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# POSITIVE EFFECTS OF FISCAL EXPANSIONS ON GROWTH AND DEBT

by Rosaria Rita Canale\*

## Abstract

The aim of this paper is to point out the shortcomings of propositions that deny economic policy any active role and propose a simple model by which public expenditure is still recognised as performing an active and positive function. The core of our thesis is that public deficit, because it actually has positive effects on the rate of growth, does not automatically increase public debt but rather reduces it. These positive effects are greater if the Central Bank's monetary policy rule does not change. The policy authority has no reason to change its behaviour since there is no strict relation between fiscal expansions and inflation. The smaller the economic weight of the country considered in terms of the whole Monetary Union, the weaker is the link. These conclusions suggest we should rethink the limits imposed by the Stability and Growth Pact to the action of governments and subordinate the possibility of spending to the inflationary effects of deficit on the whole Union. JEL classification: E62, E52.

## 1. Introduction

The creation of the European Monetary Union has deeply changed how economic policy is managed. The main idea is that monetary policies can be efficient only if there are rigid rules in single state interventions. The result is a subordination of fiscal policies to the *wider* objective of the stability of the Euro. This stability, according to the mainstream, is the necessary condition for long-run convergence towards the natural unemployment rate.

However the existence of regional divergences in growth rates has dramatically shown the trade-off – at least in the short run - between the reduction in public expenditure and the interventions required to sustain development. Mainstream economists assert that there is a single strategy to reach both goals: the free operating of market forces which, in the long run, lead to steady growth, regional convergence and sound public budgets.

The theoretical underpinnings of this conclusion can be generally referred to limits of discretionary policies and to the phenomenon of time inconsistency<sup>1</sup> both in the field of monetary and fiscal policy. In fact – following the rational expectation hypothesis – “only unanticipated

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<sup>1</sup>Kydland and Prescott (1977)

money matters”<sup>2</sup> and therefore the Central Bank is denied any active role. Moreover, in the field of fiscal policy Barro<sup>3</sup> demonstrated that public expenditure just creates expectations for greater future taxation and public debt. The intertemporal equilibrium between present and future consumption – the so-called Ricardian equivalence - tells us that there will be no increase in demand – if anything, a decrease – following the greater public deficit.

These analytical conclusions have been reinforced by studies underlining the immoral behaviour of politicians. Their rarely aim to serve the public interest, but often just to be re-elected: therefore they subordinate decisions on the optimal policy to the consensus mechanism<sup>4</sup>.

These theoretical results have been questioned and some economists have shown, also empirically, that monetary policy can be effective to reduce unemployment, without leading to higher inflation<sup>5</sup>. Other studies have reached no single conclusion on the working of Ricardian equivalence<sup>6</sup>. Therefore the question whether or not fiscal expansion increases growth is still open.

The aim of this paper is to point out the shortcomings of propositions that deny economic policy any active role and propose a simple model by which public expenditure - albeit aware of its limits - is still recognised as performing an active, positive function. The core of our thesis is that public deficit, because it actually has positive effects on the growth rate, does not automatically increase public debt but rather reduces it. These positive effects are greater if the Central Bank monetary policy rule does not change due to expected higher inflation.

These conclusions are even more valid if we consider how monetary union works: the main characteristic of an area with a single currency is a centralized monetary policy and a decentralized fiscal one. This means that the monetary policy authority behaves more or less separately from what happens in single countries. There is, therefore, no strict relation between fiscal expansions, inflation and monetary restrictions. The smaller the economic weight of the country considered in terms of the whole Monetary Union, the weaker is the link. Such conclusions force us to rethink the limits imposed by the Stability and Growth Pact to the action of governments and subordinate the possibility of spending to the inflationary effects in the whole Union of deficit spending.

The paper is organized as follows: section two contains critiques of positions refuting any role for active fiscal policies; section three contains our model, whose starting point is the acceptance of a positive relation between deficit and growth; section four derives some conclusions.

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<sup>2</sup> Lucas (1972), Sargent and Wallace (1975)

<sup>3</sup> Barro (1974)

<sup>4</sup> Buchanan and Tullock (1962).

<sup>5</sup> Clarida R. Gali J. Gertler M.(1999).

<sup>6</sup> Bernheim (1987), Seater (1993), Becker (1997) and Gruen (1991) offer a review of the subject.

## 2. Does deficit spending increase growth?

As briefly presented in the previous section, the ineffectiveness of economic policy in changing the value of equilibrium income has been widely maintained in the economic literature: the intervention of fiscal authorities through deficit spending increases debt and inflation without affecting growth. The main culprit is the effect of fiscal expansion on interest rates.

This conclusion is based on three main pillars:

- 1) The crowding-out effect
- 2) The inflationary effect
- 3) The non-Keynesian effects of Keynesian policies, so-called Ricardian equivalence.

As regards these effects on the macroeconomic equilibrium, the mainstream literature starts from a full employment equilibrium and concludes that monetary and fiscal policies only affect prices. Therefore the first general limit to be noted is that what has still to be proved is assumed as a hypothesis<sup>7</sup>. Indeed, if we remove the hypothesis that the starting point is the full employment equilibrium, the effects of policy intervention listed above become very weak and uncertain.

Let us examine them one by one.

### 1) *The crowding-out effect*

In a monetary union, the single states lose their control on monetary policy and are forced to finance public deficits through the emission of public debt. To convince the public to buy these bonds it is necessary to raise interest rates. The increase in interest rates crowds out private investment, and causes a reduction in the equilibrium income. The final result is a total or partial offsetting of the effects of the increase in public expenditure.

The central point on which this argument is based is that the supply of money is exogenous and always manageable by the Central Bank. Many economists<sup>8</sup> consider this hypothesis too strong<sup>9</sup>. On the contrary, the supply of money is considered to be largely dependent on the demand for it. The issuing institute can just indirectly control it, by increasing or decreasing the cost of refinancing, i.e. shifting the interest rate.

In a world in which credit finances most economic activity, banks have many instruments for increasing or decreasing the supply of finance in order to satisfy the demand of their clients. The

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<sup>7</sup>Arestis and Sawyer (2003).

<sup>8</sup> Keynesian, new Keynesian and New Classical but not Monetarist economists. See Kaldor (1982), but also Romer (2000). Romer considers the usual IS-LM framework unable to explain the modern working of monetary policy rules.

<sup>9</sup> See Kaldor (1982) in which he refers that New Classical Economists consider as well as Keynesians consider the interest rate as the variable the Central Bank controls to influence the supply of money. Obviously the implications on prices, output and employment for the two schools of thought are very different.

consequence of this circumstance is that the banking system – if the other conditions remain unchanged - generates internally additional resources to finance the level of activity.

The same occurs when government increases the deficit: the public, if the level of activity increases, has the power to increase the means of payments too, without automatically affecting interest rates. A change in the latter thus depends on the action of the Central Bank, desiring to influence money in circulation.

Moreover, in a Monetary Union, consisting of many countries with different economic weights, deficit spending in only one country does not necessarily trigger a reaction of the monetary authority due to the absence of effects on inflation in the whole area. Hence, fiscal expansion financed through bond emission does not automatically crowd out private investments since it does not automatically influence interest rates. To affect the latter, two conditions must be met: fiscal expansion must have inflationary effects on the whole Monetary Union and the Central Bank must raise interest rates.

These conclusions lead into the second point:

2) *the inflationary effects* of public expenditure.

Public expenditure is said to cause inflation because of its effect on aggregate internal consumption and absorption. Indeed, the injection of additional resources in the system causes an increase in private demand for both domestic goods and foreign ones. By increasing the demand for domestic goods, public expenditure directly increases internal prices and increasing demand for foreign goods imports inflation and worsens the current account balance. If the exchange rate is flexible, the second effect disappears in the long run due to both the direct increase in foreign prices and the increase in the relative prices of currencies.

However, the first effect is of major importance and requires deeper reflection. In order to state that an increase in demand causes an increase in prices – even accepting the perfect flexibility of money values - we have to formulate some additional hypotheses: a) the supply curve has a positive slope or is vertical and if so b) the increase in public expenditure does not cause a shift in the supply curve as well.

According to some economists, the supply curve is neither positive sloped nor vertical but rather horizontal<sup>10</sup>: in the presence of unemployment, firms can employ the quantity of labour they want at the current wage. The average cost of production is therefore constant, as are the prices following the mark-up mechanism.

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<sup>10</sup> The form of the supply curve depends on the production function. The debate about the form of production function dates far back to economists like Joan Robinson (1953 and 1967) and, Kaldor (1965 and 1985). The post-Keynesian school of thought continues to investigate this subject and reject the form of production function with decreasing marginal returns as a general case. For an in-depth study of the subject see Harcourt (1972) and Lavoie (1992).

The supply curve - following these arguments - is therefore horizontal- at least until it approximates to the level of full employment - reducing the immediate effect of the increase in demand on prices. Under these circumstances, inflation derives from institutional mechanisms of bargaining in the labour market, where wages and prices compete to distribute income in the way labourers and firms prefer.

Although we completely agree with the theory that affirms the positive or vertical slope of the supply curve there is another possibility of not having inflationary effects from public expenditure: if the increase in spending is addressed to increasing firm productivity and/or reducing production costs, or in general to a structural change in the economic system, the supply curve moves rightward together with the demand. The potential inflationary effects could, in this way, become null.

Finally if the deficit spending occurs in a single country belonging to a monetary union, the increase in demand causes inflation if it is able to influence the average rate of inflation, leading to a Central Bank reaction with the aim of price stability.

### 3) *Ricardian equivalence*

Robert Barro, revisiting Ricardian conclusions about the intertemporal equilibrium between income and expenditure, and much of the more recent literature<sup>11</sup> have postulated that public expenditure in the present causes expectation of greater taxation, higher interest rates and greater public debt. These expected effects reduce current consumption, offsetting the increase in income generated by the increase in autonomous demand. In other words, in order to avoid the future decrease in consumption caused by a very probable increase in taxation and interest rates, consumers and firms save more and reduce their expenditure in the present<sup>12</sup>. In the light of such argumentation, public intervention would be useless and devoid of any stabilising role.

Despite the extensive empirical literature on the subject, an unambiguous conclusion has not yet been found. Indeed, there are many shortcomings to be considered in this intertemporal equilibrium. The first is that life in a long-term horizon is uncertain and people may be influenced in their expenditure decision by the desire to satisfy an immediate need or *pleasure*. Secondly, due to life's uncertainties they might decide not to behave altruistically and shift onto future generations the burden of a greater present public debt. Thirdly, public debt could have wealth effects, thereby offsetting the expected reduction in disposable income.

Finally – in conditions of underemployment, when it is not possible to choose whether or not to work and therefore whether or not to increase consumption - the present expenditure could cause an

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<sup>11</sup> Bernheim (1987), Seater (1993) Becker (1997), Gruen (1991), Giavazzi and Pagano (1996)

<sup>12</sup> This phenomenon, also known as “non-Keynesian effects of Keynesian policies”, has been applied in the reverse mode: a reduction in public expenditure causes for the same reasons an increase in consumption (Gavazzi and Pagano, 1996).

increase in equilibrium income and thus an increase in tax flow without the need to increase the share of fiscal incomes as well.

### 3. A model relating deficit, growth, and debt reduction

Our model takes account of the shortcomings of the economic literature on the subject of discretionary fiscal policies and seeks to propose a new standpoint according to which – under certain circumstances - a positive role is assigned to public intervention.

The starting point is – as shown above – the recognition of a direct relation between deficit and growth. Here is the usual equation representing the equilibrium in the goods market at time t:

$$Y_t = C_t + I_t + G_t - T_t$$

$$C_t = c_0 + c_1 Y_{t-1}$$

$$T_t = \bar{T}$$

$$I_t = I_0 - br$$

According to these simple equations the consumption function  $C_t$  has an autonomous part  $c_0$  and depends on the income of the preceding year  $Y_{t-1}$ . Taxes in the current year  $T_t$  are, for the sake of simplicity, considered autonomous. Investments consist of an autonomous part ( $I_0$ ) and a negative part related to the rate of interest  $r$  following parameter  $b$ .

Substituting each component of aggregate demand in the initial equilibrium equation we have:

$$Y_t = c_0 + c_1 Y_{t-1} + I_0 - br + G_t - T_t$$

Dividing both sides of the equation by  $Y_t$  and indicating  $c_0$  and  $I_0$  with  $A_t$  we have:

$$\frac{Y_t}{Y_t} = c_1 \frac{Y_{t-1}}{Y_t} + \frac{A_t}{Y_t} - b \frac{r}{Y_t} + \frac{Dt}{Y_t}$$

due to the fact that  $Y_{t-1}/Y_t = 1/(1+g)$  where  $g$  is the income rate of growth. Solving for  $r$  we can finally write a dynamic equilibrium in the goods market:

$$(I) \quad r = \frac{1}{b_y} \left[ c_1 \frac{1}{1+g} - 1 + a_t + d_t \right]$$

or in terms of  $g$

$$(I') \quad g = \frac{c_1}{b_y r - d_t - a_t + 1} - 1$$

where, of course,  $d_t$  is the deficit/income ratio and  $a_t$  is  $A_t$  related to GDP.

Equations (I) and (I') indicate as usual that the growth rate of income is related to the interest rate and that the public deficit influences  $r$  and  $g$ .

The second step is to examine the functioning of the money market in order to detect how policy authority can influence the rate of interest and the quantity of money. On the side of monetary demand we have the usual relation :

$$\frac{M}{P} = kY - hr$$

where the real demand for money depends positively on current income and negatively on the rate of interest.

The same equation can be expressed in terms of rates of growth:

$$m - \pi = kg - hr$$

On the supply side, we share the prevailing conviction that the Central Bank – and this is the strategy of the European Central Bank – in order to control inflation rates through the intermediate target of monetary aggregates, shifts the rate of interest.

This conclusion derives from the circumstance that money in circulation depends largely on the demand for it. Indeed, operators can easily offset any manoeuvre trying to reduce or expand the supply of bank notes by using credit instruments and in general substitutes of money<sup>13</sup>.

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<sup>13</sup> The same supply of high-powered money can generate, through the multiplier, different quantities of means of payment, according to the availability of banks and public to demand money. Therefore, according to this point of view, the supply of money is infinitely elastic to the rate of interest.

Thus the monetary policy authority will shift the cost of money, if it wants to leave the volume of payment means unchanged, each time variables influencing demand shift too. If for example, income or prices grow, the demand for money grows as well and the Central Bank, in order to leave the quantity of money in circulation unchanged, has to increase interest rates. This conclusion is included in the famous monetary policy rule known as Taylor's rule. Here it is in a very simple form:

$$r^* = a_1 g + a_2 \pi$$

$$\frac{\partial r}{\partial g} = a_1 > 0; \frac{\partial r}{\partial \pi} = a_2 > 0$$

where  $a_1$  and  $a_2$  represent the weight the Central Bank assigns to growth and inflation respectively<sup>14</sup>.

In one small country belonging to a monetary union the rate of interest can be considered as an exogenous value as the country has no power of influencing the average values of the whole area. Therefore we can write more simply:

$$r = r^*$$

as a monetary policy rule for a single marginal country, deriving from the Taylor rule.

Substituting the value of interest rate in the demand for money we have:

$$(II) \quad r^* = \frac{k}{h} g - \frac{1}{h} m + \frac{1}{h} \pi$$

$$(II') \quad m = kg - hr^* + \pi$$

Because  $r$  assumes a constant value from equation (II), we conclude that once the monetary policy rule has been fixed, an increase (decrease) in  $g$  has to be accompanied by an increase (decrease) in the quantity of money or a decrease (increase) in inflation.

Substituting the money market equilibrium in the goods market equilibrium, recalling that  $p_t = (1+\pi) p_{t-1}$ , and solving for  $d_t$ , we have a deficit/GDP ratio which depends on both the goods market equilibrium and money market equilibrium.

$$(III) \quad d_t = 1 - c_1 \frac{1}{1+g} - a_t + b_y \frac{1}{h} \left( k - m_t \frac{1}{1+\pi} \frac{1}{p_{t-1}} \right)$$

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<sup>14</sup> For this version of the Taylor rule see Bofinger (2003).

Equation (III) indicates that the deficit  $d_t$  generates, other things being equal, the income rate of growth  $g$  and that there is a positive relation between the two. Moreover the deficit/GDP ratio is positively influenced by inflation: if it rises, interest rates rise as well to offset the endogenous creation of money and reduce investments. There is therefore the need to have a higher deficit to realize the same income growth; it depends negatively on the tax share - because of the direct effect on public balance - marginal propensity to consume and the other autonomous components of demand - because of the direct effect on income growth.[Please double check the syntax of this sentence]

The third step is to reproduce the equation describing the vinculum of public sector.

$$B_t = (1 + r)B_{t-1} + D_t - \Delta M_t$$

This equation states that the public sector deficit can be financed through debt and through monetary expansions. Hence the current debt  $B_t$  is equal to the debt received from the past  $B_{t-1}$ , plus interest on it  $rB_{t-1}$ , plus the primary deficit  $D_t$  minus the variation in the quantity of money.

Dividing all by  $Y_t$ , with  $m_t$  indicating the variation in money on GDP at time  $t$  and recalling again that  $Y_{t-1}/Y_t = 1/(1 + g)$ , we have the usual equation describing the dynamic of the debt/GDP ratio ( $b_t$ ) through time.

$$(IV) \quad b_t = \frac{(1 + r)}{(1 + g)} b_{t-1} + d_t - m_t$$

This equation – which is a finite differences equation - states that, in order to repay the debt, the rate of growth has to be greater than the rate of interest, regardless of the level of deficit and the level of money growth. As previously stated, this is a simple accounting relation which does not explain what determines the rate of growth  $g$ , what determines  $r$ , what relation there is between the two and what influence – if any -  $d_t$  has on the rate of income growth and rate of interest.

The opinion expressed in this paper is that a greater deficit can influence growth and make the debt repayable. This conclusion holds if the Central bank does not change its monetary policy rule and raise the interest rate when there is a fiscal expansion. In turn – following the European policy rules - this happens whenever fiscal expansions in just one country do not give rise to inflationary phenomena. Below the level of full employment the increase in demand is not automatically accompanied by an increase in prices, especially if it occurs in a country whose

economic weight is low and therefore unable to influence the average values of the monetary union area. In this case fiscal expansion will be accompanied by money creation that will give further support to the positive effects of the deficit spending.

To better understand what happens according to this model, we can now combine equations (I') (II') and (III) and (IV) of our model and describe how it works:

$$(I') \quad g = \frac{c_1}{b_y r - d_t - a_t + 1} - 1$$

$$(II') \quad m = kg - hr^* + \pi$$

$$(III) \quad d_t = 1 - c_1 \frac{1}{1+g} - a_t + b_y \frac{1}{h} \left( k - m_t \frac{1}{1+\pi} \frac{1}{p_{t-1}} \right)$$

$$(IV) \quad b_t = \frac{(1+r)}{(1+g)} b_{t-1} + d_t - m_t$$

This model contains four equations and four unknown variables. Once the rate of interest fixed, the rate of growth results from equation (I'), g and r determine endogenously money growth (II'), and g, r and m determine the equilibrium value of the deficit (III). Finally debt at time t is the result of all the variables above (IV).

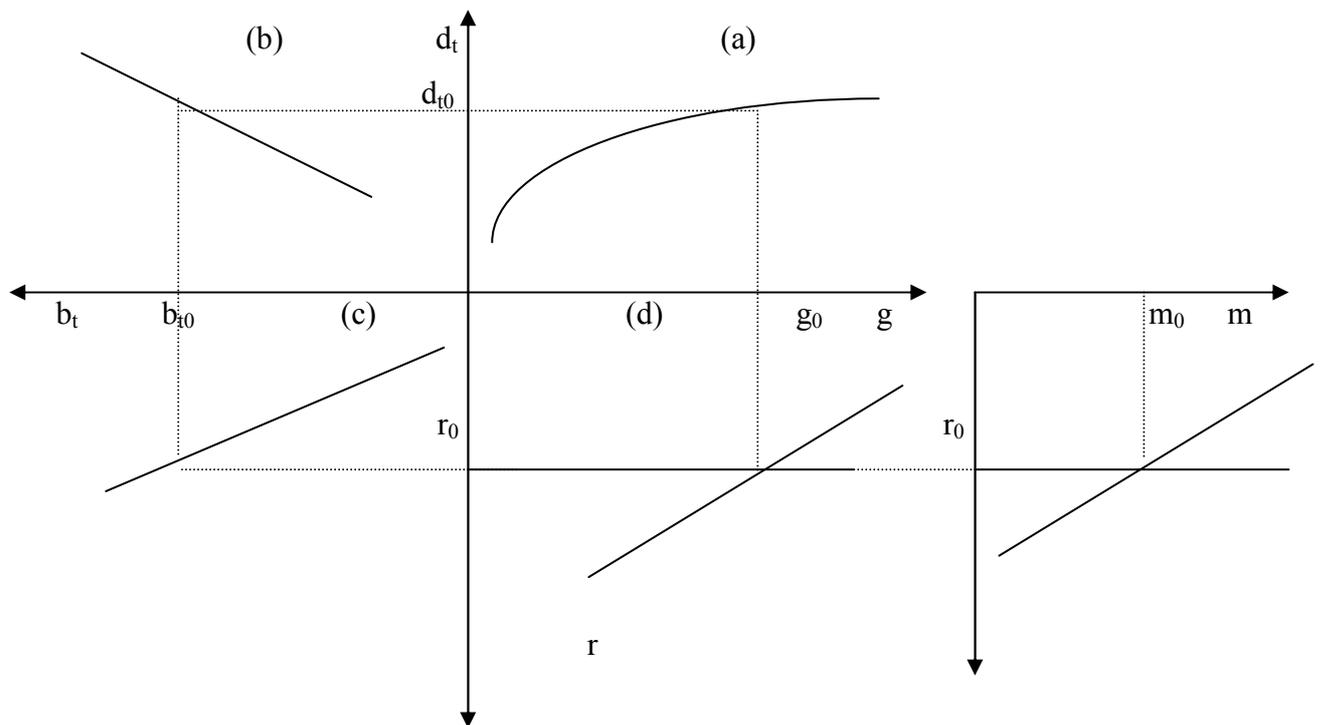


Figure 1

This situation is depicted in figure 1. Equation (III) is described in panel (a): public deficit influence the equilibrium growth rate positively. The curve shifts downward – i.e. a lower deficit is required to realize the same growth rate - whenever part of the autonomous demand  $a_t$  and the money growth  $m_t$  increase. An increase in the propensity to consume  $c_1$  causes a reduction in the slope. The curve shifts upward whenever there is an increase in the sensitivity of investment to the rate of interest, the inflation rate and the proportion between transactive and speculative demand for money.

In panels (b) and (c) curves represent the relation between debt and deficit and debt and rate of interest respectively. Both lines are described by equation (IV). Panel (d) describes the usual goods market equilibrium in a dynamic form (I) as a result of the monetary policy rule ( $r = r^*$ ) described in panel (e).

The ability to pay back the public debt – it has been stated - depends on the relation between the rate of growth and rate of interest. We therefore have to describe how the deficit increase can influence the relation between these two and consequently the level of debt.

Let us examine what happens graphically. Suppose, as in the first case, that deficit increase causes no inflationary phenomena and hence no restriction on interest rates of the Central Bank (figure 2).

Suppose that public expenditure increases without a corresponding increase in taxes. Under the assumption that – other things being equal - deficit increases growth, the curve representing the goods market equilibrium moves rightward. If the Central Bank does not shift interest rates because there is no inflationary phenomenon, which is most likely for the initial hypothesis of underemployment, the money market endogenously creates a new quantity of money (panel (e)). In panel (a) the new values of deficit and growth are shown. To the initial movement along the curve, a downward movement of the curve has been added, partly due to the increase in the means of payment. Because the rate of interest has remained constant, public spending has been financed with an increase in the means of payment created by private operators and the effect on equilibrium income has been increased.

The line representing the relation between deficit and public debt shifts upward both due to the increase in growth and the increase in the quantity of money (panel b). The new deficit level,  $d_{t+1}$ , now corresponds to a lower debt level,  $b_{t+1}$ .

Finally in panel (c) the same interest rate  $r_0$  is correlated with this new and lower level of debt. This occurs because the line now has a lower slope (increase in  $g$ ) and a higher intercept (increase in  $m$ ).

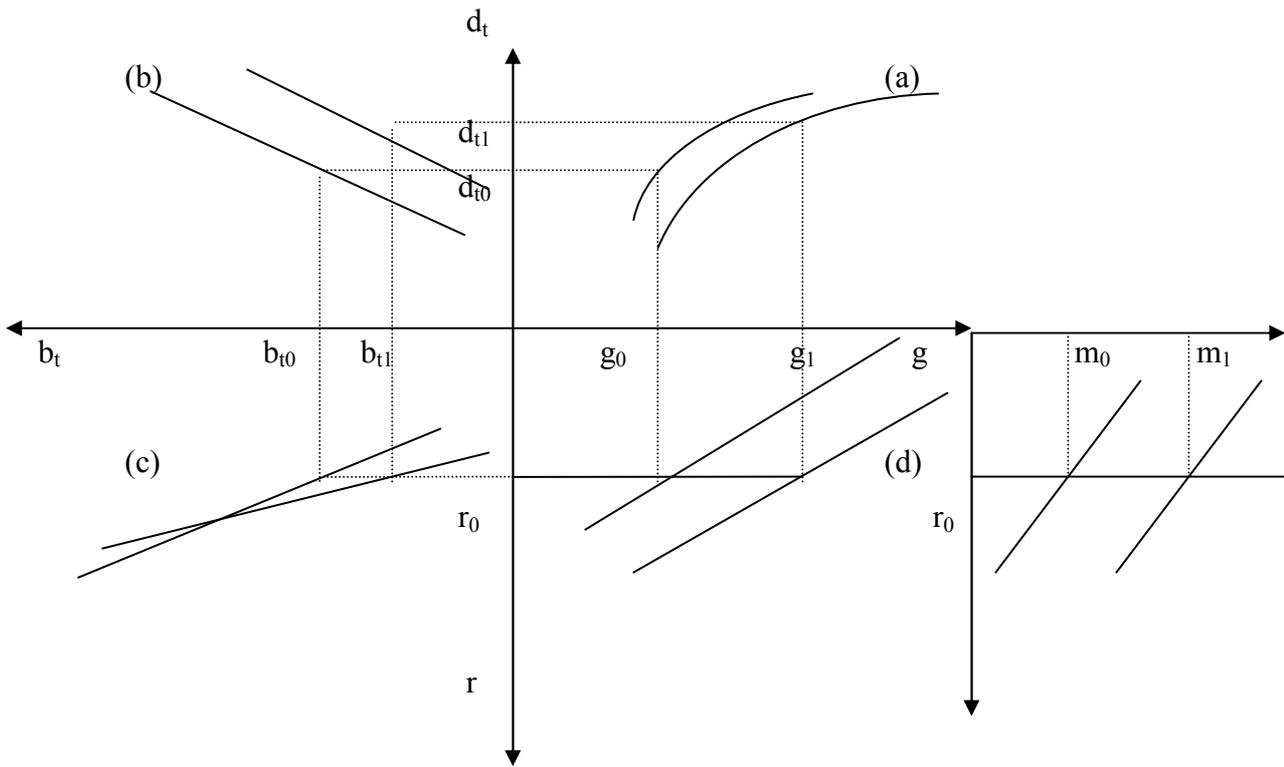


Figure 2

The second case is that of the increase in deficit associated with a rise in interest rates due to the new restrictive monetary policy rule. (figure 3).

The increase in public spending induces an increase in demand for money. In order to avoid the increase in means of payments, the monetary policy authority increases the rate of interest. To grasp this point better, suppose that the increase in interest rates is greater than the increase in growth and such as to offset the increase in payment means. In panel (d) the curve representing the equilibrium in the goods market moves to the right, and the interest rate moves upward in order to leave  $m$  constant (panel (e)). Equilibrium growth increases as a consequence of the greater autonomous demand (panel a). Debt has increased and, due to the higher interest rate, this increase is more than proportional to the deficit increase. This circumstance is shown in panel (b) with a downward shift of the curve representing the relation between  $d_t$  and  $b_t$ . In panel (c) the curve now has a lower slope and a higher intercept such that the higher debt corresponds to the higher interest rate.

In short, if the Central Bank increases interest rates, this limits the positive effects of deficit spending. Furthermore, if this increase exceeds that of the equilibrium income, the debt increases to ever greater levels. However, if the monetary policy authority increases  $r$  less than  $g$ , the money market creates money and helps to reduce public debt.

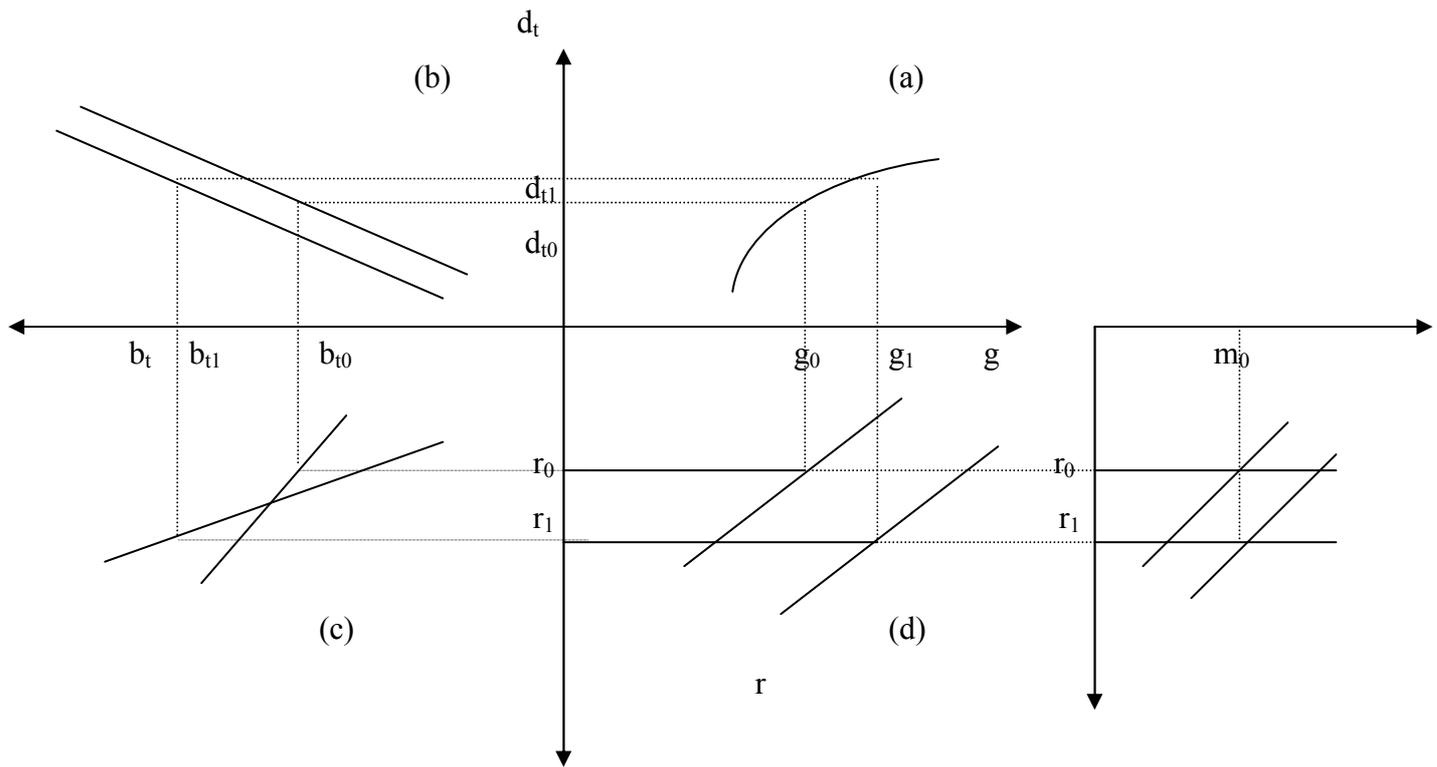


Figure 3

#### 4. Conclusions

The starting point of our paper was the critique of the idea that public spending increases interest rates, reduces private investments and present consumption and causes inflation. Looking at events from a different perspective, we concluded that deficit spending causes an increase in growth and helps to reduce debt.

Indeed, as shown above, an expansionary fiscal policy in a small country belonging to a monetary union does not influence average growth and inflation in the whole area, and the Central Bank has no reason to change its monetary policy rule and increase interest rates. Fiscal policy therefore has margins of action.

This result is based, not only on the direct relation between autonomous demand and equilibrium income, but also on the behaviour of the monetary policy authority. The asymmetrical effects of a centralized monetary policy could be either negative or positive. If therefore the expansionary fiscal policy in only one country has no inflationary effects in all the EMU countries there is no reason to increase the cost of money and offset the increase in demand. In this case the public and the banking system will create, through endogenous mechanisms, the means of payment required to finance growth and debt reduction. This – together with the missing convergence toward

full employment - leads us to rethink the fixed criteria on which EMU fiscal and monetary policies are based.

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