

Problem Set 3

The Keynesian Model

1. There has been much discussion about consumer confidence in the past year, but it might not be immediately obvious how we can model it in the Keynesian framework. One approach is to assume that consumption depends not only on net income and the expected real interest rate, but also on an index of consumer confidence, which we denote with z :

$$c = c(y - t, i - \pi^e, z),$$

where $dc/dz > 0$ (i.e. an increase in consumer confidence raises consumption at any level of net income and expected real interest rate).

Using the algebraic form of the IS-LM model, show the effect of an increase in consumer confidence on income and the nominal interest rate (i.e. derive dy/dz and di/dz). What factors determine the sensitivity of income to changes in consumer confidence? Explain verbally how these factors influence the sensitivity.

2. So far, we have assumed that government collects taxes as a lump sum, t . In practice, however, taxes are collected as a proportion of income. Let τ be the income tax rate, so that consumer net income is given by $(1 - \tau)y$. Such a proportional income tax turns out to be an **automatic stabilizer**. For example, if consumer confidence, z , drops, national income falls by less than it would if the total tax take were fixed.

a) Derive algebraically an expression for dy/dz in the presence of the proportional income tax.

b) Compare, in the IS-LM framework, the effect of a change in consumer confidence under the two tax scenarios (lump sum and proportional).

3. We have so far assumed that the money demand function is given by $m^d = m(y, i)$. It might be more reasonable to assume that money demand depends on net income: $m^d = m(y - t, i)$. Using this modified money demand equation,

a) Show graphically in the IS-LM model the effect of a change in the tax take, t .

b) Derive algebraically the income tax multiplier. Is it larger or smaller than the multiplier obtained using the original money demand function? On what does the difference depend?