INFLUENCE FACTORS OF ENDOGENOUS GROWTH*

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Abstract

The problems of growth and its determinants, were a major subject of analysis, in the economic literature, the analysts trying to find the mechanisms of the economic phenomena occurence, their influence elements. The evolution of theories and models of growth was in keeping with the dynamic of the economic reality, the factors and elements of analysis have changed complying with the stages of human development, the emergence of the teory of endogenous growth, at the end of years `80, being representative through the new trend brought in tackling the problem of long-term growth. The paper presents the key determinant factors of the endogenous growth, highlighting their role and influence in the growth process, signaling changes brought by the new theory, beside the previous research.

Key words: *factors, growth, technological progress, theories.*

JEL Classification: O33, O43

1. INTRODUCTION

The main objective of development, in the economic evolution process, is the achievement of economic growth, a basic factor in the long-term fulfillment of economic success of a nation.

In this respect, the problems of growth and its determinants, were a major subject of analysis, in the economic literature, the theoreticians and decision-making factors trying to find the mechanisms of the economic phenomena occurence, their influence factors.

The evolution of theories and models of growth was in keeping with the dynamic of the economic reality, the used factors and elements of analysis complying with the changes produced in the stages of human development. Starting from the classical factors of economic growth - labour and capital – the growth theories have changed, gradually emerging new elements (the technological progress, investments, innovation, knowledge), leading to changes in the way of economic thought.

A landmark in the evolution of these theories was the period of the end of years `80, characterized by an increase in the active population and technical progress which, in theoretical plan, has led to the emergence of a new wave of economic thought - the endogenous growth theory – with a new trend in tackling the problem of long-term growth.

2. FACTORS OF ENDOGENOUS GROWTH

The endogenous growth theory brings new elements that signifies changes from the previous researches:

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–the technological progress is an endogenous factor, product of the economic activity (opposed to the previous theories, whereat this was exogenous in nature, produced by outside market forces) - the technology is internalized in an economy functioning model;

–the new factors - knowledge and technology – are characterized by increasing returns, by reusing of the ideas the process of growth can enhance indefinitely.

On the origin of endogenous growth approaches there is the emergence of theories concerning the Research and Development, the progressive dissemination of technological innovations, the works of Romer (1986, 1990, 1994).

The endogenous growth theory is understood as a self-sustained phenomenon, by the accumulation of some important factors: investments in physical, technological capital, human capital and public capital. The rhythm of accumulation depends on the economical choice.

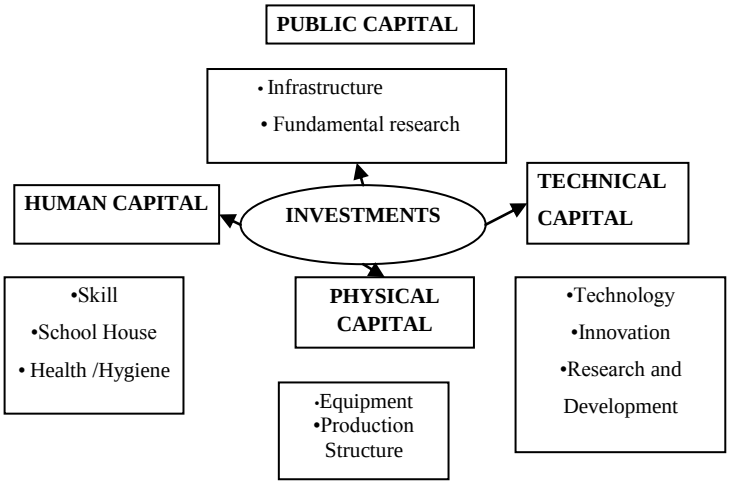

Figure 1. The main factors of endogenous growth

Source: Guellec D. (1995, p.13) apud Diemer A. in „Théories de la Croissance endogène et principe de convergence. Croissance Endogene et Convergence", p.7

•**The investments** are the fundamental determinant of economic growth, so identified both by the neoclassical models and by the endogenous growth models. In the *neoclassical* model, the investments have a *transitory impact*, while in the *endogenous* growth models, should be observed *permanent* effects[2].

•**The physical capital** consists in the equipment whereat a firm invests to produce goods and services. The novelty brought by Romer, in the analysis, consists in the fact that the proposed model takes into account **the phenomena of externality among the companies:** investing in new equipment, the company provides with the means to increase its own production and, simultaneously, of other companies, too. Since the new technologies means the enrichment of knowledge through learning by doing, this knowledge is not acquired only by a firm but it should be diffused to other companies. As such, the investment has a double effect: it acts directly on growth and, indirectly, on technological progress.

•**The technological progress** induced through innovation leads to: the improvement of the returns of productive system, the achievement of economies of scale, the reduction of ecological

[2] Among the empirical researches that examined the relationship between investments and economic growth, it should be mentioned the studies of Kormendi and Meguire, 1985; De Long and Summers, 1991; Levine and Renelt, 1992; Mankiw, 1992; Auerbach et al, 1994; Barro and Sala-I-Martin, 1995; Easterly, 1997; Bond et al, 2001; Podrecca and Carmeci, 2001. apud Petrakos, G.; Arvanitidis, P.; Pavleas, S. 2007, p.7;

and social costs of growth, diversifying the opportunities for resource allocation. The theory is based on the analysis of economic conditions favourable to technical changes, deriving from the implement an idea and testing it. The major role of Research, Development and Innovation for the economic growth, is demonstrated in many studies, by the contribution brought to the productivity growth, through technology that allows the introduction of new and superior quality products and production processes. This role was emphasized by various endogenous models and, empirically, demonstrated in several studies (Fagerberg, 1987; Lichtenberg, 1992; Ulku, 2004, apud Petrakos, G., Arvanitidis, P; Pavleas, S., 2007. p.8).

The expenditures with Research and Development (R&D) can be considered investments in knowledge that should be translated into new technologies but also in more efficient ways to use the resources of physical and human capital. The considerations concerning the relationship between research and growth, suggest that the quantitative analysis in relation to growth should take into account the activity of R&D, as an additional form of investments.

Getting a product, by the application of an appropriated idea, involves getting through some stages and high costs, but through the multiplication of the product, the following specimens should be obtained at much lower costs. Characteristically to the ideas which are causing technological changes is the fact that they generate increasing returns, with the risk, for the manufacturer, that the competitor to get rich before he (the manufacturer) should have recovered its investments, a risk limited by the individual property rights.

From an economic perspective, the theory involves elements of imperfect competition that facilitate the emergence of new ideas, new products.

The resources intended for R & D (Research and Development) can be influenced by the public policies. The government involvement in R & D, can be done both through direct measures, such as its financing, as well as through indirect measures, such as fiscal incentives and the protection of intellectual property rights (see Nadiri, 1993, and Cameron, 1998, apud Bassanini, A.; Scarpetta, S., 2001, p.16). The potential benefits which are grown from the new ideas may not be entirely appropriated by the innovators themselves, because of the *spillover* effects. Also, it interests the private sector immixture in the activities of R & D, too.

•**The human capital** is considered the main source of growth in some endogenous models but also one of the key dimensions of the neoclassical growth model.

The human capital is the central subject of research of R. E. Lucas and it is highlighted by the economists of the Chicago School (Theodor Schultz and Gary Baker, apud Diemer, 1995, p.8), too. Its significance consists in the all abilities acquired by individuals, resulting in the growth of their productive capacity and effectiveness.

The recent studies on growth, consider the training (the formal qualification) and the workforce experience, as a form of human capital. The investments in human capital (education and training expenses) can have a permanent impact on the growth process, if the specializations and highly skilled vocational training correspond to an intensive level of Research and Development and a more rapid rate of technological progress, or if a high level of qualification facilitate the adoption of the new technologies.

The studies in which the human capital is analyzed by the ability of workers to acquire qualifications, specializations and konw-how, through education and vocational training, express the quality of human capital, as reflected in various aspects (the rates of entry a school, scientific qualification etc.). The level of education acquired by population is a key determinant of economic growth (Barro, 1991; Mankiw et al 1992; Barro and Sala-i-Martin, 1995; Brunetii et al, 1998; Hanushek and Kimko, 2000, apud Petrakos, G., Arvanitidis, P., Pavleas, S., 2007, p.7). In this context, the education means an investment from which the individual expects a compensation and the developed drift, of increase in the average tuition, also, has a contribution in the growth process.

•**The public capital** is the core of the model developed by Barro.

The public capital, theoretically, is a form of the physical capital, adequate to communication and transport infrastructures, a result of the investments made by the central and local administration of the state. Also, the public capital includes the investments in the education and research domain.

The poor profitability, in applying an idea, discourages the economic agents to invest in Research and Development, a context in which the state can be involved in creating institutional structures to support the private investments rentability, subsidizing less profitable activities for economic agents, but needed for society (the diffusion of innovation in society, in the context of the existence of externalities among companies).

Unlike these factors, a number of recent studies, also, notes the influence of other factors on the growth: the political framework, the institutions quality, the openness to international trade.

•**The political framework** and the economic policies can influence some aspects of the economy, through the investment in human capital and infrastructure, the institutions improvement etc..[3]

The macoreconomic conditions are regarded as needed but not also sufficient for the economic growth (Fischer, 1993, apud Petrakos, G., Arvanitidis, P., Pavleas, S., 2007, p.8). In general, a stable macroeconomic environment can facilitate growth, by reducing the uncertainty, through the consequences it produces on productivity and investments.

•**The institutions quality** is a major influence factor of the economic performance[4]. Rodrik, (2000), apud Petrakos, G., Arvanitidis, P., Pavleas, S., (2007, p.9), highlights five key institutions (property rights, regulation institutions, institutions for macroeconomic stabilization, social insurance institutions and institutions for the conflict management), which not only exerts a direct influence on the economic growth, but also, influence other determinants of growth, such as the physical and human capital, investments, technical changes. Easterly (2001) apud Petrakos, G., Arvanitidis, P., Pavleas, S., (2007, p.9), points out that the impact of the other factors, on the economic performance, is favoured by their development in a stable and credible institutional environment.

•**The openness to trade** is asserted in the speciality literature, as a determinant of growth through the exerted influence on the economic growth. There are a number of elements whereby there are highlighted its influence on the economic growth: exploiting the comparative advantage, getting commercial further gains arising from economies of scale, the growth of efficiency and of the level of investment, the transfer of technology and the dissemination of knowledge. The studies undertaken by Dollar 1992, Sachs and Warner, 1995; Edwards, 1998 Dollar and Kraay, 2000, apud Petrakos, G., Arvanitidis, P., Pavleas, S. (2007, p.9), highlight effects of the trade on growth: higher capital flows, a growth of GDP per capita, forwarding the economic performance. The role of trade policies, for the economic growth, should be exerted in regard to the conditions (economic, social, cultural etc.) of each country.

3. CONCLUSIONS

The economic literature has shown a special interest in the problems of growth and its determinants, the theoreticiens as well as the economic decision-makers, offering different alternatives related to the way to achieve economic growth, the focus being directed towards to

[3] Kormendi and Meguire, 1985; Grierand and Tullock, 1989 Barro, 1991, 1997; Fischer, 1993; Easterly and Rebelo, 1993; Barro and Sala-i-Martin, 1995 shows the influence of macroeconomic policies and conditions, in the economic growth, apud Petrakos, G., Arvanitidis, P., Pavleas, S., 2007, p.8;

[4] The important role of institutions in the economic performance has been the subject of many analyzes (Lewis, 1995; Ayres, 1962), in the last years, also, standing out empirical studies in this acceptance, too (Knack şi Keefer, 1995; Mauro, 1995; Hall şi Jones, 1999; Rodrik, 1999; Acemoglu et al, 2002), apud Petrakos, G., Arvanitidis, P., Pavleas, S., 2007, p.9;

a wide range of targeted measures to this end: capital investments, the R & D and technical progress encouragement, a well-trained workforce.

The economic research has advanced in the way of approach of problems related to development, economic growth, international trade, the economists enunciating models based on the perfect competition, subsequently, reconsidering the theories according to perceptions change in different areas and supporting models with imperfect competition (Romer), aimed at searching the economic resorts that allow a sustainable growth.

In the context where the neoclassical model of Solow was focused on the mechanism of capital accumulation and convergence towards steady state, the new theories have searched the long-term analysis of the determinants of productivity growth. The approach has led to widening the range of production factors, that were taken into account, concerning the role of investments, technological progress induced by innovation and the major importance that the R & D it has, of the human capital and public infrastructures.

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