

EXERCISE ANSWERS UNIT 14

UNIT 14



EXERCISE 14.1 A HOUSEHOLD'S BALANCE SHEET

Consider a family of two parents and two children who have a mortgage on their home. They have paid off half the mortgage. The family also owns a car and a portfolio of shares in companies. They spend their income on food, clothing, and private school fees, and have retirement savings held in a pension fund.

- 1. Which of these items would be on a balance sheet for the household?
- 2. Using the example of the bank's balance sheet in Figure 10.16 as a guide, construct an annual balance sheet for your hypothetical household. You may want to research the typical values for these items for a family of this type.

Introduction

The question trains students to work with balance sheets and links the concept to their own experience.

Answer

- 1. A balance sheet shows the stock of assets and liabilities measured at a point in time. Hence everything in the list above will be included except the flows of income and expenditure.
- 2. The balance sheet below is per year. Assume accumulated car depreciation is £2,000.

Assets (£)		Liabilities (£)	
Property		Long-term debt	
House (market value)	200,000	Mortgage (50%)	100,000
Car	17,000		
Total	217,000		
Less car depreciation	0		
Long-term investments			
Shares (market value)	5,000		
Retirement savings (market value)	5,000		
Total investments	10,000		
Total assets	225,000	Total liabilities	100,000
Net worth			125,000

Marking guidance



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The question is fairly free in terms of what items students come up with and good answers will show realistic liabilities and assets for a household. Good answers explain the balance sheet in words.

**Teaching ideas**

Students could first come up with examples for typical household liabilities and assets. Examples could be written on the board. In a second step, students in smaller groups should construct the balance sheet. Net worth should be compared and differences should be discussed.

**EXERCISE 14.2 HOUSING IN FRANCE AND GERMANY**

In France and Germany, it is difficult for a household to increase its borrowing based on an increase in the market value of the house. In addition, large down-payments (as a percentage of the house price) are required for house purchases.

1. On the basis of this information, how would you expect a rise in house prices in France or Germany to affect spending by households?
2. In the US or UK, loans are more easily available based on a rise in home equity and only a small down-payment is required. How would you expect your answer to question 1 to change when considering the US or UK?
3. What do you conclude about the role of the financial accelerator in France and Germany compared with the UK and the US?

Note: A December 2014 VoxEU article, 'Combating Eurozone deflation: QE for the people' (<https://tinyco.re/4854300>), tells you more about the influence of a change in house prices on spending in Europe and the US.

**Introduction**

This is a question on consumption and how it is linked to house prices and the ability of borrowing. The example used is Germany and France, which is then compared to the UK and US.

**Answer**

1. For house owners in France and Germany, an increase in house prices will have little effect on their spending, given that borrowing is not affected by the value of their properties. However, the increase in house prices increases the down payment required and households hoping to purchase a house will have to save more in order to be able to pay a deposit. This will depress autonomous consumption for those households. Refer to the VoxEU article for more details.
2. In the UK or US, house owners may increase their spending given that they experience a wealth effect and also can now borrow more.
3. The role of the financial accelerator is largely absent in France and Germany whereas it has an effect on consumption in the UK and US. This is because consumers may invest in properties and later use these assets to borrow. If there is a rapid decrease in house prices, the consumers' ability to borrow (and

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finance further investment) will be restricted. Combined with depressed demand for their products, they will be heavily affected by the depression.

**Marking guidance**

Good quality questions focus on intuition and the mechanisms at work. Students may also refer to the extra reading.

**Teaching ideas**

The sub-questions are fairly short and would therefore work well as think-pair-share exercise during large group teaching. A good discussion will require use of the suggested reading.

**EXERCISE 14.3 THE MULTIPLIER MODEL**

Consider the multiplier model discussed above.

1. Compare two economies, which differ only in their share of credit-constrained households but are identical otherwise. In which economy is the multiplier larger? Illustrate your answer using a diagram.
2. On the basis of your comparison of the two economies, would you expect the multiplier in an economy to vary over its business cycle?
3. Some economists estimated the size of the multiplier in the Great Depression to be equal to 1.8. Explain how the following characteristics of the US economy at the time could have affected its value:
  - a. the size of government (see Figure 14.1)
  - b. the fact that there were no unemployment benefits
  - c. the fact that the share of imports was small

**Introduction**

The question is based on the multiplier model. Within the model we analyse extensions and applications.

**Answer**

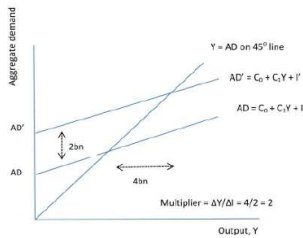
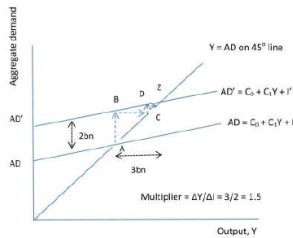
1. The consumption line will be steeper (and the multiplier larger) in the economy with the greater proportion of credit-constrained households (whose consumption largely varies with income, compared to households with credit access).

In the graph below, in the upper quadrant, we begin at A. We then assume that there is an increase in investment spending of 2bn and the aggregate demand schedule shifts upward from AD to AD'. This takes us initially from A to B. Demand now exceeds output and so output increases. This increase in output is also an increase in real income and so consumption begins to rise and so instead of staying at output expands to C (on the 45° line). Here again aggregate demand exceeds output at D and so output (and income) increase again. This followed by a further increase in consumption (as a result of the MPC), and we eventually converge to a new equilibrium at Z where income, output, and aggregate demand are all equal. Notice that the expansion in output that has occurred (the horizontal distance between A and Z) is 3bn.

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Compared with the original increase in investment (2bn) this yields a multiplier value of  $(3/2)$  or 1.5.

We repeat the process in the lower quadrant but notice that the AD curve is steeper (the MPC is higher). This means that the initial increase in spending induces a *larger* increase in consumption as output rises and this has a larger reinforcing effect on the disturbance to aggregate demand. We have omitted some of the arrows for the sake of clarity but we can clearly see that the horizontal distance between the initial and final equilibrium is larger than before (4bn rather than 3bn). Since the initial disturbance is still 2bn, the multiplier has the larger value of  $4/2 = 2$ .



2. In a recession, banks are more reluctant to provide loans. Households are thus more credit constrained and the multiplier is larger. On the other hand, in a boom banks tend to be more relaxed with lending, credit constraints are less severe, the multiplier is thus smaller.
3. Recall the multiplier (see the Einstein from Section 14.5):

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$$k = \left( \frac{1}{1 - c_1(1 - t) + m} \right)$$

At the beginning of the Great Depression, government spending and taxation was much smaller as a fraction of GDP than it is now. This would give rise to a larger multiplier.

Recall that marginal propensity to consume ( $MPC = C_1$ ) decreases with income; the relatively rich consume a smaller fraction of their income than the relatively poor, because they are willing to save a larger share of their income. Let's assume that unemployment benefits are a source of income. Hence, in an economy where a large share of unemployed workforce has no savings and few assets,  $C_1$  will be relatively larger without unemployment benefits (*ceteris paribus*). On the other hand, *ceteris paribus*,  $C_1$  will be relatively smaller with the benefits. Therefore, in this type of economy, no unemployment benefits imply relatively larger  $C_1$ , thus a relatively larger multiplier.

A small share of imports implies that most consumption expenditure is used on domestic goods. This increases the multiplier, because demand for domestic products and services decreased by relatively less than in a more open economy (where consumers could substitute to imported goods). In the formula, lower levels of  $m$  increase the multiplier effect.

It is useful to think of the tax rate,  $t$ , and the propensity to import,  $m$ , as 'leakages' from the circular flow of income. Remember: the larger the leakages, the smaller the multiplier and vice versa.

**Marking guidance**

A good answer shows confident knowledge of how the model works and how the concepts can be applied to historical developments (i.e. the Great Depression).

**Teaching ideas**

This question is quite comprehensive, and similar to an exam-type question instructors may want to set. This could be a good question for a take-home assignment on which feedback is given.

**EXERCISE 14.4 SPENDING CUTS IN A RECESSION**

Assume the government is initially in budget balance.

1. Does the government's budget balance improve, deteriorate, or remain unchanged if the government cuts its spending in a recession, *ceteris paribus*? To answer this question, use the example in Figure 14.11b. Assume the budget was in balance at point A. Once at B, the government cuts  $G$  in an attempt to improve its budget balance. Assume there are no unemployment benefits and a linear tax.
2. Evaluate the government's policy.

**Introduction**

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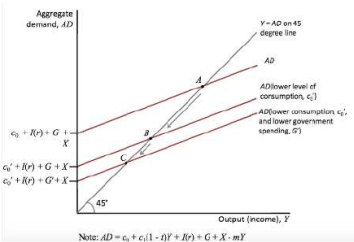
The exercise trains students to work with the Aggregate Demand model discussed in this chapter.

Answer

If we are in a situation like in Figure 14.11b (see below), begin by discussing the move from A to B. The budget balance deteriorates because of the operation of the automatic stabilizers. The government then cuts  $G$  in order to try to restore its budget balance. As the model shows, output falls further. The effect on the budget balance depends on the relative change in tax income to the change in government expenditure.

In spite of the fall in output from B to C, the budget balance does not deteriorate further.

Consider a fall in  $G$  and assume for simplicity that there are no unemployment benefits. The effect on the budget balance then depends on the fall in  $T$  caused by the fall in  $Y$  induced by the lower  $G$ . The decrease in  $G$  leads to a fall in  $Y$  by  $t$  times delta  $Y$  (the tax rate times the change in  $Y$ ), which is  $kt$  times delta  $G$ , where  $k$  is the multiplier and  $kt < 1$ . Therefore, the fall in  $T$  is less than the fall in  $G$  and the budget balance improves. This of course assumes a very simple tax structure and the absence of unemployment benefits.



Marking guidance

Students should clearly present the model, show the algebra or explain the logic clearly.

Teaching ideas

The exercise could be taught in a small group teaching session, where students come to the whiteboard and explain the model graph. The exercise could also be extended and instructors could ask students to apply the discussion to a specific historical episode.

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### Unit 5 Answers to exercises principles of economics

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**EXERCISE 14.5 METHODS TO ESTIMATE THE MULTIPLIER**

Consider the three methods discussed in this unit that have been used to estimate the size of the multiplier: the Mafia-related dismissals in Italy, the stimulus highway spending in the US, and wartime defence spending in the US.

Why do you think estimates of the size of the multiplier vary? Use the material in this unit to support your explanation.

**Introduction**

The exercise focuses on the way the multiplier is linked to the economic circumstances at the time and place of interest.

**Answer**

The principle reason is that the size of the multiplier will vary depending on the situation of the economy (as discussed in Exercise 14.3), and these three 'tests' were carried out in very different circumstances. For example, in a recession, a fiscal stimulus (such as highways spending) is likely to be more efficient than during a boom. This is because there is more spare capacity, which could be used. Indeed, the stimulus may even encourage private investment if confidence is very low. A similar stimulus when there is no spare capacity (as during a war, for example) is likely to have a much smaller multiplier effect. The increase in aggregate demand may simply cause prices to rise, with no effect on output.

Furthermore, the form of the stimulus differed in each of the cases: investing in highways is not the same as investing in wartime defence. Some stimuli may be more efficient than others e.g. might employ more people or disproportionately benefit those who may not need it as much (such as the relatively affluent). Multipliers will thus differ.

**Marking guidance**

The focus should be on the precision of the explanation and how well the student links the claims to the three real world cases. Credit should be given for use of the information in the readings associated with each case.

**Teaching ideas**

This can be either a longer essay-type question, where students are expected to do some extra research on the real-world cases, or used as a shorter intervention in a large classroom setting, where students could discuss this with their neighbours.



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**EXERCISE 14.6 CONTRIBUTIONS TO CHANGE IN REAL GROSS DOMESTIC PRODUCT OVER THE BUSINESS CYCLE**

In the table in Figure 13.8 we showed the contributions of the main components of expenditure ( $C$ ,  $I$ ,  $G$ , and  $X - M$ ) made to US GDP growth during the recession of 2009. We can use FRED to see whether these contributions changed during the recovery phase of the recession.

Go to the FRED website ([tinyco.re/8136544](https://tinyco.re/8136544)). Search for 'Contribution to GDP' using the search bar, and select these four annual series:

Contribution to percentage change in real gross domestic product:  
 Personal consumption expenditures  
 Contribution to percentage change in real gross domestic product:  
 Gross private domestic investment  
 Contribution to percentage change in real gross domestic product:  
 Government consumption expenditure and gross investment  
 Contributions to percentage change in real gross domestic product:  
 Net exports of goods and services

Click the 'Add to Graph' button to create a graph of the four series. Use the 'Add Data Series' option to add a series for the growth of real GDP.

1. Do the contributions to GDP add up approximately to the growth of GDP?

Now use the data you have downloaded to carry out the following tasks for the period from 2007 to 2014:

- Describe the contributions to US GDP growth in the recession (2008 Q1 to 2009 Q2) and in the recovery phase from 2009 Q3 of the business cycle. If you analyse the data using the FRED graph, you will see the recession shaded in the chart. Prepare a table like the one in Figure 13.8.
- What might explain the differences seen in the role of consumption and investment during the recession and recovery phases of the business cycle?
- From the contribution to GDP growth of government consumption and investment expenditure, what can you infer about the US government's fiscal policy during the crisis?

Note: To make sure you understand how these FRED graphs are created, you may want to extract the data into your spreadsheet and reproduce the series.

**Introduction**

This is a data question based on the components of GDP. It exposes students to work with raw data, which is an important part of CORE

**Answer**

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Data	Real GDP Growth 1930-2014
Source	US. Bureau of Economic Analysis (2016). Real Gross Domestic Product [A191RL1Q225SBEA]. Retrieved from FRED. Federal Reserve Bank of St. Louis.
Link	<a href="https://research.stlouisfed.org/fred2/series/A191RL1Q225SBEA/">https://research.stlouisfed.org/fred2/series/A191RL1Q225SBEA/</a>
Instructions (if appropriate)	
Notes (if applicable)	
Publish/download	21/01/2016
Load data	
X-axis variable	Years

Data	Contributions to Percent Change in Real GDP: Gross Private Domestic Investment 1930-2014
Source	US. Bureau of Economic Analysis (2016). Contributions to percent change in real gross domestic product: Gross private domestic investment [A006RY2A224NBEA]. Retrieved from FRED. Federal Reserve Bank of St. Louis.
Link	<a href="https://research.stlouisfed.org/fred2/series/A006RY2A224NBEA/">https://research.stlouisfed.org/fred2/series/A006RY2A224NBEA/</a>
Instructions (if appropriate)	
Notes (if applicable)	
Publish/download	21/01/2016
Load data	
X-axis variable	Years

Data	Contributions to Percent Change in Real GDP: Personal Consumption Expenditures 1930-2014
Source	US. Bureau of Economic Analysis (2016). Contributions to percent change in real gross domestic product: Personal consumption expenditures [DPCERY2A224NBEA]. Retrieved from FRED. Federal Reserve Bank of St. Louis.
Link	<a href="https://research.stlouisfed.org/fred2/series/DPCERY2A224NBEA/">https://research.stlouisfed.org/fred2/series/DPCERY2A224NBEA/</a>
Instructions (if appropriate)	
Notes (if applicable)	
Publish/download	21/01/2016
Load data	
X-axis variable	Years

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Date	Contributions to Percent Change in Real GDP: Net Exports of Goods And Services 1930-2014
Source	US. Bureau of Economic Analysis (2016). Contributions to percent change in real gross domestic product: Net exports of goods and services [A019RY2A224NBEA]. Retrieved from FRED. Federal Reserve Bank of St. Louis.
Link	<a href="https://research.stlouisfed.org/fred2/series/A019RY2A224NBEA/">https://research.stlouisfed.org/fred2/series/A019RY2A224NBEA/</a>
Instructions (if appropriate)	
Notes (if applicable)	
Publication/download date	21/01/2016
X-axis variable	Years

Date	Contributions to Percent Change in Real GDP: Government Consumption Expenditures And Gross Investment 1930-2014
Source	US. Bureau of Economic Analysis (2016). Contributions to percent change in real gross domestic product: Government consumption expenditures and gross investment [A822RY2A224NBEA]. Retrieved from FRED. Federal Reserve Bank of St. Louis.
Link	<a href="https://research.stlouisfed.org/fred2/series/A822RY2A224NBEA/">https://research.stlouisfed.org/fred2/series/A822RY2A224NBEA/</a>
Instructions (if appropriate)	
Notes (if applicable)	
Publication/download date	21/01/2016
X-axis variable	Years

Year	Net Exports	Consumption	Investment	Government Expenditures	Growth Rate
2006-01-01	-0.08	2.04	0.42	0.29	2.77
2007-01-01	0.96	1.90	-0.81	0.30	1.88
2008-01-01	1.11	-0.23	-1.71	0.64	-0.33
2009-01-01	1.10	-1.08	-3.63	0.64	-2.48
2010-01-01	-0.43	1.32	1.08	0.02	2.65
2011-01-01	-0.02	1.85	0.73	-0.85	1.88
2012-01-01	0.08	1.01	1.82	-0.38	2.25
2013-01-01	0.29	1.00	0.86	-0.86	1.77
2014-01-01	-0.15	1.06	0.73	0.16	2.41
2015-01-01	-0.71	2.16	0.82	0.32	2.88
2016-01-01	-0.13	1.88	-0.28	0.14	1.83

Table: Annual Data. Contributions to GDP















