

Human Capital as a factor of Economic Growth

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Abstract:

Economic growth is known as a worldwide discussed question and the development as well; a global policy objective that dates from 1940s. On the whole it's a long time that all countries make great efforts to determine some and possibly all factors which lead to sustainable growth and economic development.

Human capital as a factor of economic growth is identified not only as a major factor but also a suitable remedy to alleviate the poverty in the world. Health care and qualified education lead to economic growth and are centered on the development of human capital. Indeed, the advent of "endogenous growth models" with human capital (providing externalities) have certainly enhanced the understanding of the mysteries of rapid and long sustainable high growth performances of East Asian economies.

Using Panel data econometrics, in this study we aim to identify the effects of some important factors of economic growth specially education in some MENA, Middle East North African countries because the study of developing countries offers both

ملخص:

النمو الاقتصادي كما هو معروف في جميع أنحاء العالم مسألة حاسمة، فالتنمية إلى جانب ذلك تعتبر هدفا رئيسيا لكل سياسة اقتصادية منذ أربعينات القرن الماضي. وعلى وجه الخصوص بذلت الكثير من بلدان العالم جهودا كبيرة ومعتبرة من أجل تحديد بعض أو جميع العوامل، التي من شأنها أن تؤدي إلى تحقيق النمو المستدام والتنمية الاقتصادية الشاملة ككل.

رأس المال البشري كعامل من عوامل النمو الاقتصادي، ليس فقط باعتباره عاملا رئيسيا ولكن أيضا هو علاج مناسب للتخفيف من حدة الفقر في العالم. فالرعاية الصحية والتعليم المؤهل يؤدي إلى نمو حقيقي.

والواقع فإن بروز " نماذج النمو ذات العوامل الداخلية" مع رأس المال البشري، وتوفير العوامل الخارجية بات من المؤكد في تعزيز وفهم سريع لأسرار التنمية

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policy questions of fundamental importance and reach a set of experiences to examine.

Education is a social science that encompasses teaching and learning specific knowledge, benefits and skills; for economists working on education is an investment which its impact on the economic growth is so considerable. The new line of thinking is that for developing successfully a country needs to initially spend a fair amount of money on health care and education in the development process.

Key words: *Human capital, Education, economic growth, MENA countries.*

المستدامة التي تميزت بأنها عالية الأداء من خلال اقتصاديات دول شرق آسيا.

باستخدام بيانات الاقتصاد القياس، تهدف هذه الدراسة إلى تحديد آثار بعض العوامل الهامة على النمو الاقتصادي خصوصاً التعليم في بعض دول MENA، والشرق الأوسط، وبلدان شمال إفريقيا لأن الدراسة في هذه البلدان النامية على حد سواء، تعتبر مسائل ذات أهمية أساسية، والتوصل إلى فحص مدقق لمجموعة من التجارب الميدانية.

I. The position of MENA countries within the world economy

Middle East North Africa region is so important in the world economy because of its very rich natural resources, including approximately two thirds of known oil reserves in the world and a labour force of mass; there is a great economic and financial diversity between these countries with the rest of the world which have considerable differences in economic dimension, population, and trade and financial relations. The region comprises States of Middle East and the State of North Africa such as: Afghanistan, Algeria, Bahrayn, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Somalia, Sudan, the Syrian Arab Republic, Tunisia, United Arab Emirates, Yemen, Pakistan, and Gaza. They include approximately 7, 7 percent of the population of the world. The 24 countries of the region are gathered only for analytical aims. The GDP of the exporters of the oil explain approximately two thirds of the GDP of the area. Among the 24 countries of the region, 13 of them primarily find their exports in the hydrocarbons (Algeria, Bahrain, Iran, Iraq, Kuwait, Libya, Oman,

Qatar, Saudi Arabia, Sudan, the Syrian Arab Republic, United Arab Emirates and Yemen). Currently the greatest problem in the region is its growth rate which has been close to zero percent for more than 30 years, whereas in other developing countries the growth rate reaches the 2,5 percent per year.

In spite of its geopolitical importance, the influence of MENA region in the global economic system of the world remains weak. Political and economic instabilities and the war are the essential obstacles of economic development in these countries.

The countries of this area must reach higher growth rates and be better integrated in the world economy, in order to better create employment opportunities and qualified labour to reduce poverty and to improve the living conditions of the population. The real GDP growth per capita of the region, during 30 last years, practically stagnated in comparison with other developing countries. It is obvious that population growth compared to the growth rates involves a reduction in GDP growth per capita.

In recent research on the sources of TFP (Total Factor Productivity) growth of MENA region as well as that of other regions proves that to reverse the negative rate of growth in the TFP, the State must concentrate on the improvement in the way of controlling and the quality of the institutions, while investing in human capital and by establishing a suitable environmental policies. Recent empirical studies, based on data of a great number of countries, prove that the quality of the institutions is significant not only for stimulation of the growth with the time but also to explain the differences of the levels of incomes per capita and TFP between the countries.

Consequently, the government size in the countries of the region, measured by the ratio of public expenditure of the central government to GDP, gave an average of approximately 42 percent of the GDP in 1970s,

that is approximately 12 percentage higher than for the whole of the group of the developing countries (other than the countries of MENA). Although this ratio since then decreased, at the end of 1990s it is remained relatively high compared to the international standards.

Despite apparent reforms starting in the mid-1980s, the growth performance of the region has often been disappointing. Since the large fall in international oil prices in the mid-1980s, most MENA economies have experienced a market slowdown and/or macroeconomic crisis. In spite of a small recovery of GDP per capita in the 1990s (from -1 percent in the 1980s to 1 percent in the 1990s), the MENA region is, for the second decade, the slowest growing region in the world (see Dasgupta, Keller and Srinivasan, 2002)

1. Education: the heart of labour productivity

In a knowledge-based economy the importance of empowering education system becomes essential to promote innovation. During the 1980s and 1990s, MENA economies significantly improved their level of human capital. With one of the largest proportion of youth (12-24 years old), as well as the highest levels of youth unemployment in the world , the middle East and North Africa region currently face a new chapter of education development. Having succeeded in providing basic education to the great majority of the eligible population, education systems must turn to a different set of sector issues. MENA countries make significant investments in education: public spending on education in the region averages 5 percent of GDP, which is higher than the average for most other regions of the world. (World Bank, 2005)

MENA countries have the lowest level of foreign direct investment in the world, but are increasingly integrating into world markets. Governments now recognize that the quality of Human Capital, including secondary and higher education, as well as life-long learning, determines

their ability to compete, develop their domestic economies and enter into global market place, thereby creating jobs and new opportunities.

Education is an investment; obviously the impact of education on the economic growth is considerable. Several studies confirm that education influences positively the economic growth. (Using panel data for 120 developing countries from 1975 to 2000 Baldcci.E, Clements B, Gupta.S, found that education and health expenditure have a positive and significant impact on the accumulation of capital thus can involve a higher economic growth). In fact, education improves quality, and consequently the productivity of the labour. The human capital is the heart of the productivity of labour.

The role of human capital as stimulating economic development is identified in the literature of economic growth. According to Romer (1986) and Lucas (1988), the human capital as a factor of economic growth is identified not only as principal factor but also a suitable remedy to alleviate the poverty in the world more generally (Squire (1993), Ravallion and Chen (1997), Sen (1999), Schultz (1999)). At the macroeconomic level, the relation between the performance of education and the productivity per capita is proven: Mankiw, Romer and Weil (1992) found that a strong rate of schooling of the 12-17 years was associated with a higher GDP per capita; it was thus an empirical approximation of the "human capital" of their ideal model. Many studies confirmed this relation. One of these studies is done by Ph. Aghion and E. Cohen (2004), they tried to show the role of education and the production of knowledge in the production of social capital.

2. The need for education expenditure in MENA region

We note that education and health become more significant in what was called the "demographic transformation" because of three mechanisms. Initially, health decreases the infant mortality rate. In the less developed countries, the social structure is characterized by large

families, and the majority of these families live under difficult conditions. However, if the families had few children, the State would spend more resources of each one, and would thus obtain an educated and healthier population, which is called the demographic transformation

During last 30 years, the MENA region achieved significant progress by increasing its attempts on improving the human capital. In a sample of 12 countries of MENA region including Afghanistan, Algeria, Bahrayn, Egypt, Iran, Iraq, Kuweit, Pakistan, Syria, Sudan, Tunisia, Jordan, the volume of the not educated population over 25 years decreased by 80 percent in 1970 to 46 percent in 2000. For the same period, the average periode of instruction passed from 1,3 years in 1970 to 4,5 years in 2000. In several countries of the region the human development indicators are high in comparison with the international scale. However, as a whole, the quality of human capital in this area really could not advance. Although the countries of the region devote more expenditure on education than other countries having comparable incomes, their system of education is not completely effective. This is due primarily to the quality and the effectiveness of the professors, and also, with poor educational techniques. All that contributed to inflate the administrative bureaucracies and polarize the expenditure towards the higher studies, than primary studies. Then in some countries, the education system finished producing the graduates with the qualifications which do not correspond to the request of a modern and world economy. Recently, the advanced research by Klasen (2002) proved that the gender inequalities have unfavourable effects on the growth.

3.Equality: an essential factor of development

Giving to the women the equal opportunity to contribute to the economic life significantly increases the prospects for growth and the economic productivity in this region. No country can increase the standard of life and improve the good social welfare without the effective participation of its whole population. In these countries the absence of

organizations supporting the education system and the existence of financial problems for the students decreased the incentive for the men to continue studies in contrast the advent of freedom situation for the women increases their motivation for the higher studies. During the last decades, the majority of MENA countries improved the statute of the women by increasing the public expenditure on health and education. In 2000, the average expenditure for education reached 5,3 percent of GDP which is the highest in the world. But the improvement of the education conditions for women, increased their aspirations to have higher income; but the low degree of female participation in labour market means that the MENA region does not collect sufficiently the returns of this investment. The major problem in the education sector of MENA countries is that schools and universities do not effectively convey socially and economically useful skills and competencies to all who attend and also most of these skills do not match with the needs in labour market.

The search for the fundamental determinants of economic growth led many economists to turn to human capital as a growth potential engine. As the human capital is generated by education and professional learning, it is utilized in the economy in the form of labor market. Thus, the structure of the labor market is of primary importance for the determination of the quantity and the quality of the human capital (Pissarides, 2000b).

II .The convergence and specification of the model

There exist a great number of studies on economic growth models. In these studies, the Solow-Swan growth model (1956) has been the centre of our attention in which the focus is on the relation between growth rate and primary level of per capita income. It is based fundamentally on a neoclassic production function on which specific hypotheses such as constant return to scale of the production, and decreasing return to scale for each factor of production and a positive constant elasticity among

factors are assumed. With the fixed rate of savings, this function of production can produce a general equilibrium model. Among applicable aspects of the Solow-Swan model we note the hypothesis of conditional convergence. According to this hypothesis, more the primary level of real GDP per capita tending to the equilibrium level is low, more the growth rate is raised. Indeed the convergence is conditional, because stable levels of capital and the production per capita depend on saving rate, growth rate of population and the situation of the production function, while these factors are crucially different through different regions and countries.

Because of many similarities in the economic structure of Middle East North African countries, there exist many common policies which would be applicable in the all. Also we estimate the existence of convergence in our sample. Essentially, the economic convergence is a long duration tendency to the equilibrium per capita income or per capita production. Therefore, because of the convergence, a question is posed:

Do developing countries with a low per capita income develop more rapidly than rich countries having access to a high per capita income? To answer this question, two hypotheses are discussed: absolute convergence and conditional convergence. According to the hypothesis of absolute convergence, all economies converge toward a steady state of balance in the long term. More specifically, the hypothesis is adapted to the homogeneous economies such as America or the European Union (EU), having similar economic conditions, and having no different economic structures.

1. The debate on the convergence

The absolute convergence hypothesis lies on two types of arguments: for Abramovitz (1986), the convergence lies on the character of innovation and technical progress. Developing countries grow more

rapidly than others because they can imitate the new production techniques that they have not been able to finance previously.

According to Solow (1956), all countries, in each level of development, converge automatically toward an equilibrium when some variables are controlled (for example population growth rate or the rate of save). In the long term, the growth rate is equal to the growth rate of the technical progress, richest countries grow less rapidly than others and growth rate equalize in the long term. This mechanism is based on two central hypotheses: marginal return of capital is decreasing and the technical progress is a public good².

More great is the difference between per capita income and its steady state, higher is the speed of growth. The steady state has a positive relation with the rate of savings and the level of technology; but it is related negatively by the rate of degradation and the growth rate of the population.

For an underdeveloped economy, that suffers a relatively low rate of savings and little modern technology; based on a level of the low income, the growth rate remains inferior and the speed of convergence is slow. Therefore, a lower level of per capita income is not necessarily an indicator of a highest growth rate. This can lead to reject the hypothesis of convergence (Barro and Sala-i-Martin, 1995).

According to hypotheses of the Solow-Swan model, an economic growth model is indicated as follows:

$$GY_{it} = \alpha - (1 - e^{-\beta t}) \ln GDP_{i,t-1} + X.\gamma$$

Where GY_{it} and $\ln GDP_{i,t-1}$ respectively show the annual growth rate of real per capita income for the country i at the time t and the logarithm of real per capita income for this country with a lag. The constant

² Boiscuvier E.(2000), La convergence sur le bassin méditerranéen : mouvement d'ensemble ou logique de clubs ?, 4emes rencontres Euro- méditerranéen ,25-27 Septembre, Faculté des sciences Juridiques, Economiques et de Gestion de Nice

coefficient represents the level of production in the long-run equilibrium which depends on the rate of profitability, the rate of saving and effective rate of depreciation; β indicates the speed to which the whole of the country converges towards a balanced growth. The higher value of β shows the higher speed of convergence. Moreover, positive and significant β implies the approval of convergence hypothesis. Barro and Sala-i-Martin (1996) show that for all positive β , the $(1 - e^{-\beta t})$ coefficient must be negative, which implies that the growth rate decreases with the increase in revenue. Matrix X defines other socio-economic variables which affect the growth, the vector of the coefficients γ represent the importance of considered variables in the economic growth of the countries.

2.The General form of the econometric model.

$$\text{Growth} = c + \beta_1 \text{LnGDP}_{it-1} + \beta_2 \text{Health}_{it} + \beta_3 \text{INF}_{it} + \beta_4 \text{DEF}_{it} + \beta_5 \text{URB}_{it} + \beta_6 \text{SCU}_{it} + \beta_7 \text{PTT}_{it} + \varepsilon_{it}$$

Growth: dependent variable "economic growth rate" calculated by $\text{Ln}(\text{PIB}_{it}/\text{PIB}_{it-1})$ and shows the average rate of economic growth of a country i at time t . LnGDP_{it-1} : the logarithm of income per capita with one lag, Health_{it} : the governmental health expenditure INF_{it} : the public expenditure on infrastructure, DEF_{it} : the military expenditure (defence expenditure) in selected countries, *The Health*, *INF* and *DEF* are the variables which measure the effect of governmental size on the economic growth in these countries, URB_{it} : the percentage of urban population in each country per annum, SCU_{it} : the social security and welfare (% of GDP), PTT_{it} : the proportion of numbers of the students to numbers of teachers. ε_{it} : the errors, c : is the constant. The β variables are the coefficients estimated in our econometric model and the coefficients of estimated β in the model show the effects of the independent variables on dependent variable (i.e. the GDP growth rate for each country).

Results of above table show the estimation of regression determined by panel data model. All estimated variables are significant with the threshold of 95 percent except the coefficient of infrastructure (with the threshold of 90 percent). The number of time series sample is 12 and for the panel is 42. R^2 and adjusted R^2 show that almost 90 percent of the variation of dependent variable depends on the variations of independent variables. The index of F-statistics equal to 49,07 means that all the variables of our regression model simultaneously are significant. DW equal to 2,72 refuses the assumption of the existence of autocorrelation relation between the residues.

3. Method of equation estimation

To analyze the sensitivities of dependent variable by independent variables, we used the method of General Least Square (GLS) with the test of fixed effects. The value of constants is near to each other and it seems that there exist the convergence between the growth rate of these countries and their public expenditure.

Among the estimated fixed effects we have the least fixed effect for Iran and the highest for Tunisia. It means that the effects of public expenditure on economic growth in Iran are more effective than for Tunisia. The essential reason depends on the GDP and oil revenues which do not exist for Tunisia.

As we expressed in our theoretical study, the negative and significant coefficient of GDP in logarithmic value confirm the hypothesis of β convergence in these countries. Knowing that with the structural economic variables in our model this type of convergence is conditional convergence. In other words, each country converges towards its steady state during the time of convergence. We notice that the coefficients of health expenditure and social security have negative effects on GDP growth, which can be astonishing. But although in the recent years most of public health expenditure and social security are sacrificed to the profit

of scientific research and health equipments like the laboratories, hospitals etc. Because of having lag effects, the negativity of these coefficients can be justified; according to some economists there exists a short-term paradox between social equality and economic growth. The expenditure for health and the social security improves social justice, but they can prevent the economic growth in short term.

The *PTT* variable is an education index in these countries and expresses the proportion of numbers of students compared to the teachers. We observe that it is a significant variable with the threshold of 95 percent and according to the theoretical part it expresses the dominating role of education in MENA countries.

According to the coefficient of *URB*, one can conclude that with the increase in the urbanization, the form of life of will be changed from an agricultural economic towards an industrial economy (economy of services). Knowing that the value added caused by the services compared to the goods is more considerable and it involves the increase in income per capita in the country and obviously leads to economic growth.

CONCLUSION

Since Paul Romer's article (1986) on the economic growth, the subject of endogen growth has been the focus of many economists' discussions. Before Paul Romer some people thought that the size of the State had eviction effects on the investment of the private sector and finally that these effects were ineffective on the economic growth; especially for developing countries and in transition. He has tried to express the quality and proportions of public expenditure for each economic sector. The essential question is: if the role of the State is important for the economic growth, in what parts should it be concentrated and also the public expenditure, spent in which sectors would be more efficient to obtain the economic development in these countries?

In our research we tried to verify the effects of some public expenditures on the economic growth in selected MENA countries (Iran, Egypt, Tunisia, Turkey and Morocco) and we found that there exists a conditional convergence between these countries. Also there exists some positive effects of infrastructure and education expenditure and negative effect of health and defence expenditures on the economic growth. Because in the recent years most of public health expenditure and social security are sacrificed to the profit of scientific research and health equipments like the laboratories, hospitals etc., also by considering the lag effects, the negativity of these coefficients can be justified,

REFERENCES

- Aschauer, D. (1989) « Is government spending productive? », *Journal of Monetary Economics*, 23, 177-200
- Ayadi E., Berthomieu C., Sameti M. (2002), « Efficacité des dépenses publiques d'investissement et croissance : analyse comparée de l'Iran », communication présentée aux 6^{ème} rencontres Euro-Méditerranéennes, CEMAFI-RIME, Nice, 25-27 sept.
- Barro R.J (1991): "Economic growth in the cross section of countries", *Quarterly Journal of Economics*, CVI (May 1991), 407-444
- Barro R.J., Lee J-W. (1994), "Sources of economic growth", *Carnegie Rochester Conference Series on Public Policy*, 40, pp.1-46
- Boiscuvier Eléonore (2000), *La convergence sur le bassin méditerranéen : mouvement d'ensemble ou logique de clubs ?*, 4^{emes} rencontres Euro-méditerranéen, 25-27 Septembre, Faculté des sciences Juridiques, Economiques et de Gestion de Nice
- Devarajan S, Swaroop V., Zou H. "The Composition of Public Expenditures and Economic Growth. », *Journal of Monetary Economics* 37, 2 April, 313-44, 1996.
- Enayati F., Sasan A. (2004) "Public Finance and Financial strategy of Governments" *Isfahan Engineering Association, Danesh nama*

-Hakura.D.S (2004), « Growth in the Middle East and North Africa », IMF working paper

-Jalali Naini.A.R., Souril.D.(2000), « Economic growth and Fiscal Policy in selected MENA countries. » IRPD, Iran

-Khan.H.Mushtaq (2003), « l'échec de l'Etat dans les pays en développement et les strategies de réforme institutionnelle », Revue d'Economie du Développement, N°2-3 September, pp 5-48

-Lau L.J.,Jamison D.T., Louat F.F. (1991), "Education and productivity in developing countries: an aggregate production function approach ", World Bank, Washington, WP series 612.

-Linder D.L., Velenchik A. D. (1992), "Government spending in developing countries: trends, causes and consequences" The World Bank Research Observer, vol. 17, n°1, janvier

-McDonald S., Roberts J.(2001) "Growth and multiple forms of human capital in an augmented Solow model: a panel data investigation", Department of Economics, University of Sheffield, UK

-Ram R. (1996),"Productivity of public investment on private capital formation: a study relating to Mexico", World Development, vol. 24, numéro 8, pp. 1373-1378

-Stiglitz J.E, (2000), "Economics of public sector", New york, W-W.Norton

-Wolf E.N. (2000), "Human capital investment and economic growth: exploring the cross-country evidence", Structural Change and Economic Dynamics, Vol 11, pp 433-472

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Dependent Variable: GROWTH?

Method: GLS (Cross Section Weights)

Date: 08/01/05 Time: 10:14

Sample: 1980 2000

Included observations: 12

Total panel (unbalanced) observations 42

Convergence achieved after 16 iteration(s)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
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LNGDP?	-0.324328	0.053791	-6.029417	0.0000
HEALTH?	-0.086723	0.024090	-3.599939	0.0009
INF?	0.019407	0.011572	1.677100	0.1013
DEF?	-0.015840	0.003068	-5.162911	0.0000
URB?	0.014417	0.001548	9.313672	0.0000
SCU?	-0.010493	0.003009	-3.487422	0.0012
PTT?	0.003891	0.000833	4.671439	0.0000
Fixed Effects				
_EGY--C	1.676937			
_IRN--C	1.601019			
_MAR--C	1.655125			
_TUN--C	1.761867			
_TUR--C	1.624650			
Weighted Statistics				
R-squared	0.907538	Mean dependent var	0.034831	
Adjusted R-squared	0.873636	S.D. dependent var	0.130379	
S.E. of regression	0.046347	Sum squared resid	0.064441	
Log likelihood	170.6545	F-statistic	49.07652	
Durbin-Watson stat	2.717451	Prob(F-statistic)	0.000000	
Unweighted Statistics				
R-squared	0.273401	Mean dependent var	0.015040	
Adjusted R-squared	0.006981	S.D. dependent var	0.046515	
S.E. of regression	0.046352	Sum squared resid	0.064455	
Durbin-Watson stat	3.519863			