Australian Journal of Basic and Applied Sciences, 5(8): 10601065-, 2011
ISSN 1991-8178

# An Empirical Research On The Relationship Between Entrepreneurship And Economic Growth

Mahnaz Rabiei PhD

Islamic Azad university- south Tehran branch, (IRAN).

**Abstract:** This paper extends the line of research attempting to link innovation and economic growth by using endogenous economic growth. Innovators of each industry invest in internal R&D and eventually in the local search for information. In this article innovation and entrepreneurship has applied Roamer's endogenous model for Iran economy development and the effects of labor variables, physical capital, human capital as well as research and development, ratio of entrepreneurs' production from total production have been studied. Economic time series statistic of 1968-2008 is used to study the stationary variables by unit root test, and then the model is tested to study the residuals, Unit equation model is used for assessment. Furthermore, technologies create changes in comparative cost of production, and increase the comparative advantages in corporations and ultimately in the countries. Unique characteristics of Innovation and new ideas are not challengeable. For example, achievements in a new method, will give others easier access, without causing interruptions to the previous users.

**Key words**: Entrepreneurship In, Innovation, Economic Model, Endogenous Economic Growth

## INTRODUCTION

Some economists argue the entrepreneurs have central role to explain economic growth. For example, Holcombe (1998) claims that, the engine of economic growth is entrepreneurship, Others Barro(1997) finds that entrepreneurs are the most important factors to explain differences in growth across economies. Jones (1995) uses the time series plots of growth and the growth rate of the numbers of scientists and engineers to test the validity of R&D based growth models. He finds no evidence that these variables are positively related. Aghion and Howitt (1998) provide explanations for the contradicting results of Jones. Scherer (1982), Griliches and Lichtenberg (1984), Aghion and Howitt (1998), and Zachariadis (2003) provide strong evidence that in the U.S. economy R&D investment and growth are positively related. Porter and Stern (2000) is one of the first studies that utilized aggregate level patent data to examine the determinants and the effects of innovation. They find that innovation is positively related to human capital in the R&D sectors and national knowledge stock. In sum, the analysis suggests that sustained R&D-driven growth is possible without weak or strong scale effects and when perfectly competitive producers operate under constant returns. The potential for scale-invariant endogenous growth is not new, but is achieved very differently to the previous literature. (Dalgaard andkriner, 2001), (Strulik, 2005), (Strulik2007). In a recent study, Steele (2000) raises criticism against traditional theoretical approaches to economic growth. Dividing the contemporary account into two broad categories, mathematical macroeconomic models and institutional or historical accounts, Steele questions the underlying neoclassical assumptions of a social equilibrium and individual optimization. So, recent empirical literature investigates an important role of entrepreneurs for growth. Romer (1986) in a model that called endogenous growth model formulated categories of knowledge through research and development. We argue Basic on these models; technological innovation is created in the research and development sectors and the existing knowledge stock, new ideas and innovation improve production technology and cause increase inputs, so can access to higher production level. At basic of these models is their postulation that endogenously determined innovation enables sustainable economic growth. In this paper, we develop a model of entrepreneurial innovation to explain relative differences in growth. The focus of this paper is on the role of entrepreneurship in economic growth.

we use the data of Iran for the period 1967–2009 to investigate the following postulations of entrepreneurial innovation based endogenous growth models that entrepreneurial innovation alters important implications of existing R&D based growth theory and there are constant returns to innovation; innovation direct to permanent increases GDP.

## MATERIALS AND METHODS

***Entrepreneurs And Transfer Technology:***

Entrepreneurs in developing country can use these methods for Transfer technical elements of a country:

**Crossponding Author:** Mahnaz Rabiei PhD, Islamic Azad university- south Tehran branch, (IRAN).
E-mail: dr_mahnaz_rabiei@azad.ac.ir

1. book, journal and other information published by instruments such as commercial posts, standards, patent information.
2. Education and training specialist force abroad and therefore the transition from education through to the destination country of origin.
3. Personal observations and informal contacts through travel, conference, meeting and visit centers of production.
4. Exchange of information and personnel through the technical cooperation program.
5. Employment of foreign experts and establish consultation arrangements.
6. To enter through products or technologies, especially those that are on.
7. Importing machinery and equipment with the relevant technical information.
8. Reverse engineering.
9. Preparation of specification and education by forming importers.
10. Official use of specific technical knowledge, the exclusive right, invention, production processes and commercial signs.
11. Foreign Direct Investment.

***Modeling Econmic Growth And Entrepreneurship:***

The basic neoclassical theory of growth, such as Solow model, explains growth as exogenously determined changes or levels of technological progress. As such the neoclassical model is limited because it tells us very little about the factors that shape and mould technological progress, and in the extension growth. Some of the more pioneering and important contributions in this field include Romer (1986, 1990), Lucas (1988), Grossman and Helpman (1991), and Aghion and Howitt (1992). In this models Growth is generated by investments in knowledge and the models outline the determinants of investment decisions in knowledge. Furthermore, some of these models, such as e.g. Lucas (1988) differentiate between physical and human capital. This implies that the relative importance of capital could be substantially more important than acknowledged by the Solow model, especially if there exists positive externalities in accumulation of (foremost human) capital. While technologies or knowledge may be of diverse types and have different sources, such as basic scientific research, private R&D and innovation, or learning by doing, the entrepreneur does not generally hold a central position (if any) in the endogenous growth models. There is extending upon Segerstrom *et al* (1990) and Aghion and Howitt (1992), is offered by Grossman and Helpman (1991) where all R&D and investment decisions are made by forward-looking profit maximizing entrepreneurs.

Our empirical model builds on the growth model of Mankiw. Romer and Weil (1990).Then in this model growth is driven by technological change; technological change arises as a result of intentional actions taken by people who respond to market incentives; The model has three sectors: research and development (R&D) sector, intermediate goods sector and final output sector. The final output is produced according to Cobb-Douglas production function:

$Y=A\,(K,h)$,

Where $Y$ is the output, which empirically can be measured real per capita GDP, $h$ the human capital input, $K$ the capital input. A is knowledge stock.

$$Y_t = AK_t^a h_t^{1-a} \Rightarrow \frac{Y_t}{K_t} = AK_t^{a-1} h_t^{1-a} \Rightarrow \frac{Y_t}{K_t} = A\left(\frac{h}{K}\right)^{1-a}$$

$$\Rightarrow Y_t = K_t A\left(\frac{h}{K}\right)^{1-a} \Rightarrow Y_t = \bar{A}K_t$$

$$\bar{A} = A\left(\frac{h}{K}\right)^{1-a} = A\Psi^{1-a}$$

In the relationship between growth rate and investment rate

$$Y_t = \bar{A}K_t \Rightarrow LnY_t = Ln\bar{A} + LnK \Rightarrow dLnY_t = dLnK_t \Rightarrow \frac{\frac{dY_t}{dt}}{Y_t} = \frac{\frac{dK_t}{dt}}{K_t}$$

$$g_y = \frac{K^0}{K} = \frac{i_t^k Y_t - \delta K_t}{K_t} = i_t^k \frac{Y_t}{K_t} - \delta$$

$$g_y = -\delta + \bar{A} i^k$$

The most crucial postulation of the Romer'smodel that leads to sustainable economic growth is the fact that production of new designs is linear in human capital employed in the R&D sectors and knowledge stock. This has two implications: first, devoting more human capital to research leads to a higher rate of production of new designs; second, the larger the total stocks of designs and knowledge are, the higher the productivity of an engineer working in the research sector will be. After a new design is produced, it enters into an economy because a new design enables the production of a new intermediate good that can be used to produce output; it also increases the total stock of knowledge and the productivity of human capital in the research sector.

***The Model:***

In this section we are going to test the theoretical model's prediction that economic growth rate. In this study, the general form of Cobb - Douglas production function was used, with assumes economic dynamic scale and competition are incomplete. This function is non-linear, but it can be change to a linear function of the logarithmic to use easier.

In Cobb Douglas production function, dependent variable is GDP (G) and independent variables are including employees labor (L), human resources having higher education or human capital (HC), investment inventory (K), cost of research and development costs (R&D), ratio of entrepreneurs' production from total production (ENT), and war dum60, L shows logarithm. This relationship was tested with using data on the growth rates of real GDP for Iran over the time period 1968-2009. All data were used of Time series Data Bank of Iran statistic center, and then we are going to run the regression:

LG=c(1)*LL+c(2)*LR&D +c(3)*LHC+c(4)*LK+c(5)*LENT+DUM60

**Table 1:** dependent and independent variables

| Variable | |
|---|---|
| LG | LOG GDP |
| LL | LOG LABOR |
| LR&D | LOG R&D |
| LHC | LOG HUMAN CAPITAL |
| Lk | Log Capital |
| LENT | Log Entrepreneurs production /total production |
| Dum60 | Dummy for Cultural Revolution |

We also performed some specification tests and investigated stationery and then all parameters were estimate using OLS.

## RESULT AND DISCOUSSIONS

***Stationary:***

In this paper I use Augmented Dickey Fuller for unit root test. The test was done for all variables in the model, that the results are summarized in Table 1. These statistics indicate that a unit root can be rejected for the first difference but not the levels for all variables at the 5% significance level. ADF unit root tests

***Estimation Model:***

All variables in model I (1) the estimation model ordinary least square method is used. In the equation, the Stationary test was done for the model; with the test model variables have been stationary. Therefore the production function estimated with ordinary least square method. Considering the results of ordinary least square estimation method can be analyzed following the above:

LG=0.05*labor + 0.08*r&d + 0.15*lhc + 0.5*lk + 0.3*lent- dum5960

*t= (3.8) (4.2) (3.6) (3.3) (2.1)*

*$R^2$ =0.89* *$\overline{R^2}$ =0.89* *DW = 1.73*

**Table 2:** Significance level

| Variable | Test statistics | | | Critical values |
|---|---|---|---|---|
| | % | % | 0% | |
| *V* | 3.63 | 2.94 | 2.61 | -3.63 |
| *labor* | 3.63 | 2.94 | 2.61 | -4.16 |
| *R&D* | 3.63 | 2.94 | 2.61 | -6.35 |
| Human capital | 3.66 | 2.96 | 2.62 | −4.58 |
| capital | 3.63 | 2. 95 | 2.62 | −3.59 |
| LEN | 3.69 | 2.97 | 2.63 | -4.18 |

R2 in the model shows that is a good model. And variable can explain 89 percent of Production changes. F-test confirmed the whole regression being significant. To review the whole model is the stationary test was done for residual function and Table 2 shows the results of Dickey Fuller test that shows recursive regression is false. It means the estimated model have stationary.

**Table 3:** Dickey fuller unit root test on residual

| Series | MacKinnon critical values | | | ADF test statistic |
|---|---|---|---|---|
| | 1% | 5% | 10% | |
| *Residual* | 3.65 | 2.96 | 2.62 | -4.12 |

These findings based on the estimated model for Iran, the role of innovation and entrepreneurship caused higher economic growth, the next section focus on the innovation and entrepreneurship.

***Organization Entrepreneurship:***

Innovation is a key source for create comparative advantage. That is one of the factors affected on economic growth. Innovative researches help countries to lead economic and industrial sectors. Entrepreneurs organize direction firm and they increases rate of production and it will cause economic growth. This paper investigates organization Entrepreneurial; it is a process in which innovative goods is produce by create entrepreneurial culture in an organization which was established before. In the most paper focus on individual entrepreneurship while the organization entrepreneurship is more difficult than individual entrepreneurship because some authoritarian structure of organizations and hand controls conservatism prevents create innovation and don't improve entrepreneurs.

***Entrepreneurs In Projects:***

Creativity and innovation is related to the role of Entrepreneurs which directly supervising the work of individuals had also affects the total project. Entrepreneurs, also indirectly are effective stage of implementation and production strategies. It should not be unaware from impact on individuals and project implementation and production strategies. And they must investigate impact consumer behavior, which certainly can play an important role in creating innovation.

***Entrepreneur And Innovation:***

Entrepreneurs play an important role in encouraging and stimulating innovation in institutions. Entrepreneurs play effectively contributed in increasing product quality and quantity. Entrepreneur provides the director of policy and financial executive project. Entrepreneurs may affect on choice of project leader control

and they give the project leader accuracy necessary. On the other hand, Project manager invited people to work different parts of the common problems or promote active cooperation of the organization. Finally, they play an important role in the creation a suitable model for innovation.

Although entrepreneurs have indirectly role in creation of innovation, but they should not have direct role in project control because their role reduces the performance group, reduced autonomy and waste time to search for the Project as well as the low control can have negative effects, such as when the entrepreneur do not lead necessary guidance.

***Conclusion:***

In this article, after reviewing the theoretical principles and experimental studies, the model and estimation was introduced. This paper investigate effect of innovation and entrepreneurship on economic growth and Innovation management and entrepreneurship increase productivity and efficiency and optimal allocation of resources and production factors in the economy and thus has a positive effect on economic growth.

## REFRENCES

Aghion, Philippe, and Peter Howitt, 1998. Endogenous Growth Theory, (Cambridge,Massachusetts: The MIT Press).

Barro, R., 1991. Economic Growth in Cross- Section Countries. Quarterly Journal of Economic.

Brown, L. Shona, & Eisenhardt, M. Kathleen, 1995. Product Development: Past Research, Present Findings, and Future Directions. *Academy of Management Review*, 20(2): 343-378.

Coe, T. David, Elhanan Helpman, and W. Alexander Hoffmaister, 1995. North-South R&D Spillovers. NBER Working Paper, No. 5048, Cambridge, Massachusetts: National Bureau of Economic Research.

Cooper, G. Robert, Kleinschmidt, J. Elko, 1987. New Products: What Separates Winners from Losers?, Journal of Product Innovation Management, 4(3): 169-184.

Crossan, M. Mary, Lane, W. Henry, White, E. Roderick, 1999. An Organizational Learning Framework, Academy of Management Review, 24(3): 522-537.

Frantzen, Dirk, 2000. R&D, Human Capital and International Technology Spillovers:A Cross Country Analysis, Scandinavian Journal of Economics, 102(1): 57-75.

Frantzen, Dirk, 2000. R&D, Human Capital and International Technology Spillovers:A Cross Country Analysis, Scandinavian Journal of Economics, 102(1): 57-75.

Griffith Rachel, Stephen Redding, and John Van Reenen, 2001. Mapping the Two Facesof R&D: Productivity Growth in a Panel of OECD Countries, The Institute for Fiscal Studies, Working Paper, 02/00 (London, United Kingdom: The Institute for FiscalStudies..

Griffith Rachel, Stephen Redding and John Van Reenen, 2001. Mapping the Two Faces of R&D: Productivity Growth in a Panel of OECD Countries, The Institute for Fiscal Studies, Working Paper, 02/00 (London, United Kingdom: The Institute for Fiscal Studies).

Gupta, K. Ashok, & Wilemon, L. David, 1990. Accelerating the Development of Technology-Based New Products. California Management Review, 32(2): 24-44.

Jones, I. Charles, 1995. Time Series Test of Endogenous Growth Models, Quarterly Journal of Economics: 495–525.

Porter, E. Michael, and Scott Stern, 2000. Measuring the 'Ideas' Production Function:Evidence from International Patent Output, NBER Working Paper NO. 7891, Cambridge: Massachusetts: National Bureau of Economic Research).

Romer, M. Paul, 1986. Increasing Returns and Long Run Growth, Journal of Political Economy, 94: 1002–37.

Romer, M. Paul, 1990. Endogenous Technical Change, Journal of Political Economy, 98: 71–102.

Romer, M. Paul, 1994. The Origins of Endogenous Growth, Journal of Economic Perspectives, 8: 3–22.

Savvides, Andreas, Marios Zachariadis, 2003. International Technology Diffusion and TFP Growth, forthcoming, Oklahoma: Oklahoma State University, Department of Economics,.

Savvides, Andreas, Marios Zachariadis, 2003, International Technology Diffusion and TFP Growth, (forthcoming, Oklahoma: Oklahoma State University, Department of Economics).

Scherer, F.M., 1982. Inter-Industry Technology Flows and Productivity Growth, The Review of Economics and Statistics, 64: 627-34

Schumpeter, A. Joseph, 1934. The Theory of Economic Development. London: Transaction Publishers,

Tushman, Michael, & Nadler, David., 1986. Organizing for Innovation. CaliforniaManagement Review, 28(3): 74-92.

Wheelwright, C. Steven, & Clark, B. Kim, 1992.Revolutionizing Product Development: Quantum Leaps in Speed, Efficiency, and Quality. New York, USA: The Free Press.

Zachariadis, Marios, 2003. R&D, Innovation, and Technological Progress: A test of the Schumpeterian Framework without Scale Effects, Canadian Journal of Economics, 36(3): 566-686.

Zander, Udo, & Kogut, Bruce, 1995. Knowledge and the Speed of the Transfer and Imitation of Organizational Capabilities: An Empirical Test. Organization Science, 6(1): 76-92.

Zirger, Billie Jo, & Maidique, Modesto, 1990. A Model of New Product Development:An Emperical Test. Management Science, 36(7): 867-883.