THE STABILISING ROLE OF THE FISCAL AND BUDGETARY POLICIES WITHIN THE SIMPLIFIED KEYNESIAN MODEL

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Rezumat

Scopul lucrării este de a investiga politicile fiscale şi bugetare pe baza modelului keynesist simplificat. Acesta se axează pe dezechilibrul de la nivelul politicilor fiscale şi bugetare încercând să justifice raționalitatea deficitelor, respectiv: aspectul strategic pe plan politic de a lăsa o moştenire dificil de administrat, precum şi cel al conflictelor dintre partide ce pot influența alegerile bugetare ale guvernului. Prezentarea modelului are drept scop evidențierea rolului stabilizator al bugetelor publice în raport cu obiectivul utilizării depline a forței de muncă.

Abstract

The purpose of the paper is to investigate the fiscal and budgetary policies using the simplified Keynesian model. It focuses on the

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imbalance in the fiscal and budgetary policies trying to justify the rationality of the deficits: the political strategic aspect to leave a hard-to-administrate legacy, and the inter-party conflict, which may influence the budgetary decisions of the government. The purpose of the presentation is to show the stabilizing role of the public budget in relation with the full employment goal.

1. Introduction

The fiscal-budgetary policy is the result of the budgetary decision of the state to economic and social purposes. This involves, on the one hand, the mobilization of revenues and, on the other hand, the public expenditure. Until the mid 1930's, the economic theory focused more on the allocation of resources than on the regulation of the circumstances through the public finances. Keynes distanced of the neoclassical and liberal analyses focusing on unemployment, its causes and the remedies available to the public authorities. The Keynesian approach rejected the hypothesis of price flexibility in the market economy, currency neutrality, market economy optimality and the theorems of welfare redistribution before the exchange. He also didn't disqualify the public financial imbalances.

The Keynesian analysis was improved in time by new models, one of the outstanding ones being the model of Bernanke and Blinder (1988) which explains how the monetary and fiscal-budgetary policies must be coordinated in order to alleviate unemployment in a market economy.

The studies conducted by economists have shown that the economic cycles might amplify the budget deficits or may worsen the crises if the state would want to observe the constraint of budget equilibrium. Furthermore, the public expenditure might increase much faster than the economic activity because of the lasting exogenous shocks (war), as Wagner (1911) and Peacock and Weiseman (1967) have shown. Therefore, the authors recommend, like Myrdall (1933), to have cyclic budgets relying on the automatic stabilizers, thus the

theory of the fiscal relaxation. The insufficient observation of these approaches led Keynes to formulate its thesis on the deficit by expenditure, between 1950-1975, supporting a fine tuning of the economic activity with the purpose to attenuate of remove the economic cycles.

The purpose of the paper is to investigate the fiscal and budgetary policies on the basis of the simplified Keynesian model. It focuses on the imbalance in the fiscal and budgetary policies trying to justify the rationality of the deficits, on the political strategic aspect of leaving behind a hard-to-administrate legacy and on the inter-party conflicts which can influence the budgetary decisions of the government. The purpose of the presentation is to show the stabilizing role of the public budget in relation with the full employment goal. The paper consists of four sections. Section two shows the general framework of the model, while section three focuses on the role of the fiscal and budgetary multipliers. Section four presents the conclusions.

2. Presentation of the model –general framework

The Keynesian model is extremely well-known due to its clear representation which considers either the global offer and the global demand, or the equality of saving and investments.

Eventually, as Keynes warned on a lasting imbalance in the case of the unemployment, we would better analyse, using the multipliers, the ways to adjust an economy characterized by the underuse of the production factors. Two working hypotheses have been considered: i) the economic imbalance is not a product of the automatic mechanisms of the decentralised markets, rather the result of several functions of behaviour or of the anticipations playing a central role; ii) the balance thus obtained doesn't ensure the full utilization of the workforce. The model takes into account the actual demand represented by the global revenue (Y) which the entrepreneurs hope to obtain from the current volume of the workforce which they want to employ. This principle of the actual demand imposes that the production of enterprises is function of the maximal global demand anticipated by the enterprises, on the one hand, and of the technical constraints due to resources rarity, on the other hand. Say's principle was, therefore, reversed because the anticipated demand is the one

which creates the offer of goods, which determines the workforce volume:

$$Q^{D,a} = \overline{Q}^{S} \qquad N = N(Q^{S}, K) \;\; \text{cu} \;\; \frac{\partial N}{\partial Q^{S}} \succ 0 \qquad (1.)$$

(1.)

If the anticipated demand (global offer) is fully absorbed on the market due to the expenditure of the economic agents (purchase of consumption goods and investments), then $N = N^*$, meaning that the workforce is fully employed. However, different from the classical model, there may be a difference between the offer of goods, based on the anticipative demand, and the global market demand, if the level of the workforce is set at the minimum amount of workforce offered and demanded, more precisely, at the part of workforce demand at the rate of the current wage. The imbalance between the anticipated demand and the global demand affect, thus the workforce market. Determining this reverse relation of causality, Keynes doesn't take into consideration any more the autonomy of the neoclassical workforce market. Supposing a closed economy, the model can be described as follows:

4) The demand of workforce depends on the level of the anticipated demand. The enterprises employ a number of workers technically necessary to produce the production set by the anticipated demand;

5) The production allows the remuneration of the production factors. The income obtained from the current and sold production, and from the amount owned at the beginning of the period can be found totally or not, in the purchases of goods and services for consumption and investments. They depend on the behaviour of saving and investment because the function of consumption is the most stable in the Keynesian system;

6) If the incomes are not fully re-injected the need of investments will not be covered by the volume of the current savings and, thus, there will be unemployment because $S > I$. This relies on the following hypotheses:

- The prices are rigid on the short-term because of the nominal wage, a cost element, therefore a price element too. The adjustments are done through amounts;

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- The balance is studied at this stage of the analysis only starting from the market of goods and services;
- On the workforce market, the nominal wage, like other prices, is considered to be rigid on the short-term ($w = \varpi$). The whole workforce offer wants to be employed at the current wage ϖ and the employees are "victims" of the monetary illusion;
- The investments are considered exogenous or as constant part of the national income. This hypothesis is obvious in the full model where the investments depend on the interest rate.

The *simplified model* can be presented in global terms or starting from the equality between economies and investments. Let *Y* be the global product so that $Y = PQ^S$, where *P* – is the price vector; *C* – is the private consumption; *I* – represents the private investments; *S* – represents the private savings. The sum *C+I* represents the global demand; the equality between the global offer and the global demand is achieved if:

$$Y = C + I = C + S \tag{2.}$$

Suppose *C* and *I* are behaviour functions stable in relation with the incomes. *C* can be considered as a linear function of income:

$$C = c(Y) \text{ with } \frac{\partial C}{\partial Y} \succ 0 \quad \frac{\partial^2 C}{\partial Y^2} \prec 0 \tag{3.}$$

or $C = cY + C_0$ with

$$\begin{cases} \dfrac{\partial C}{\partial Y} = c = cst \\ \\ \dfrac{\partial^2 C}{\partial Y^2} = 0 \end{cases} \tag{3'.}$$

where *c* is the marginal inclination towards consumption and C_0 is the level of the autonomous consumption. On the short-term, the marginal inclination towards consumption is given by $\dfrac{C}{Y}$.

The investments are either an exogenous variable, $I = \bar{I}$ (4.),

or a linear function of income $I = \alpha Y + I_0$ (5.),

or an increasing function of income, $I = I(Y)$ (6.),

$$\frac{\partial I}{\partial Y} \succ 0 , \quad \frac{\partial^2 I}{\partial Y^2} \prec 0 .$$

For a short period of time, *P* is a variable because the processes are rigid. Because the workforce cannot be fully used, the prices are stable. Thus, inflation appears.

The full utilization is when the income of balance (Y_e) is equal with the income of the full employment ($Y_{L_{PE}}$). The relation between the income and prices allows the graphical representation of the idea of inflationist barrier.

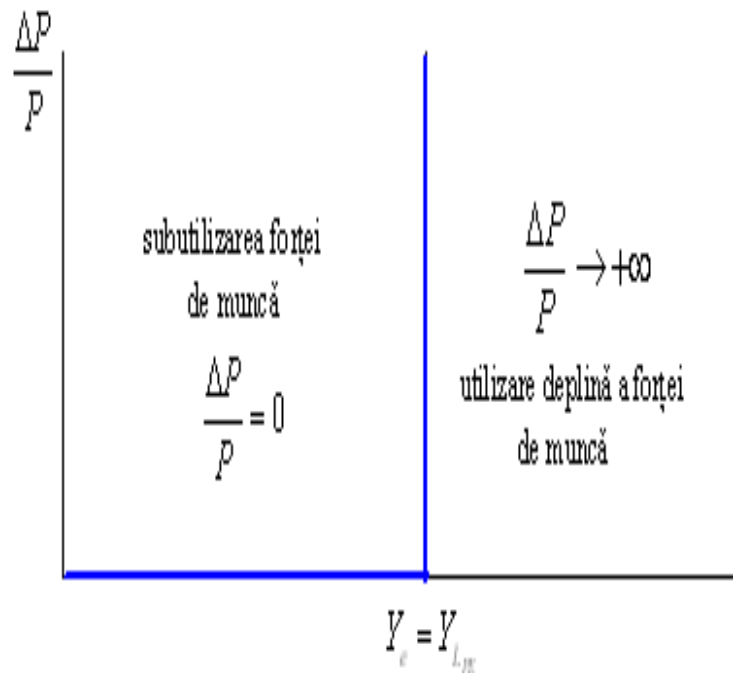The equality between the global offer and the global demand leads to:

4. An inflationist gap if the balance income is higher than the full employment income;

5. A full employment if the balance income is equal with the full employment income;

6. A deflationist gap if the balance income is lower than the full employment income.

These conjunctural situations correspond to the difference of level between saving and investments:

d) An inflationist gap when the investments are higher than the saving;

e) A full employment when the saving is equal with the investments;

f) A deflationist gap employment when the saving is higher than the investments.

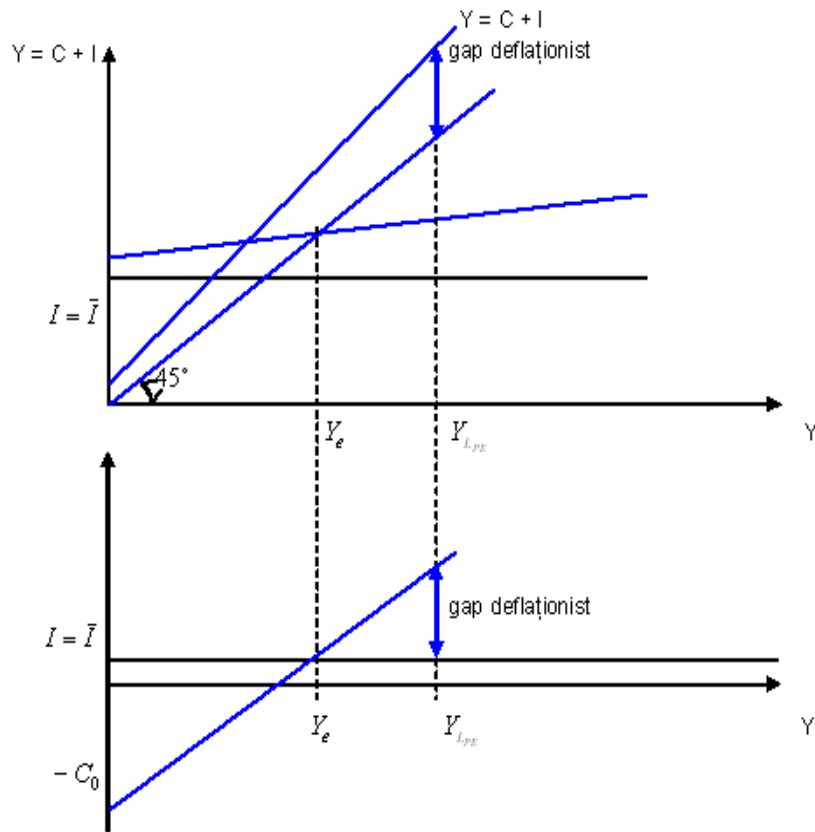Figure no.1
Situation of the underemployment/full employment

subutilizarea forţei
de muncă

$$\frac{\Delta P}{P} = 0$$

$$\frac{\Delta P}{P} \rightarrow +\infty$$

utilizare deplină a forţei
de muncă

$$Y_e = Y_{L_{pE}}$$

Source: Semedo Gervasio, Économie des Finances Publiques, Ellipses Édition Marketing S.A., Paris, 2001, p. 221.

These different situations of the global offer in relation with the global demand, coupled with the relative positions of the functions of saving and investment, can be represented graphically supposing that the investments are exogenous variables, saving being a linear income function ($S = sY + S_0 = sY - C_0$), s showing the marginal inclination towards saving while the consumption being a linear and stable function of the income. We have therefore considered the inflationist situation, with full employment, and the deflationist situation.
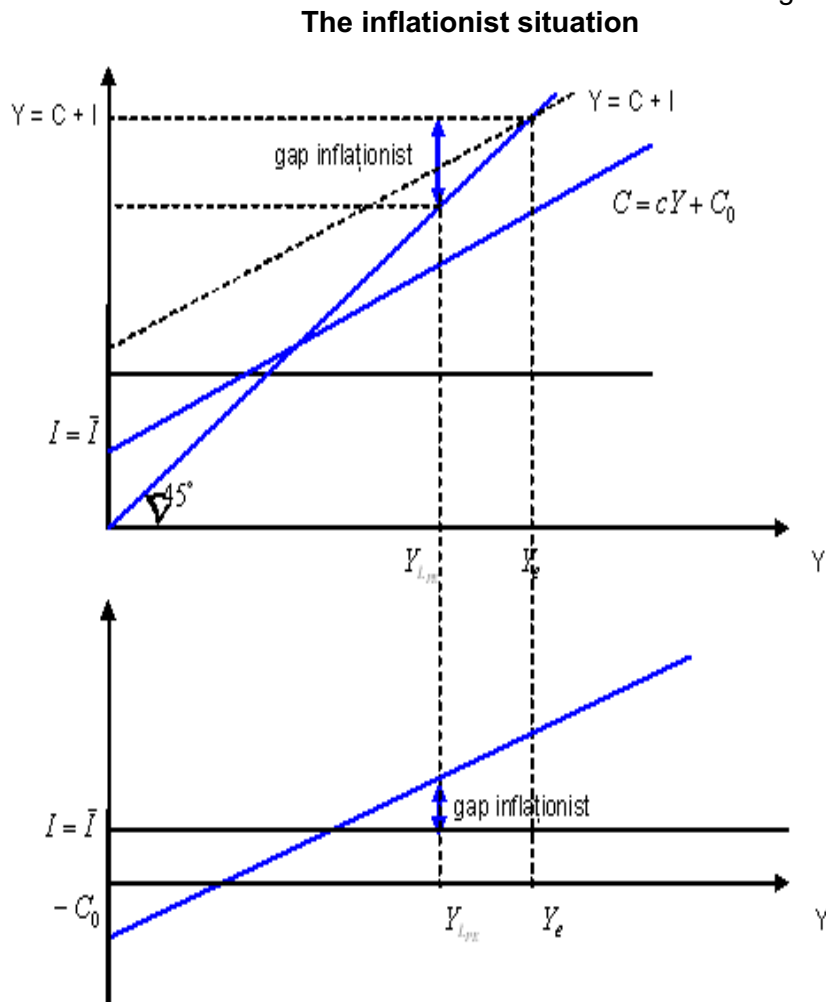
Figure no.2

The deflationist situation

Source: Semedo Gervasio, Économie des Finances Publiques, Ellipses Édition Marketing S.A., Paris, 2001, p. 222
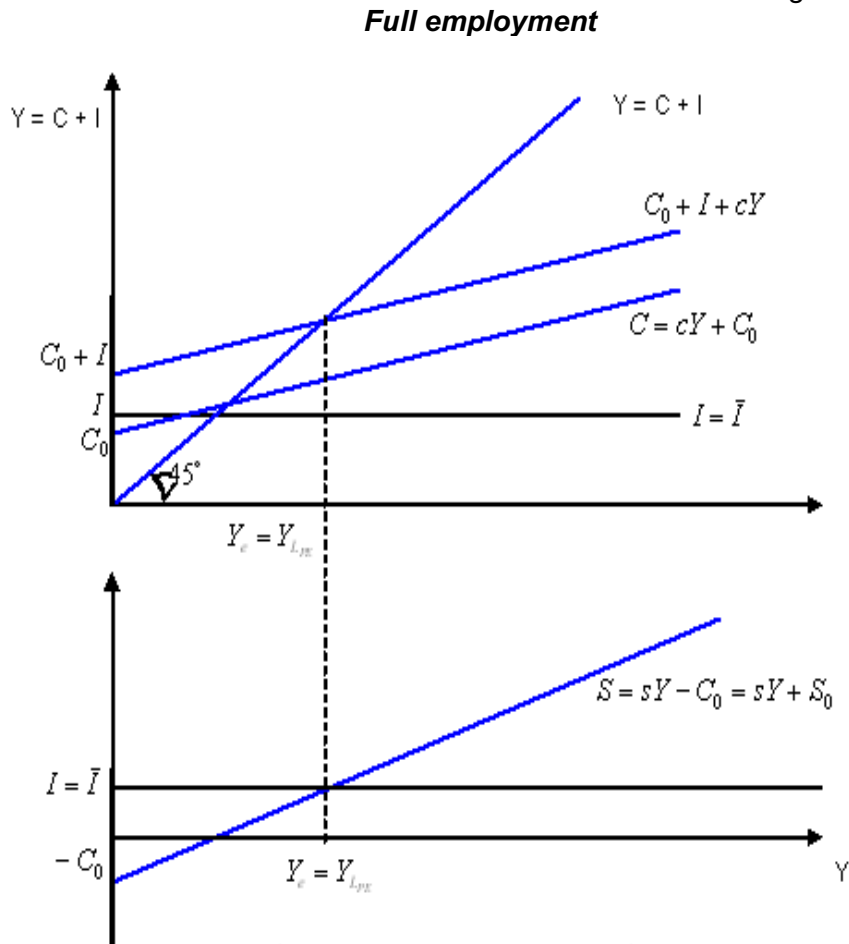
Figure no.3

The inflationist situation

Figure no.4

Full employment

Source: Semedo Gervasio, Économie des Finances Publiques,
Ellipses Édition Marketing S.A., Paris, 2001, p. 22

3. Fiscal and budgetary multipliers

The principle of the multiplier is a manner of economic adjustment in the case of the underutilization of the production factors. The type of adjustment differs from the neoclassical adjustment, price variation.

In our case, of the underutilization, and taking into account the hypothesis of the inflationist barrier, the adjustment is done exclusively through the amounts, the level of production (or activity) and workforce. The activity is influenced by the internal or external demand.

We assume an economy with no state intervention, in which the variation of the level of activity is given by investments, which may converge towards a stable balance.

Let the balance of underutilization ($Y = pQ^S$) be equal with *C + I*:

$$C = cY + C_0$$
$$Y = cY + C_0 + I$$

(7.)

The optimism of the entrepreneurs leads to higher investments, therefore to higher incomes. Indirectly, the consumption increases and the balance equation becomes:

$$Y + \Delta Y = C + \Delta C + I + \Delta I$$

(8.)

$$Y + \Delta Y = Y + \Delta C + \Delta I$$

$$\Delta Y = c\Delta Y + \Delta I$$

$$\Delta Y = \frac{1}{1 - c}\Delta I$$

The *investment multiplier* (*k*) is the ratio of the increase of the income to the increase of investments: $k = \dfrac{\Delta Y}{\Delta I} = \dfrac{1}{1 - c}$.   (10.)

The variation of the level of activity can also be induced spontaneously by consumption and by the functional distribution of the income.

By hypothesis, the inclination towards the consumption of wages (c_ϖ) is higher than the inclination of the capital holders c_k, because the income not distributed to the households is saved by the enterprises. We also assume that the income is entirely distributed to the production factors:

$$Y = W + R_k = \text{\textit{workforce} + \textit{capital incomes}}$$ (11.)

Taking into account two social groups, the consumption function becomes:

$$C = c_{\varpi}W + c_k R_k$$

$$C = c_{\varpi}(Y - R_k) + c_k R_k$$

$$C = c_{\varpi}Y + (c_k - c_{\varpi})R_k \tag{12.}$$

$$C = (c_{\varpi} + (c_k - c_{\varpi})\frac{R_k}{Y})Y$$

However, because by hypothesis the marginal inclination towards consumption of the income from wage is higher than the marginal inclination towards consumption of the profit ($c_{\varpi} \succ c_k$) we reach, through the function of consumption, to the fact that the marginal inclination towards consumption is a decreasing function of the profits. On the short-term one can see that:

- Income distribution between wage and profit plays an important role in determining the global demand (if the increase of $\frac{R_k}{Y}$ signifies a reduction of the global consumption);
- An income policy favourable to wages is necessary in order to influence the demand, but the Keynesians didn't stipulate the direct increase of wages.

On the contrary, on the long-term (in the theory of growth), the achievement of a sustained growth is subordinated to a higher level of saving, which seems paradoxical.

The aggregation of *C* and *I* into a single block of autonomous expenditure leads us to the *expenditure multiplier* if $I = \alpha Y + I_0$:

$$\frac{\Delta Y}{\Delta A} = \frac{1}{1 - c - \alpha} = \frac{1}{1 - (c + \alpha)}$$

(14.)

The multiplier increases with the increase of the propensity to spend ($c + \alpha$). If ($c + \alpha$) is very close to the unit, then $\frac{\Delta Y}{\Delta A} \to +\infty$, and the economic balance is unstable.

If the state intervenes, the fiscal-budgetary policy determines the variation of the rate of activity.

We consider the following *model of a closed economy* with constant prices, in order to reveal a Keynesian point of view regarding the efficacy of the fiscal-budgetary policy

$$Y = C + I + G$$
(15.)

$$Y - T = C + I + G - T = Y_d$$
(16.)

$$C = c(Y - T) + C_0$$
(17.)

$$I = \bar{I}$$
(18.)

where Y_d - available income.

We assume that *T* doesn't change, $T = \bar{T}$. By definition, the public financial imbalance (budget deficit) increases, and $\Delta Y = \Delta C + \Delta I + \Delta G$. If $\Delta I = 0$ then:

$$\Rightarrow \Delta Y = c(\Delta Y - \Delta T) + \Delta C_0 + \Delta G$$

$$\Delta Y = c\Delta Y + \Delta G \qquad \Delta G \succ 0$$

$$\Rightarrow \frac{\Delta Y}{\Delta G} = \frac{1}{1-c}$$

The increase of the public expenditure increases the income more than proportionally ($\frac{1}{s} \succ 1$; $0 \prec c \prec 1$). This increase of the revenue is similar with the increase produced by the equivalent increase of the private investments. The multiplier we obtained, the *multiplier of the budget expenditures*, has the same value as the investments multiplier.

We can calculate the *fiscal multiplier* in the same way. It acts in opposite direction with the budgetary multiplier, because if the taxes increase, the income decreases. For the expenditure that doesn't change, the fiscal multiplier expresses the increase of the income because the collection by the state of the taxes and dues decreased while the expenditure didn't change, but the budget deficit varies.

We know that:

$$Y = C + I + G$$

$$Y = c(Y - T) + I + G + C_0 \qquad (20.)$$

$$Y = cY - cT + I + G + C_0$$

$$Y(1 - c) = -cT + I + G + C_0$$

$$Y = \frac{1}{1 - c}(C_0 - cT + I + G)$$

$$\Delta Y = \frac{1}{1 - c}(\Delta C_0 - c\Delta T + \Delta I + \Delta G)$$

$$\frac{\Delta Y}{\Delta T} = \frac{-c}{1 - c} \qquad (21.)$$

where $\Delta T \prec 0 \Rightarrow \Delta Y \succ 0$

In the case of the *lumpsum taxes*, the variation of the production level is in opposite direction with the change in the collection by the state of the taxes and dues when the expenditure is constant. A higher rate of collection would decrease both the production and the incomes.

The expression of the fiscal multiplier is lower, as absolute value, than the expression of the budget multiplier: $\left| \frac{\Delta Y}{\Delta T} \right| = \frac{c}{1 - c} \prec \frac{1}{1 - c} = \frac{\Delta Y}{\Delta G}$ because $c \prec 1$. This shows that it is much more efficiently to increase the public expenditure than to decrease the axes, because the additional public expenditure translate into a higher private demand, while the decrease of taxes and dues increases the available income which doesn't fully translate into demand if the economic agents prefer to save.

The same kind of analysis can be used when comparing the effects of budget rebalancing by decreasing the public expenditure or by increasing the dues and taxes. It is better to act on the public expenditure and to take loans instead of increasing the taxes in order to supplement the resources, thus to decrease the public financial imbalance.

The *balanced budget multiplier* expresses the influence exerted on the level of production by the equal or simultaneous increase of the state expenditure and revenues.

We know that:

$$Y = \frac{1}{1-c}(C_0 - cT + I + G)$$

$$\Delta Y = \frac{1}{1-c}(\Delta C_0 - c\Delta T + \Delta I + \Delta G)$$

$$\Delta Y = \frac{1}{1-c}(-c\Delta T + \Delta G) \tag{22.}$$

for
$$\Delta T = \Delta G$$

$$\Delta Y = \frac{1}{1-c}(-c\Delta G + \Delta G)$$

$$\Delta y = \frac{1}{1-c}\Delta G - \frac{c}{1-c}\Delta G$$

$$\Delta Y = \Delta G\left(\frac{1-c}{1-c}\right) = \Delta G \tag{23}$$

The increase of the budget balance leads thus to a higher rate of activity which is equal with the increase of the public expenditure. The multiplier is equal, in this case, with the unit. This is a limit case which proves, in Keynesian vision, that the budget balance doesn't signify the neutrality of state intervention; the balance and stability of the budget have real effects influencing the production by the equivalent modification of the taxes. The interpretation of the budget as an instrument of the economic policies is documented by the budgetary multiplier.

We assume that the tax is a linear function of the income:

$$T = tY + T_0; \quad 0<t<1 \tag{24.}$$

where t – average direct taxation rate; T_0 - autonomous tax.

$$Y = C + I + G$$

$$C = c(Y - T) + C_0$$

$$Y = c(Y - (tY + T_0)) + I + G + C_0$$

$$Y = cY - ctY - cT_0 + I + G + C_0$$

$$Y = cY(1 - t) - cT_0 + I + G + C_0$$

$$Y(1 - c(1 - t)) = I + G + C_0 - cT_0$$

$$Y = \frac{1}{1 - c(1 - t)} \left[I + G + C_0 - cT_0 \right] \qquad (25.)$$

From this last equation we obtain the expenditure multiplier: $\frac{\Delta Y}{\Delta G} = \frac{1}{1 - c(1 - t)}$ (25'). It allows us to see that the expenditure multiplier, in the case of a *proportional tax*, is less significant than in the case of the lumpsum tax. Thus, for $t \prec 1$ we obtain $\frac{1}{1 - c(1 - t)} \prec \frac{1}{1 - c}$. This decrease of the expenditure multiplier is generated by the direct tax but the convergence of the economy towards full employment is less brutal.

In the case of this mechanism, we assume implicitly that the increase f the public expenditure will increase the revenue, which allows increasing the taxes and decreasing the deficit:

$$\Delta G \Rightarrow \Delta Y \Rightarrow \Delta T \Rightarrow \Delta G \Rightarrow$$

$$t_1 \qquad t_1 \qquad t_2$$

Because $\overset{t_2}{T} = tY + T_0$ then:

$$\Delta T = t \Delta Y$$

$$\Delta T = t \frac{1}{1 - c(1 - t)} \Delta G = \frac{t}{1 - c(1 - t)} \Delta G$$

This result can be interpreted as follows:

- Any action aiming to boost the budget is partially affected by the increase of tax. In other words, the budget deficit compensates the expenditure by additional revenues;

- If we want to have a variation of the revenue we need to increase the public expenditure more than they would be increased by the budgetary multiplier.

We also consider the transfers T^a) which decrease with the increase of the income, which implies that they dampen the increase of investments and of the revenues because the propensity towards consumption decreases.

$$Y = C + I + G$$

$$I = \bar{I}$$

Because $G = \overline{G}$

$$T = tY + T_0$$

$$T^a = -t^a Y + T_0^a$$

then $C = c(Y - tY - T_0 + T_0^a - t^a Y) + C_0$ (26.)

The equilibrium equation
$Y = c(Y - tY - T_0 + T_0^a - t^a Y) + C_0 + I + G$ allows calculating the change of the income for the variation of *G*:

$$\Delta Y = c\Delta Y - ct\Delta Y - ct^a \Delta Y + \Delta G$$

$$\Delta Y(1 - c + ct + ct^a) = \Delta G$$

$$\Delta Y = \frac{1}{1 - c(1 - t - t^a)} \Delta G \qquad (27.)$$

The value of the multiplier is thus, reduced, which is explained by the decrease of the transfers – thus, of the available income – when the global revenue increases. The presence of transfers introduces an element of automatic stabilization which adds to the presence of the direct tax.

In an *open economy*, the analysis of the multiplier doesn't take into consideration, directly, the subsidies for export and the customs taxes. The customs taxes and the fiscal burdens act indirectly on the level of imports (*M*) and exports (*X*). For simplification, the exports are considered autonomous in relation with the revenue, and the imports are assumed to vary with the revenue. The global balance is given by the following equation:

$$Y = C + I + G + X - M \tag{28.}$$

$$Y = c(Y - T) + I + G + X - M + C_0$$

With $M = mY + M_0$ and $X = \overline{X}$ $\quad$ (29.)

If we consider an autonomous variation of the exports, ΔX, while the imports, investments and public expenditure doesn't change, then:

$$\Delta Y = c\Delta Y + \Delta X - m\Delta Y$$

$$\Rightarrow \Delta Y = \frac{1}{1 - c + m} \Delta X = \frac{1}{s + m} \Delta X \tag{30.}$$

In conclusion, the exports stimulate production and the workforce. The revenues are either consumed or saved but the foreign enterprise use part of the consumption in the form of the imports. Only that part of the consumption intended for the domestic products generates, in turn, the increase of production and additional revenue, which is divided between consumption, household saving and imports. If s and m have low values then the multiplying effect is stronger. The Keynesian doctrine also takes into account the categories of imports and the import functions in the analysis of the budgetary and fiscal multiplier: $M = m_c C + m_i I + m_g G + M_0$ where

m_j - the propensity for consumption, investments and spending ($j = c, i, g$).

If $C = c(Y - T) + C_0$

$I = \overline{I}$

$G = \overline{G}$

The *expenditure multiplier* is then: $\dfrac{\Delta Y}{\Delta G} = \dfrac{1 - m_g}{1 - c(1 - m_c)}$ (31.), and

the tax multiplier is: $\dfrac{\Delta Y}{\Delta T} = \dfrac{-c(1 - m_c)}{1 - c(1 - m_c)}$ (32.).

The introduction of the foreign trade decreased the multipliers due to the imports.

4. Conclusions

The fiscal-budgetary policy is the result of the budget decision which the state takes for economic and social purposes. This calls for the mobilization of the revenues and for public expenditure.

Keynes distances from the neoclassical and liberal analysis focusing on unemployment, its causes and the remedies that the public authorities can use. The Keynesian approach rejects price flexibility in the market economy, currency neutrality, market economy optimality and the theories of welfare redistribution before the exchange. It also doesn't disqualify the public financial imbalances.

The Keynesian analysis was improved in time by new models which explain how the monetary and fiscal-budgetary policies have to be coordinated in order to alleviate unemployment in the market economy.

The simplified Keynesian model aims to show the stabilising role of the public budgets in relation with the objective of full employment. The model shows that i) the multipliers loose efficacy when direct taxation, transfers and foreign trade are used; ii) one of the conditions of the budgetary policy efficacy is the possibility to change the locations of the budget, that is to say, to have room for manoeuvres; iii) the use of the budget always implies recurrent obligations for the state and delay problems.

Acknowledgement

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