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# **Crowding Out of Monetary Policy as a Limitation of Fiscal Policy**

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## Crowding Out of Monetary Policy as a Limitation of Fiscal Policy

*If expansionary fiscal policy is inflationary, expansionary fiscal policy forces an inflation-targeting central bank to be somewhat more restrictive in its monetary policy. This altered central bank policy comes at a cost in terms of output which has to be calculated against the output gain achieved by the expansionary fiscal policy.*

### Introduction

According to Alston et al. (1992), most economists agree that fiscal policy has a significant stimulative impact on a less than fully employed economy. The consensus seems to be that while some offsetting factors exist (such as higher interest rates or Ricardian-type inter-temporal adjustments), those offsets are only partial.

This paper adds another effect to the list of potentially offsetting factors: If expansionary fiscal policy is inflationary, expansionary fiscal policy forces an inflation-targeting central bank to be somewhat more restrictive in its monetary policy. This, however, comes at a cost in terms of output which has to be taken into account when calculating the output gain achieved by expansionary fiscal policy.

The paper develops a simple model to show this effect. The model uses comparative statics and fairly weak assumptions. The model is not microfounded as the basic mechanism can most easily be shown by using aggregate macroeconomic relationships.

### Model

To see the argument, Table 1 is a good starting point. The table shows how expansionary fiscal and monetary policy measures affect real GDP and inflation.

Table 1: Fiscal and Monetary Policy Transmission Mechanisms

Expansionary fiscal policy			Expansionary monetary policy		
Government spends additional money ( $\Delta G$ )			Central bank creates additional money ( $\Delta M$ )		
Government acquired the money it additionally spends through higher taxes or through increased borrowing		Government had hoarded the money it additionally spends (unlikely)	Commercial banks hoard the additional money in their excess reserves	Commercial banks pass the additional money through to their customers (borrowers)	
Money so received would have been spent otherwise	Money so received would have been hoarded otherwise			Borrowers hoard the money (unlikely)	Borrowers spend the money
↓	↓	↓	↓	↓	↓
No effect on aggregate demand	Effect on aggregate demand		No effect on aggregate demand	Effect on aggregate demand	
Possible additional effect on aggregate demand*			Possible additional effect on aggregate demand*		
Supply is perfectly elastic	Supply is perfectly inelastic		Supply is perfectly elastic	Supply is perfectly inelastic	
Real GDP increases by $y_G \Delta G$	Inflation increases by $\pi_G \Delta G$		Real GDP increases by $y_M \Delta M$	Inflation increases by $\pi_M \Delta M$	

\* There may be an additional effect on aggregate demand if other actors (households for example) hoard less and spend more money in response to the policy action. For example, if the additional government spending is financed through higher borrowing, this may drive up interest rates. This may induce households to hoard less money, either by spending it or by bringing it to their bank. The bank may then lend this money to borrowers who likely spend it. Next to higher interest rates, changed asset prices, changed exchange rates, and changed expectations may induce similar effects.

Table 1 starts with the fact that the government cannot create money. Therefore, if the government wants to spend additional money, it either has to use money it hoards or has to take away the additional money from someone else (taxpayer, lenders, etc.). If this someone else would have spent the money as well, aggregate demand does not increase. An effect on ag-

gregate demand only materializes if the money would have been hoarded otherwise. It should be noted that hoarding money is different from bringing money to the bank. This is because if money is brought to the bank, the bank will likely lend it out again. Thus, this money does not lay idle. Hoarded money, on the other hand, lays idle.

Major “hoarders” in an economy are households that hold cash. Firms, on the other hand, are usually too cost-conscious to hoard much cash. Commercial banks may hoard money by holding excess reserves at the central bank. This may even earn them interest. For this and other reasons, commercial banks have recently become major hoarders in some economies. In the US, for example, excess reserves have increased from less than \$2 billion in 2007 to about \$2,700 billion by 2014. Like the central bank, but unlike households and firms, the government can also hoard money at the central bank by depositing money in its account there. However, given their high debt levels, most governments do not systematically hoard money there nowadays.

Unlike the government, the central bank can create money. Thus, it does not have to worry where its money comes from and whether this money would have been spent otherwise. In that regard, creating additional aggregate demand is easier for the central bank than for the government. However, in another regard, it is also harder for the central bank as it generally does not purchase final goods and services directly. Rather, it works through commercial banks which may then pass the money through to borrowers. The borrowers will then usually spend the money as there is little point in borrowing money otherwise.

Thus, as Table 1 shows, fiscal and monetary policy measures can have a positive effect on aggregate demand. On top of this, an additional effect on aggregate demand may materialize if, in response to the policy action, other actors, such as households, hoard less and spend more. Such altered behavior may be induced by changed interest rates, changed asset prices, changed exchange rates, or changed expectations.

Once aggregate demand increases, the question becomes how elastically the additionally demanded goods and services are supplied. If supply is perfectly elastic, real GDP will increase (by  $y_G\Delta G$  and  $y_M\Delta M$  respectively). If supply is perfectly inelastic, inflation will increase (by  $\pi_G\Delta G$  and  $\pi_M\Delta M$  respectively). If supply is somewhat elastic, both real GDP and inflation will increase somewhat.

Based on that, let's assume firstly that

$$Y = y_G G + y_M M + y_R R, \quad (1)$$

where  $Y$  is real GDP,  $G$  is government spending,  $M$  is central bank money creation (that is the money stock) and  $R$  is a residual term that captures all other factors that influence real

GDP, such as technology, the capital stock and labor supply. As in Table 1, the parameters  $y_G$  and  $y_M$  capture how fiscal and monetary policy measures affect real GDP.

The money stock, as understood here, includes central bank money as well as that part of commercial bank money that is used for transactional purposes (e.g. demand deposits but not savings deposits etc.). In the fractional-reserve banking system common today, the central bank has some but not complete control over the so defined money stock. The situation mirrors the situation of the government which has complete control over its discretionary spending, but incomplete control over its non-discretionary spending (that is spending mandated on a multi-year basis by existing legislation). Both the central bank and the government have, however, sufficient control over their respective tools to meaningfully execute their policy.

Let's assume secondly that

$$\pi = \pi_G G + \pi_M M + \pi_S S, \quad (2)$$

where  $\pi$  is inflation,  $G$  is government spending,  $M$  is the money stock and  $S$  is a residual term that captures all other factors that influence inflation, such as oil price and wage shocks. As in Table 1, the parameters  $\pi_G$  and  $\pi_M$  capture how fiscal and monetary policy measures affect inflation.

Note that both assumptions are very weak, and nearly tautological, as  $y_G$ ,  $y_M$ ,  $\pi_G$  and  $\pi_M$  can in principle take any value (including zero), and as  $R$  and  $S$  act as residuals.

Let's assume thirdly that the central bank follows an inflation target and is successful in achieving it, so that inflation is constant:

$$\pi = \pi_G G + \pi_M M + \pi_S S = \text{const.} \quad (3)$$

This assumption is a bit of a stretch as central banks cannot completely control inflation. We will relax this assumption therefore later.

Solving equation (3) for the money stock and plugging the result into equation (1) yields:

$$Y = y_G G + y_M \frac{(\text{const} - \pi_G G - \pi_S S)}{\pi_M} + y_R R. \quad (4)$$

Taking the partial derivative with respect to government spending yields:

$$\frac{\partial Y}{\partial G} = y_G - y_M \frac{\pi_G}{\pi_M} \quad \text{for } \pi_M \neq 0. \quad (5)$$

## Results and Discussion

The results of the model are:

1. If  $y_M$ ,  $\pi_G$  and  $\pi_M$  are positive, the impact of expansionary fiscal policy on growth is less than the “pure” fiscal coefficient  $y_G$ . An offsetting effect exists. Fiscal policy is somewhat less efficient than frequently perceived.
2. If  $y_M$  is equal to zero or negative (that is if expansionary monetary policy does not affect growth or even reduces growth), no offsetting effect exists as the less expansionary monetary policy is then irrelevant or even good for growth.

Discussion: It seems unlikely that expansionary monetary policy does not affect growth or even reduces growth. After all, the basic assumption of the paper is that fiscal policy can have a significant stimulative impact on an economy – a point shared by most economists, as quoted at the beginning of the paper. If this is the case, however, there is no reason why only government-induced additional aggregate demand should have an impact on growth and central-bank-induced additional aggregate demand should have not (see also Table 1).

3. If  $\pi_G$  is equal to zero or negative (that is if expansionary fiscal policy is inflation-neutral or even deflationary), no offsetting effect exists. After all, if expansionary fiscal policy is not inflationary, there is no reason for a central bank to cut back on monetary policy in response to expansionary fiscal policy.

Discussion: It seems unlikely that expansionary fiscal policy is inflation-neutral or even deflationary. If we assume, as above, that fiscal policy can have a significant stimulative impact on an economy, then it is highly likely that part of the impact hits inflation rather than real GDP. After all, otherwise we would have to assume that each and every good and service that is additionally demanded is permanently supplied perfectly elastic.

Also not a counter-argument is the idea that inflation is always and everywhere a monetary, rather than a fiscal, phenomenon (Friedman 1970). This is because the left-hand side of the quantity equation includes, next to money, the velocity of money. The velocity of money, however, reflects hoarding of money which, as Table 1 shows, can be affected by fiscal policy.

4. If  $\pi_M$  is equal to zero (that is if expansionary monetary policy does not affect inflation), equation (5) is undefined.

Discussion: Expansionary monetary policy not affecting inflation does not seem to be much of a concern. Central banks have repeatedly shown capable of generating massive inflations, even hyperinflations.

Currently, some central banks can be seen struggling with increasing inflation. However, this should not be interpreted as a general inability of central banks to affect inflation. Rather, it reflects an understandable reluctance by central banks to make early full use of the entire potential arsenal of monetary policy. What it highlights, though, is that central banks cannot control inflation completely at will (see next point).

5. Equation (3) implicitly assumes that the central bank can return inflation to the desired level immediately. This assumption is a bit of a stretch as central banks cannot completely control inflation. However, the result in equation (5) holds as long as the central bank *somewhat* responds to inflation deviating from target. The offsetting effect is smaller then, though.

Discussion: Relaxing equation (3) seems appropriate as central banks do not completely control inflation. However, as discussed, it is sufficient to assume that the central bank *somewhat* cuts back on monetary policy in response to a more expansionary fiscal policy. And this is realistic.

This point is most obvious for central banks that explicitly target the inflation rate. After all, they derive their policy actions from a model which forecasts the future path of inflation. As this forecast usually includes the government's fiscal stance as a variable that drives up inflation, a near-mechanistic feedback loop exists.

And even central banks that target inflation less explicitly seem to react to fiscal policy. For example, when the ECB reverted to quantitative easing in 2015, it stated that it did so because most indicators of actual and expected inflation had drifted towards their historical lows (ECB 2015). It can be assumed that with less fiscal support (Eurozone fiscal policy became gradually more expansionary in 2014, see e.g. IMF 2015), this situation would have arisen sooner and the ECB would have started quantitative easing earlier.

That central banks take an interest in fiscal policy can also be seen from their organization charts as most of them run fiscal policy units (e.g. ECB Fiscal Policy Division, Fed Fiscal Analysis Section, etc.).

6. Equation (5) shows that fiscal policy will be the more effective the larger the inherent growth effect of fiscal policy (the higher  $y_G$ ), the less the inherent growth effect of monetary policy (the lower  $y_M$ ), the lower the "inflation cost" of fiscal policy (the lower  $\pi_G$ ) and the higher the "inflation cost" of monetary policy (the higher  $\pi_M$ ).
7. If the second term of equation (5) is equal to or larger than  $y_G$ , expansionary fiscal policy is ineffective or even contractionary. This is the case if monetary policy is equally good or better than fiscal policy in boosting growth, and less or equally bad in causing inflation by doing so.

Discussion: Parameter sizes can only be determined empirically. This paper is largely agnostic about their size. As argued above, there is, however, some theoretical reason

to believe that  $y_M$ ,  $\pi_G$  and  $\pi_M$  are positive. In this case, some offsetting effect in the sense of this paper exists. The exact size of this offsetting effect is open. The fact that central banks do not completely control inflation and may accommodate expansionary fiscal policy somewhat may reduce the size of the offsetting effect somewhat (see above).

8. It is not possible to turn the result around and show by the same token that expansionary monetary policy crowds out expansionary fiscal policy. This is because equation (3) binds only the central bank. After all, it is the central bank, and not the government, which is tasked with achieving a certain inflation rate.
9. The recent increase in excess reserves reduced the size of  $y_M$  and  $\pi_M$  for a given policy action  $\Delta M$  (see Table 1). From equation (5), we can see, however, that the absolute size of  $y_M$  and  $\pi_M$  does not affect the size of the offsetting effect. The size is the same size whether  $y_M$  and  $\pi_M$  are 0.4 and 0.6, or 0.04 and 0.06.

## Policy Implications

The main policy implications of the paper are:

1. Given the offsetting effect described in this paper, fiscal policy may be less efficient than frequently perceived. This should make governments somewhat more reluctant with respect to active aggregate demand management.  
One might claim that at least in a situation where a central bank undershoots its inflation target, some fiscal support is welcome. However, as argued above, central banks generally do not lack the means to achieve a given inflation rate but are usually just reluctant to make full early use of their entire arsenal. All too active, or even erratic, fiscal policy may then mostly work to complicate the picture for the central bank. And it may delay the central bank's response, as argued for the ECB above.
2. The offsetting effect described in this paper has special implications for currency unions, such as the euro area. This is because if monetary policy becomes less expansionary when fiscal policy becomes more expansionary, then also monetary policy becomes more expansionary when fiscal policy becomes less expansionary. In that sense, and in contrast to conventional wisdom, it might actually be good for aggregate demand in, say, crisis-stricken Greece if the fiscal stance in the other euro area countries is not too expansionary. After all, the less expansionary fiscal policy in these countries, the more expansionary ECB monetary policy can be. The latter may actually be more helpful for aggregate demand in Greece than higher government spending in countries as distant as, say, Germany.



## Literature

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