts to encourage household business, cottage industries and small scale industries. The impact of government consumption expenditure increases, if it is used through micro-finance schemes.

In upper middle and lower middle income countries, the R&D expenditures help in searching new avenues of establishing new businesses with small amount in shortest span of time and help in generating employment level. Secondary education helps both in generating need based entrepreneurial activities and then still plays pivotal role in transforming need based entrepreneurial activities into improvement led activities. Socio-economic conditions help to generate in improvement led entrepreneurial activities and then to transform them into growth oriented entrepreneurial activities.

Taking from the aspects of generating and continuing of entrepreneurial activities, to generate need based entrepreneurial activities and then to transform those into improvement led activities, the drivers include government stability, government consumption expenditures and secondary education and investment profile. To generate improvement led activities and then to transform them into growth oriented entrepreneurial activities, the drivers include government stability, government consumption secondary education and socio-economic activities. While to generate and continue growth led entrepreneurial activities, the drivers include government stability, government expenditures and socio-economic activities.

Further, it is found in this study that the variables like explained entrepreneurial activity, explained necessity based entrepreneurial activates, R&D expenditures, socio-economic conditions explain significantly the variation in change in per capita income, where the impact factor of R&D is the highest. The results explain that R&D activities affect economic growth both by building up entrepreneurial potentials and skills and by having direct impact by increasing the value added of economic activities on large scale (i.e. large scale industries, firms etc.). The impact of improvement driven and growth oriented entrepreneurship activities have insignificant impact on change in per capita income. It explains the fact that the major economic activities in upper middle and lower middle income countries are based on necessity based entrepreneurship activities and skills, with the first objective of wining the bread for survival.

It is also found that the variables like explained entrepreneurship, and population growth affect change in employment, where the impact factor of the earlier independent variable is significantly high. While other variables like secondary education, R&D expenditures, govt. stability, per capita growth have indirect impact on change in employment through explained entrepreneurship activities. The unexplained growth entrepreneurship significantly explains the variation in change in employment; while the other variables like necessity based and improvement driven entrepreneurship activities have insignificant impact on change in employment.

Further investigation deduced that the variables like explained entrepreneurial activity, necessity based entrepreneurial activities and govt. stability have significant impact on change in population. This fact is also backed by the general phenomenon in lower middle income and occasionally in upper middle income countries that in low paid or low earned families, the number of children is high than average.

APPENDIX

Variables Definitions

(1) Entrepreneurship

We develop a list of possible support to entrepreneurship initiatives and variation that address the particular constraints to entrepreneurship based on literature review. This list is intended to be illustrative of the types of interventions that can be used to address context specific constraints, rather than being an exhaustive collection of all types of possible entrepreneurship support initiatives and adaptations.

Recognising the importance of entrepreneurship initiatives that have been adapted to the specific needs of the (potential) entrepreneurs, we further disaggregate by entrepreneurial profile focusing on three types of entrepreneurs based on their enthusiasm for entering into entrepreneurial activity.

- **Necessity Driven Entrepreneurs**: entrepreneurs who have few or no other income generation or employment opportunities, and thus become entrepreneurs to sustain their livelihood by necessity rather than choice;
- **Opportunity Driven Entrepreneurs**: entrepreneurs who pursue a perceived market opportunity and choose to start their own business, despite having the option of generating an income through employment elsewhere at the time of starting a business.
- **Growth Oriented Entrepreneurs**: entrepreneurs who have a relatively higher job creation potential (which may also be an indication of greater international market reach and/or a higher degree of innovation in products and services offered).
- **Total Early-stage Entrepreneurial Activity Rates:** Percentage of 18-64 population who are either a nascent entrepreneur or owner-manager of a new business.

(2) GDP Growth (Annual %)

The Annual percentage growth rate of GDP at market prices is based on constant local currency. Aggregates are based on constant 2000 U.S. dollars.

(3) Secondary Education, Pupils

Secondary education pupils are the total number of pupils enrolled at secondary level in public and private schools.

(4) Secondary Education, General Pupils

Secondary general pupils are the number of secondary students enrolled in general education programmes, including teacher training.

(5) Self-employed, Total (% of Total Employed)

Patent applications are worldwide patent applications filed through the Patent Cooperation Treaty procedure or with a national patent office for exclusive rights for an invention—a product or process that provides a new way of doing something or offers a new technical solution to a problem. A patent provides protection for the invention to the owner of the patent for a limited period, generally 20 years.

(6) Expense (% of GDP)

Expense is cash payments for operating activities of the government in providing goods and services. It includes compensation of employees (such as wages and salaries), interest and subsidies, grants, social benefits, and other expenses such as rent and dividends.

(7) Research and Development Expenditure (% of GDP)

Expenditures for research and development are current and capital expenditures (both public and private) on creative work undertaken systematically to increase knowledge, including knowledge of humanity, culture, and society, and the use of knowledge for new applications. R&D covers basic research, applied research, and experimental development.

(8) Population Growth (Annual %)

Annual population growth rate for year *t* is the exponential rate of growth of midyear population from year *t*–1 to *t*, expressed as a percentage. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship—except for refugees not permanently settled in the country of asylum, which are generally considered part of the population of the country of origin.

(9) Government Stability

A measure of the government's ability to stay in office and carry out its declared programme(s), depending upon such factors as the type of governance, cohesion of the government and governing parties, approach of an election, and command of the legislature.

(10) Socio-economics Conditions

An estimate of the general public's satisfaction or dissatisfaction with the government's economic policies, covering a broad spectrum of factors ranging from

infant mortality and medical provision to housing and interest rates. Different weights are applied in different societies, depending upon the relative political impact.

(11) Investment Profile

A measure of the government's attitude toward inward investment as determined by four components: the risk to operations, taxation, repatriation, and labour costs.

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