

Problem Set 2

Due in Lecture on Monday, October 9th. "Box in" your answers to the algebraic questions.

1. Elasticities approach.

- 1.1 Suppose that each one percent depreciation in the US dollar induces a 0.70 increase in exports and a 0.25 decrease in imports. Starting from a position where exports equals imports, what will be the impact on the trade balance?
- 1.2 Suppose the US experiences the exchange rate depreciation while running a large trade surplus. What will happen to the trade balance?
- 1.3 Suppose that instead of the elasticities being constant, they are smaller in the short run, and larger in the long run. What is the time path of the trade balance over time (starting from initial balance)?

2. Equilibrium income and multipliers. Consider the following model of the economy:

<u>Eq.No.</u>	<u>Equation</u>	<u>Description</u>
(1)	$Y = AD$	Output equals aggregate demand, an equilibrium condition
(2)	$AD \equiv C + I + G + X - IM$	Definition of aggregate demand
(3)	$C = \bar{C} + c(Y - T + TR)$	Consumption function, c is the MPC
(4)	$T = \bar{T} + tY$	Tax function; \bar{T} is lump sum taxes, t is tax rate
(5)	$TR = \bar{TR}$	Transfers function
(6)	$I = \bar{I}$	Investment function
(7)	$G = \bar{G}$	Government spending on goods and services
(9)	$X = \bar{X}$	Export spending
(10)	$IM = \bar{IM} + mY$	Import spending

There is no real exchange rate effect now because the real exchange rate is assumed constant (and so its effect is subsumed into the constant in (9) and (10)). **In your answers to the questions below, show your work, and "box in" your answers.**

- 2.1 Solve for Y , setting $\bar{A} \equiv \bar{C} + \bar{I} + \bar{G} + c(\bar{TR} - \bar{T})$.
- 2.2 Calculate the change in income for a given change in lump sum transfers.
- 2.3 Show what the multiplier is for a change in lump sum transfers.
- 2.4 Calculate the change in income for a given change in government spending.
- 2.5 Calculate the change in the trade balance for a given change in lump sum transfers. Hint:

$$TB \equiv X - IM, \text{ so } \Delta TB = \Delta X - \Delta IM - m\Delta Y.$$

2.6 Solve for a change in the budget surplus resulting from the change in lump sum transfers, recalling your answer to 4.3.

2.7 Suppose autonomous exports increase. Show what the implications for the trade balance and the budget balance. Do they move in the same or different directions?

3. Expenditure Switching/Expenditure Reduction

Suppose equations (9) and (10) in the above model were altered to:

(7)	$X = \bar{X} + vq$	Export spending
(8)	$IM = \bar{IM} + mY - nq$	Import spending

5.1 Solve for equilibrium income. What is the government spending multiplier in this model?

5.2 Solve for the multiplier for a given unit exchange rate devaluation.

5.3 (optional) In order to improve the trade balance by \$1 billion, what would have to happen to government spending on goods and services; alternatively, what would have to happen to the real exchange rate?