

International Economics for Managers (MBA) Problem Set

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2019/20

The Problem Set contains two types of question.

- Some are pretty straightforward. They are narrow, numerical exercises with a single correct answer, and the aim is to sharpen thinking about the basic economic tool kit.
- Some are more open ended. They are broader and give you the opportunity to think creatively about using economic theory to understand practical issues.

Session 1

Question 8.1

Consider the following data relating to a typical basket of goods and services in the UK:

| Item | Price on Jan 1 st 2014 ¹ | Price on Jan 1 st 2015 ² |
|-----------------------------------------------------|------------------------------------------------|------------------------------------------------|
| Loaf of bread (Warbutons white sliced toastie 800g) | 95p | £1 |
| 1 pint of milk (SO Organic semi skimmed) | 60p | 60p |
| Chicken breast (breast fillet 460g) | £3.20 | £3.30 |
| Eggs (free range woodland medium SO organic x6) | £1.90 | £1.90 |
| King Edward potatoes (2.5kg) | £1.95 | £2 |
| Dove soap (x4) | £3 | £3 |
| Total | | |

- What is the total of the current prices divided by the total of the old prices?
- Multiply this number by 100 to calculate the CPI level

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¹ These numbers are hypothetical

² These numbers are based on <http://www.sainsburys.co.uk/> as of May 2015

- c. Subtract 100 to find the inflation rate

Hint: *Markets for Managers*, Ch. 8.1.

Question 8.2

Use the dynamic equation of exchange to show the following situations:

- a. Under a Gold Standard productivity gains will lead to deflation
- b. Even though the Fed increased the money supply on December 31st 1999, because this was in response to fear surrounding the Y2K bug, it didn't lead to inflation
- c. Hyperinflation occurs when people lose confidence *in currency*, and therefore their desire to hold it dramatically falls (i.e. their desire to spend money dramatically increases)

Question 8.3

Draw a dynamic AD-AS diagram that satisfies the following criteria: (i) the Solow growth rate is 2% per year; (ii) AD is consistent with a level of total spending (M+V) equal to 6% per year; (iii) SRAS is consistent with inflation expectations of 4% per year. If a productivity shock caused the Solow growth rate to increase to 4% per year what would inflation be if prices were perfectly flexible? (Assume spending growth (M+V) doesn't change).

Hint: See the video, "An Introduction to the Dynamic AD-AS Model", September 2014.³

Question 8.4

- a. Write down the equation of the AD curve and calculate the slope.
- b. In reality high rates of inflation are likely to reduce real growth. How should the Solow curve be drawn if this is the case?

Hint: See the video, "An Introduction to the Dynamic AD-AS Model", September 2014.⁴

Question 8.8

The Taylor Rule is a general guideline that allows policymakers to ascertain an appropriate interest rate for various growth rates of inflation and output. We can use a simple version of the rule.⁵

³ <https://www.youtube.com/watch?v=qXYNUjWYopo>

⁴ <https://www.youtube.com/watch?v=qXYNUjWYopo>

$$\text{Taylor rule} = 1 + (1.5 \times \text{inflation}) - (1 \times \text{unemployment gap})$$

- a. Assuming that the natural rate of unemployment is 8%, complete the following table to calculate the implied Taylor rule interest rate for Germany, France, Greece and the Eurozone, as of January 2013.

| Country | Inflation | Unemployment rate | Unemployment gap | Implied Taylor rule |
|----------|-----------|-------------------|------------------|---------------------|
| Germany | 1.65 | 5.4 | | |
| France | 1.17 | 10.8 | | |
| Greece | 0.21 | 26.5 | | |
| Eurozone | 2.00 | 12.0 | | |

- b. The main refinancing rate in January 2013 was 0.75. Based on the information above, was monetary policy too tight, or too loose in the Eurozone?

Hint: *Markets for Managers*, Ch. 8.2.⁶

Question 8.9

In December 2013 many economists believed that there was a deficiency in aggregate demand (AD) in the Eurozone. The rate of inflation was 0.7% and real GDP growth was -0.1%. According to Eurostat the forecast for real GDP growth in 2 years time is 1.5%. If you assume that this is the Solow growth rate, and take an inflation target of 2%, by how much should policymakers attempt to increase AD by?

Show your answer on a graph.

Hint: See the video, “An Introduction to the Dynamic AD-AS Model”, September 2014.⁷

+ Discussion Question 8a

Provide an example of a central bank that has adopted quantitative easing (QE). Briefly define QE, and explain the arguments in favour. What are the downside risks? Did it work? Should central banks continue to use QE?

⁵ See Nechio, F., “Monetary policy when one size does not fit all” *FRBSF Economic Letter*, June 13th 2011

⁶ Note that this version of the Taylor rule is slightly different to the one mentioned in the textbook. This is because it is easier to find and use unemployment data than potential growth rates.

⁷ <https://www.youtube.com/watch?v=qXYNUjWYopo>

Hint: *Markets for Managers*, Ch. 8.2.

+ Discussion Question 8b

Some people argue that when interest rates are low monetary policy loses its effectiveness. List 2 different ways in which central banks can still generate an increase in nominal GDP, even at the “zero lower bound”. Do you think these policies have been tried recently? How effective have they been?

Hint: *Markets for Managers*, Ch. 8.2.

Session 2

Question 9.1

According to Okun’s law a 2% increase in GDP is required to reduce unemployment by 1%. In late 2008 Larry Summers feared that the US unemployment rate was set to reach 10%.⁸

- a. Assume that the natural rate of unemployment was 6%. By how many percentage points would GDP need to rise by to maintain unemployment at its natural rate?
- b. In 2008 US GDP was approximately \$14.4 trillion. But how much would GDP need to rise to get unemployment down to its natural rate?

Question 9.2

We can define “m” as the marginal propensity to consume. This is the proportion of any additional income that an agent spends on consumption. For example, in the 2008 stimulus around 30% of rebate checks were spent.⁹

- a. Combine the following equations and solve for Y

$$Y = C + I + G$$

$$C = m(Y - T)$$

- b. Find the derivative of this equation with respect to taxes. This gives the “tax multiplier”.
- c. Find the derivative of this equation with respect to government spending. This gives the “spending multiplier”.

⁸ See Weinzierl, M.C., and Werker, E.D., “Barack Obama and the Bush Tax Cuts” January 2009

⁹ See Weinzierl, M.C., and Werker, E.D., “Barack Obama and the Bush Tax Cuts” January 2009

- d. Assume that the 2008 stimulus was split between 50% tax cuts and 50% spending increases. Calculate the weighted multiplier
- e. Use your answer to part d to calculate the size of the fiscal stimulus required to boost GDP by your answer to part b of the previous question
- f. According to *The Economist* Obama estimated that the tax multiplier was 1.0 and the spending multiplier was 1.6.¹⁰ If this is the case, what size should the stimulus be?

Hint: *Markets for Managers*, Ch. 9.2.

+ Discussion Question 9a

Provide a real example of a government engaging in a fiscal stimulus. What are the arguments in favour? What are the arguments against? Assess whether you personally think it was effective at boosting AD.

Hint: *Markets for Managers*, Ch. 9.2.

Session 3

Question 10.1

When we look at the equation for total spending, it gives the impression that imports reduce GDP.

$$GDP = C + I + G + (X-M)$$

In fact, GDP is intended to measure the domestic production of final goods, and therefore imports shouldn't affect GDP at all. If an American buys a Japanese car for \$30,000, this will appear as an increase in consumption (C). By subtracting the value of imports (M) this ensures that GDP remains unchanged. The use of M is therefore an accounting strategy rather than an expenditure variable.

Imagine that an American buys a new car for \$30,000; the car was assembled in the United States but the manufacturer used \$10,000 of imported parts in the production process. What is the impact on GDP?

Question 10.2

Consider “Josko Joras (A)”, December 2012

Complete the following table:

| | | | | | |
|--|----------------|----|---------|--------|----------------|
| | Big Mac prices | | | | |
| | In local | In | Implied | Actual | Under (-)/over |

¹⁰ “Much ado about multipliers” *The Economist*, September 24th 2009

| | currency | dollar s | PPP* of the dollar | exchange rate: Jan 30 th 2009 | (+) valuation against the dollar, % |
|----------------------------|-----------------|-------------|-----------------------|------------------------------------------------|-------------------------------------------|
| United States ¹ | \$3.54 | 3.54 | - | - | - |
| Argentina | | 3.30 | 3.25 | 3.49 | -7 |
| Australia | A\$3.45 | | 0.97 | 1.57 | -38 |
| Britain | £2.29 | 3.30 | 1.55 ² | 1.44 ² | -7 |
| Canada | C\$4.16 | 3.36 | | 1.24 | -5 |
| Czech Republic | Koruna 65.94 | 3.02 | 18.6 | | -15 |
| Egypt | Pound 13.0 | 2.34 | 3.67 | 5.57 | |
| Euro Area ³ | €3.42 | 4.38 | 1.04 ⁴ | 1.28 ⁴ | 24 |

Hint: *Markets for Managers*, Ch. 10.3

* Purchasing Power Parity; local price divided by price in the United States

¹ Average of New York, Chicago, Atlanta and San Francisco

² Dollars per pound

³ Weighted average of prices in euro area

⁴ Dollars per euro

Source: “Big Mac Index”, *The Economist*, February 4th 2012¹¹

Question 10.3

Complete Exercise 6 of “Josko Joras (B)”, December 2012

Hint: *Markets for Managers*, Ch. 10.2.

+ Discussion Question 10b

Is the Eurozone an optimal currency area?

Hint: *Markets for Managers*, Ch. 10.4.

+ Discussion Question 10c

¹¹ See <http://www.economist.com/node/13055650>

What is the Big Mac Index? Explain briefly why the price of Big Macs might be a useful way to make inferences about the value of a currency.

+ Discussion Question 10d

If you were asked to predict a currency crisis what key indicators would you look for? How does an understanding of past currency crises help us to predict future ones?

Session 4

Question 7.1

What are the three main sources of government revenue?

Hint: *Markets for Managers*, Ch. 7.1.

Question 7.2

As of April 2015, UK income tax applied at the following rates:

| | |
|----------------------------------|--------------------|
| Standard personal allowance (0%) | £0 - £10,600 |
| Basic rate (20%) | £10,601 - £31,785 |
| Higher rate (40%) | £31,786 - £150,000 |
| Additional rate (45%) | £150,000 + |

Complete the table below:

| Job | Salary | Tax obligation | Proportion of income paid in tax |
|----------------------------|-----------------------|----------------|----------------------------------|
| Bar staff | £12,000 ¹² | | |
| Trainee manager, McDonalds | £18,500 ¹³ | | |
| Recent graduate, | £33,200 ¹⁴ | | |

¹² <http://www.careerbuilder.co.uk/article/msn-312-job-search-britains-lowest-paying-jobs/>

¹³ <http://www.mcdonalds.co.uk/ukhome/whatmakesmcdonalds/questions/work-with-us/wages/what-is-the-average-salary-of-a-mcdonalds-restaurant-employee.html>

¹⁴ <http://www.escpeurope.eu/escp-europe-programmes/master-in-management/overview-master-in-management-escp-europe-business-school/master-in-management-mim-escp-europe-business-school/student-profiles-master-in-management-escp-europe-business-school/>

| | | | |
|-------------|---------------------|--|--|
| ESCP Europe | | | |
| CEO, HSBC | £7.4m ¹⁵ | | |

Question 7.3

An economics lecturer is invited to provide a day of teaching in Bulgaria, for a fee of £700. Although the flights will be paid for he will incur £65 of out of pocket travel expenses. Generally speaking, he feels that he needs to be able to earn £500 to compensate for being away from home overnight.

- Assuming that this income would incur a 40% tax rate, will he take the job?
- What would the tax rate need to be for him to take the job?
- How much tax revenue is generated in both cases?

+ Discussion Question 7c

Provide a real example of a country adopting a flat tax. What were their reasons for doing so? Was it effective?

Question 10.4

Consider “Argentina: What Happened Next”, January 2014

Label each of the different variables in the following formula for debt dynamics:

$$\Delta debt = d(r - g) - (T - G)$$

Question 10.5

Consider “Argentina: What Happened Next”, January 2014

Which of the following events that occurred in Argentina did not, all else equal, increase the debt burden?

- Russian default leads to an increase in interest rates
- 28% fall in exports to Brazil
- 13% cut in government salaries
- 8.7% fall in tax revenues
- Standard & Poor’s downgrade credit rating

¹⁵ <http://www.cityam.com/1415705309/which-ceos-european-bank-have-biggest-pay-checks-two-uk-banks-take-second-and-third-place>

Question 10.6

Use the debt-dynamics applet from *The Economist*¹⁶ to calculate gross general government debt as a % of GDP for Portugal in 2020 under the following conditions:

0.8% GDP growth, 1.5% budget surplus, 6.8% interest rate, 0.8% inflation.

¹⁶ “The maths behind the numbers” *The Economist*, November 9th 2011. See <http://www.economist.com/blogs/dailychart/2011/11/debt-dynamics-0>