1 Money Taxation

Consider an economy with a single commodity, \( \ell = 1 \), chocolate. There are 5 consumers, so \( n = 5 \). The endowments are defined as

\[
\omega = (\omega_1, \omega_2, \omega_3, \omega_4, \omega_5) = (50, 40, 30, 20, 10)
\]

1.1 A Single Currency

There is one money. The chocolate price of money is \( P^m \geq 0 \). In each of the following cases, solve for the set \( \mathcal{P}^m \) of equilibrium prices \( P^m \), given the following tax policies \( \tau \). Provide the units in which the variables are measured.

a) \( \tau = (\tau_1, \tau_2, \tau_3, \tau_4, \tau_5) = (1, 1, 0, 0, -2) \)

b) \( \tau = (10, 5, 0, -8, -7) \)

c) \( \tau = (20, 2, 1, -2, -20) \)

1.2 Two Monies

Consider a scenario where there are 2 monies, red dollars \( R \) and blue dollars \( B \), with respective chocolate prices of money, \( P^R \geq 0 \) and \( P^B \geq 0 \).

In each of the following cases, solve for the equilibrium exchange rate between \( B \) and \( R \). Do these depend on the endowments \( \omega \)? Give the economic explanation for your answer.

a) \( \tau^R = (1, 1, 0, 0, -2) \) and \( \tau^B = (1, 0, 0, 0, -2) \)

b) \( \tau^R = (1, 1, 0, -1, -2) \) and \( \tau^B = (1, 1, 0, -2) \)

c) \( \tau^R = (3, 2, 1, 0, -6) \) and \( \tau^B = (4, 0, -1, -1, -2) \)

1.3 The Absence of Money Illusion

Explain the difference between the “absence of money illusion” and the “quantity theory of money”. Be precise (with symbols).