

## Four novels on the theory of economic growth

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**Abstract.** The aim of these notes is to assist the students of the Business Administration Department of the University of People, U.S.A. to understand critically some major aspects of the theory of economic growth.

**Keywords.** Economic growth, Economic models, Quantitative economic applications.

**JEL.** E10, E11, E13, E14, E19.

### 1. Introduction

**E**conomics is the science that studies the way in which societies use scarce resources to produce and distribute valuable goods among different people and social groups. Its purpose is to explain economic phenomena: 1) Economy is a science for having its own object, which are economic phenomena, a method and a set of economic theories capable of explaining those phenomena. 2) It is an empirical science, since it is contrasted in reality. More specifically, it refers to economic issues related to the life of man. 3) It is not an exact science, because human actions and reactions are not mathematically predictable. It can be shown that their conclusions are not always accurate but reflect new trends in behavior. All science is characterized by being a set of theories or hypotheses, in which criteria of the scientific method have been applied (contrast of hypothesis with empirical evidence). This study reviews and critically evaluates four (4) models of economic growth.

### 2. Economic model of growth of Sraffa

Piero Sraffa (1898-1983) is part of the select group of notable economists, original and profound thinkers, who had to do with the progress of twentieth-century economic thought, both theoretically and doctrinally. Master in the management of abstraction, as the only possible method to understand the economic world, he proposed modern analysis based on a good knowledge of pre-Marxist classics. In any case, his praised, controversial, minimized or neglected theoretical work has concerned the most important general theories and not a few partial ones. The purpose of his work was the creation of the foundation of the critique of the marginality theory; criticism that resumed the followers of his line of thought. On this basis, he considers only a set of problems of economic theory, very restricted but crucial; its central concern, whose development would constitute the “core” of his theory, were the necessarily existing relations between prices of production and the distribution of national income under given conditions of production. Its theoretical construction also proved apt for the significant solution of certain problems, which had been debated for a long time, concerning the classical theory and the Marxian theory of value. The foundations established by the author, and their theoretical purposes, generated new research and the refinement of analytical and formal tools, which would develop rapidly, choosing

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to constitute, after the sixties, a specific community of thought, with not insignificant successes in the reinterpretation of theses up to then established and in obtaining new results (Barro, 1998: 56).

Sraffa examined capitalism as a general form of organization of the society in which he is immersed, he abstracted the structural economic bases of that reality, distinguishing them from political processes and economic policy and came to represent the essence of the economy from concepts whose contents were, in principle, empirically determinable. He proposed to build an image of the commercial society based on empirical foundations and not on unverifiable hypotheses or on assumptions derived from theories about human nature (Barro, 1998: 248). His masterpiece: "Production of merchandise by means of merchandise" has been common to consider in a relationship of continuity with the classical-Marxist tradition and in a relationship of rupture with the neoclassical tradition. His main contribution to economic thought is condensed into a precise and rigorous abstract system that has become an alternative paradigm to the dominant neoclassical explanation of value and distribution (Osipian, 2007: 129).

Sraffa, in his comments on the first volume of Works and correspondence by David Ricardo, makes an interpretation of the "distribution and distribution" theory completely different from that of the marginality school. This is based on the approach of the surplus that so insightfully glimpsed both in the Essay on the Low price of grain and in the successive versions of Principles. This interpretation, which he insinuates in his later theoretical works, gives Ricardo a preferential place in economic theory even though his analysis had been relegated, distorted and even forgotten until this moment (Osipian, 2007: 134).

The author captures the analytical difficulty, against which Ricardo persistently struggled, which consists of not having a method of measuring advanced capital that is consistent with the general determination of the "normal" benefit rate. This difficulty as well as the one that refers to the problem of the invariable unit of measurement of prices, originate from the fact that the prices of the commodities vary due to changes in the distribution even though their labor-values remain unchanged (Osipian, 2007:219). Nevertheless, Sraffa perceives implicit in the Essay a rational principle of determination of the rate of profit which, when being generalized, will allow to solve the theoretical difficulties of the English economist. The new interpretation of Ricardo's work had a great impact when it spread, not so much because the analysis of distribution is central to the theory of growth (addressed at the time by neoclassical and Keynesian), but for two more reasons. Firstly, it made easier to understand the part of Marxist analysis value based on Ricardian theory and secondly it claimed the optics of the surplus to study the value and distribution, which had been for a long time, and until then, almost forgotten or considered logically deficient (Barro, 1998: 64).

In the first part of Production are contained: the demonstration that the approach to the analysis of value and distribution adopted by classical economists, and Marx, is logically coherent and allows to demonstrate prices as means to distribute the social over product and see that they reflect both technical and social causes. Within this general framework of analysis, he solves the problem of determining the rate of profit and the relative prices of goods from more general hypotheses than those of the theories of the value of Ricardo and Marx. In the theoretical developments of the latter it is attempted to determine the rate of profit as a ratio of aggregates in value, after having determined the values; in Production it is demonstrated that the rate and the values must be determined simultaneously (Osipian, 2007: 147).

The economic model of Sraffa is:

$$P = (\text{labor cost per unit}) + (\text{capital cost per unit}) * (1+r)$$

Where P: the price of the item

r: the rate of profit

W: cost per unit in each sector (assumption)

$r$  and  $W$  are equalized between sectors due to competition (assumption).

It is based on a series of basic hypotheses that describe some elements of capitalist society that are assumed given and essential for the beginning of the projected analysis. Such elements refer to the technical aspects of the production system and to certain social norms of distribution and circulation of wealth in a privileged state of the economic system: the equilibrium or reference situation investigated by the ancient classical economists. From this set of assumptions is built the image of the essential of an ideal capitalist economy: a decentralized economy in which only phenomena, relations and general, technical and social trends, which have a certain regularity, stability and permanence; making abstraction of momentary, temporary and particular forces. This model explains the determination of the relative prices of the merchandises that allow at the same time the reproduction of the production system, the distribution of the social surplus and the continuity of the economic system under the same situation (Barro, 1998: 84).

This image or theoretical model deals with a specific problem: that of production prices and its relation to the formation of the income of social groups. This constitutes the fundamental reference frame for the analysis of other related problems, addressed in the same work by Sraffa, or for new developments faced by post-Sraffian economists. In addition to the progress made in the research on joint production and fixed capital, Sraffa's theory inspired many scholars and led to accelerated developments in other areas such as: techniques in a general framework; vertical integration in production (Osipian, 2007: 153).

The most important contribution of Sraffa to economic theory is a rigorous solution to the problem of determining the prices of production within a conceptual structure similar to that of classical ancient theory, close to Marxist theory and different from the traditional and contemporary neoclassical theory. This conceptual framework, an approach to surplus measurement not based on the labor-value theory, allowed its author to solve the main problems of the classical theory of value and distribution, particularly those of the Ricardian theory, specifying its limitations. It also made it possible for traditionally accepted doctrines to be scrutinized and demonstrated their sustainability only in special cases. This happened with: the theory of the rate of profit and relative prices based on the orthodox Marxian approach of labor-value; the traditional theory of marginal productivity, value and distribution; and the international trade theory of Heckscher-Ohlin-Samuelson.

The specific central object of Sraffa's analysis is the problem of prices and their relation to distribution. It is proposed to isolate conceptually the variations in the equilibrium relative prices originated in changes in the income distribution of those associated with other causes, for example, those that can occur when the technical conditions are altered. In the general case, that is, when part of the national income is assigned to wages and the remaining part to benefits, it is necessary to inquire about changes in prices when the wage rate fluctuates, keeping production techniques constant, and exploring the possibility of predicting them according to a certain rule (Osipian, 2007: 124).

### 3. Austrian School of Economics for growth

Carl Menger was the founder of the Austrian School of Economics, one of the least publicized among those, who provoked the marginalist revolution at the end of the 19th century. His first book, *Grundsätze der Volkswirtschaftslehre* (Teaching Principles of Political Economy) makes important criticisms of classical economics, as it presents a theory of value antagonistic to the mainstream of thought. According to this vision, it is the goods' prices that determine the production costs and not the other way around. Carl Menger also conducted a thorough research on the currency, where he explores the historical evolution of money, as well as a theory of monetary value that served as a starting point for other thinkers of this school, such as Wieser and Von Mises (Osipian, 2007: 134).

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One of the exponents of the Austrian School is Ludwig von Mises. Von Mises began to teach at the University of New York in 1948, after the Nazi persecution forced to leave Vienna to most of the researchers of this current, turning off the school in Austria and being reborn in the United States. One of his valuable contributions to the economic science is his (economic cycle)theory based on monetary and structural causes; in addition to the scientific demonstration of the impossibility of quantifying economic efficiency in the socialist model. This impossibility becomes the contrast with the Austrian concept of dynamic efficiency, driven by innovation, entrepreneurship and competition in the system, while in socialism, controls and centralized planning make adequate allocation of resources unfeasible. In the specific case of Venezuela, we can verify the thesis of Ludwig von Mises, because efficiency and socialist economic model appear as dissociated (Rostow & Kennedy, 1990: 189).

For the Austrian School the marginal utility, specifically the law of diminishing marginal utility, explains why the consumer obtains a lower subjective satisfaction each time he consumes additional units of a good, and can explain by himself the formation of prices without including the costs of production. That is to say, that from the principle of marginal utility, the Austrian School came to the conclusion that it is not costs that determine prices, but on the contrary, it is the prices of final goods and services that determine the costs of production (Rostow & Kennedy, 1990: 190).

The Austrian theory of the economic cycle is perhaps its best-known contribution to economics, at least for orthodoxy. This is especially true when one considers that the main reason for the rise in the popularity of the Austrian economy after the recession of 2007 was its explanation of the causes of the recession (and its predictions of the recession before the crash) (Osipian, 2007: 141).

It is important to understand a) the underlying assumptions behind the theory of the trade cycle, and b) the relationship between the supply of money and the interest rate. This relationship is explicitly rejected by John Maynard Keynes. Keynes suggests that the main contributor to the interest rate is the so-called liquidity preference of the company or the preference of the consumer to have liquid money or deliver it to an investor saving it in non-liquid ways (Barro, 1998: 111).

Unlike Keynes, Mises recognized the demand for money as neutral over time. Keynes mixed the concepts of money and capital, without realizing that withholding money (or retaining a medium of exchange) does not translate into a reduction in the supply of capital in the market. Against Keynes, Mises believed that a decrease in the money supply or search for lending capital would simply manifest itself in the structure of production as a change in the prices of capital goods. The interest rate on a good, or what Mises called the original interest, is that established by the relationship between the value of discounted future assets versus the value of the present goods (Rostow & Kennedy, 1990: 192).

Money is related to the interest rate in the sense that as a means of exchange it can be used to acquire a certain amount of goods. Instead of exchanging real capital in the market, money allows a complex series of exchanges to take place without one individual having to satisfy another directly, offering the other good exactly at his request. As such, the loan of money follows the same praxeological laws as other goods. Like other goods in the market, when the price decreases, the demand increases. By increasing the supply of money in the market the costs of borrowing, or the interest rate, decrease and the quantity demanded of loan able funds increases. This tends to catalyze the investment (Barro, 1998: 125).

The Austrians distinguish between an increase in the supply of loanable funds as a result of an increase in savings and the increase resulting from an increase in the money supply. The latter is the one that leads to the economic cycle. Providing a full explanation of the Austrian business cycle theory would require going deeper into the Austrian theory of capital, which unfortunately falls outside the scope of

this essay. In any case, using what has been established up to now, the theory of the economic cycle can be explained as one that predicts the lack of coordination in the market, which stems from an artificial reduction in the cost of borrowing money. This decrease in the interest rate is artificial in the sense of arriving as a result, not of an increase in loanable funds through an increase in savings, but of an increase in loanable funds through an increase in the money supply (Osipian, 2007: 213).

Friedrich von Hayek, on the other hand, was one of the most recognized disciples of von Mises. Hayek states that information in the market economy is imperfect, incorporating uncertainty into economic analysis in a coherent and pioneering way, even before other schools of thought. An important contribution of Hayek is his monetary theory and the relation with the economic cycles. Regarding the expansion of the money supply, Hayek shows that this expansion does not generate an effect of growth in the real economy, but distortions in prices, which lead to an inefficient allocation of resources. This means that the inflation generated by a bad monetary policy of the government, impoverishes the people and destroys the efficiency of the economic system. Hayek also contributes in the deepening of the thesis of impossibility of quantification of economic efficiency in the socialist (Lavrov & Kapoguzov, 2006: 87).

Like Menger and von Mises, Hayek was convinced that it is the ideas and not the strength, which must prevail to establish a free society, being the most propitious field of ideas, the Academy and not Politics. In this sense, all the thinkers of the Austrian School made valuable contributions to the new liberal thought (Barro, 1998: 114).

But the primordial difference that distances the Austrian School from other schools of economic thought is the theory of value. Classical and neoclassical schools claim that prices are determined by production costs while the laws of consumer behavior only complement this price formation. Nevertheless, the Austrians' conclusions were completely different (Rostow & Kennedy, 1990: 194).

For the Austrian School, the marginal utility, specifically the law of diminishing marginal utility, explains why the consumer obtains a lower subjective satisfaction each time he consumes additional units of a good. This also and can explain the formation of prices without including the costs of production. That is to say, that from the principle of marginal utility, the Austrian School came to the conclusion that it is not costs that determine prices, but on the contrary, it is the prices of final goods and services that determine the costs of production (Lavrov & Kapoguzov, 2006: 94).

The Austrian School of Thought has provided the economic science with a wide variety of unique ideas. It is not realistic to provide a detailed explanation of the whole Austrian theory within the limits of an introduction. However there are some key theories by which the Austrians have become known providing a solid basis for further research in Austrian economics (Barro, 1998: 196).

According to the value theory of the Austrian School, no company will be willing to pay for the factors of production a price higher than that consumers would pay for the final good. In contrast, companies are willing to pay the prices of productive factors, because consumers are willing to pay the final prices. What we can conclude is that the costs are the result of the existence of expected prices of goods and services and not the other way around. If anyone doubts the importance of this premise (Rostow & Kennedy, 1990: 198).

#### 4. Economic model of Lucas

In models that involve externalities due to the accumulation of factors, the change in their total productivity does not occur as a result of innovation in the strict sense. It is the experience and learning, the transfer of knowledge by the incorporation of physical capital and / or formal education that generate spills triggering a process of sustained growth in the economy (Barro, 1998: 202). Among these models, the work of Lucas is the one most interesting. Lucas suggests that externalities are caused by the accumulation of human capital, the same ones

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that reinforce the productivity of physical capital and make the economy grow in a sustained manner. This accumulation can occur in two ways: as a result of a learning process in the firm (learning by doing) or as the product of the formal education of the person (Rostow & Kennedy, 1990: 193).

The model of Lucas (1988) finds that the growth of human capital is basically related to two factors: a) the quality of the education and b) the amount of time dedicated to the study. If these factors were exogenous, the productivity growth described in the Solow model (1957) would be determined one by one by the two factors exposed by Lucas. However, Lucas gets so endogenous the amount of time devoted to the study. In the end, economic growth ends depending on factors such as the inter-temporal preference rate, the elasticity of substitution in consumption and the rate of depreciation of capital. In contrast, long-term growth depends merely on change exogenous productivity (Lavrov & Kapoguzov, 2006: 124).

Lucas' growth model is generated via a production function that is the following:

$$Y = AK^{\alpha}(hL)^{1-\alpha}$$

Where Y,A,K, are defined

l: the proportion of total labor time spent working

h: the stock of human capital (it is called so by Lucas)

and  $0 < \alpha < 1$

Lucas (1988) was based on the idea of human capital to build a model of two sectors with endogenous growth. In one of which the final production of obtains through the combination of physical and human capital. This product can be consumed or transformed into physical capital. In the other sector, the production and accumulation of capital is made from physical and human capital. Likewise, human capital accumulates faster when more physical capital exist, to make that process possible (Barro, 1998: 189).

The production function of physical and human capital presents constant returns to scale, that is, that increasing these two forms of capital entails to double the production. This model is part of the first generation of those theories that highlight the externalities by accumulation of factors, in which the change in total factor productivity is not produced by effect of innovation in the strict sense. In them experience and learning, knowledge transfer by the incorporation of physical capital and / or formal education are sufficient reasons to trigger a process of sustained growth in the economy. In this model, the accumulation of capital human is given in two possible ways, either as a result of a learning process in the firm (learning by doing) or as a product of formal education. This investigation deals only with the latter (Romer, 2007: 198).

Lucas begins by considering an alternative growth engine or at least complementary to technological change, such as human capital, thus developing two models. The first emphasizes the accumulation of human capital through the school, and the second focuses on the specialization that is acquired through learning (Lavrov & Kapoguzov, 2006: 133).

This development model is the pillar on which the new theories of growth rest and especially the contribution of human capital to economic growth according to the theories of endogenous growth, the productive capacity of individuals increases with their education, not only by the incorporation of skills and abilities for work, but also for the impact on health and nutrition, which increases labor productivity.

Lucas (1988) presents the basic ideas that allow introducing human capital as an enhancer of capital and as a factor of its own reproduction and growth. Lucas states that an individual dedicates many years of his life to school, in order to obtain capacities that will allow him to improve his productive capacity. The decision to invest in education is based on a comparison between the costs of education

(income, school fees, tickets, supplies, etc.) and the future advantages of more advanced schooling. So consider schooling as an investment decision to increase a person's human capital.

The double characteristic of human capital: On the one hand, of information being of knowledge (like technology) and on the other side, of being appropriable by individuals (like physical capital). Being of knowledge, it is produced essentially with itself, students are trained by teachers and those who use their present knowledge to acquire new knowledge. This makes human capital look like technical knowledge and the rules of accumulation with dynamic scale returns can be applied to it, as well as generating an endogenous growth process (Romer, 2007: 202).

The central ideas of Lucas (1988) do not necessarily require a focus on optimizing consumption, but that they can be reproduced in situations where the savings rate is determined by habit formation. The advantage of using this assumption is practical. The figures for the savings rate are available for a large number of countries. On the other hand, parameters such as the elasticity of substitution in consumption have to be estimated and, as already mentioned, these estimates are not always reliable.

In the analysis of the long-term growth, an advantage of using the technique of calibration-simulation in a model such as Lucas (1988) - and not a traditional econometric methodology - is to avoid the problem of endogeneity. A large amount of econometric work<sup>7</sup> analyzes the effects of human capital on growth. However, Lucas model (1988) clearly indicates that several variables that directly affect long-term growth also have an effect on human capital. When these variables are used as controls for the econometric regressions, the total effect that human capital has on economic growth is underestimated (Lavrov & Kapoguzov, 2006: 87).

Notwithstanding the above, models like those of Lucas (1988, 2009) also present limitations. The main one is that the way in which they are built ends up generating that in the long term the growth of the per capita product is, or very similar to that of human capital, or at least proportional to it, which seems to be an underestimation of other factors in economic growth.

### **5. Identification of the technological factor by both the growth accounting method and the quantitative method**

The Growth Accounting methodology is a process used in the Economic Sciences to measure the contribution of various factors to economic growth and indirectly the pace of technological progress. It first appeared by Solow (1956), in order to find the determinant causes of growth observed internationally after the end of the Second World War. In fact, Solow came to the conclusion that over 80% of product growth per worker was due to technological progress, i.e. factors other than the inflow of capital and labor (Romer, 2007: 205).

Technological progress is the result of an activity that requires significant financial resources and can therefore be determined by economic criteria. Endogenous determination of technological progress is one of the key features of many modern models economic growth. Regardless of its various disadvantages, the Solow- Swan is considered as one of the most important tools of modern economic analysis. Despite its simplicity, this model reveals the basic function of its dynamic mechanism economic growth, and has been the main source of inspiration for the evolution of today's theory is called a new theory of economic growth (Lavrov & Kapoguzov, 2006: 134).

According to the Growth Accounting methodology, the growth rate of an economy's product is decomposed into two segments. The first segment includes the actors of production - usually capital and labor - and the second one the residual, which is considered a measure of productivity growth of the inputs of the inputs. This is attributed to different factors and, above all, to the advancement of technology. This defined as the increase in output when inputs are stable, and

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expressed as we have indicated through Total Factor Productivity (TFP). More specifically, the difference in product and input change rates is equal to the rate of change of a factor related to the productivity of the system being studied. This factor refers to the productivity of capital and labor and its rate of change is expressed by TFP (Romer, 2007: 222).

This method has been applied to almost the entire world economy. It is common to note that the observed levels of economic growth cannot be attributed solely to changes in capital or labor, and therefore technological progress or lack thereof plays an important role in economic growth. Moreover, the advantages of this methodology are the following (Lucas, 1988):

1. It is necessary to use statistical data, which in the majority of them can be gathered with a sufficient degree of precision.

2. No arbitrary assumptions are required, and

3. Calculations are controlled at each step

The methodology is applied on the basis of the overall production function which is in the form of:  $Y = A \cdot f(L, K)$ .

If K and L were homogeneous, this method could be applied. In principle, this framework would make it possible to separate the contribution of what is measured, k and l, of what remains unmeasured, z. Now, neither K nor L are homogeneous in practice, but some kind of aggregation can be expected to make the procedure valid - if not exactly, at least roughly (Romer, 2007: 225).

The problem with this approach is that it considers all generations (or crops) of capital (or work) as equals. Actually, technological advances tend to be incorporated in the latest capital harvests. This means that the New capital is better than the old capital, not just because machines deteriorate and they break with time, but also because the new capital is better than it was the old one, even when it was new. This also means that there cannot be technological progress without investment. If this is what "incorporation of technology to capital" means, then this idea cannot be collected in the framework of Solow (1956) for the reasons that he himself aptly describes (Lavrov & Kapoguzov, 2006: 141).

In the production function we add the efficiency of the work we have:

$$Y = f(K, L, E)$$

Where labor efficiency = knowledge of society on production methods, improving technology leads to increased labor efficiency.

$$L \times E = \text{number of efficient workers}$$

Case improvement technology leads to increased labor efficiency but at a steady pace. Since the economy is in a steady state, the growth rate of output per worker depends only on the pace of technological progress. Based on the model, only technological progress can explain a sustained rise in living standards.

The technological structure considered can be summarized by

$$c + i = y = zf(k, l)$$

Where c and i are consumption and investment in units of consumption and q is the number of units of new capital that are manufactured from a unit of final output. The contribution of investment-specific technological advance to output growth is then

$$\frac{a\hat{q}}{\hat{z} + a\hat{q}}$$

where q is technological progress and z is technological change so.

It's as if all technological progress was something like the study of time and movement, a way to improve organization and functioning of inputs without reference to the nature of the inputs themselves. The surprising assumption is that the old and the new capital participate by the same in technological progress. The progress technologies have an influence on production only when they are brought to the practice by forming net capital or by replacing the equipment outdated by the latest model (Lavrov & Kapoguzov, 2006: 143).

In other words, unlike Solow (1956), the implementation is not free, but it requires the acquisition of new machines. In addition, it also requires new human capital since both workers and management must learn to use the new technology. This learning will be done well through experience or training, or both. This type of technological progress is called here specific to investment goods; someone must invest to benefit from it.

In this view is correct, growth accounting should take into account the numerous types of physical and human capital, each specific at least in the part of the technology to which it is incorporated. In other words, the growth accounting should be developed within a framework of generations or harvests of capital, vintage capital. This document argues that a model of generations of Capital can clarify some of the main keys to economic growth experienced in the United States since the end of the Second World War World. The well-known model of Lucas (1988) does not fit in this framework. In Luke's model, all physical capital, whether old or new, "participates equally" in the technological progress generated by the human capital sector; and, as Solow's quote emphasizes, this does not fit with the simple observation of how progress works.

The Solow model (1956) is the essential framework for growth accounting. The fundamental point is that this model is unable to justify these four observations:

1. The prolonged slowdown in productivity growth that started around 1973. To explain the slowdown, the model emphasizes that technical progress has been stopped since 1973. This, of course, is at odds with the simple observation of events: personal computers, mobile phones, robots and the Internet, among others.

2. The fall in the relative price of capital goods relative to the assets of consumption. This price fell by 4 per cent per year during the postwar period, and it is a symptom of the obsolescence of old capital caused by the arrival of new and better capital. This relative decrease in price is not compatible with a unisectoral growth model such as Solow's (1956).

3. The productivity of a plant that operates with the best available technology It is very different than the average plant. They can differ in two, three, or more times, depending on the industry. This does not match a model such as Solow's (1956), in which all companies use the same production function.

4. The recent increase in wage inequality. The framework does not say anything about it (Lavrov & Kapoguzov, 2006: 144).

## 6. Conclusion

Economic science has not achieved the construction of a growth theory that includes dimensions associated with the understanding of phenomena and the clarification of the causes that have led to the simultaneity of stagnation in economic activity and inflation. It lacks theories that explain in greater depth the determinants of the distribution and concentration of income; It is the inability of economic agents to perfectly anticipate the future, which generates a state of constant uncertainty in the system; productive asymmetries between developed countries and developing; the high levels of external indebtedness.

This gap is explained by the fact that the convergence towards economic growth is a game of supply and demand, which is based on the interaction and the efficient combination of different variables and different agents within a market that has a territorial and sectoral context. The trend towards development self-sustaining precise determinant variables such as: investment in human capital, the regime of incentives, financial resources, timely information and institutional ordering.

### References

- Barro, R. (1998). Notes on Growth Accounting, NBER *Working Paper*, No.6654. doi. [10.3386/w6654](https://doi.org/10.3386/w6654)
- Christine Dunn Henderson Online Library of Liberty, (2018). [Retrieved from].
- Lavrov, E., & Kapoguzov, E. (2006). *Economic Growth: Theories and Problems*, OmsSU, Omsk.
- Lucas, R.E.Jr. (1988). On the mechanics of development planning. *Journal of Monetary Economics*, 22(1), 3-42. doi. [10.1016/0304-3932\(88\)90168-7](https://doi.org/10.1016/0304-3932(88)90168-7)
- Osipian, A. (2007). *Economic Growth: Education as a Factor of Production*, KEHI Press, Kramatorsk.
- Romer, P. (2007). *Economic Growth*, from *The Concise Eyclopedia of Economics* by David R.
- Rostow, W., & Kennedy, M. (1990). *Theorists of Economic Growth from David Hume to the Present*, Oxford University Press, New York.
- Solow, R.M. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics*, 70(1), 56-94. doi. [10.2307/1884513](https://doi.org/10.2307/1884513)



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