MODELS OF ECONOMIC GROWTH BASED ON ECONOMIC INVESTMENT

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Abstract:
In this article are presented some models of growth based on investment (Keynes's model, the Harrod – Domar model). At the reliance economic growth should, on the one hand, an economic policy that promotes increased efficiency, with a maximum simplification of the legal framework, in order not to be hindered economic freedom and free initiative, on the other hand, need a greater willingness to save and invest as much in profit, with an increased desire to work. Boosting economic growth during the transition period and is based on increasing the capital stock. The investment is thus an essential key to economic growth because it acts as both demand and supply.

Key words: *growth, investment, model, national income*

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All economic theories consider investment as one of factors of economic growth. Investing acting on supply and demand.
Keynes believes that the application is actually made up of consumption and investment, it is actually economic engines. Keynesians economists and Keynes considered as part of investment demand.
Keynes's model can be presented simplified as:

$$C + S = Y \quad (1)$$
$$S = F(Y) \quad (2)$$
$$I = F(Y, E) \quad (3)$$
$$I = S \quad (4)$$
$$Y = P \ (P - \text{constant}) \quad (5)$$

where: Y is national income,
C consumption,
S savings (including corporate savings),
I investment,
P production capacity of the economy, full employment in conditions of employment,
K capital,
E exogenous causes,
t time.
Y, C, S, I, P values are expressed in net / unit time.

Capital stock as part of the investment, there are explicit in Keynes's system. Can trigger a collapse or a chronic unemployment due to contradiction between the values of Y (given by equations 1, 2, 3, and 4) and provided that income is equal to production capacity (relation 5). It is a static and can not be used in explaining business cycle.

Multiplier is an economic approach implemented in 1931 by M. All Khan, who analyzed the relationship between domestic investment and unemployment, changes in the volume of employment will depend on the variation of net investment.

JM Keynes was inspired by this analysis when it determined the relationship between income and investment: an increase in investment causes a proportional increase in national income, as rising demand leads to increased production results in an increase in national income. The inclination towards marginal consumption is even higher multiplier effect is stronger.

According to the multiplier, the main cause of fluctuations in the economy is to change investments. This includes the existence of a strict causality between changes in investment and GDP variations, which allow gender savings and investment, provided the full employment of labour.

John Maurice Clark and Albert Aftalion economists were the first who brought to the fore accelerator theory. The accelerator is symmetrical in relation to Keynes's Multiplier and the link between investment and consumption. In the investment is a function of income, we can talk about the relationship between investment and income. In the condition in which production capacities are used at maximum level, an increase in demand causes an increase in higher rate of investment. The effect occurs in the negative sense, where there is excess production capacity. Variations are more extensive investment than consumption variations. This acceleration effect is explained by the nature of the investment. The effect is more pronounced because of the time factor, bets on long-term results are short term (the investment does not appear immediately in economic activity). Delays in implementation have important consequences on the stability of the economic system. Changes the structure or economic situation can distort the desired results of a previously executed investment. The investment is thus a decisive factor in the changing situation (in short, thanks accelerator, investment increases faster).

Samuleson is the economist who explained fluctuations in the short term by combining the multiplier effect and accelerator (the oscillations).

This principle can be summarized thus increasing autonomous investment income increased → growth demand → multiplier mechanism. In other words, determine the need for equipment for new investment under the principle of acceleration. This investment creates, in turn, a new multiplier effect, which will be followed by acceleration, and so has a multiplier effect stabilizer, while the accelerator has a destabilizing effect.

The investment is thus an essential key to economic growth because it acts as both demand and supply.

Harrod Domar model considers that the data source of funds for loan investment is savings. Key to growth lies in explaining the level of investment in relation to fixed capital and in relation to human capital. For it is necessary to encourage savings and / or generation of advanced technologies that allow companies to produce more output with less capital (capital ratio decreased - production.

Under this model, growth rate depends on the following factors: the level of savings and investment productivity (the production capital).

Harrod Domar model was created for the purpose of analyzing the business cycle. Later, he was suitable for explaining economic development.

In the cycle of business investment plays a double role: on the one hand, the income generated by investment helps to increase national income and the level of employment, creating wealth, on the other hand, the rapid accumulation of capital result consume existing investment costs and may cause a crash and a state of economic depression.

This model explains why an economy should not grow as fast as its potential rate of growth. The model is based on the idea that current income determines the amount of savings, which leads to investment, affecting the rate of growth. If savings are not sufficient, the potential rate of growth will be achieved.

Harrod Domar model with a strong is Keynesian indicate that the economy can not reach their potential automatically. This idea is central to several theories of the business cycle developed by several economists such as Marx, Hobson, Keynes, Hansen, Kalecki, Kaldor, Sweezy and others.

In the Marx Hobson, capital accumulation appears explicitly, but its role is not entirely clear. As long as the stock of capital is below the critical KN system was in the form:

Case I: $K < K_n$

$C + S = Y$ (6a)

$S = F(Y)$ (7a)

There is no basis for investment (8a)

$I = S$ (9a)

$Y = P$, (P is constant) (10a)

$\frac{dK}{dt} = I$ (11a)

Investments and savings are identically equal (equation 9a) and the full engagement of the workforce is maintained automatically.

When we reach the critical level K KN, future profitability of capital accumulation (investment) will decrease radically, prosperity and ends abruptly.

Case II: $K \geq K_n$

$C + S = Y$ (6b)

$S = F(Y)$ (7b)

$I = a$, (a – constant) (8b)

$I = S$ (9b)

$Y = P$, (P is constant) (10b)

$\frac{dK}{dt} = I$ (11b)

In this case the system is surdetermined the upper limit of investment (equation 8 b) being too small to reach the level of Y required by equation 10 b, attracting the crisis itself.

The importance of Marx Hobson is as follows: accumulation of capital has a strong negative effect on the profitability of investment, and supported the idea of Keynes and his followers, and non-economists Keynesians

A system under development contains some of the systems reviewed above; it highlights the relationship between capital and productivity.

a. In a case where are no contradictions

$C + S = Y$ (12)

$S = F(Y)$ (13)

There is no basis for investment (14)

$I \equiv S$ (15)

$Y = P$ (16)

$\frac{dK}{dt} = I$ (17)

$P = F(K, s)$ (18)

The system is not surdetermined.

If we consider the simplest system (would be more general and more realistic to consider $S = \alpha Y + \beta$, $\beta \leq 0$, we assume $\beta = 0$) then:

$S = \alpha Y$ $(0 < \alpha < 1)$ and (19)

$P = Ks$ (20)

where s is the ratio between productivity and capital required by the existing technology, and α is constant.

in this case: $Y = Y_0 e^{\alpha s t}$ (21)

b. Where possible contradictions

b_1 If deemed investment function described by equation 3 with equation 15 creates an identical system of Keynes.

b_2 If we consider $\alpha s \leq r$, r is the maximum rate of growth that the economy can achieve, then equation 18 becomes:

$$P = Ks \quad (22)$$

If $\alpha s = r$, since the investment function is identical to savings, the economy is in equilibrium, under conditions in which he not only full employment but lack an excess of capital accumulation.

If you insert additional assumption that capital income (profits and interest) remains a constant part of national income, then an average profit of capital remains unchanged, despite the continued accumulation of capital (provided that s remains constant).

If the upper limit of s decrease gradually as the state maintains full employment of labour and full use of the state capital, the profitability of investment will be gradually reduced.

Restriction in equation 22 implies: αs growth rate may not be achieved as a result of insufficient growth of production factors, other than capital; of them, most importantly labour. If, on the existence of such restrictions national income increased to maximum r, hiring full employment is maintained by the definition of r, but a part of the capital stock becomes unproductive. If we define, $\sigma = \frac{dP}{dK}$ then $\sigma <$s. The cyclic important implications.

Relation 14 is amended as follows:

$$I = \theta(Y, E, y) \quad (23)$$

where $y = \frac{s}{\sigma}$ and $\theta(y) < 0$ the system acquired a powerful cumulative force.

If, in some cases (not necessarily decrease labour) income not increase until the αs, will develop unproductive capital (increasing y). This reduces the return on investment. Its growth rates decrease (even become negative), and the corresponding decrease in the rate of increase in income causes an additional capital stock unproductive. This in turn, decreases profitability investment.

You said very clearly that the presence of unproductive capital in the economy does not show in itself that the restriction of 21 is operative relationship. Unproductive capital will grow when income recorded a decrease in the rate of evolution αs, regardless of cause. None of the investment does not intervene. This shows that investment and income will be increased to the required level. In this way, besides the obvious assumption that the αs is impossible physically, another hypothesis may be suggested even in the absence of this level of growth required level can not be achieved due to institutional factors, or more precisely, due to the particularities of investment in capitalist society. Empirical verification of these assumptions is absolutely necessary.

Conclusions

The conclusions derived on the basis of this model were as follows:

1. growth depends on the amount of capital and labour;
2. more physical capital generates economic growth;
3. net investment lead to the accumulation of capital, which generates output links and higher revenue;
4. favouring higher income increased savings.

The model has several limitations:

- ✓ growth and economic development are two different concepts, economic growth is a necessary but not sufficient for economic development;
- ✓ foreign loans needed to cover the gap caused by insufficient savings determine future problems regarding the payment of debts;
- ✓ the decline suggests that if income increases investment, productivity of capital will reduce the capital and production will increase.

This type of system can be made and some objections:

a. reject the whole approach on the pretext that the treatment of parametric s is illegitimate. The existence of a relatively rigid relation between income and capital stock for the production is established. Economics often dismiss s his will deprive it of most of its meanings cycle, since a slow reduction in the rate of profit ($\frac{d^2Y}{dK^2}$<0), will exert powerful effects of the crisis over five or seven years. There are still reasons to believe that the relationship between capital and production capacity in short period is less flexible than usually assumed in traditional theories.
b. the unproductive capital is not distributed equally among all industries and across all firms.
c. if in the investment function is an important role played by exogenous factors (development of new methods of producing, changing tastes and habits of population, population growth, aggressive competition), the previous accumulation of capital, capital etc. unproductive, will have reduced effects on return on investment.

The aim is to create a bridge over the gap existing between the desired growth of capital and the current level.

1) where 21 is the actual relationship, then there are three possibilities:
   a. reduction of α;
   b. reducing his developing industries that require capital expenditure / unit output high;
   c. growth in the general level of prices.
2) 21 if the relationship is not effective, the required growth rate is possible physically, there are other possibilities, other than those listed above. Among them include: various methods to encourage private investment (low interest rates, tax incentives, etc.). A guaranteed income growth, as a method of creating investment opportunities, should be explored in this connection. In addition, there is no inherent reason to curb the investment to play an equally important.

The problem relating to their growth and development in general was made after the political economy. Development progress is both quantitative (increase) and a qualitative (structural change) of the production.

Neoclassical theories of economic growth occurred as a result of rejection, as argued, the theory of Keynes, prevalent in early twentieth century, also have occurred due to the use and concept of residue in explaining economic growth.

Items common neoclassical theories are:

- growth is determined by factors that are of economic nature (residue);
- growth is not natural;
- growth requiring state funding for research, education, etc.. (direct intervention in the economy)

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