Fiscal Policy, Part II: The Ramsey Problem.

Structure of the Ramsey Problem: Government can credibly precommit to a path of excise taxes \( \{\tau_i\}_{i=0}^{\infty} \) to finance a path of government expenditures \( \{G_i\}_{i=0}^{\infty} \). The task of the government is to choose the path of taxes to maximize the utility of households.

- Excise taxes are distortionary – they influence marginal decisions and therefore demand for goods which will therefore affect households’ utility.

Let the demand for good \( i \) be denoted as:

\[
x_i^* = x_i(m, p_1, p_2, ..., p_n; \tau_1, \tau_2, ..., \tau_n)
\]

Where:

\[
m = \text{income} \\
p_i = \text{price of good } i \\
\tau_i = \text{tax on good } i
\]

We can express the effect of taxes on utility by introducing the concept of indirect utility. This is defined as:

Indirect Utility: The indirect utility function is the direct utility function \( U(x_1, x_2, ..., x_n) \) in which the arguments \( (x_1, x_2, ..., x_n) \), i.e. choice variables, are replaced with their optimal values \( (x_1^*, x_2^*, ..., x_n^*) \). Since these are functions of income, prices, and taxes, the indirect utility function will be a function of these variables.

\[
U(x_1^*, x_2^*, ..., x_n^*) = V(m, p_1, p_2, ..., p_n; \tau_1, \tau_2, ..., \tau_n)
\]

This is useful since it represents clearly how the government choice of taxes affects household utility.
Steps

1. Set up household utility maximization problem – derive indirect utility function.

2. Government chooses taxes in order to maximize household utility subject to the intertemporal government budget constraint.

3. The conclusion: The optimal tax policy is one of constant taxes. This is known as the tax smoothing hypothesis.

4. Provide an example: Financing a war.