Chapter 2
Fiscal Policy in Germany B

1. The Model

The model of unemployment, inflation, and the structural deficit can be characterized by a system of three equations:

\[ u_1 = A_1 - G_1 \] (1)
\[ \pi_1 = B_1 + G_1 \] (2)
\[ s_1 = G_1 - T_1 \] (3)

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

\[ L_1 = \pi_1^2 + u_1^2 + s_1^2 \] (4)

\( L_1 \) is the loss to the German government caused by inflation, unemployment, and the structural deficit. We assume equal weights in the loss function. The specific target of the German government is to minimize the loss, given the inflation function, the unemployment function, and the structural deficit function. Taking account of equations (1), (2) and (3), the loss function of the German government can be written as follows:

\[ L_1 = (B_1 + G_1)^2 + (A_1 - G_1)^2 + (G_1 - T_1)^2 \] (5)

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

\[ 3G_1 = A_1 - B_1 + T_1 \] (6)
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 $B_1$ requires a cut in German government purchases. From equations (1) and (6) follows the optimum rate of unemployment in Germany:

$$3u_1 = 2A_1 + B_1 - T_1$$  \hspace{1cm} (7)

From equations (2) and (6) follows the optimum rate of inflation in Germany:

$$3\pi_1 = A_1 + 2B_1 + T_1$$  \hspace{1cm} (8)

And from equations (3) and (6) follows the optimum structural deficit ratio:

$$3s_1 = A_1 - B_1 - 2T_1$$  \hspace{1cm} (9)

Unemployment in Germany is not zero. And the same holds for inflation and the structural deficit there.

2. Some Numerical Examples

For easy reference, the basic model is reproduced here:

$$u_1 = A_1 - G_1$$  \hspace{1cm} (1)

$$\pi_1 = B_1 + G_1$$  \hspace{1cm} (2)

$$s_1 = G_1 - T_1$$  \hspace{1cm} (3)

And the optimum level of German government purchases is:

$$3G_1 = A_1 - B_1 + T_1$$  \hspace{1cm} (4)