



THE IMPACT OF ENTREPRENEURSHIP ON ECONOMIC GROWTH: GEM DATA ANALYSIS

DOI: [10.17261/Pressacademia.2017.494](https://doi.org/10.17261/Pressacademia.2017.494)

JMML-V.4-ISS.3-2017(14)-p.320-326

Mesut Savrul¹

¹Canakkale Onsekiz Mart University, Canakkale, Turkey. msavrul@comu.edu.tr

To cite this document

Savrul, M. (2017). The impact of entrepreneurship on economic growth: GEM data analysis. Journal of Management, Marketing and Logistics (JMML), V.4, Iss.3, p.320-326.

Permemant link to this document: <http://doi.org/10.17261/Pressacademia.2017.494>

Copyright: Published by PressAcademia and limited licenced re-use rights only.

ABSTRACT

Purpose - Since the last decade of the 20th Century, the relation between entrepreneurship and economic performance have been discussed and empirically examined by various studies. Although the importance of the impact of entrepreneurship on economic performance have been studied empirically exclusively at the firm and industry level, country level contributions are rather short. Taking this deficiency into account, the aim of this study is to examine investigate the impact of entrepreneurial activities on economic growth at country level.

Methodology - The empirical analysis of the study is modelled by consolidating entrepreneurship as an intermediate variable to the Cobb-Douglas growth model beside the basic variables of labour, gross capital formation, and gross domestic product per capita. The data of 35 countries covering 2006-2015 period is used in the study and the data is collected from OECD and Global Entrepreneurship Research Association databases.

Findings - The results of the study produce that although the changes in the entrepreneurial variables don't effect economic growth immediately, they present a significant and positive effect in the long run.

Conclusion - As the effect of entrepreneurial activities on economic growth come out in the long run, policies for entrepreneurship should be planned on a long-term basis.

Keywords: Entrepreneurship, GEM data, economic growth, Schumpeterian growth, economy wide country studies.

JEL Codes: L26, O40, O50

1. INTRODUCTION

The entrepreneurial function is accepted as a vital component of economic growth for a long time and latest empirical studies, which argue that historical theories explaining economic growth with capital accumulation and expansion of the labour force now fail to satisfy explaining production function implicitly, and the lessons learned from the experiences of the countries are supporting this approach (Baumol, 1968: 65). At the present time entrepreneurship is regarded as a significant setting for economic development by expanding employment, innovation and welfare. However the factors such as institutional context and level of economic development of the host country may differentiate the dynamics of entrepreneurship which give rise to extensive diversities across countries in introduction of the entrepreneurial activities (Autio, 2007).

Schumpeter (1934) is one of the first scholar to spotlight on the significance of entrepreneurial activity, in the debate about the function of entrepreneurship in the economic development. He argues that entrepreneurs fulfil the search, discovery,

opportunity evaluation, mobilization of the production factors for the business, making time-wise arrangements, taking obligation for administration and being the unpredictability in the existence of market imperfections. However, although a notable time has passed over the first arguments theories of economic growth clearly cover the variables of entrepreneurship. While general equilibrium models are facing challenges in dealing with the innovating entrepreneurship dynamics, profit conveniences for entrepreneurs aren't acknowledged by the neo-classical postulate of perfect competition (Solow, 1956). The connection between entrepreneurial features of economic performance has not been investigated enough yet and the empirical proof on the relationship between economic growth and entrepreneurship is still narrow and offer a mixed picture (Tang and Koveos, 2004: 162-163).

In this perspective, this study concentrates on the direct impact of entrepreneurship on economic growth. The study is formed of four sections. The first part includes the discussion on the rising importance of entrepreneurship phenomenon. In the second part the inclusion of entrepreneurship in economic growth is dealt within the framework of evolution of economic theory. In the third part the former studies dealing with the effect of entrepreneurship on economic growth is reviewed to conclude an appropriate model for the study. And in the following section the relation is analyzed empirically using the data of 35 countries including total early-stage entrepreneurial activity (TEA), labour force, gross capital formation and gross domestic product per capita for the years 2006-2015.

2. RISING IMPORTANCE OF ENTREPRENEURSHIP

When small and specifically new enterprises are recognized as an instrument for entrepreneurship by the last decade of the 20th Century, its contribution on innovative and competitive capability beside employment and social and political stability began to attract attention. In the following course the expectations towards small businesses changed from being a social good to an instrument for economic growth via entrepreneurship. Actually entrepreneurial function's being an essential determinant of economic growth is also represented by econometric evidence and it is argued that the lack of entrepreneurship is going to result in a reduce in economic growth. In this perspective, the positive connection between entrepreneurship and economic growth is justified across a wide range of units of observation, connecting the establishment, business, industry and the country (Acs et.al, 2009: 226).

A potential transformation in economics was postulated by Schumpeter (1908) by demonstrating the entrepreneur's being the underlying force of economic development, at the beginning of the 20th century. Despite the contribution of Schumpeter and although it was noticed that entrepreneurship had an significant role in economic theory since the 18th and early 19th century, its being regarded as a production factor in explaining economic growth materialized only in the latest decade (Santarelli and Vivarelli, 2007:455).

Economic growth is exogenously driven by technological progress in neoclassical or exogenous growth models. In contrast, the theories of the new economic growth or endogenous growth models suggest that the accreditation of knowledge and technologies, seen as forces that are internal to the economic system, stimulate economic growth. As stated in the stock of human capital model of Romer is crucial for economic growth and accordingly countries with larger stocks of human capital will have a faster economic growth (Hessels and Stel, 2011: 258).

The shift towards knowledge intensive industries in new business environment gave rise to emergence of entrepreneurship in which especially small businesses play an active role. Knowledge spillovers and the evolution of industries as learning mechanism serving as agents of change in small businesses (Fritsch, 2013: 26) however although small business and entrepreneurship are associated concepts, they aren't identical because entrepreneurship is a sort of behaviour focusing on resources more than opportunities. In this regards, it is clear that this kind of behaviour may actualize in large businesses as well as the small ones (Thurik and Sander, 2004: 140).

The roles of entrepreneur have attracted attention in the community of economist for a long time by means of both the static role of organization of the other factors of production and the dynamic role of innovation and creation. Thereby a considerable literature and countless definitions exists on the topic. To brief the subject the traditional definitions of the term can be grouped in four leading categories as follows (Tyson et.al, 1994: 166):

- entrepreneurship as stabilizing force;
- entrepreneurship as risk-taking;
- entrepreneurship as innovation;
- entrepreneurship as founding, owning or managing a enterprise.

Regarding these functions of entrepreneurship, it is clear that the dynamics of entrepreneurship within any given economy is outlined by climate of the economy which may be listed as the perceptions of entrepreneurs, access to capital, quality of governance, interdependencies between economic development and institutions, and other resources (Acs et.al, 2008:

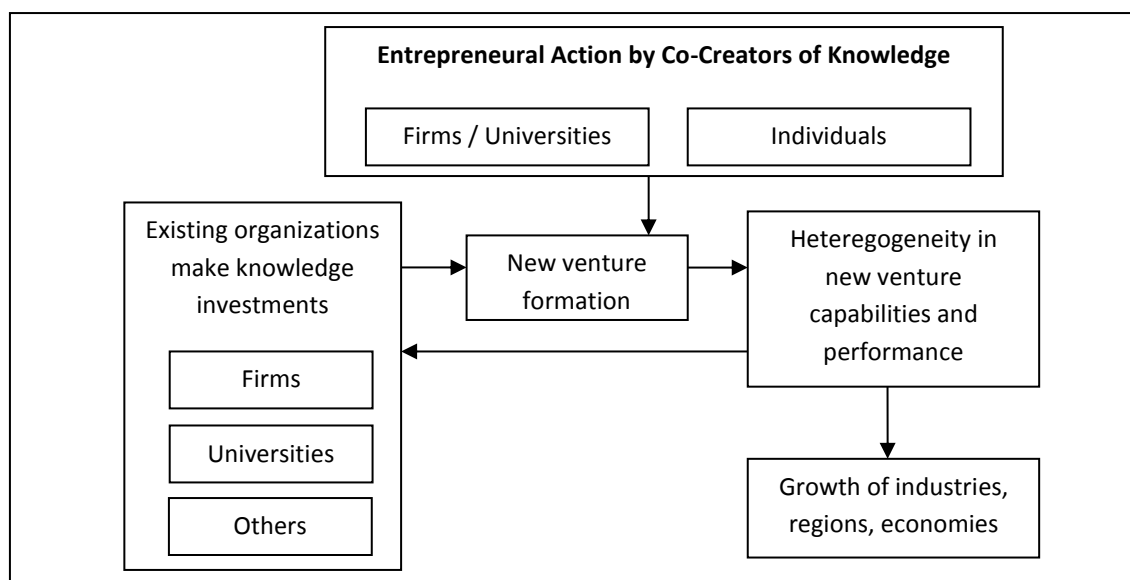
219). Before taking country level discussion a step further, the connection of entrepreneurship and economic growth will be referred in the next section.

3. ENTREPRENEURSHIP AND ECONOMIC GROWTH

Schumpeter (1934) highlights the role of the entrepreneur as the major element of economic development in his Theory of Economic Development. In the study, it is defined that innovation efforts of an entrepreneur forces the firms to introduce new inventions which result in the current products and technologies to be obsolete. This mechanism, called as creative destruction, is the leading features of Schumpeter Mark I regime (Acs et.al, 2009: 219). Likewise Romer (1990) argues that entrepreneurship is the instrument which converts knowledge into economic growth. In his model, the need for developing new products to gain competition advantage force the enterprises to employ researchers and the RD efforts of this researchers convert knowledge into economic growth. However the generated knowledge can't be commercialized by the researchers but the entrepreneurs who discover potential opportunities and start new firms to exploit knowledge (Acs et.al, 2006: 4-5).

These historical aspects of entrepreneurship that connect entrepreneurship and economic growth, later emerged in many fields of study such as management and economics. In the current view, the literature propose that economic performance is contributed by the entrepreneurial activities such as introduction of innovations, creation of change, creation of competition and enhancement of rivalry. (Wong et.al, 2005: 337). In today's business environment, how the entrepreneurial action can affect economic growth can be seen in Figure 1.

Figure 1: Strategic Entrepreneurship



Source: Agarwal, R., Audretsch, D., Sarkar M.B., 2007. The Process of Creative Construction: Knowledge Spillovers, Entrepreneurship, and Economic Growth. *Strategic Entrepreneurship Journal*, 1: 263-286, p.267.

Entrepreneurship may affect economic growth in many distinct ways such as introduction of essential innovations which result in production processes or new products. The crucial roles played by the entrepreneurs such as Sam Walton, Ray Kroc, Bill Gates, Michael Dell, Henry Ford, Andrew Carnegie and Thomas Edison led to transformation in many initial industries. Another way the entrepreneurs boost productivity is competition building. They can improve our knowledge of what is technically applicable and by offering alternatives for the existing products and services in the market, what consumers prefer (Stel et.al, 2005: 311-312).

The ways how entrepreneurship can be effective on economic growth can be extended further. To stay within the scope of the subject, we may summarize these effects in three essential ways as follows (Audretsch and Thurik, 2004: 6-7);

- The first is the creation of knowledge spillovers. As established in literature, knowledge spillovers are an significant mechanism underlying endogenous growth.

- A second is generation of economic growth by entrepreneurship capital through boosting the number of enterprises and raising competition. It is discussed in literature that competition is more helpful to knowledge externalities than local monopoly.
- A third is generation of economic output by entrepreneurship capital by presenting diversity among enterprises. Entrepreneurship capital increases the variety of enterprises in a certain location beside generating a greater number of enterprises.

In making a country level consideration, the variables such as level of corruption, regulatory framework, extent of educational capital and availability of financial capital directed towards entrepreneurship influence entrepreneurial effort considerably (Bowen and Clercq, 2008: 749). In this respect, it is clear that the variation of the impact of entrepreneurial actions of economic growth in country level can be questioned in many ways. Before analysing this question, how the literature approaches this topic will be dealt in the next section.

4. LITERATURE REVIEW

Using cross-sectional data of the 37 countries taken from GEM database and developing a Cobb–Douglas production function, Wong et.al. (2005) investigated technological innovation and firm formation as independent determinants of economic growth. They analysed the contrast between different classes of entrepreneurship activities as determined using opportunity TEA, necessity TEA, high growth potential TEA, Total Entrepreneurial Activity (TEA) rates and overall TEA. The result of their study concluded that only high growth potential entrepreneurship has significant impact on economic growth of the four types of entrepreneurship evaluated.

In their paper Acs et.al. (2006) identified entrepreneurship as an instrument to facilitate the knowledge spillover. For the study, they used a panel of entrepreneurship data for 18 countries. The findings of their analysis has shown that entrepreneurial activity helps to promote economic growth beside measures of human capital and R&D.

Stel et.al. (2005) investigated the effect of total entrepreneurial activity (TEA) on GDP using the data of 36 economies. They analysed if this impact depends on the level of economic development measured as GDP per capita. They adjusted data by consolidating incorporating the Growth Competitiveness Index to generate a range of alternative interpretation on economic growth. The results of their study has shown that entrepreneurial activity by owner/managers of young businesses and nascent entrepreneurs has impact on economic growth, however this impact depends upon the level of per capita income which This imply that different stages of economic development influence the role of entrepreneurship in the host country.

In their study, Acs and Varga (2005) developed an empirical model which indigenize cluster effects on knowledge spillovers beside entrepreneurial activity within a Romerian framework. They used the model to measure the level of entrepreneurship in particular economies using their GEM cross-national data. Findings of the study introduced that cluster effects and entrepreneurial activity have a statistically significant and positive effect on technological change in the countries of the European Union.

Using GEM micro and macro data, Acs and Szerb (2007) carried out an analysis to determine the effect of entrepreneurship on economic growth. They based their study upon development level criterion for the countries. Their study ended up with the policy recommendations such as concentrating on supporting enterprise development, upgrading technology availability and increasing human capital for middle income countries, and reducing entry regulations' not resulting in more high-potential start-ups for developed economies.

In their study, Bowen and Clercq (2008) empirically tested if the institutional characteristics affect the allocation of entrepreneurial effort. The findings of the study proved that positive relationship between allocation of entrepreneurial efforts of a country toward high-growth activities and the level of financial capital supports the aspect that financial pressures can be harmful to entrepreneurs who intend to raise their business.

5. MODEL

The study intends to analyse both the time dimension with cross-sectional dimensions of various countries. Due to the presence of time and cross-sectional dimensions of the data set covered in the study, use of panel regression analysis is found eligible.

5.1. Data Set

The study covers gross domestic product per capita (constant 2005 US\$), gross capital formation (constant 2005 US\$), labour force (total) and total early-stage entrepreneurial activity data from 35 selected countries covering 2006-2015 period. The TEA variable used in the study is collected from Global Entrepreneurship Research Association databases. The

country selection is based upon the countries included in Global Entrepreneurship Research Association database and the countries with missing data is excluded from the analysis. The other variables used in the analysis are Reel GDP (2005=100), as GDP; labour force as LAB and gross fixed capital as (2005=100. The reel variables are used in the analysis, the L value of the variables show their logarithm is taken and the D value shows their difference is taken.

5.2. Method

In order to avoid spurious relationships between the variables, the variables used in the study should be stationary. Stationary of the variables has been tested with Cross-Section Dependence Tests and the results of the tests have shown horizontal section dependency between variables as seen in Table 1 below. Therefore, in this study the stationarity of variables is tested with Peseran (2007) which takes horizontal section dependency into account.

Table 1: Cross-Section Dependence Test

	LGDP	LGFC	LLAB	LTEA
Breusch-Pagan LM	2379.689 ^a	2196.815 ^a	3630.481 ^a	1409.632 ^a
Pesaran Scaled LM	50.72096 ^a	45.41970 ^a	86.97960 ^a	22.60040 ^a
Bias-Corrected Scaled LM	48.77652 ^a	43.47526 ^a	85.03515 ^a	20.65596 ^a
Pesaran CD	22.26190 ^a	15.74572 ^a	26.44057 ^a	14.60987 ^a

a indicates signficancy at 1% level of significance

Null hypothesis: No cross-section dependence (correlation)

The results of Peseran test are listed below. Accordingly, LLAB and LTEA are stationary in their level and 5% significance level. All variables were found to be stable at the 5% significance level when their difference is taken.

Table 2. Pesaran Unit Root Test

Variables	Without Trend	With Trend
LGDP	3.129 (0)	0.068 (1)
LGFC	1.542 (0)	-0.143 (1)
LLAB	-3.572 (1) ^a	0.716 (1)
LTEA	-1.911 (1) ^b	-0.776 (1)
DLGDP	-1.409 (1) ^c	-2.010 (0) ^b
DLGFC	-1.864 (1) ^b	-1.959 (0) ^b
DLLAB	-1.614 (1) ^b	-2.059 (0) ^b
DLTEA	-3.013 (1) ^a	-4.189 (0) ^a

a, b and c respectively indicate signficancy at 1%, %5 and %10 level of signficance, Ho rejected

The impact of TEA on economic growth can be examined via a Cobb-Douglas model of growth. In Cobb-Douglas growth model, output is a function of production factors of on capital and labour, A Cobb-Douglas production growth model in which TEA is regarded as a production factor can be expressed as follows;

$$Y = f(K, L, TEA) \quad (1)$$

or in an open format;

$$Y = K^{\beta_1} L^{\beta_2} TEA^{\beta_3} \quad (2)$$

when we take the logarithm of the difference of both sides, our equation is transformed into a growth equation.

$$DLY = \beta_1 DLK + \beta_2 DLL + \beta_3 DLTEA + e_2 \quad (3)$$

When the variables used in the study is replaced in equation, model is transformed into;

$$DLGDP = \beta_1 DLCFC + \beta_2 DLLAB + \beta_3 DLTEA + e_2 \quad (4)$$

The equation (4) is estimated with Pooled OLS, Fixed effect and Random Effect models and the results of the tests are listed below in Table 3.

Table 3: Panel OLS

Dependent Variable: DLGDP			
Variable	Pooled OLS	Fixed Effect	Random Effect
DLGFC	0.216483 ^a	0.200449 ^a	0.204783 ^a
DLLAB	0.049665	0.025255	0.041207
DLTEA	-0.004354	-0.001368	-0.002135
C	0.010160 ^a	0.010394 ^a	0.010032 ^a
R ²	0.63	0.77	0.66
DW	1.31	2.02	1.76
N	315	315	315

a, b and c respectively indicate significance at 1%, %5 and %10 level of significance, Ho rejected White cross-section standard errors & covariance (d.f. corrected)

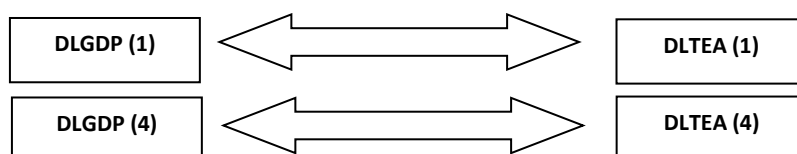
White cross-section correction is carried out in order to avoid autocorrelation, heteroskedasticity and cross section dependence problems in estimated in equation. According the results of estimation, while LTE variable is not significant, all investment variables in the model are found to be significant.

In the study, because LTE variable is stationary in its level, causal relationships were investigated by Granger causality analysis. The relationship between the two variables (variable) in the sense of Granger causality investigated by the following equation. Granger causality relationship between two variables can be investigated with the following equation.

$$\Delta Y_{it} = \alpha_0 + \sum_{j=1}^m \alpha_j \Delta Y_{it-j} + \sum_{j=1}^m \beta_j \Delta X_{it-j} + u_{it} \quad (5)$$

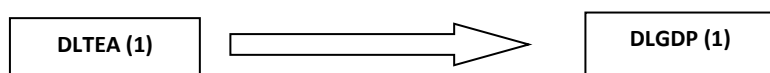
$$\Delta X_{it} = \gamma_0 + \sum_{j=1}^m \gamma_j \Delta X_{it-j} + \sum_{j=1}^m \delta_j \Delta Y_{it-j} + v_{it} \quad (6)$$

To resolve the internality problem, autocorrelation correction and to avoid heteroskedasticity and cross section dependence problems, white cross-section correction are carried out. m value is found as 1 and 4 according to FPE (final prediction error) and Akaike criteria. Additionally, relations with the GMM method was estimated again. The lagged values of LGDP and LTEA are used as instrumental variable. The resulting causal relationship is shown in the figure below.



A bi-directional causality between DLGDP and DLTEA is found by both 1 and 4 lag.

According to the results obtained with equations GMM method, a unidirectional causality from DLTEA to DLGDP has been identified. J statistic results showed that Instrumental Variables are valid.



6. CONCLUSION

For long, it has been accepted that the entrepreneurial function is a essential element of economic growth. The lessons gained from the experiences and the latest empirical evidence seem to validate this aspect. Based on this resolution, in this study, the impact of entrepreneurship on economic growth is empirically investigated. The analysis of the study is modelled by incorporating entrepreneurship as an intermediate variable to Cobb-Douglas model of growth.

The results of the study have shown that TEA are not affective on output (GDP) in the current period, however the investments made via TEA create an emerging impact and arise a causality from DLTEA to DLGDP in time. It has been determined that in the longer time periods the impact of TEA on GDP increases and causality gains strength. As a result the effect of TEA on growth does not occur immediately but it has been found to manifest itself in time so it can be concluded

that as the effect of entrepreneurial activities on economic growth come out in the long run, policies for entrepreneurship should be planned on a long-term basis.

REFERENCES

- Acs, Z.J., Audretsch, D.B., Robert J.S., 2009, *Entrepreneurship, Growth, and Public Policy*. New York: Cambridge University Press
- Acs, Z.J., Desai, S., Hessels, J., 2008, *Entrepreneurship, Economic Development and Institutions*. *Small Business Economics*, 31, pp.219-234
- Acs, Z.J., Szerb, L., 2007, *Entrepreneurship, Economic Growth and Public Policy*. *Small Business Economics*, 28, pp.109-122
- Acs, Z.J., Audretsch, D., Braunerhjelm, P., Carlsson, B., 2006, *Growth and Public Policy Growth and Entrepreneurship: An Empirical Assessment*. *Discussion Papers on Entrepreneurship, Growth and Public Policy*, 3205, pp.1-29
- Acs, Z.J., Varga, A., 2005, *Entrepreneurship, Agglomeration and Technological Change*. *Small Business Economics*, 24, pp.323-334
- Agarwal, R., Audretsch, D., Sarkar M.B., 2007, *The Process of Creative Construction: Knowledge Spillovers, Entrepreneurship and Economic Growth*. *Strategic Entrepreneurship Journal*, 1, pp.263-286
- Audretsch, D., Thurik, R., 2004, *Growth and Public Policy A Model of the Entrepreneurial Economy*. *Discussion Papers on Entrepreneurship*, 1204, pp.1-17
- Autio, E., 2007, *Global Entrepreneurship Monitor: 2007 Global Report On High Growth Entrepreneurship*. Wellesley, MA/London: Babson College and London Business School
- Baumol, W.J., 1968, *Entrepreneurship in Economic Theory*. *The American Economic Review*, Vol. 58, No. 2, *Papers and Proceedings of the Eightieth Annual Meeting of the American Economic Association* May, pp.64-71
- Bowen, H.P., Clercq, D., 2008. *Institutional Context and the Allocation of Entrepreneurial Effort*. *Journal of International Business Studies*, Vol. 39, No. 4, pp.747-768
- Fritsch, M., 2013. *Handbook of Research on Entrepreneurship and Regional Development*. Cheltenham: Edward Elgar Publishing
- Hessels, J., Stel, A., 2011. *Entrepreneurship, Export Orientation, And Economic Growth*, *Small Business Economics*, 37, p.255-268
- Pesaran, M.H., 2007. *A Simple Panel Unit Root Test in the Presence of Cross Section Dependence*. *Journal of Applied Econometrics*, 27, pp.265-312
- Santarelli, E., Vivarelli, M., 2007. *Entrepreneurship and the Process of Firms' Entry, Survival and Growth*. *Industrial and Corporate Change*, Vol.16, No.3, pp. 455-488
- Schumpeter, J., 1934. *The Theory of Economic Development*, New Jersey: Transaction Publishers
- Schumpeter, J., 1908. *Quarterly Journal of Economics*. *On the Concept of Social Value*, Vol.23, 1908-9, pp.213-232
- Solow, R.M., 1956. *A Contribution to the Theory of Economic Growth*. *The Quarterly Journal of Economics*, Vol.70, No.1, pp.65-94
- Stel, A., Carree, M., Thurik, R., 2005. *The Effect of Entrepreneurial Activity on National Economic Growth*, *Small Business Economics*, 24, pp.311-321
- Tang, L., Koveos, P.E., 2004. *Venture Entrepreneurship, Innovation Entrepreneurship, and Economic Growth*. *Journal of Developmental Entrepreneurship*, 9, 2, pp.161-171
- Thurik, R., Wennekers, S., 2004. *Entrepreneurship, Small Business and Economic Growth*, *Journal of Small Business and Enterprise Development*, Vol.1, No.1, pp.140-149
- Tyson, L.A., Petrin, T., Rogers, H., 1994. *Promoting Entrepreneurship in Eastern Europe*. *Small Business Economics*, 6, pp.165-184.
- Wong, P.K., Ho, Y.P., Autio, E., 2005. *Entrepreneurship, Innovation and Economic Growth: Evidence From GEM Data*. *Small Business Economics*, 24, pp.335-350