(1) [8 points] **Effects of Fiscal Policy in the Long Run**

Soon after his election in 1992, President Clinton proposed to reduce government spending and increase taxes

(a) [2 points] What effect would this have on the government budget deficit?

*Government budget deficit is defined as \( G - T \). A decrease in government spending \((G)\) and an increase taxes \((T)\) causes government deficit to fall.*

(b) [6 points] Use the Classical model for a closed economy to state and illustrate what the long-run impact of this program would be on national saving \((S)\), investment \((I)\), and the real interest rate \((r)\)

*A fall in government budget deficit causes national saving \((S)\) and investment \((I)\) to increase and real interest rate \((r)\) to fall in the long run.*
(2) [12 points] **Classical Model**

Assume that RGDP \( Y \) is 6,000. Consumption \( C \) is given by the equation \( C = 600 + 0.6(Y - T) \). Investment \( I \) is given by the equation \( I = 2,000 - 100r \), where \( r \) is the real interest rate in percent. Taxes \( T \) are 500 and government spending \( G \) is 500.

(a) [3 points] What is the equilibrium value of \( r \)?

\[
Y = C + I + G
\]
\[
\Rightarrow \quad 6000 = 600 + 0.6(6000 - 500) + 2000 - 100r + 500
\]
Therefore, \( r = 4 \)

(b) [2 points] What are the new equilibrium values of \( C \) and \( I \)?

\[ C = 3900 \text{ and } I = 1600 \]

(c) [3 points] What are the values of private saving \( S^p \), public saving \( S^g \), and national saving \( S \)?

\[ S^p = Y - T - C = 6000 - 500 - 3900 = 1600 \]
\[ S^g = T - G = 0 \]
\[ S = S^p + S^g = 1600 \]

(d) [4 points] Suppose that both government purchases \( G \) and taxes \( T \) increase by 100. Is \( r \) increasing or decreasing? Explain

\[
Y = C + I + G
\]
\[
\Rightarrow \quad 6000 = 600 + 0.6(6000 - 600) + 2000 - 100r + 600
\]
The new equilibrium value of real interest rate is \( r = 4.4 \).

Alternatively, you may answer this question as follows. The increase in \( G \) reduces \( S \) by 100 and the increase in \( T \) raises \( S \) by less than 100. The overall effect of balanced-budget fiscal policy is to reduce national saving \( S \). Therefore, \( r \) rises.
Part C (10 points) Working with Macroeconomic Data

For data to use in these exercises, go to the Federal Reserve Bank of St. Louis FRED database at research.stlouisfed.org/fred


See attached figure 1

(2) [5 points] Plot a graph of growth rates (percentage change from 4 quarters earlier) of real GDP and full-employment GDP. Which variable is smoother? Can you pick out the dates of recessions on the graph?

See attached figure 2
Figure 1: Real GDP ($Y$) and real Potential GDP ($Y_P$): U.S. data (1965:Q1-2008:Q3)
Figure 2: Quarter-to-quarter growth rates of real GDP ($Y$) and real Potential GDP ($Y_P$): U.S. data (1965:Q1-2008:Q3)