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THE FACTORS DETERMING EXTENT OF THE DEMAND FOR INVESTMENT

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Abstract. The relationship between the volume of demand and inflation, as a component of the aggregate demand the optimal volume of the applied both domestic and foreign sources is considered. As a component of aggregate demand the application of the investment and their volume is taken. It is shown that the excessive growth of investment may lead to the inflation and the stresses in economy.

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1. Introduction

In spite of the increasing of the national income plays an important role in the growth of the efficiency of social production, it is necessary to take into account the cost of this increasing. Therefore, to increase the efficient of use of the investment to raise the national income is of great interest. The raise of the efficient impact on increasing of the national income in general relates to the efficient use of the investment recourses in the increase in national income. Another condition for the the efficiency of investments related to its optimal capacity. Considring the relationship between the volume of demand and inflation, as a component of the aggregate demand the optimal volume of the applied both domestic and foreign sources should be determined. As a component of aggregate demand the application of the investment and their volume must be consistent with the realization of the national interests. Thus, the excessive growth of investment may lead to the inflation and the stresses in economy. On the other hand a little than needed volume of the investment could lead to the deflation.

2. Main discussions

The inflation problem has been always in the focus of attention all the time in different economic studies. The following known theories of describing the formation of investment funds may be noted:

- The up to date value approach

- Keynes investment theory of marginal efficiency of capital and investiment approach (Mec-Mei model)
- Simple akselator model
- Effective akselator model
- Neo-classical Investment Model
- Tobing Mode

Keynis investment theory is based on the concept of marginal efficiency (MEC) of investment in the fixed assets given in the book "General Theory of Employment, Percent and Money" by S.M. Keynis. The marginal efficiency of investment is a such percentage rate that provides the equality of the income of the investment projects to its present value.

Since in the Keynis approach in the investment process, the marginal efficiency (MEC) that indicates the benefit from the investment in each period and marginal efficiency of the investment are related to each other as a the marginal efficiency of the investment, "expected amount of profit" or "the volume of internal efficiency" are called (MEC-ME approach).

In the Keynis approach the investment decisions varies in dependence on the marginal effectiveness investment, and therefore the percentage rate, uncertain waits, and optimistic or pessimistic character of the investors [3, p.4].

Keynis's investment theory was inspired by the present value methods. Two elements are taken of the attention now by the present value theory. The first of them is the cost of the investment the company intent to invest; second one is the current value of the annual net income that the investment will give in future.

Thus, based on the current value methods the evaluation method of the investment is as follows:

a) the investment project is realized if its current net value is greater than 0. It means that the current net value is greater that the current cost i.e. the investment project is profitable.

b) the investment will not be done if its current net value ıs less that zero.

Another important factor affecting the amount of investments to the country, is the change change the volume of the demand for goods and services. If the demand for goods and services will raise then it may be covered by the increasing the intensity of the production using the existing production capacity. The long-term increasing demand may be met by the increasing production capacity. Thus, if the investment resources in the country are prevailing other conditions, then one can strengthen the intensive factors of the production raise and increase the volume of GDP by changing the rate between production cfactors using the investments.

From this point of view a simple akselator model developed by Paul Samuelson explains the decisions of the companies not over the percentages but over the production or sales

$$a = \frac{\Delta K}{\Delta Y}$$

Here ΔK is the increasing of the main funds, ΔY- increasing of the production.

To provide the needed fixed assets in order to increase the volume of the produced product from Y_0 to Y_1 one needs the investment of amound

$I = a((Y)_1 - (Y)_0)$ [5, p.95]

Thus The "stimulated" investment is a function of the increasing of GDP.

This model first was used by A. Aftalan in 1913 and G.M. Klark in 1919 in the economic analysis. Later, this model was used by R. Harrod, C. Hicks and P. Samuelson in developing of the theory of economic growth. The fixed assets are one of the key factors of the production.

There exists a close relation between the volume of the main funds and production. The economic nalyzes justificate the optimal proportion between the volume of the fixed assets and production [4, p.39]. In order to increase the production of any volume, the investment also should be increasedin this proportion. For example, suppose that the volume of investment and the expected production volume is proportional

$$(K)_t = a(Y)_t$$

Here K_t - is a volume of the fixed assets in time *t*, $(Y)_t$ is a GDP in this time produced by these funds.

The companies make some investments to raise their fixed assets to the desirable level. ThenGDO increases from Y_{t-1} to Y_t. The volume of the main funds in this process increases from $K_{t-1}(= aY_{t-1})$ to $K_t(= aY_t)$. If to neclect the amortization the volume of the needed investment will be as follows

$$(I)_t = (K)_t - (K)_{t-1} = a((Y)_t - (Y)_{t-1} = a\Delta(Y)_t \text{ [8, p.24]}$$

According to this formula, any increase in production will require a suitable increase in the the fixed assets. The price of the fund exchange capacity in the Western countries varies between 2 and 3 [4, p.39]. For the working of this formula it is necessary and impotant the continuous increasing in demand for consumer goods and using of the capital-intensive technologies.

Here the additional costs related with investment decisions as well as, for the training of the employees for working with the new production technologies, or the additional costs related with the delay in the production during the establishment of the new devices, have been considered by Eisner-Strotz (1963) and Lucas (1967) and is caaled "costs for the adoptation the the new thechnologies" [3, p.4].

In the simple accelerator relator model the wish of the companies to find some period for the proving optimal volume of the fixed assets was of criticism while the keeping the percentage level out of the focus, taking the accelerator coefficient as a constant, the assymetric working of the model (i.e. while increasing the production the investment also increases, but otherwise when the production does down the investment decreases no of the same ammount, but only of the renewing ammount)[1] .

Koyck (1954) assumed that the volume fixed assets depends not only on the current investments but also on the former ones. He developed the elactic accelerator model to avoid the criticism pointed at the simple accelerator model [3, p.3].

According to the elastic accelerator model the companies can achieve the desired amount of the fixed assets no in one year, by investment each year a part of the difference between main and desired funds.

After a certain period, the volume of the main funds reaches the desirable level. This case is called "the principle of adaptation of the fixed assets". The period for the reaching the desired level of the fixed assets of the company depends on the period necessary for its adaptation to the changing economical situation and also on the period when the new production units will give some benefit.

Let's consider the investment function. The amount of the investment necessary for the raising the current fixed assets to the optimal one in *t* years may be given by the formula

$$I_t = \lambda(K_t^* - K_{t-1}), \quad 0 < \lambda < 1.$$

Here I_t is a volume of the investment in *t* years, λ is a coefficient that indicates the approach of the existing fixed assets to the optimal valume at the moment t.

In the elastic accelerator model the investments are related to the production volume and corresponding percentage coefficient. The value of the coefficient λ depends on the the percentage rate. Thus when percentage level raises the value of the coefficient goes down and the investments decreases. So we have

$$I_t = \lambda(K_t^* - K_{t-1})$$

If to consider that $K_t^* = vY_t$ we get

$$I_t = \lambda(vY_t - Y_{t-1})$$

This formula is called an elastic accelerator model.

If the coefficient λ is close to 1, then the company can reach the optimal volume of the fixed assets in comparably short time –in one or two years. This process can take mote longer time if λ is small enough.

The neoclassical theory was developed by economist D.W. Jorgenson from USA in the 1960-th. This theory also deals with investments and tries to define the optimal volume of the fixed assets of the companies.

According to this theory when the marginal productivity of the capital is equal to its marginal cost the company can reach to the optimal fund volume [1, p. 427]. The marginal benefit of the company provided by the additional fund unit is equal to the product of the marginal production (MPk) produced by this unit by the cell price (P) of this product. So for the marginal product we get [9]

$$MPk = \Delta Y / \Delta K.$$

It is known that the difference between the marginal productivity of the capital (MPK) and marginal costs of the invesvtments to the fixed assets defines the marginal benefit volume. In the neoclassical investment theory the main factors influing to the investments are pecentage volume, taxes, the expected increase of the benefits of the fixed assets and prices of the invested goods.

The Tobin theory was developed by economist James Tobin Tobin from USA in 1969. This theory constructed a functional relationship between costs and investments to the fixed assets. This coefficient *q* is called Tobin coefficient and is calculated as follows:

q= (Market volume of the existing main funds) / (Renewal costs of the existing fixed assets).

As we see the Tobin coefficient is calculated as a ratio between the parts owned by the company and market value of the sold bonds and the renewal costs of the production units.

As a result of the calculations we get:

If $q>1$, then the companies invest for the increasing the owned main funds;

If $q<1$, Then companies do not harry to invest (even for renewal);

If $q=1$, then the companies invest only for renewal.

However, when we examine the matter carefully, we see that the Tobin coefficient means a parametric feature for the investment function and is not a cause. In other words, if the companies are not showing a tendency to increase successful sales and profit levels their shares can not be sold at a good price.

As is seen in the considered theories, the investments do not give immedite benefit in terms of quantity and quality production, of and not immediately, it takes place within a specified time period. Therefore, we aim to define the volume of the investments providing the needed growth through the fixed assets.

In other words, in the model we will consider the factors defining not the the amount of the investment, but the fixed assets. The sum of the volume of the previous and current investments to the fixed assets forms the total volume of the existing fixed assets in each section [7, p.100].

To avoid the causing inflation, the determined volume of the investment costs must be consistent to the volume of the proposal in the country, as well as current amount of GDP as its main part, consumer costs as a part of the demand. Note that if this factor is not taken into account the increase in demand during the investment, the country's investment policy can not succeed.

Under such conditions the scale of the national economy is regularized by the effective strategies in the imposed state tax rates, government expenses, monetary and fiscal policy. Here the consumer spending of the demand is of particular importance. So if the demand of any product increases, then its production at this time, the increase of GDP should be provided.

The drawing attention issue here is to establish the ratio between capital and other production factors. The ratio between these factors is determined by the technological development level and the marginal productivity. Hence, investment demand in the country is defined by the by the level of other resources in accordance with this ratio. To increase the production volume in the country it is important the use of all production factors, as well as labor and capital.

Of course, soil and other natural resources hase an important role here. However, considering the today's scientific and technological progress and the development of the technology leads to decrease the dependence of the production raise and generally economical development on the natural resources [6, p.350].

3. Linear production function

In this case, the production capacity of labor can be expressed in the formula:

$$b = \frac{L}{Q}$$

Production stock holding is determimed by the formula

$$a = \frac{K}{Q}$$ [2, p.154].

Here b and a is a valume of the labor and catital factors for producing of a unit product, respectively. They also are called a production technology coefficient.

The ratio between capital and labor capacities in the country's GDP indicates the the level of the technological development and application of the high technologies in the country. Thus, the use of modern technological achievements and their application are always at the expense of large capital cost.

Then the tchnological level of the country may be defined as

$$c = a : b = \frac{K}{Q} : \frac{L}{Q} = \frac{K}{L}$$

Of course, while the technological development in the production process will raise, the correlation between the factors of production will turn to the capital that in its turn will result in a reduced capacity to work with due to an increase in labor productivity. After reaching a certain level due to the decreasing benefits law increase of the share capital in the production process reduces its marginal productivity. Hence, there is a necessity to define some weight ratio between the capital and production in the country. The investments in the different industry areas in the country can determined considereing this ratio.

The intersection point of the capital and labor is the point where they both have zero marginal productivity.

Because in spite of involvement of the labor factor in the production process means involvment of other factors, the scale of the factors involved to the production process, the optimality of the ratio between them depends mainly on the correct ratio and diection of the capital. So, in terms of productivity the optimal combination of the production factors is the main indicator of the efficient use of the investments.

Because, the main factor defining the increase in the level of employment in the country is the annual net investment volumes.

Naturally, the investment comes before the increase of the productivity in the terms of the economical process, but considering the existence of defined ratio of the union of capital and labor, the investment that is needed for increasing of a unit of labor in production is also intersting topic for the economics.

So from the above formula we get

$$c = \frac{\Delta K}{\Delta L}.$$

Here *c* stands for the technological level of the country. It shows the fund increase necessary for the increase of the labor in one unit. ΔK is an increase volume of the net investment, ΔL is increase of the number of the emplyed workers.

From this formula we obtain

$$K = \alpha + \beta\left(\frac{K}{L}\right).$$

Thus, the volume of investment funds in the country, which are necessary due to the increase in demand for labor, is defined by the union ratio of the main funds and labor. This ratio is even more unique parameter. Thus, this parameter indicates the net investment to the production, labor volume togehter with their productivity and technological level.

Table 1. The dynamics of the labor and main fonds in Turkey in the period of 1988-2014.

	K	L	K/L		
1988 [YR1	84,671,004,388.06	17,754,000.00	4769.123		
1989 [YR1	91,021,815,818.42	18,222,000.00	4995.161		
1990 [YR1	98,069,701,519.21	18,539,000.00	5289.913		
1991 [YR1	105,267,497,760.49	19,288,000.00	5457.668		
1992 [YR1	112,342,864,259.83	19,459,000.00	5773.311		
1993 [YR1	121,468,906,494.11	18,499,000.00	6566.242		
1994 [YR1	128,863,668,702.17	20,006,000.00	6441.251		
1995 [YR1	136,579,313,653.43	20,586,000.00	6634.573		
1996 [YR1	145,754,553,480.93	21,194,000.00	6877.161		

Note. The table is developed by the authors on the base of the materials of the State Statistical Committee of the Republic of Turkey and the World Bank.

Let's investigate the numbers in the above table by the simple regression method. In this study using the considered variables the continuity of the time seies has been controlled.

The table below shows the applicablity of the proposed model.

Table 2. The results of the regression investigations

Variable	K	S	Probablity
K/L	1.47	0.79	0.07
C	-0.02	0.03	0.59
R^2=0.12 Obtained R^2=0.08 F=3.45(0.07)		DW=1.92 X^2_{sc}=0.00001(0.99) X^2_{NET}=1.17 (0.27)	

As we see from this table the value R^2=0,12 shows the adequacy of the model. The statistics *F* is 3,45 with the probablity 0,07. Durbin-Watson statistics is equal to 1,92. All these show the adequacy of the model. Thus the capital-labor ratio is a principle indicator of the needed investments in the country. The 1% increament of this argument results 1,47% increament of the main funds in the county.

4. Conclusion

Thus, in spite of the optimal amount of investment in the country is determined by resouces defined by the level of technological development of the country and combined with these investments in a certain ratio, it mainly relates with the correct direction of these investments. As we see from this, the size of the country's investment factor, or rather the size of the required investment is defined by the volume of the labor factor and the union ratio of the production factors determined through the level of technology used in the economic sphere. In our opinion, here as a deternining factor of the labor force is the unemployed part of the economically active population.

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