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Entrepreneurship Capital and Economic Performance in MENA Region: Dynamic Panel Approach

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Abstract
The aim of this paper is to investigate the impact of entrepreneurship capital on economic performance at the macroeconomic level. Our empirical study was conducted on a sample of 16 countries of MENA region covering the period from 1995 to 2009. Referring to the dynamic panel model (GMM method) which highlights the contribution of entrepreneurship capital on GDP growth rate of MENA region, our econometric results reveal on the one hand that entrepreneurship capital measured in terms of startup rate positively affects and boosts the economic performance, it is a significant and important factor which provides the productivity growth in long term of primary factors and on the other hand that innovation factor measured in term of share expenditure on research and development does not have a determinant impact on economic performance in these countries. This result is due to the low level of investments and expenditures on research and development devoted in these countries.

Keywords: entrepreneurship capital, innovation, economic performance, dynamic panel data

INTRODUCTION

The importance of technological innovation to economic growth has been well documented in theoretical and empirical literature (Solow, 1956; Romer, 1986) (Mansfield, 1972; Nadiri, 1993); however, the concept of entrepreneurship has not found its place for many years in the mainstream empirical economic research on the sources of economic growth. (Porter, 1990; Baumol, 1993; Lumpkin and Dess, 1996) have treated theoretically and empirically how entrepreneurship affects the economy.

Davidsson (2003) supports the views of Kirzners (1973) ‘‘entrepreneurship consists of the competitive behaviours that drive the market process’’. Entrepreneurship manifested itself in various ways such as, market entry of new firms and also imitative and innovative entries into new markets by established firms.

Accordingly, innovation is considered as a form of entrepreneurship. Wennekers and Thurik (1999) and Carree and Thurik (2003) suggest that entrepreneurship by creating change, introducing innovations, creating competition and enhancing rivality contributes significantly to economic performance.

During the pre-20th century Cipolla, 1981 and Lazonick, 1991, showed that entrepreneurship is essential to the long term economic growth. Entrepreneurship, by penetrating new markets, reallocates resources to new opportunities, adopts new production techniques, diversifies output and introduces competition. In the mid-20th century, this concept lost its figure in the face of the mounting evidence that large scale of production enhanced efficiency (Weis, 1976).

In the last two decades, knowledge and information revolution triggered theories linking entrepreneurship to economic growth with evolutionary economics. Wennekers and Thurik (1999) identify the multiple roles of the entrepreneur over the innovator. They demonstrate that general innovative role involves new entry (start ups) besides newness (implementing inventions).

This paper contributes to the existing literature by presenting an empirical analysis that measure the impact of entrepreneurship capital on economic performance at a macro level, which highlights the contribution of the considered variable in explaining the GDP growth rate of 16 countries of MENA region. GMM method reveals that entrepreneurship capital is a key factor which promotes the growth of the primary factors of productivity in long term. So, each country will converge to its stationary state well the entrepreneurship capital boosts in long term the growth.

This paper is structured as follows: we will start in the first and the second section with a review of the literature and the empirical evidence of the link between Entrepreneurship Capital and Economic

Performance. Next, section 3 represents the empirical part where we will present the data and the model used, while in the fifth section, we will present our empirical results that Entrepreneurship Capital is a key factor in explaining the economic performance in MENA region, but innovation in these countries does not have an impact on economic performance.

Entrepreneurship Capital to Economic Performance: Literature Review

The new theories of industries evolution developed a theoretical framework concerning the relationship between entrepreneurship and economic performance (Jovanovic, 1982; Ericson and Pakes, 1995; Audretsch, 1995; Hopenhayn, 1992; Lambson, 1991 and Klepper, 1996). In contrast of the traditional theories which suggest that entrepreneurship will retard economic growth, the new theories suggest that entrepreneurship will stimulate and generate economic growth. The reason of this divergence in theory is linked to the context of the underlying theory. While in the traditional theory the new knowledge has no role, static efficiency determined widely by the capacity to exhaust scale economies on the contrary dictates growth. The new theories which are dynamic in nature, focus on the role played by knowledge. Knowledge in nature is uncertain, asymmetric and related to high cost of transactions, discrepancies related to the expected value of new ideas appear.

The neoclassical model of production function of Robert Solow (1956) is composed of two key factors of production these are capital and labor. To explain the determinants of economic growth, economists have based their premises on a model of production function. Paul Romer (1986) criticized the model of Solow and perceived that another factor of production function is omitted which is “knowledge”. Lucas (1988) as well and others showed that knowledge was an important factor of production in addition to the other factors of capital and labor. It was important because it was endogenously determined as a result of externalities and spillovers. A fourth factor of macroeconomic production function is involved such as entrepreneurship (Audretsch and Keilbach 2004; Audtretsch and al 2006). Entrepreneurship is the combination of the existing production factors in new ways to create wealth (Audretsch 2007).

Entrepreneurship has a crucial role in the process of knowledge spillovers. As such, entrepreneurship capital boosts economic performance. It has an important effect at all levels; at the macro level, it is considered as a driver of job creation and structural change. At the micro level, it’s the generator of creation and growth of new firms. Wennekers and Thurik (1999) perceive that economic growth is generated by three entrepreneurial activities such as; innovations, growth employment and competition. Romer (1986), Lucas (1988) and Gene M. Grossman and Elhanan Helpman (1991) argue that knowledge spillovers allows the transformation of available knowledge into new product, so it’s seen as an important mechanism of endogenous growth. Entrepreneurship facilitates knowledge spillovers through the implication of startups and growth of new enterprises where their ideas are commercialized.

Entrepreneurship can affect economic performance as well by increasing the number of enterprises and thus increasing the competition. Jacobs (1979) and porter (1990) note that the impact of entrepreneurship on competition is not only in the product market but also in the input market for new ideas embodied in economic agents.

The higher number of firms promotes the competition of new ideas and so the high competition between firms generates the entry of new firms. The third way of affecting economic performance by entrepreneurship appears in the level of diversity among the firms. Jacobs (1969) shows that the diversity of industries inside a region generates knowledge externalities, innovative activity and economic growth respectively.

Linking Entrepreneurship Capital to Economic Performance: Empirical Evidence

Some recent work seeks to identify the particular aspects of the contribution of entrepreneurship to economic growth. Reynolds et al (1999), entrepreneurship has a crucial role in the promotion of economic growth, they explained the variations of economic growth rates by variations in entrepreneurial activity. While many studies develop a direct link between entrepreneurship and economic growth, other studies develop an indirect relationship through an interaction between entrepreneurship and employment growth.

Some studies endeavor to explain that entrepreneurship is an important factor in explaining the higher levels of economic growth in countries or regions of a country. Van Stel and al. (2004 and 2005) used three explanatory variables of the economic growth of a country; entrepreneurship rate, per capita output, global competitiveness index. They used Global Entrepreneurship Monitor (GEM) database, they find that the effect of entrepreneurship activity rate on economic growth positively affects the level of economic development.

Blanchflower (2000) finds a negative relationship between self-employment and economic growth in his study of 23 OECD countries during 30 years. Carree and al (2002) advance the following question: “is there is an ‘equilibrium’ level of entrepreneurship in a country?”. They found that entrepreneurship has

a negative consequence on aggregate economic growth whether below or above the 'equilibrium' level. In their extension version, Carree and al. (2007) found that entrepreneurship below the 'equilibrium' negatively affects the economic growth. Wong, Ho and Autio (2005) used the production function Cobb-Douglas in explaining entrepreneurship and technological innovation as determining factors of growth in developing countries and they found that the rapid growth of new enterprises generates job creation in small and medium enterprises SME.

Acs and al (2004) found that the relationship between entrepreneurship and economic growth is positive. Also, Klepper and al. (2007) in their study of 84 countries from the World Bank data found a positive relationship between self-employment rates and economic growth. Thurik (2009) distinguished between the models of economic management and economic entrepreneurship for the purpose of explaining that models of entrepreneurial economies are a better reference to clarify the role of contemporary entrepreneurship. Opposed to the cycle of entrepreneurial economy, a successful economy of management requires a necessity of policies and institutions. Theoretically, evidence exists, entrepreneurship absorbs unemployment but also unemployment raises the level of entrepreneurship. This hypothesis was studied by Audretsch and Thurik (2001) using a panel data of 23 OECD countries between 1974-1998.

Acs and al (2005) tested the hypothesis that entrepreneurship is the channel of technical knowledge spillover. In models of endogenous theory, technical knowledge generation and spillover constitute the endogenous stimulus to growth. They used a sample of 20 OECD countries and they found that the combination of the two variables has a positive effect on economic gowth.

Salgado-Banda (2005) used as proxy of productive entrepreneurship a new variable based on patent data rather than a proxy based on self-employment data. He studied the case of 22 OECD countries and he found that self-employment is negatively correlated with economic growth, while the relationship between the measure of productive entrepreneurship, the level of innovation in different economies and economic growth is positive.

Audretsch and Fritsch (2002) considered the entrepreneur, the routine, rotational and shrinkage levels that present the different regime growth at a regional level. This concept refers to the degree of entrepreneurship measured by the creation of new businesses and employment growth. Regions with a higher density of population have greater problems in generation employment. Start ups and small business is more important for economic development in the long term than for regional growth in the short term. Van Stel and Storey (2004), using a sample of United Kingdom between 1980 and 1998, link the impact of employment growth and the creation of new businesses to specific public policies in UK that supported entrepreneurship. The qualification of entrepreneurial or non-entrepreneurial region depends on the stock and the quality of the human capital of the region.

Audretsch and Keilbach (2004) analyzed the effect of capital venture on regional economic growth. Capital venture entrepreneurial activity requires capital and labor as production function. They concluded that the effect of capital venture on regional economic growth is positive and a negative effect of the level of investment and unemployment for determining the level of capital venture. Social diversity, participation in public employment, educational level and crowding have a positive effect on capital venture.

Audretsch et al (2006), with a sample of German region in 1990, estimated a production function and they found a positive relationship between entrepreneurship, capital venture and regional economic growth. Holtz-Eakind and Kao (2003) used the rate of entry and exit of businesses to measure entrepreneurship and productivity to measure the growth and they concluded that entrepreneurship positively affects the growth. Koo and Kim (2009) establish a model of economic growth. The rate of economic growth is the function of the growth rate of economically useful local knowledge function of R & D, university research, social capital, entrepreneurship, human capital and the industry's structure. They found that entrepreneurship has a significant role in regional growth.

METHODOLOGY

Data and model

In light of the empirical framework mentioned above which seeks to explore the impact of capital entrepreneurship on economic performance, this section is about empirically validating this relationship on a panel of 16 countries of MENA region (Tunisia, Algeria, Saudi Arabia, Syria, Morroco, Oman, Libya, Lebanon, Kuwait, Jordan, Egypt, Djibouti, Bahrain, Iran, Yaman et Emarates) over the period stretching from 1995 to 2009. Data is taken from the World Bank (2009).

The model used is an extension of the neoclassical growth model based on the production function of Cobb Douglas. Entrepreneurship Capital measured in terms of startup rates and innovation measured in terms of research and development expenditure are explicitly entered as exogenous determinants of economic performance.

$$Y_{it} = \alpha K_i^{\beta 1} LogL_i^{\beta 2} EC_i^{\beta 3} RD_i^{\beta 4} \varepsilon \qquad (1)$$

GDP growth rate: is the dependant variable "Y" (economic performance)

The production Factors: the model of the Cobb Douglas is often used to link the production factors to productivity. Generally, GDP is described in terms of two factors of production: Labor and Capital. Paul Romer (1986) has criticized the Solow model and he found that another production factor is omitted; which is "Knowledge". Lucas (1988) has also demonstrated that knowledge is an important factor in the production function.

A fourth factor of production in the macroeconomic production function is involved "entrepreneurship" (Audtretsch and keilbach 2004, Audtretsch and al 2002). Entrepreneurship has a dual effect at the macro level; considered as generator and creator of job and at the micro level, entrepreneurship is the generator of creation and growth of new enterprises.
Capital: used as an indicator of physical capital (K), the Gross Fixed Capital Formation (investments in terms of percentage of GDP); (Audtretsch and keilbach, 2004).

Labor: is expressed by the number of workers in each country in the period of 1995- 2009, we introduced the log function in the labor variable.

Entrepreneurship Capital: the measure of Entrepreneurship Capital is diversified such as Total Entrepreneurial Activity (Van Stel, Carree and Thurik, 2005), the nascent entrepreneur (Wennekers, Van Stel, Thurik and Reynolds, 2005; Carree, Van Stel, Thurik and Wennekers, 2002, 2007) and the rate of startups (Acs and al 2005, Audtretsch, Bönte and keilbach 2008, Audtretsch and Keilbach 2004). In this paper, we have used the number of startups of new businesses relative to each country as a measure of entrepreneurship that allows the transfer of Knowledge. So entrepreneurship is measured in terms of the rate of new start ups in every country in MENA region. This indicator is the ratio between the number of start ups and the population of each country. It reflects the proportion of the inhabitants of a country to start a new business.

Innovation: Innovation, as a determinant of growth, is measured in terms of inputs such as expenditure on research and development (Mansfield, 1972), or in terms of outputs such as patents (Griliches, 1990). In this paper, we have used as a measure of innovation; the expenditure in research and development in every country of MENA region (Percentage of GDP) from 1995 to 2009.

Descriptive Analysis
Table 1 presents the descriptive statistics for each variable of economic performance expressed in terms of GDP growth rate and production factors. the table shows that the average rate of GDP growth over the sample is 1.67 and the standard deviation is 3.53 and there is a decrease in GDP growth rate of 11.9 and a maximum of 14.17. Which means that the rate of GDP growth is heterogeneous across countries in MENA region.

Entrepreneurship and the emergence of new start ups has an average of 3.40 with a minimum of 9.63 and a maximum of 26.33. But we show also the small proportion of research and development. We can notice that there is a few number of countries which invest in research and development.

Table 1: Descriptive Analysis

variables	*Observation*	*mean*	*Standard deviation*	*min*	*max*
PIB	240	1.67	3.53	-11.99	14.17
K	240	23.45	7.78	6.92	50.02
CE	240	3.40	5.49	9.63	26.33
LOGL	240	7.81	1.49	4.94	10.84102
RD	240	7.60	18.25	0.00	

Dynamic Panel Data Estimation
We use the panel data to analyze the effect of variations in variables over time on economic perfomance in a country. The panel data is analyzed by GMM-type estimator Arellano and Bond (1991, 1998), Arellano and Bover (1995), and Blundell and Bond (1998). The estimation equation has the following form:

$$yit - yi,t-1 = \alpha + \beta yi,t-1 + X'it\delta + \lambda t + uit \qquad (2)$$

or

$$yit = \alpha + \beta yi,t-1 + X'it\delta + \lambda t + uit \qquad i = 1, \ldots, N ; t = 2, \ldots, T$$

y is the GDP growth rate, i is the MENA country, t is a period of time/year, β is a scalar, X' is the set of explanatory variables 1 × K and δ is K ×1, λ_t is the time-specific effect, $u_{it} = \mu_i + \upsilon_{it}$ with μ_i presenting the unobservable country's specific effect and υ_{it} the error term.

The GMM-type estimator is considered if the time dimension of the panel is fixed and small (see Nickell (1981) and Judson and Owen (1999)), when the individual heterogeneity is present in panel data models with lagged dependant variable generating biased and incompatible estimates

Estimation Procedure
To estimate dynamic panel, two econometric methods were used. Firstly, by least ordinary squares with specific effects which permits to control the heterogeneity of individuals or countries. (Sevestre, 2002), the OLS can't provide efficient estimators due to the presence of lagged endogenous variable in our model. So we use the second estimation method (GMM), Generalized moments method, which

provides solutions for problems of bias of simultaneity (Kpodar, 2007). The econometrics of panel data allows us to control the heterogeneity of observations in their individual dimensions (Fixed or Random effect).

Fixed effects model: the fixed effect model estimation depends on the hypothesis that the individual effects α_i are represented by constant presented as follows;

$$yit = \alpha i + ß' Xit + \varepsilon it \quad (3)$$

$$i = 1\ldots..T \quad t = 1\ldots..T$$

In Fixed Effect model, the estimator of α_i and $ß_i$ parameters is called "Fixed Effects estimator" or "Within Estimator". The Fixed Effects estimator employs gaps for individual means and eliminates the persistent differences between countries. This procedure, which emphasizes the variability intra countries, presents an advantage of the ability to identify and measure the non observable effects.

Random Effects Model: in this model, the constant term specific to the individual "i" is random. This model is divided into fixed term and random term specific to the individual which allows the control of the individual heterogeneity. while in fixed effect model, we decompose the constant, in the random model we decompose the residues.

The model is presented as follows:

$$Y_{it} = \alpha_i + \sum_k \beta_k X_{kit} + \sum_p \lambda_p Z_{pi} + \varepsilon_{it} \quad (4)$$

$$i=1,\ldots,N \text{ and } t= 1,\ldots..,T_i$$

The individual random term α_i is composed into: $\alpha_i = \alpha + \mu_i$

α_i, presents the fixed component and μ_i presents the non- observable individual stochastic component. The random effect model can be written as follows:

$$Yit = \alpha + \sum_k \beta_k Xkit + \sum_p \lambda_p Zpi + \mu_i + \varepsilon it \quad (5)$$

$$i=1,\ldots, N \text{ and } t= 1,\ldots..,Ti$$

This model suggests the independence between error term and explanatory variables.

Hausman Test 1978: the Haussmann test 1978 is a test that treats the problem of endogeneity. Supposing that we are trying to test the presence of a correlation or a failure of specification and we have two types of estimators for the parameters of the model, the first (absence of correlation) is the unbiased estimator with a minimum variance under the null hypothesis of correct specification of the model. Again, under the alternative hypothesis of incorrect specification, the estimator is assumed to be biased. In contrast, the second estimator, the fixed effect model, is not biased in both cases.

The main hypothesis of Haussmann test;

$H0 : E(\mu i /Xi) = 0$ Estimators of Random Effects are efficient

$H1 : \neq E(\mu i /Xi)$ Estimators of Random Effects are biased

Under the null hypothesis of correct specification, the test statistic is asymptotically distributed under the Khi Squared for K degree of freedom (number of variant factors in time). If P- Value is less than 5%, this means that the model is significant and we retain in this case the fixed effects model as they are efficient.

GMM Estimation: Arellano and Bond (1991) developed a Generalized Method of moment (GMM) by exploiting all orthogonality conditions existing between lagged endogenous variable and the error term. Thus, all endogenous variables lagged with 2 or more lags are valid instruments for the equation in first difference. Arellano and bover (1995) and Blundell and Bond (1998) found that if the autoregressive process is persistent, so the lagged values on level of endogenous variables are weak instruments for equation in first differences. Moreover, the differentiation of the level equation eliminates variations between countries and takes into account variation within countries. The System GMM of Blundell and Bond (1998) can raise this limit, it combines the equation in first difference with the level equation. Although in the model of Arellano and Bond (1991), the lagged values on level equation of dependant variable and first differences of the exogenous variables are instruments for the equation in the first difference. Bover (1995) and Blundell and Bond(1998) proposed to use additional conditions moments where the lagged values of the dependent variable in the first difference are orthogonal to the error terms, so they are instruments for the level equation.

Estimation Results

The estimation results of Fixed and Random Effects models provided by table 2 show that the coefficients of production factors such as Physical Capital and Labor are positive. In Fixed Effects model, the coefficient of physical capital is 0.107 which means an increase of 1% in physical capital which leads to increase the GDP Growth Rate to 0.107. This result is close to the results reported by Cobb Douglas (1928).

Thus, we find that the labor factor is positive (elasticity of 0.42) but it is not significant. This means an increase of 1% in employed population which increases the GDP Growth Rate to 0.42.

This may be due to the low level of labor productivity and the unqualified labor in MENA countries. The coefficient of innovation is positive but is statistically not significant. Innovation as measured in terms of share of expenditures on research and development does not have a determinant impact on economic performance. This reflects the small or even absence of investments and the efforts devoted in research and development in MENA countries. The coefficient of

entrepreneurship capital is statistically significant, entrepreneurship boosts economic performance in some countries (an increase of 1% of entrepreneurial capital increases GDP growth rate to 0.54), countries such as Tunisia, Morocco.. Have adopted some policies to support and stimulate new businesses such as microfinance.

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Then, we can conclude that start ups as a measure of entrepreneurship capital are a driving force for explaining economic performance of countries. So entrepreneurship capital is an important additional factor to the production function. This result is consistent with empirical studies that have addressed this relationship and found that entrepreneurship capital positively contribute to economic performance of MENA countries Van Stel and al (2004, 2005) ; Wong, Ho and Autio (2005) ; Acs and al (2004) ; Klapper and al (2007), Audtretsch and Keilbach (2004) ; Audtretsch, Bönte and keilbach (2008). Fisher statistics (15, 153) = 3.39 confirms the individual heterogeneity (observable)

(P- Value< 5%), the overall model is significant. Estimation results of Random Effects model are not better than those obtained by Fixed Effects. Physical capital and entrepreneurship Capital are also significant and have a positive impact on economic performance, while labor and innovation are not significant. It is necessary to verify the absence of correlation between individual random term and explanatory variables of the model as from Hausman Test. Hausman test refutes the hypothesis of the absence of correlation between random term and explanatory variables (P-Value <5%). Estimators of Random Effects are biased, so it would be better to retain estimators of fixed effects that are not biased.

Table 2: Estimation results of fixed and random effects models

Dependant variable GDP Growth Rate	Fixed effects	Random Effects
Constante	- 5.17	-2.10
	(0.12)	(0.26)
Physical Capital	0.107	0.10
	(0.00)*	(0.00)*
Log Labor	0.42	0.07
	(0.32)	(0.75)
Entrepreneurship	0.54	0.34
Capital	(0.00)*	(0.00)*
innovation	0.01	0.017
	(0.25)	(0.10)
T.Hausman (P- Value)	0.0276	

p-values are in brackets(), *significatif at 1%

According to results of GMM- system (table 3), we accept the presence of an effect AR(1) and the absence of an effect AR(2). In addition, the physical capital and entrepreneurship capital have a significant and positive impact on economic performance of countries, this indicates that, first, entrepreneurial culture is an expansion in MENA countries, second, the adoption of these countries of new policies that promote and finance entrepreneurs. Thus, GMM-system innovation has a positive effect on economic performance, this means that policies that stimulate investments on research and development in these countries relatively fosters economic performance. This result confirms Romer's (1986).

We can conclude that the relation between entrepreneurship capital and economic performance is dynamic.

Table 3: Estimation Results of GMM method

variables	GMM in first difference	GMM- system
Physical Capital	0.13	0.08
	(0.09)***	(0.23)
Entrepreneurship Capital	0.81	1.005
	(0.00)*	(0.02)**
Log labor	0.79	0.37
	(0.25)	(0.50)
Innovation	0.017	0.025
	(0.25)	(0.003)*
Constant		-5.08
		(0.37)
observations	132	173
AR(1)	0.019	0.02
AR(2)	0.157	0.16
Sargan	0.003	0.002
Hansen	1	1
Number of instruments	40	53

*significatif at 1% **significatif at 5% ***significatif at 10% P- value in brackets()

DISCUSSION AND CONCLUSION

A country that has a higher degree of entrepreneurship has a higher level of economic performance. Our analysis also concludes that at the macroeconomic level, innovation does not have an effect on economic performance. Innovation and entrepreneurship capital can be regarded as two separate phenomena. This result is in contrast with neoclassical models of growth which consider innovation ias one of the important determinants of growth and as a proxy of entrepreneurship.

The basic premise of this paper has basically been the empirical and theoretical relationship between Entrepreneurship Capital and economic performance in the context of MENA region. This statistic approach is related to a conceptual approach, since there are various ways to measure the entrepreneurship capital. This variable can be regarded as an identifiable synthetic index to the measure of the institutional variables.

We should give an importance to the institutional factors that support and enhance Entrepreneurship Capital and economic performance. Baumol (1993, 2002), Davis and Henrekson (1999), Fölster (2002) suggest that the activities of Entrepreneurship Capital and the rate of growth should be understood in relation to the incentives provided by the institutional setting in each region or country.

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