Chapter 4
Fiscal Policy in Germany B

1. The Model

The model of unemployment and inflation can be characterized by a system of two equations:

\[ u_1 = A_1 - G_1 \]  \hspace{1cm} (1)
\[ \pi_1 = B_1 + G_1 \]  \hspace{1cm} (2)

The targets of the German government are zero unemployment and zero inflation in Germany. The instrument of the German government is German government purchases. There are two targets but only one instrument, so what is needed is a loss function. We assume that the German government has a quadratic loss function:

\[ L_1 = \pi_1^2 + u_1^2 \]  \hspace{1cm} (3)

\( L_1 \) is the loss to the German government caused by inflation and unemployment. We assume equal weights in the loss function. The specific target of the German government is to minimize the loss, given the inflation function and the unemployment function. Taking account of equations (1) and (2), the loss function of the German government can be written as follows:

\[ L_1 = (B_1 + G_1)^2 + (A_1 - G_1)^2 \]  \hspace{1cm} (4)

Then the first-order condition for a minimum loss is:

\[ 2G_1 = A_1 - B_1 \]  \hspace{1cm} (5)

Here \( G_1 \) is the optimum level of German government purchases. An increase in \( A_1 \) requires an increase in German government purchases. And an increase in
B1 requires a cut in German government purchases. From equations (1) and (5) follows the optimum rate of unemployment in Germany:

\[ 2u_1 = A_1 + B_1 \]  

(6)

And from equations (2) and (5) follows the optimum rate of inflation in Germany:

\[ 2\pi_1 = A_1 + B_1 \]  

(7)

Unemployment in Germany is not zero, nor is inflation there.

2. Some Numerical Examples

For easy reference, the model of unemployment and inflation is reproduced here:

\[ u_1 = A_1 - G_1 \]  

(1)

\[ \pi_1 = B_1 + G_1 \]  

(2)

And the optimum level of German government purchases is:

\[ 2G_1 = A_1 - B_1 \]  

(3)

It proves useful to study two distinct cases:
- a demand shock in Germany
- a supply shock in Germany.

1) A demand shock in Germany. Let initial unemployment in Germany be zero, and let initial inflation there be zero as well. Step one refers to a decline in the demand for German goods. In terms of the model there is an increase in A1