

# Exam 3. Econ520. Spring 2012

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UNC

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## **Instructions:**

- Answer all questions.
- Clearly number your answers. Write legibly.
- Do *not* write your answers on the question sheets.
- *Explain* your answers – do not just state them.
- *Show* your derivations – do not just state the final result.
- Do not refer to any notes or books. You may use a calculator.
- The total time is 75 minutes.
- The total number of points is 100.

# 1 Saving

1. [20 points] Interest rates have declined in the U.S. since the 1980s. How do you think this affects the U.S. saving rate? Explain your answer using the life-cycle model and illustrate in a graph showing the lifetime budget constraint.
2. [15 points] Explain, with reference to the life-cycle model, how the following events may have contributed to falling saving in the U.S.:
  - (a) rising government spending on health care;
  - (b) generous Social Security benefits for the cohorts retiring about now.

# 2 Labor Markets

[25 points] Productivity has been growing at about 2% per year for a long time.

1. Illustrate the effects of productivity growth in a Walrasian labor market diagram.
2. Why did we not observe rising hours worked as rising wages move workers along the labor supply curve (which we assume to be upward sloping)?
3. Why did we not observe rising unemployment or falling wages as a given amount of goods can be produced with fewer workers (think NC textile mills)?

Illustrate your answers in a labor market diagram.

### 3 Short Questions

1. [15 points] Why did lending between financial institutions freeze up during the Great Recession? What are the roles played by leverage and complex securities (such as mortgage backed securities)?
2. [7 points] According to Relative Purchasing Power Parity, what is the main determinant of a country's exchange rate in the long run?
3. Uncovered Interest Parity (UIP): Consider the following data. Domestic interest rate  $i = 0.1$ , foreign interest rate  $i^* = 0.15$ , expected exchange rate next year  $E(t + 1) = 1$  [dollars per Euro].
  - (a) [6 points] Solve for today's exchange rate  $E(t)$ .
  - (b) [12 points] Suppose that  $i^*$  rises to 0.2 while  $E(t + 1)$  stays the same. Plot the time path of  $E$  between  $t$  and  $t + 1$  and explain why the foreign currency appreciates or depreciates between  $t$  and  $t + 1$ .

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End of exam.

## 4 Answers

### 4.1 Saving

1. A changing interest rate has ambiguous effects. Substitution effects lower saving. Income effects raise saving (on average, because most households are savers, not borrowers). See Figure 1.
2. Health spending and Social Security benefits transfer resources from young (saving) to old (dissaving) persons. The expectation of future benefits reduces saving rates even before the benefits are paid out, which could explain low savings of the cohorts retiring now.

If you want to draw a graph: the endowment point shifts along the lifetime budget constraint to the Northeast. If the old receive more than their fair share of transfers, the budget constraint may also shift out. Saving declines.

### 4.2 Labor Markets

1. The diagram shows upward sloping labor supply and downward sloping labor demand (marginal product of labor). Productivity growth shifts labor demand up. Wages and hours rise.
2. Income effects increase the demand for leisure. The labor supply curve shifts up. Whether hours rise or fall depends on whether labor supply or labor demand shifts faster.
3. Unemployment / falling wages: If aggregate demand were fixed, this is what we would observe. And we observe falling employment in some industries where productivity grows and demand does not keep up (this is one reason why manufacturing declines). However, additional income generates rising demand for goods. Aggregate demand shifts out. Labor demand increases. Flexible wages and prices ensure full employment. Wages are determined by the marginal products of the marginal workers.

### 4.3 Short Questions

1. Borrowing requires collateral. In the crisis, the value of collateral declined (mortgage defaults). The assets available as collateral were complex and therefore difficult to value, both for collateral purposes and in case of a sale. Financial institutions were highly leveraged, so that a decline in assets lead to a large decline in equity, threatening solvency. This made liquid institutions reluctant to lend (hard to assess risk). Once lending become more difficult, institutions became even more reluctant to lend in order to preserve their own liquidity. A negative spiral was the result.

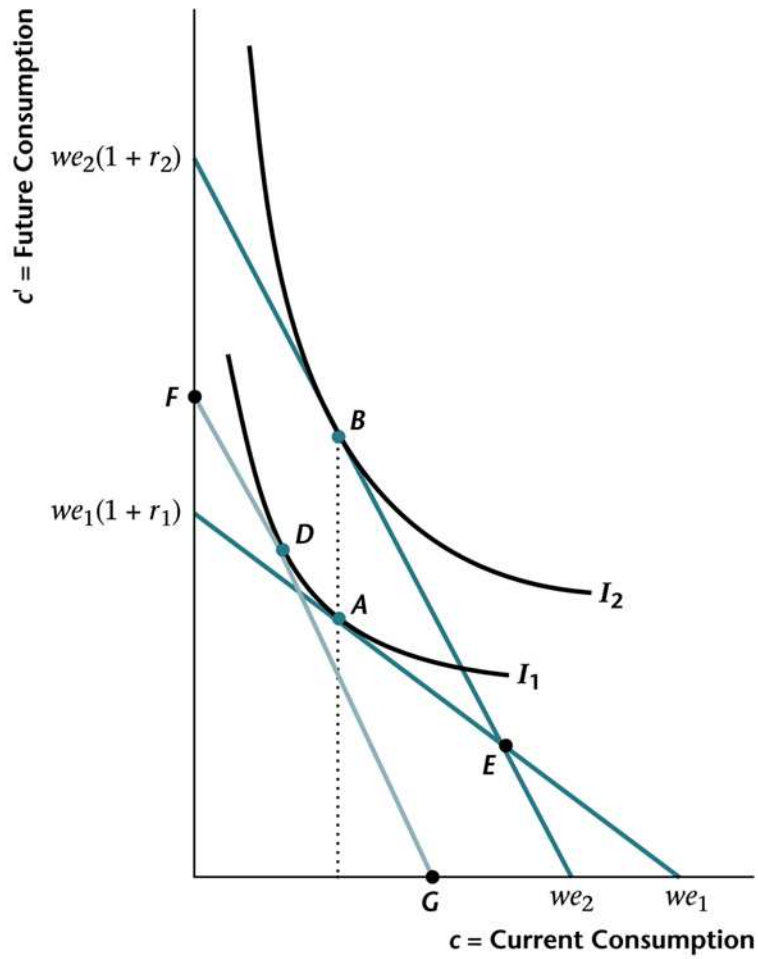


Figure 1: Changing interest rate

2. PPP asserts that the real exchange rate is constant over time:  $q = Ep^*/p$  where  $E$  is in dollars/Euro. Therefore,  $E$  rises when  $p$  grows faster than  $p^*$ . In words: if dollar inflation is fast, the dollar depreciates. Domestic inflation (or monetary policy) is the main determinant of the exchange rate.

3. UIP

(a)  $E(t) = (1 + i^*)/(1 + i)E(t + 1) = 1.05$ .

(b) At impact,  $E(t)$  rises to 1.1. It gradually falls back to 1 by  $t + 1$ ; the Euro depreciates while  $i^* > i$ . The depreciation is needed to equate the dollar returns on dollars and Euros, as UIP requires. The expected capital loss offsets the higher interest income.

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End of answers.