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**Fiscal Policy as a Stabilization Instrument**

**Giorgio Liotti**

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## CRISEI

### **Fiscal Policy as a Stabilization Instrument**

**Giorgio Liotti**

Dipartimento Aziendale ed Economico  
Università degli Studi di Napoli, Federico II

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Tel. (+39) 081 547 47 36

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## **Abstract**

This paper investigates the role of the fiscal authority in the case in which a negative shock hits the economic system. We analyze the several kinds of behavior that the fiscal authority can adopt during a crisis and show how the various approaches impact upon the effectiveness of fiscal policy. In general, there are two approaches: a) Adopt a neutral behavior or b) Adopt an active behavior in order to stabilize output volatility caused by a slump. Using a constrained minimization process it emerges that the mere use of a monetary policy is ineffective to counteract the crisis, with the risk of keeping the system in a situation in which aggregate demand falls below the potential output. In this context, an expansionary fiscal policy may be crucial to restore the output equilibrium.

Keywords: crisis, fiscal authority, monetary authority, budget deficit, sustainability

JEL CLASSIFICATION: E61, E63

## **1. Introduction**

In the last forty years, the active role of the fiscal authority regarding the stabilization of the output level has been largely neglected by modern economic theory (Arestis and De Antoni 2007). As a consequence, it has lost its fundamental role which it had attained during the Great Depression. Before the Great Depression, neutrality of public finance, as prescribed under the neoclassical approach, had dominated economic policy choices. At the outbreak of the crisis in 1929, the principle of neutrality was abandoned and governments started to intervene in the economy.

Public intervention in the national economy through the use of fiscal policy - subsequently rationalized by Keynesian theory - became a fundamental instrument both from an anti-cyclical perspective and to counteract mass unemployment in the case of a prolonged crisis; indeed, the aim was to bring the level of output close to full-employment income (Keynes 1936). Until the late 1960s, the "Keynesian system" was able to guarantee growth in stability conditions. Indeed, the developed countries experienced low rates of unemployment and low inflation. The fundamental instrument for bringing the economy close to full-employment income was the use of expansionary fiscal policies (Arestis 2011) which generated increases in aggregate demand when private investment was stagnant. In this context, with respect to the neoclassical view, the role of monetary policy was revisited, and finally considered subordinate to fiscal policy; in other words, monetary policy had to be accommodating towards fiscal policy. Thus the role of monetary policy was considered secondary to that of fiscal policy.

The first major criticism of Keynesian theory was leveled by Friedman (1968, 1977) and his followers. They rejected the possibility that a discretionary fiscal policy could be a useful instrument for stabilizing the economy. They stressed that, in the case of a negative shock, the stabilization objective should be entrusted to monetary policy, both because it can affect output levels and it can be implemented relatively quickly. In the 1970s, two economic crises caused by the oil shocks in 1974 and 1979 led to the rise of a new economic phenomenon called "stagflation". In order to counteract the high rate of unemployment in developed countries, governments adopted standard Keynesian policies. These policies did not produce reductions in unemployment rates but, on the contrary, they produced a major increase in inflation, a high public deficit and a growth in the debt-GDP ratio. In this context, fiscal policy was not seen as a stability factor, but as an instability factor for the economic system. This situation gave impetus to

others authors like Lucas (1976, 1977, 1980) and Sargent and Wallace (1975, 1976) who, albeit in different contexts, underlined the ineffectiveness of fiscal policy to stimulate output level, and stated that only an unforeseen shock was able to move the system away from its equilibrium. Moreover, also Real Business Cycle Theory (REBCT) lent a further contribution to eliminate any stabilization of the economy through the management of aggregate demand on the part of fiscal policy, stating that deviations from a trend are caused only by a random walk (Nelson and Plosser 1982) i.e. a technological shock.

The ineffectiveness of fiscal policy as a stabilization instrument was accepted inasmuch as many empirical works demonstrated that the fiscal multiplier was null or even negative (Hemming, Kell and Mahfouz 2002). Furthermore, it has recently been shown that deficit reductions can have a positive effect on growth (Alesina and Ardagna 2009). This policy has become a guideline for European governments. Many criticisms have been leveled against this view, the most important of which is that it does not distinguish the effect of deficit reduction between a normal and slump phase of the economic cycle (Jayadev and Konczal 2010).

The economic crisis in 2007 reopened the debate on the role and effectiveness of fiscal policy, especially because estimates about the value of the fiscal multiplier have been revisited (see, amongst others, Ramey 2011, De Long and Summers 2012, Blanchard and Leigh 2013, Auerbach and Gorodnichenko 2012), distinguished according to the particular phase of the economic cycle in question. Thus, since 2007, the idea has been reinforced— supported by many authors (including Arestis and Sawyer 2003, Allsopp and Vines 2005, Krugman 2005) - namely the need to review the role of fiscal policy in the case of recession.

This paper sets out to investigate the role of the fiscal authority when a negative shock hits economic system. I will analyze two types of behavior that the fiscal authority can adopt during a crisis, which correspond to two different considerations about the effectiveness of government intervention in national economies. Governments can decide to adopt a) a neutral behavior or b) an active behavior, in the sense that they can decide to stabilize the output volatility caused by a slump through expansionary fiscal policies.

The paper is organized as follows: in section 2 we present the model considering a loss function for fiscal authority in which both the inflation problem and the possible gap between output level at time  $t$  and its target are taken into account. We see that a negative shock has negative consequences on the value of the loss function and on the economic equilibrium. In section 3 we develop the reaction function of the fiscal authority and analyze two different behavior types to be adopted during a crisis, representing two different approaches concerning the effectiveness of fiscal policy. In 3.1 we assume that the monetary authority attempts to stabilize the economy, while the fiscal authority behaves passively. In section 3.2 it is shown that the fiscal authority plays a key role because the monetary authority alone is unable to restore the equilibrium. In section 4 we make some considerations about the sustainability of debt and public deficit and, finally, in section 5 we summarize our conclusions.

## 2. A stylized macro model

Suppose there exists a general loss function for the fiscal authority in which targets regarding output level and inflation are set. We consider a closed economy in which the system is demand-constrained. The loss function is expressed in the following way:

$$L_s = 1/2 (Y_t - Y^*)^2 + 1/2 (P_t)^2 \quad (1)$$

where  $Y_t$  is the output level at time  $t$ ,  $Y^*$  is the output target and  $P_t$  the increase in prices at time  $t$ .

The aggregate demand at time  $t$  is given by:

$$Y_{d,t} = Y^* - \alpha (r_t - r^*) + \beta (D_t - D^*) + \varepsilon \quad (2) \text{ where } t=1,2,\dots,n$$

In the aggregate demand, parameters  $\alpha$  and  $\beta$  represent “weights”, namely how monetary and fiscal instrument respectively affect the output level at time  $t$ . In addition,  $r_t$  and  $D_t$  represent, respectively, the interest rate chosen by the monetary authority and the level of primary budget deficit for spending on goods and services at time  $t$  chosen by the fiscal authority. In this work it is assumed that  $r_t$  is set exogenously by the monetary authority; in other words, given that our interest is to analyze the role of the fiscal authority, no particular function will be specified for the monetary authority. Moreover, it can be supposed that  $r^*$  represents the long-run interest rate set by the monetary authority, which allows the system to be maintained in a stable condition. Instead,  $D^*$  represents the primary budget deficit of the fiscal authority, which can be assumed to correspond to a balance between spending and revenue, that is  $D^*=0$  (even if this is not a fundamental condition). Furthermore, for simplicity, it is supposed that the increase in prices at time  $t$  is defined as follows:

$$\dot{P}_t = P_t - P^* \quad (3)$$

$$P_t = P^* + f(Y_t - Y^*) \quad (4)$$

$$\dot{P}_t = P_t - P^* = f(Y_t - Y^*) \quad (5)$$

The conditions concerning the inflation rate will depend only on the output level at time  $t$ . Hence we can have two possibilities:

- a) If  $Y_t \leq Y^*$  then  $P_t = P^*$  and  $\dot{P}_t = 0$
- b) If  $Y_t > Y^*$  then  $P_t > P^*$  and  $\dot{P}_t > 0$

The conditions assume that the economy is demand-constrained, and that firms have a certain productive capacity. Firms can increase the production level up to their maximum potential capacity without increases in costs. In section 3 below it is explained why prices are not flexible. Given that our objective is to analyze the possible behavior of the fiscal authority during a slump, we analyze only the first case of the two cases set out above, that is the only one in which there are no price increase. Thus, if  $r_t$  and  $D_t$  are equal to their target ( $r^*, D^*$ ), it may be seen that

$$\begin{aligned} Y_t &= Y^* + \varepsilon \\ \dot{Y}_t &= Y_t - Y^* = \varepsilon \\ Y_t &= Y^* \end{aligned} \quad (6)$$

The possible output gap results only from a shock. However, if  $\varepsilon=0$ , then we see that the output level at time  $t$  will be equal to its target. Hence, if the monetary and fiscal authorities do not aim to maximize the trade-off between inflation and output, we can see that the output gap is dependent only on exogenous shocks. In other words, the authorities have no incentive to set the inflation rate and output level above their targets. They prefer to opt for stability in each period, avoiding the possible trade-off between output-inflation and the time-inconsistency problem.

The task of the two authorities is to stabilize the output level at time  $t$  around  $Y^*$ , which means that, if we start from an equilibrium position in which no shock occurs, then  $\varepsilon=0$ . Hence the authorities will set  $r_t$  and  $D_t$  equal to their target values  $r^*$  and  $D^*$  such that  $Y_t=Y^*$  and  $P_t=P^*$ , which implies that both  $\dot{Y}_t$  and  $\dot{P}_t$  are equal to zero. Analyzing the loss function (1), we observe some characteristics:

1) The hypothesis is that the fiscal authority assigns the same weight both to the output level and inflation rate; this means that the fiscal authority is interested not only in stabilizing the output level but also in considering price stability.

2) The fiscal authority is interested in narrowing all the possible gaps that can lead to instability in the system. It is tantamount to saying that the objective for the fiscal authority is to have a certain “stability”, in the sense that, in each period, both the objectives set in the loss function must be achieved. This means that, in each period, the fiscal authority prefers to have  $Y_t=Y^*$  and  $P_t=P^*$ , which means that the value of the fiscal loss function in each time  $t$  will have to be zero ( $L_t=0$ ); any value of the loss function

other than zero is considered “bad”. Substituting (2) in (1) and deriving for  $D_t$ , it may be seen that the level of deficit at time  $t$  is fixed by the fiscal authority as follows:

$$D_t = D^* + \alpha/\beta (r_t - r^*) - (1/\beta)\epsilon \quad (7)$$

where we may suppose that  $D_t$  is the level of primary deficit at time  $t$ ; we see that it depends on the interest rate and the negative shock. It is the general reaction function of fiscal authorities and can be decomposed according to:

- 1) possible occurrence of shocks;
- 2) different behaviors that the fiscal authority may adopt, in terms of divergent approaches of economic theory regarding the effectiveness of government intervention in the national economy. In a normal phase of the economic cycle, when  $\epsilon=0$ , the level of primary deficit depends only on the interest rate.

Equation (8) below:

$$D_t = D^* + \alpha/\beta(r_t - r^*) \quad (8)$$

represents the set of combinations of  $r$  and  $D$  on the reaction function of the fiscal authority, which leads the economy to its equilibrium, in the case in which no shock occurs. The slope will depend on the specific values of parameters  $\alpha$  and  $\beta$ . The values may change according to the particular phase of the economic cycle. If, for any reason, the interest rate at time  $t$  were higher than  $r^*$  (even if - for considerations made previously - in a normal phase of the economic cycle, the interest rate at time  $t$  should be equal to the long-run target), it would cause a reduction in investment. In this case, the fiscal authority should increase the deficit to offset the reduction in investment and keep the system in equilibrium (figure 1). It may be noted that the slope of the reaction function depends on the values of  $\alpha$  and  $\beta$ , which depend, in turn, on the specific phase of the economic cycle.

### 3. Fiscal policy strategies under negative shocks

Suppose that the economic system is in equilibrium: this means that all the above conditions are respected. When a negative shock hits the economy, two major consequences occur: 1) Given that  $\epsilon$  is negative, the output level at time  $t$  will be lower than its target  $Y_t < Y^*$ , and this will generate a rise in the unemployment rate, 2) At the same time, assuming a) an asymmetric Phillips curve (Tobin 1972) and b) the existence of rigidities in the labor and goods market (Fisher 1977, Akerlof and Yellen 1985, Mankiw 1985), we can consider that both wages and prices are rigid downward. In this case, prices at time  $t$  are equal to the expected prices. This is because prices are not perfectly flexible. In this context, the market mechanisms needed to restore the full employment equilibrium through flexibility of wages and prices do not work.

Therefore, given that the output level is lower than  $Y^*$ , prices at time  $t$  are still equal to  $P^*$  ( $P_t = P^*$ ). This implies that, in this specific case, the loss function at time  $t$  is modified, eliminating the inflation problem from the fiscal loss function. Hence the only objective that remains in the fiscal loss function is to determine how to restore the equilibrium of full employment, leading  $Y_t$  back to its target  $Y^*$ . It is important to point out that the fiscal loss function is modified only for period  $t$ , that is, at the time in which the crisis hits the economy. In other periods, if the economy is not hit by a negative shock, (1) still applies. Accordingly, the loss function for the fiscal authority at time  $t$  can be modified in the following way:

$$L_{s,t} = 1/2 (Y_t - Y^*)^2 \quad (9)$$

In this context, the fiscal loss function considers only the gap between  $Y_t$  and  $Y^*$ . It may thus be seen that, for the fiscal authority, it is fundamental that the level of output returns to its target, eliminating negative social costs arising from the crisis. However, there are two strategies which the fiscal authority can implement during a crisis: one is to delegate to the monetary authority the possibility of stabilizing the

output gap, giving the fiscal authority a passive role; or the fiscal authority can intervene directly in the national economy through purchasing goods and services, its role changing from passive to active.

As was stated above, given that the monetary authority is independent, it chooses the level of interest rate in each period, while the choice regarding the spending level on goods is a task of the fiscal authority. Given a negative shock, we can analyze the different role of the fiscal authority according to whether the neoclassical or Keynesian approach is adopted.

### **3.1 Passive role of the fiscal authority**

In this context, when a negative shock occurs, the output level at time  $t$  will be lower than target  $Y^*$ . In this situation, the two authorities should act to stabilize the economy through appropriate interventions. There is a large literature which assumes that the task of stabilizing the economy has to be delegated to the monetary authority inasmuch as, by lowering the interest rate, it can stimulate private investment and guarantee economy recovery. On the other hand, according to criticism of the effectiveness of fiscal policy, the only task that the fiscal authority should perform is to maintain the balance of public finance since it cannot modify the output level. We can call it, with some simplicity, the neoclassical approach. Hence an expansionary fiscal policy cannot modify the output level for at least two reasons: 1) Because Ricardian equivalence (Barro 1974) - to which we will return in section 4 - works and, 2) Because - before 2007 - a large literature had underlined the ineffectiveness of fiscal policy as a stabilizer of the economy. Indeed, it assumed that the value of fiscal multipliers was very low and, in some cases, negative (Hemming, Kell and Mahfouz 2002)).

According to this view, we suppose that management of the negative shock is entirely delegated to the monetary authority, while the fiscal authority adopts a passive behavior. This means that the reaction function of the fiscal authority is (8), i.e. one in which, even if a negative shock occurs, it is not taken into consideration. This equation takes into account only the movement of interest rates. In this context, the fiscal authority adopts a "passive" behavior, in the sense that it follows reductions in the primary deficit as a response to lowering the interest rate. This means that each interest rate reduction must be accompanied by a reduction in primary deficit. Suppose that the monetary authority responds by lowering the interest rate. If the fiscal authority does not consider it necessary intervening, then, it refers again to the equation (8); in this way, at each reduction of interest rate corresponds a reduction of level of spending. In other words the role of stabilization of output is delegated to the monetary authority. This means that, if the monetary authority acts by lowering the interest rate, according to equation (8), the fiscal authority must reduce the level of spending according to the principle of austerity.

The problem is that, in a recession phase, this policy is unlikely to lead the system into equilibrium: each positive effect due by a lowering of the interest rate would be offset by a reduction in fiscal spending. Furthermore, if we followed the setting in equation (8), we would forgo a fundamental instrument for stabilization. Indeed, especially in a recession phase, estimates of the value of fiscal multipliers are higher than those in a "normal" phase of the economic cycle. Therefore, when coping with a negative shock, the use of monetary policy alone may not be able to produce the desired effects: private investment by firms, in a slump, are little affected by a reduction in the interest rate but, rather, depend on expected future profits and ultimately on the possibility of selling their own products. This is an important assumption of Keynesian theory. It implies that, if expectations of entrepreneurs do not improve, continued reductions in the interest rate are likely to have modest effects on investment. Moreover, in this model, the positive effects generated by lowering the interest rate are offset by a restrictive fiscal policy, and this results in the

system staying in a permanent situation in which aggregate demand lies below the potential output. The reaction function of the fiscal authority determined by equation (8) holds when no shock hits the economy. Substituting equation (8) in (2), we still have the situation in which output at time  $t$  is lower than the target.

In this context, we must analyze the role of fiscal policy and how it can be used as an economic stabilizer (Krugman 2012, 2013), Arestis 2011, Arestis and Sawyer 2004, Gauti B. Eggertsson and Krugman 2010). Given the difficult counteracting the crisis (mostly in Europe) following the neoclassical approach, it has been underlined that the sole use of monetary policy does not allow to bring the economy back to its previous equilibrium. The economic crisis in 2007 has reopened the debate of effectiveness of fiscal policy, and estimates of the value of fiscal multipliers have been revisited, distinguishing the particular phase of the economic cycle in question. In this context, only an increase in public spending, via directly purchasing goods, can improve expectations of entrepreneurs, increasing aggregate demand, restore the equilibrium and boost growth. It may thus be seen that fiscal policy is able to affect the output level, and that fiscal intervention under certain circumstances is also sustainable.

### 3.2 Active role of the fiscal authority

As regards the alternative approach, now that we have seen that monetary policy alone cannot tackle the slump, we can obtain the response of the fiscal authority in the event of a negative shock. Rewriting equation (7), we can analyze the active role that the fiscal authority can play when a crisis occurs. Given the modified fiscal loss function derived in the recession phase, the reaction function of the fiscal authority is:

$$D_t = D^* + \alpha/\beta (r_t - r^*) - (1/\beta)\epsilon \quad (7)$$

As we have seen, a negative shock ( $\epsilon < 0$ ) will result in a shift of aggregate demand, and hence the level of output at time  $t$  will be lower than  $Y^*$ . We now take equation (7) into account, where the fiscal authority's reaction function depends both on the negative shock and the interest rate chosen by the monetary authority. If the monetary authority lowers the interest rate to zero, then the reaction function of the fiscal authority must allow, on the one hand, for reductions to the spending due to reductions in the interest rate, and on the other, it must increase the spending level due to the size of the negative shock. The effect on deficit will not be null because the increase in spending to tackle the shock will exceed the reduction resulting from lowering the interest rate to tackle the crisis. This is due to the hypothesis that in a time of crisis,  $0 < \alpha < 1, \beta > 1$ , and  $\alpha/\beta < 1/\beta$ . Indeed, the upward shift in the intercept will cause the deficit, even if the interest rate is zero, to be greater than zero, but lower than what it would be if the interest rate were non-zero (figure 2). We see that in this case, an expansionist fiscal policy can be set to counteract the negative shock. As regards the reaction function, the level of deficit spending required to restore the equilibrium depends on:

1. the value of the fiscal multiplier in a recession and
2. the size of the negative shock.

The value of the fiscal multiplier is of great importance to allow the fiscal authority to choose the spending level needed to restore the equilibrium, given the size of the shock and the interest rate set to zero. Instead, the greater the value of  $\beta$ , the lower will be the increase in public spending required to restore the equilibrium.

As regards the effects of fiscal policy, recent estimates of the fiscal multiplier show that its value varies greatly depending on the phase of the economic cycle concerned. In a "normal phase" the value of the fiscal multiplier is lower than that in a recession phase. In a normal phase, the fiscal multiplier is



generally estimated to be lower than 1, while in a recession phase it lies between 1 and 2.5 (Ramey 2011, De Long and Summers 2012, Blanchard and Leigh 2013, Auerbach and Gorodnichenko 2012).

This means that the role of fiscal policy cannot be only to keep the budget in equilibrium, but it would be important to frame its action in the context of the particular phase of the economic cycle. In other words, we need to adopt "functional finance" in which, in a recession, a primary budget deficit is important to allow the equilibrium to be restored, while in an "expansion" phase, it is advisable to achieve the balance or a surplus in the budget. There are some objections about the effectiveness of fiscal policy (see Arestits and Sawyer 2010), including "crowding-out" and "Ricardian equivalence".

As regards crowding-out, in the context of endogenous money, the Central Bank cannot control the supply money directly, although it can control only the interest rate. This means that crowding-out caused by an increase in the interest rate is not an automatic mechanism, but it stems from a precise choice of the monetary authority.

According to the Ricardian equivalence effect, any deficit/surplus of the public budget has no effect on the output level, because rational agents consider that each deficit/surplus will cause an increase/reduction in future taxation, leaving the overall level of demand unchanged. However, Ricardian equivalence has been strongly criticized for several reasons (for details see Arestis and Sawyer 2010) including: 1) people do not live forever, and they do not care about future taxation when they are dead; 2) Ricardian equivalence works when the economy experiences full-employment conditions; 3) future taxes and income are uncertain. Thus, in this view, Ricardian equivalence does not work, and hence an expansive fiscal policy, in the case of the "functional finance", has an effect on output level. This means that the anti-cyclical role of fiscal policy is restored.

#### **4. Sustainability of deficit and public debt**

The other fundamental task in defining the size of the primary deficit required to bring the economy to its original equilibrium is to analyze the behavior of the monetary authority when faced with an expansionary monetary policy. For our purposes, it is not necessary to know how the monetary authority chooses to set the interest rate, but it is important to analyze how different behaviors adopted by the monetary authority can affect the size of the budget deficit.

We saw, in the previous section, that the "crowding-out" effect depends on an autonomous decision of the monetary authority to raise the interest rate, and that this effect is not an automatic mechanism but a precise choice of the monetary authority. Of course, monetary policy could be influenced by other priorities, as well as by its structure or by its degree of independence of the government. For example, a monetary authority with a high degree of independence or totally independent of the government (like the ECB) might consider that a fiscal policy could lead to future inflationary pressures. Accordingly, if the monetary authority considers price stability a primary objective, it will attempt to hinder any expansionary fiscal policy. This approach could be right in a boom phase, but in a recession phase it is not a sound strategy. Furthermore, it is also very hard to believe that a fiscal policy can be used in the case of strong economic growth. In this case, the monetary authority could respond to an expansionary fiscal policy with a restrictive monetary policy (raising the interest rate). This would mean that, given that the reaction function of the fiscal policy is the set of combinations between the levels of interest rate and spending that lead the economy to equilibrium, at each increase in the interest rate the fiscal authority should increase the level of public spending and, consequently, also the level of deficit required (assuming that the government finances the increase in public spending by deficit) to lead the economy to its equilibrium.

Thus the behavior of the monetary authority is of great importance not only to restore the equilibrium in the event of a negative shock but especially to determine future tasks of the fiscal authority.

If the fiscal authority responds to a negative shock with an expansionary fiscal policy to stabilize the economy and eliminates negative social costs ( $L_s=0$ ), then it will be forced to consider the costs which this policy entails regarding future debt repayments, especially if the monetary authority does not behave accommodatingly. If the monetary authority behaves otherwise and responds to the fiscal policy by continuously raising the interest rate, there could be a dynamic mechanism which could lead the fiscal authority to abandon the stabilization objective of the economy if it becomes too expensive. If the monetary authority adopts accommodating behavior, it should not raise the interest rate. In this way the cost for the fiscal authority to restore the equilibrium would be sustainable. This situation can be seen from figure (2), where the fiscal policy reaction function has a positive slope with respect to the interest rate level.

The most important argument against the use of an expansionary fiscal policy which should negatively affect the debt/GDP ratio concerns non-sustainability of the public debt in the long run (Reinhardt and Rogoff 2010). The idea is that, if the debt/GDP ratio is too high (above 90%), then growth is weak and in the long run the debt is non-sustainable. Recent studies on this issue have failed to confirm this hypothesis, and hence the real problem is not the sustainability of debt per se, but the level of interest rate and growth rates of countries in crisis. If growth rates are high, the budget deficit may be covered in the event of a crisis by a surplus in an expansionary phase. As shown by several authors, amongst whom Arestis and Sawyer (2011) and DeLong and Summers (2012), under certain conditions (a fiscal multiplier higher than 1, a low interest rate, hysteresis effect and growth), the public deficit in a recession phase is self-financed and may even, under particularly favorable conditions, lead to long-run improvements in public finance. Thus, as stated above, the behavior of the monetary authority becomes fundamental: holding the interest rate at a low level not only allows the fiscal authority to finance public spending at lower cost, making the deficit and debt sustainable, but is also desirable when a negative shock is prolonged (functional finance).

Primary deficit and public debt become unsustainable when the monetary authority behaves uncooperatively. This occurs for two reasons: first, because raising the interest rate forces the fiscal authority to make a greater effort to restore the equilibrium (and it will probably be forced to increase future tax levels); secondly, it can have an adverse effect on private investment and on the future growth rate once the equilibrium has been restored, impeding technological improvements and employment growth. Hence a higher degree of cooperation between fiscal and monetary authorities could be decisive in allowing a swifter economic recovery.

## 5 Conclusions

In this paper we investigated the role of the fiscal authority in the case in which the economy is hit by a negative shock. In the first part of the paper we stressed that the role of fiscal policy - as a means of stabilizing the economy - has changed in the last forty years. It has become increasingly marginal, and the stabilization objective has been assigned to the monetary authority. The problem is that, when the economy is hit by a negative shock, the mere use of monetary policy may not be sufficient to restore the equilibrium. Indeed, without an expansionary fiscal policy, the negative shock might result in aggregate demand lying permanently below potential output; in this context, the role of fiscal policy becomes indispensable, especially when the monetary authority has exhausted all the resources at its disposal to tackle the crisis.

We started with a loss function for the fiscal authority in which the preferences concerning the output level and inflation are defined. We assumed that the fiscal authority prefers stability in each period

rather than looking for a particular trade-off between inflation and output. Hence, the optimal value of the social loss function is zero, i.e.  $L_s=0$ , and each departure from this value is considered non-optimal. Two possible strategies for the fiscal authority were analyzed, based on two different approaches regarding the effectiveness of an expansionary fiscal policy.

In the first case, if fiscal policy is judged ineffective to stabilize the output level, then the stabilization policy is delegated to the monetary authority which uses its instrument – the interest rate – to offset the negative shock. In this case, the negative shock in the reaction function of the fiscal authority vanishes. According to equation (8), each positive effect on aggregate demand generated by a reduction in the interest rate will be offset by a reduction in the spending level. Thus austerity policies are unable to restore the equilibrium. If monetary policy is unable to restore the equilibrium (in a slump, investments are not affected by the interest rate but they are affected by company expectations), reconsidering the role of fiscal policy becomes fundamental. Indeed, it is likely that this strategy determined by equation (9) leads the economy into a recession.

This leads us to consider the second approach, whereby fiscal policy can help the economy to recover through direct purchase of goods and by improving expectations on the part of firms. Thus, when a negative shock occurs, the optimal response of the fiscal authority should be to increase public spending; the size of the intervention depends on the level of the interest rate, the size of the shock and the value of the fiscal multiplier in a time of crisis.

Another issue explored herein concerned the long-run sustainability of the deficit and public debt. If public spending is to be able to feed strong economic growth in the mid term, then by increasing tax revenues and given a low interest rate on government bonds the deficit is likely to be self-financed.

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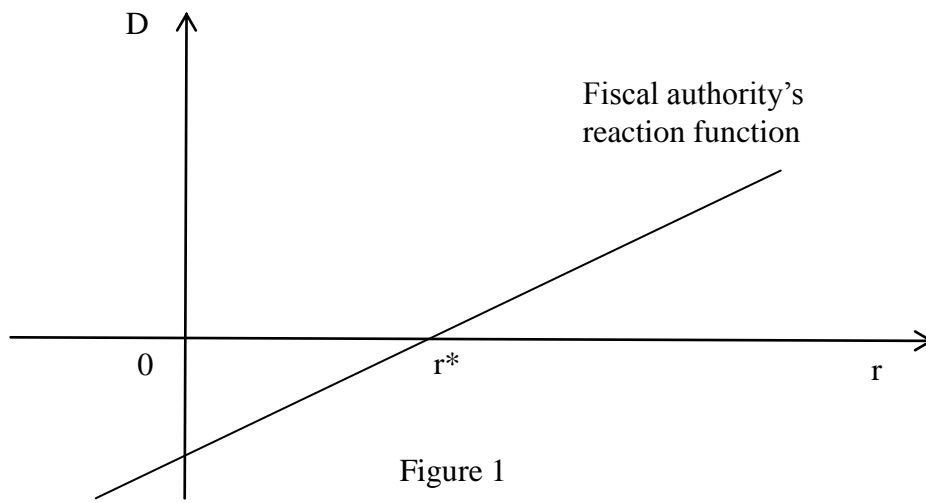


Figure 1

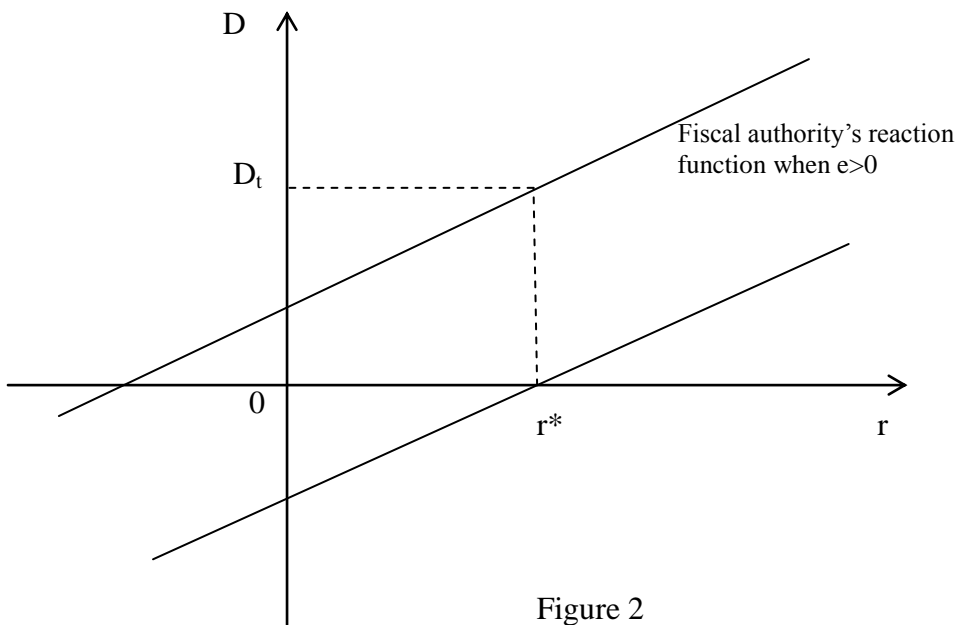


Figure 2