Coordinating Monetary and Fiscal Policies in an Open Economy

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Abstract: This paper looks at the possible coordination problems that might result when monetary and fiscal policies are operated by separate authorities. In an open economy, the feedback from movements in the exchange rate to the rate of consumer price inflation means fiscal policy can have a non-neutral effect on output even if monetary policy acts to keep inflation at target. This might encourage governments to run an overly expansive fiscal policy at the expense of weakness in the tradable sector. Preventing this scenario might require the monetary authority to target a measure of domestically-generated inflation or have a separate target for the exchange rate. Alternatively, the government could delegate the assessment of policy against its fiscal rules to an independent fiscal council.

Keywords: Monetary policy, fiscal policy, policy coordination, exchange rate, open economy, fiscal councils

JEL Classification: E1, E5, E6

Introduction

The arguments for delegating monetary policy to an independent central bank are intellectually appealing and have underpinned movements to reform many central banks around the world. The theoretical case set out by Kydland and Prescott (1977) and refined by Barro and Gordon (1983) concerns the inflation bias that is generated by the discretionary use of monetary policy. If policymakers can spring an inflation surprise to secure higher short run output and employment then low inflation announcements are time inconsistent and will fail to influence inflation expectations if the public are rational.

The subsequent literature has posed many practical solutions to this problem. Rogoff (1985) suggested delegating monetary policy to a central banker who had stronger preferences for lower inflation than the general public. Walsh (1995) argued that a central banker could be made to behave in an in-
flation-adverse way if faced with a contract specifying a penalty if inflation differs from its target.

Early empirical evidence was found to be supportive of monetary independence. Alesina and Summers (1993) reported an inverse relationship between average inflation and an indicator of central bank independence for a cross-section of countries. They also found little relation between this indicator and average GDP growth and its variance which suggests that delegating monetary policy has not significantly hampered policymakers in stabilising the economy.

More significantly the era of monetary policy independence has coincided with a sustained fall in global inflation after the high inflation of the 1970s and 1980s. Although other factors may have contributed to this record the overwhelming view is that monetary policy independence has been highly successful in anchoring inflation expectations. As a result, and unlike many other areas of economic policy, its continuance has not been called into question in the post financial crisis period. In fact, it is now increasingly the case for other parts of the policy framework to be given stronger independence from politicians. The last two decades have marked a clear victory for rules over discretion.

But have the potential problems of policy coordination been overlooked? Blinder (1982) and Nordhaus (1994) were among the first to discuss the possible consequences of having the two main levers of economic policy pulled by different people. They warned that if monetary and fiscal policymakers have different and competing objectives it may lead to dissatisfaction with the eventual policy mix. For instance, if monetary policy targets inflation and fiscal policy economic growth and low unemployment, they may get caught in an interaction that leads them to a high deficit and high interest rate equilibrium. Monetary policy is tight because fiscal policy is loose, and fiscal policy is loose because monetary policy is tight. Higher equilibrium interest rates could then have repercussions for investment and long run economic growth.

Nordhaus gives the example of German reunification in the early 1990s. Loose fiscal policy resulting from the government’s unwillingness to raise taxes to pay for reunification led the independent Bundesbank to raise interest rates. Had fiscal policy been tighter monetary policy could have been loosened and the high deficit – high interest rate outcome possibly avoided.

Nordhaus also described the problems facing the Clinton Administration’s attempts in 1993 to reduce the US budget deficit. The negative impact on the
economy, and hence its palatability to elected politicians, would be eased if there was a coordinated response from monetary policy to offset the fiscal squeeze.

Blinder and Nordhaus both view the coordination problem as an example of how a Nash equilibrium in a game played by separate monetary and fiscal policymakers may not be optimal from the point of society. Of course, if the game were played repeatedly we may expect the Nash equilibrium to be supplanted by a superior coordinated equilibrium. However, because the horizon of the fiscal authority or government tends to be limited by the electoral cycle it makes credible commitment to a coordinated path difficult.

It has been argued that if monetary policy follows clear and explicit rules the actions of the fiscal authority are constrained. In this case the game between the policymakers no longer reflects a Nash one but takes a Stackelberg form where the fiscal authority moves first by choosing the most favourable position on the reaction function of the monetary authority. Whilst this can certainly offer an improvement on the Nash outcome it still may not be an efficient outcome in terms of the resulting policy mix. This is because the shorter horizon of fiscal policymakers may create a situation where the policy mix moves along the monetary policy reaction function through the ratcheting up of fiscal expansions.

These concerns about policy coordination though have been set aside by the apparent success of monetary policy independence in delivering low inflation. However most of the analysis in Blinder and Nordhaus relates to a closed economy. In this paper I argue that the coordination problem takes on an important new dimension in an open economy if the exchange rate has an effect on the rate of consumer price inflation. In this case fiscal expansions can lead to a boost in output and employment without compromising the inflation target. But it also induces an appreciation in the exchange rate and a weakening external position. A government running loose fiscal policy over a period of time can therefore create significant imbalances in the economy even though inflation remains at target. An imbalance between growth in the non-tradable and tradable sectors was a feature of several economies including the US and the UK in the lead up to the recent financial crisis.

In the next section I outline a simple model of an open economy and show how a fiscal expansion may result in higher output in the short run while still maintaining the inflation target. Even though output will return to its equilibrium level in the long run, as the accumulation of trade deficits lower private sector wealth and consumption, the government may still be tempted
to exploit the short run effects on output by running an excessively loose fiscal policy.

In the final section I briefly discuss two ways in which this policy coordination problem can be alleviated. The first is by changing the inflation target from consumer price index inflation to a measure based only on domestic output inflation. A similar result would arise if the monetary authority followed both a target for the rate of consumer price inflation and the exchange rate. The second is by the government making a credible commitment to fiscal discipline by delegating the assessment of whether it is maintaining fiscal rules to an independent authority such as a fiscal council.

### A simple open economy model

A simple open economy model along the lines of Mundell (1963) and Fleming (1962) is represented by equations (1) – (7). First, output \(Y\) is the sum of consumption \(C\), government spending \(G\) and net-trade which is exports minus imports \((X-M)\).

\[
Y = C + G + X - M \tag{1}
\]

Consumption is a positive function of wealth \((F)\) and a negative function of interest rates \((r)\).

\[
C = \gamma F - \sigma r \tag{2}
\]

The rate of consumer price inflation \((\pi)\) is positively related to the output gap \((Y - Y^*)\) and to changes in the exchange rate \(q\) relative to some equilibrium level \(q^*\). Monetary policy is operated by an independent central bank, which retains control of the interest rate with the aim of maintaining its inflation target (normalised to zero in this model).

\[
\pi = 0 = (Y - Y^*) + \Lambda(q - q^*) \tag{3}
\]

Exports are a positive function of exchange rate movements whereas imports are a negative function.

\[
X = \phi_X(q - q^*) \tag{4}
\]

\[
M = -\phi_M(q - q^*) \tag{5}
\]
The exchange rate is governed by uncovered interest parity assuming that the overseas interest rate is normalised to zero.

\[ \dot{q} = r \]  

(6)

Finally, the evolution of wealth is determined by movements in the current account. A current account deficit results from an appreciation in the exchange rate \((q < q^*)\) and the build up in foreign liabilities reduces wealth accordingly.

\[ \dot{F} = (\phi_X + \phi_M)(q - q^*) \]  

(7)

Given the zero inflation target and the structure of the economy the interest rate rule operated by the central bank is derived by substituting (1),(2),(4) and (5) into (3).

\[ r = \gamma F + \frac{\gamma}{\sigma} \Gamma + \frac{(\phi_X + \phi_M + \lambda)}{\sigma}(q - q^*) - \frac{1}{\sigma} Y^* \]  

(8)

Using the interest rate rule it is possible to write down the dynamics of this simple open economy model as a pair of coupled differential equations.

\[ \begin{bmatrix} \dot{q} \\ \dot{F} \end{bmatrix} = \begin{bmatrix} \frac{(\phi_X + \phi_M + \lambda)}{\sigma} & \frac{\gamma}{\sigma} \\ \phi_X + \phi_M & 0 \end{bmatrix} \begin{bmatrix} q \\ F \end{bmatrix} + \begin{bmatrix} -\frac{(\phi_X + \phi_M + \lambda)}{\sigma} q^* + \frac{\gamma}{\sigma} G - \frac{1}{\sigma} Y^* \\ -(\phi_X + \phi_M) q^* \end{bmatrix} \]  

(9)

The particular solution to this system is:

\[ q^* = q^* \]  

(10)

\[ F^* = \frac{Y^* - G}{\gamma} \]  

(11)

Figure 1: Equilibrium in the simple open economy model

\[ \dot{F} = 0 \]

\[ q = 0 \]
Figure 1 shows the equilibrium in this simple economy as a phase diagram with the dashed line SS representing the saddle-path solution. The system is saddlepath stable where the negative eigenvalue is

$$\lambda = \frac{(\phi_X + \phi_M + \Lambda) - \sqrt{(\phi_X + \phi_M + \Lambda)^2 + 4(\phi_X + \phi_M)\gamma}}{2\sigma} < 0$$

And the corresponding eigenvector is

$$[\omega] \text{ where } \omega = \frac{\lambda}{\phi_X + \phi_M}.$$

The effects of a fiscal expansion in the short run and long run

The effects of a fiscal expansion in this simple economy are shown in Figure 2. The economy starts at the equilibrium \((q^*, F_0)\). Following the fiscal expansion the exchange rate jumps to the point \((q_0, F_0)\) on the new saddlepath \(S_1S_1\). The economy is now running a trade deficit leading to a fall in wealth, so the economy moves down the saddlepath to \((q^*, F_1)\). Therefore the fiscal expansion eventually crowds out an equal amount of private consumption through the decline in wealth. The monetary policy rule means that inflation remains at target throughout.

Figure 2: A fiscal expansion in the simple open economy model
Of particular interest is the effect of a fiscal expansion on output. From (1) this is expressed as:

\[
\frac{dY}{dG} = \frac{dC}{dG} + 1 + \frac{dq}{dG} (\phi_X + \phi_M) \tag{12}
\]

In the short run (the immediate impact of the policy change) there is no change in foreign wealth \( \frac{dF}{dG} \bigg|_{SR} = 0 \) and an appreciation in the exchange rate \( \frac{dq}{dG} \bigg|_{SR} = \frac{\omega}{\gamma} \) which is deduced from the slope of the saddlepath.

The short run impact on consumption, substituting in for the change in the interest rate, is given by:

\[
\left. \frac{dC}{dG} \right|_{SR} = -1 - (\phi_X + \phi_M + \Lambda) \frac{dq}{dG} \bigg|_{SR} \tag{13}
\]

Therefore (12) simplifies to:

\[
\left. \frac{dY}{dG} \right|_{SR} = -\Lambda \frac{dq}{dG} \bigg|_{SR} = -\Lambda \frac{\omega}{\gamma} \tag{14}
\]

As \( \omega < 0 \) and \( \gamma > 0 \) then it must be the case that \( \frac{dY}{dG} \bigg|_{SR} > 0 \) if \( \Lambda > 0 \).

This is the key result from the model as it shows a fiscal expansion can be successful in increasing output in the short run providing the exchange rate appreciation has a negative impact on the rate of consumer price inflation.

This differs from the closed economy model where the interest rate response would result in an immediate and offsetting reduction in private consumption. It also differs from the textbook Mundell-Fleming model of an open economy where \( \Lambda = 0 \) so the fiscal expansion is exactly offset by the
reduction in net trade. When $\Lambda > 0$ the interest rate response of the central bank to hit the inflation target is lower and as a result the appreciation in the exchange rate is also lower so the fall in net trade is less than the fiscal expansion.

In the long run the economy reaches the new equilibrium ($q^*, F_1$). Therefore the long run effect on wealth is $\frac{dF}{dG}_{LR} = -\frac{1}{\gamma}$ and the long run effect on the exchange rate is $\frac{dq}{dG}_{LR} = 0$.

The fiscal expansion ultimately crowds out an equal amount of private consumption via a reduction in wealth $\frac{dC}{dG}_{LR} = -1$ meaning there is no long run change in output $\frac{dY}{dG}_{LR} = 0$. The output of the economy returns to $Y^*$ but with a different mix of expenditure.

In this model the fiscal policy authority can exploit the effect of the exchange rate on inflation to buy additional output while inflation is kept at target. Although this is only a temporary effect the government may face a powerful incentive to take advantage. The electoral cycle means the government may discount the future at a higher rate than the electorate and certainly wouldn’t wish to leave a good inheritance to rival parties should they be voted out of office. However, if fiscal policy is continuously loosened it will lead to a sustained weakness in the external sector of the economy. These longer term imbalances between the performance of the tradable and non-tradable sectors reflect a possible policy coordination failure in an open economy when monetary and fiscal policies are operated by different authorities.

**Solving the open economy coordination problem**

There are essentially two solutions to the coordination problem shown in the previous section using the simple open economy model. First, the monetary policy rule could be altered to account for the possible effects of exchange rate movements on the rate of inflation. This could involve an explicit target for the exchange rate or using an inflation measure that only includes domestically-generated inflation. Second, the government could commit fiscal policy to a path that rules out exploiting the short run effects of fiscal expansions on output.
Most monetary policy rules target the consumer price index (CPI) measure of inflation which measures the changing cost of a basket of goods and services produced at home and imported from overseas. Therefore the CPI target can be thought of as a combination of output prices and nominal exchange rates. Kirsonova, Leith and Wren-Lewis (2006) argue monetary authorities in an open economy should target output inflation and not consumer price inflation. This is because policy rules based on consumer price inflation can induce instability because of the feedback from interest rates to consumer prices via the exchange rate.

This is simple to see in the model presented here. If the inflation target is based on output inflation alone (via the output gap as in equation 3(a) which is equation (3) where $\Lambda = 0$) then the Mundell-Fleming model results stand and fiscal expansions are neutral with respect to the level of output.

$$\pi = 0 = (Y - Y^*) \quad (3a)$$

Alternatively, Leith and Wren-Lewis (1997) assert there is a case for including an exchange rate target alongside the rate of inflation in the objectives of monetary policy. For example interest rate policy should be influenced by the deviation of the exchange rate from some medium term equilibrium value such as the Fundamental Equilibrium Exchange Rate (FEER). However, adding an exchange rate target to the policy rules remains unorthodox and perhaps unnecessary if domestic output price inflation can be used instead.

Many governments have established fiscal rules in order to signal a disciplined approach to the public sector finances and rule out opportunistic fiscal expansions. However, as they are also often the arbitrator of the rules they have limited credibility. In fact, over optimism relating to the sustainability of growth and how this translates into fiscal revenues has been a source of recorded deficit bias in public sector accounts around the world in the period leading to the recent financial crisis.

Ensuring fiscal discipline through the delegation of fiscal policy would separate tax and spending decisions from political accountability but delegating the assessment of government policy against its stated fiscal rules to an independent body would not. Hall and Henry (2006) called for the creation of a fiscal policy committee in the UK to provide an independent assessment of whether the fiscal rules were being upheld.

This job is now being undertaken in a growing number of countries by fiscal councils. Calmfors and Wren-Lewis (2011) suggest these are a complement rather than a substitute for the fiscal rules. This will however only provide a
strong incentive for a government to maintain their fiscal rules if the reputa-
tional cost of having the fiscal council report a breaking of the rules is suffi-
cient to outweigh the short-term benefits of a fiscal expansion on the econo-
my.

Summary remarks

When monetary and fiscal policies are operated by two separate authorities
with competing objectives there is a risk that the respective policymakers get
locked in a game which leads to a loose fiscal policy-tight monetary policy
outcome that is suboptimal for the economy as a whole. Expansionary fiscal
policy aimed at increasing growth and lowering unemployment will be coun-
tered by monetary policy seeking to control inflation. The resulting high defi-
cit-high interest rate equilibrium could hamper longer term investment and
economic growth.

The standard defence made by advocates of monetary policy independence
is that this coordination problem is unlikely to happen if monetary policy fol-
lows clear and explicit rules. In this case the fiscal authorities will anticipate
the offsetting reaction of monetary policymakers and conclude there is little
benefit from unleashing a fiscal expansion to stimulate the economy. This
view, however, is more applicable to a closed economy. In this paper I have
used a simple model to show that if there is feedback from the exchange rate
to consumer price inflation an expansion in fiscal policy can still increase out-
put in the short run even if monetary policy acts to maintain inflation at its
target rate. Therefore the coordination problem can still matter and result in a
suboptimal policy mix and an unbalanced economy.

The incentive for the fiscal policymaker to exploit the short run effects on
output will depend on a number of factors. These are the extent and persis-
tence of the pass-through from the exchange rate to consumer price inflation
and the horizon of the government. When the exchange rate has a large
and/or persistent effect on consumer price inflation, which is more likely if
imports make up a larger share of domestic consumption, then the short run
output effects of a fiscal expansion are also larger. The more weight the gov-
ernment places on short-term relative to long-term economic performance
will also increase the incentive to make a fiscal expansion.

There are two possible solutions to the open economy coordination prob-
lem between monetary and fiscal policies. The first is to lower the output ben-
efit of a fiscal expansion by removing the potential exchange rate effect on the
operation of monetary policy. This could be done by targeting domestically
generated inflation only or by having a separate target for the exchange rate in line with a medium term equilibrium rate. The second is to increase the government’s horizon making the effects of a fiscal expansion on short-term output less attractive. This could be achieved if the government faces a credibility cost to running excessively large fiscal deficits. The increasing number of fiscal councils around the world to provide an independent assessment of whether governments are meeting their own fiscal rules has become a popular method for enforcing fiscal discipline on governments.

References

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