

## Econ 387: Midterm 1

February 9, 2006

### Answer Key

- [1] [10 Marks]. What is the definition of an indifference curve? Why are indifference curves an important component of macroeconomic analysis? (Provide two reasons).

*An indifference curve is defined as the set of all commodity bundles that an individual ranks identically. Indifference curves (preferences) are important in macro because: [1] they describe an individual's willingness to substitute across commodities (thereby helping us make predictions); and [2] the relative position (or level) of indifference curves allows us to evaluate the welfare consequences of any change in the economic environment.*

- [2] [10 Marks]. Real wages have risen dramatically over the last century. Nevertheless, the aggregate level of hours worked (per capita) has remained more or less constant. Is this observation inconsistent with neoclassical theory? Explain (a diagram may be helpful).

*Yes, this observation is consistent with neoclassical theory, since an increase in the wage has an ambiguous impact on labor supply. That is, on the one hand, an increase in the wage increases the relative price of leisure, compelling individuals to work more (they substitute out of leisure and into consumption). On the other hand, an increase in the wage increases wealth, so that people desire to consume more output and leisure (wealth effect). In principle, these two effects could just cancel; see diagram.*

- [3] [10 Marks]. Consider the following data from the U.S. economy (1939–47). [Diagram depicts rise in GDP, employment and a decline in consumption]. If we interpret the U.S. entry into WW2 (December 1941) as an exogenous shock (together with the associated increase in government spending, that was financed largely by debt), is the basic neoclassical model consistent with the movements in GDP, consumption, and employment (from their trend levels)? Explain (a diagram may be useful).

*Since we wish to address the employment effect of fiscal policy, consider the simple 'static' neoclassical model:  $\max u(c, l)$  subject to  $c = zn - \tau$ , where  $\tau = g$  (government budget constraint) and  $n + l = 1$ . In this model, an exogenous increase in  $g$  implies a higher tax burden, and so reduces the after-tax income of the representative household. Since the wage is fixed at  $z$ , this implies a pure (negative) wealth effect; i.e., the demand for all normal goods declines. In the present context, this implies a decline in  $(c, l)$ . The decline in  $l$  necessarily implies an increase in labor supply (household work harder to make up for the shortfall in income). So, the model implies a reduction in  $c$  and an increase in  $n$ . Since technology remains unchanged, an increase in  $n$  implies an increase in GDP. These are exactly the effects we observed during WW2, so yes, the model is consistent with observation.*

- [4] [10 Marks]. Consider a small open economy that faces a world interest rate  $R$ . There is a representative agent with an exogenous endowment of time-dated (and non-storable) output  $(y_1, y_2)$ , and preferences for time-dated output given by  $U(c_1, c_2)$  satisfying the usual restrictions. Using this model, identify two separate shocks to output, each of which leads to an increase in the current account deficit, but with each having different implications for economic welfare. Be careful to provide real-world examples of the shocks you consider and to explain your results in words (draw a separate diagram for each shock).

*Draw a diagram with an initial point  $(c_1, c_2) = (y_1, y_2)$ , so that the current account (in this case  $CA = y_1 - c_1$ ) is equal to zero. Consider a shock that leads to a transitory decline in current GDP. We can interpret such an event as a recession. Since this is a small open economy, the interest rate remains unchanged. But the decline in GDP implies a reduction in household wealth, which implies a reduction in the demand for all normal goods; i.e., in this case,  $c_1$  and  $c_2$ . If households have a consumption-smoothing motive (i.e., if preferences are convex), then the decline in  $c_1$  will not be as large as the decline in  $y_1$ . Intuitively, households would like to borrow against their future income (which has remained unchanged) in order to smooth consumption. This borrowing translates into a larger current account deficit. Since consumption falls at each date, welfare declines as well.*

*Consider now a shock that leads to an increase in expected future GDP. We can interpret such a shock as the arrival of ‘good news’ about (say) the future prospects of the domestic economy (e.g., the arrival of a new technology that is expected to boost future income). Again, since this is a SOE, the interest rate remains unchanged. The good news translates into greater wealth, so the household sector demands more consumption both today and tomorrow (since consumption is assumed to be a normal good and preferences are convex). Since current income has not changed, the only way to increase current consumption is by borrowing (from foreigners). This too then leads to an increase in the current account deficit. However, since consumption is increasing at all dates, this shock leads to an improvement in welfare.*