Total Factor Productivity as a Projection of the Social Environment

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Abstract: The principal object of this research is to reveal the factors of economic growth in various economic theories, to consider different approaches to systematize these factors and justify the need for the application of an organic approach in the study of the economic system, through which we can look at total factor productivity as a projection of the social environment on economic growth.

Key words: Social Environment, Economic Growth, Production Function, Total Factor Productivity

I. Introduction

What is economic growth and what are the factors determining it are matters considered and studied by many economists. Sources of growth are all factors that provide long-term increase in aggregate production, the most important of which are the growth of the labor force, investment in human and physical capital, increasing the degree of technological development, innovation, openness, sound institutions, good infrastructure, foreign direct investment (FDI). Some of

I. Въведение

Какво е икономическия растеж и кои са факторите, които го обуславят са въпроси, разглеждани и изучавани от много икономисти. Детерминанти на растежа са всички фактори, които осигуряват дългосрочно нарастване на съвкупното производство, по-важните от които са растежът на работната сила, инвестициите в човешки и физически капитал, по-вишаването на степента на технологично развитие, иновациите, отвореността на икономиката, стабилните институции, добра инфраструктура, преките частни инвестиции (ПЧИ). Една част от тези
these factors are included in the total factor productivity, as part of the production function.

In the modern development of economic theory, economic factors such as land, capital and labor have been increasingly neglected at the expense of non-economic ones - socio-cultural, geographic, demographic, and other psychological factors, which determines the need to implement a more different approach to the study of the economic system.

The purpose of this paper is to show that total factor productivity can be viewed as a projection of the social environment.

II. Factors of growth in various economic theories

To identify characteristics and problems of measuring economic growth, it is necessary to trace historically how the theories of economic growth have developed from static to dynamic single-factor multivariable models.

Historical growth theories go from a simple and sketchy representation to a more thorough examination of the various relationships between economic growth and the factors determining it, as greater importance is placed on the application of statistical and mathematical methods of analysis, undergoing transition from static to dynamic analysis. Another distinction that can be done is by the type and nature of the models, taking into consideration the specific tasks of the respective economic school. Different models are created, their tasks being to achieve continuous, stabilized or optimized growth (Pirimova, 2001).

The first growth patterns discussed by representatives of the classical school are static, They do not consider the changes that occur in economic development over time. Their goal is to achieve sustainable growth, limited to the establishment of the steady state of the economy in the present.

One of the most prominent representa-
tives of the classical school - Adam Smith (Smith, 1982) identified as key drivers of growth labor productivity and the employed labor force.

According to Keynes (2001) fluctuations in aggregate demand are the main source of economic instability and if the demand can be maintained at the level of full employment of resources, the most important problems of the market economy could be overcome. To meet this objective the state plays a crucial role as its fiscal policy should be consistent with aggregate demand, not with the desire its revenues to be equal to its costs.

Unlike Keynesian models that argue for the instability of the process of growth, neoclassical models (Cobb & Douglas, 1928; Solow, 1957, Solow 1956) prove its sustainability, being themselves more suitable for practical measurement through the use of different mathematical and statistical methods and means. As key sources of growth are indicated the dynamics of supply and various combinations of production factors. Unlike Keynesian theories, neoclassical growth theory is based on the assumption that factors of production can be fully used and it helps the elasticity of prices. Growth factors are not only investments, but also labor and natural resources. Neoclassical growth models are multivariable, with independent and interchangeable factors.

A significant place in the neoclassical growth theory is devoted to the technical progress, which in some models is included as a direct factor, while in others it provides indirect impact on the productivity of other factors. These model advocate the idea that balanced economic growth, where supply equals demand is possible. Methodology applied to regression analysis by establishing production functions makes it possible to quantify the contribution of a factor on the growth in the economy. Through the production function - $Y(t) = A(t) * F[K(t), L(t)]$ or $Y = A * K^a * L^b$, (1.) (Solow, 1957), is established the relationship between growth efficiency.
between the maximum possible amount of output (GDP), produced in a specific combination of production factors available, which are mostly capital - K (gross capital formation) and labor - L (the number of employees in the economy or time spent in man-days or man-hours). But there is a "residual component" which in economic literature is defined most commonly as “total factor productivity” (A) and unites the influence of all other factors not included in labor and capital, such as technological, environmental and institutional factors (Mladenova, 2011).

Among the most important advantages of the neoclassical growth model is the deepening and improvement of analysis using mathematical and statistical methods and tools, which makes it possible to test growth factors and dependencies between them more accurately and fully. Modern theories of economic growth (Romer, 1986; Romer, 1990; Lucas, 1988; Barro & Sala-i-Martin, 2003) increasingly include technology and human capital, which is the individual's knowledge, skills and abilities leading to better realization of individuals in the labor market and an increase of their productivity.

It is important to note that apart from the economic factors that determine economic growth, non-economic factors also have an important influence on it, as it cannot be isolated from different political, socio-economic, institutional, environmental and cultural factors. These activities they call investments in the workforce and consequently lead to activities that increase capacity and production potential, "human capital" (Becker, 1993) and study those specific activities that increase capacity and production potential of the workforce and consequently lead to economic growth. These activities they call investments in human capital. (Simeonova-Ganeva, 2010) It is they that lead to an increase in human capital in the economy. Different authors used as measures of human capital stock various indicators such as level of education and average number of years of education, tests of the cognitive skills of students, the literacy rate of the adult population, enrollment in the education system and others. (Simeonova-Ganeva, 2010). It should be borne in mind that the term "human capital" is debateable. (Minchev, 2013, p.248)

1 Gross capital formation - includes the cost of acquisition of tangible and intangible fixed assets net of proceeds from the sale of existing fixed assets plus changes in inventories - source NSI - Main macroeconomic indicators 2008.

2 These are professional skills, education and others. For the first time in the 1950s-60s, Schultz, Becker and Minser introduce the concept of "human capital" (Becker, 1993) and "study those specific activities that increase capacity and production potential of the workforce and consequently lead to economic growth. These activities they call investment in human capital." (Simeonova-Ganeva, 2010) It is they that lead to an increase in human capital in the economy. Different authors used as measures of human capital stock various indicators such as level of education and average number of years of education, tests of the cognitive skills of students, the literacy rate of the adult population, enrollment in the education system and others. (Simeonova-Ganeva, 2010). It should be borne in mind that the term "human capital" is debateable. (Minchev, 2013, p.248)

Съчетание на наличните производствени фактори, а това най-често са капитал – K (бруто капиталообразуване) и труд – L (броят на заетите лица в икономиката или отработеното време в човекодни или човекочаса). Но съществува и един „остатъчен компонент”, който в икономическата литература се определя най-често като „обща факторна производителност” (A) и обединява влиянието всички други фактори, които не са включени в труда и капитала, като технологични, екологични и институционални фактори (Mladenova, 2011).

Сред най-съществените преимущества на неокласическите модели на растежа е задълбочаването на усъвършенстването на анализа, чрез използване на математико-статистически методи и средства, благодарение на което става възможно по-точно и пълно да се изследват факторите на растежа и зависимостите между тях.

Съвременните теории за икономически растеж (Romer, 1986; Romer, 1990; Lucas, 1988; Barro & Sala-i-Martin, 2003) все повече включват технологични и човешкия капитал, който представлява индивидуалните знания, умения и способности, водещи до по-добрата реализация на индивидите на пазара на труда, както и до увеличаване на тяхната производителност.

Тук е важно да се отбележи, че освен разгледаните икономически фактори, които обуславят икономическия растеж,
cultural, geographic and demographic processes and phenomena. A number of theorists, representatives of institutional economics, economic sociology and political science, as Matthews, Knack, Keefer, Brunetti, Brander and others emphasize and explore the importance of these particular factors on the economic development of countries (Petrakos, 2008).

In the systematization of growth factors made by Pirimova (2014), it is indicated that some authors divide them into factors and conditions, since “factors are mainly crucial in creating GDP. In contrast, the conditions are supplementary, secondary... conditions may include natural, political, socio-economic, international environment; historical, geographic, demographic, and many other non-economic assumptions” (Pirimova, 2014). There can also be distinguished endogenous (economic) and exogenous (non-economic) factors. Endogenous factors emerge within the economic system while exogenous are external to it. Scientific and technological progress, human capital, etc. can be dubbed endogenous factors, while political instability, any force majeure, and other psychological factors are exogenous. But “the division of the factors is largely contingent because their practical manifestation is often mixed. The impulses can be formed by non-economic processes, but they are transformed into growth or decline in economic activity depending on the response of the economic system.” (Pirimova, 2014).

III. Organic approach to the study of economic growth

Given that total factor productivity (A) combines the influence of other factors outside the labor and capital, the question arises whether this is a significant factor of growth (Temple, 1999). The research for Bulgaria shows that TFP identifies regional differences on economic growth. When comparing TFP (A) of

3 The study was done in two statistical areas defined NUTS1: North and South East Bulgaria and Southwest and South Central Bulgaria. The study was performed by Stanimira Nikolova for the period

важно влияние върху него оказват и неикономическите фактори, тъй като той не може да бъде изолиран от различните политически, социокултурни, географски и демографски процеси и явления. Редица теоретици, представители на институционалната икономика, икономическата социология и политическите науки, като Matthews, Knack, Keefer, Brunetti, Brander и други, подчертават и изследват значението именно на тези фактори върху икономическото развитие на страните (Petrakos, 2008).

При систематизация на факторите на растежа, направена от Pirimova (2014), се посочва, че някои автори ги разделят на фактори и условия, като „факторите имат основно решаващо значение в процеса на създаване на БВП. За разлика от тях условията имат допълващо, второстепенно значение...условията могат да обхащат природната, политическата, социално-икономическата, международната среда; исторически, географски, демографски и много други неикономически предпоставки“ (Pirimova, 2014). Също така факторите могат да се разграничат на ендогенни (икономически) и екзогенни (неикономически) фактори. Ендогенните фактори се зараждат вътре в икономическата система, докато екзогенните са външни за нея. Към ендогенните фактори могат да се причислят научно-техническият прогрес, човешкия капитал и др., а към екзогенните – политическа нестабилност, някакви форс-мажорни обстоятелства, психологически фактори и други. Но „това подразделение на факторите е до голяма степен условно поради по-често смесеното им практически проявление. Импулсите могат да се формират от неикономически процеси, но се трансформират в растеж или спад на икономическата активност в зависимост от реакцията на икономическата система“ (Pirimova, 2014).

III. Органичен подход при изследване на икономическия растеж

Като се има предвид, че общата факторна производителност (A) обединява влиянието на други фактори, извън труда и капитала, възниква въпросът доколко тя е значим фактор на растежа. Изследванията за България показват, че нейното влияние определя регионалните разлики върху икономическия растеж.3 При

3 Изследването е направено за две статистически зони, определени по NUTS1: Северна и
North and South-East Bulgaria with that of the Southwest and South Central Bulgaria, a clear imbalance between the two statistical areas can be observed. The trend of growth of TFP (A) for Southwest and South Central Bulgaria is rising, while North and Southeast Bulgaria is downward, which is the main cause of regional disparities in the country. Efforts should be directed towards the study of the social environment and, in particular, the political and socio-cultural environment rather than the economic environment as investment and employment in both statistical areas are very similar.

These results alert us to the need to look for another approach to the problem. That mixed practical manifestation of the factors on economic growth requires the application of an organic approach where all the factors (and conditions) of economic growth are to be seen in unity. This means that the economic system can be seen as a system immersed in society. The very social environment can be seen as a unity of economic, political and socio-cultural environment.

The economic environment includes all economic institutions. It has a direct impact on businesses and finds concentrated expression in the market and its legal regulation relating to competition and economic power (Minchev, 2013). The economic environment with its market institutions and competition contributes to an increase in aggregate production and the realization of economic growth. The reason for this is that on the one hand the market is exempt from the procedures that are obsolete and ineffective, on the other hand, it stimulates entrepreneurial initiative, improving the organization of production, the development of innovation and new technologies, which are

1999-2014. On the basis of the production function, using correlation and regression analysis the influence of factors, in particular of the TFP, on the economic growth of Bulgaria and its regions was evaluated.

4 The organic approach reflects the totality and unity of an interdisciplinary approach; individualism and holism; subjective and objective approach, inductive and deductive approach (Minchev, 2013).
an important source of growth. The legal regulation of the market has a significant influence on economic growth. Frequent amendments to the regulations and disregard for intellectual property rights discourage FDI and business development that are extremely important, especially in times of uncertainty and crisis.

The political environment consists of all political institutions. It has an impact on the economic development in two ways - as a political power to enforce formal rules and by accumulation and spending on public goods (Minchev, 2013). Creating public goods, the state complements the private sector and thus creates opportunities for better satisfaction of social needs and increased GDP. Furthermore, by participating in the development of science, health and technological innovations, it promotes the formation of growth factors. Measures, forms of government regulation, are particularly needed in times of crisis, when it is necessary to support the process of self-regulation of the market, while in periods of economic growth, government intervention may be more relaxed (Pirimova, 2014).

The socio-cultural environment affects economic actors through its institutions. This is done primarily through the moral, psychological, traditional, etc. restrictions, imposed in the realization of economic interests (Minchev, 2013). Culture can be interpreted in a narrow and broad scope of the concept. In the narrow range it includes the results of activities aimed at refining the mind of people in all areas of spiritual life - literature, art, architecture, education, science. The broad sense can be presented in two versions. One option includes spiritual culture, and all forms of social and psychological life of people, ranging from customs to the habits and diet. Another option adds to the achievements in the spiritual realm and those of material one, called material culture. Culture in the broadest sense is a unity of material and spiritual achievements of people or society as a whole technologies, which are a valuable source of growth. The legal regulation of the market has a significant influence on economic growth. Frequent amendments to the regulations and disregard for intellectual property rights discourage FDI and business development that are extremely important, especially in times of uncertainty and crisis.

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(Minchev, 2013). The culture medium with its moral and psychological attitudes also affects the economic growth and in particular the “panic and loss of confidence can contribute to develop a local into a regional crisis” (Pirimova, 2014). No less important to growth is the development of science, education and health, leading to the formation of human capital in the economy, and hence to greater productivity and efficiency of production.

IV. Conclusions

Given the neoclassical production function already discussed earlier, we can conclude that unless it includes components of human capital and technical progress, TFP can be seen as a projection of the social environment that finds concentrated expression precisely in total factor productivity, including any factors other than labor and capital that lead to economic growth.

As a unity of economic, political and socio-cultural environment, social environment should be analyzed together with the factors of labor and capital as the main determinant of economic growth. Efforts should be directed to study the impact of this environment on total factor productivity, as this could serve as a basis for decisions to achieve sustainable growth.

Acknowledgments

This paper was supported by the Scientific Research Fund of University of Ruse under Project FNI 14-BM-01 “Factors for local decomposition in today’s economy of Bulgaria”.

2013). Културната среда със своите морални и психологически нагласи също оказва влияние върху икономическия растеж и по-конкретно „паниката и загубата на доверие могат да допринесат за прерастването на една локална в регионална криза” (Pirimova, 2014). Не малко важни за растежа са и развитието на науката, образованието и здравеопазването, водещи до формирането на човешки капитал в икономиката, а от тук и до повишаване на производителността и ефективността на производството.

IV. Заключение

Като имаме предвид вече разгледаната по-рано неокласическата производствена функция, можем да обобщим, че общата факторна производителност, освен че включва компонентите човешки капитал и технически прогрес, може да се разглежда и като проекция на обществената среда, която намира концентриран израз именно в общата факторна производителност, включваща всички други фактори, освен труда и капитала, които водят до икономически растеж.

Обществената среда като единство от икономическа, политическа и социокултурна среда, следва да се анализира, наред с факторите труд и капитал, като основна детерминанта на икономическия растеж. Усилвата трябва да бъдат насочени към изследване влиянието на тази среда върху общата факторна производителност, тъй като това би могло да послужи като основа за решения с цел постигане на стабилен растеж.

Благодарности

Настоящата статия е подкрепена от Фонд „Научни изследвания” при Русенския университет по Проект ФНИ 2014–БМ–01 „Фактори за локална декомпозиция в икономиката на България в съвременните условия”.
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