CHAPTER 9

Building the Aggregate Expenditures Model

This chapter is the first of two chapters that develops the first macroeconomic model of the economy presented in the textbook—the ***aggregate expenditures model.*** In the chapter you will find out what determines the demand for real domestic output (real GDP) and how an economy achieves an equilibrium level of output (and employment).

A major section of the chapter describes the largest component of aggregate expenditures—***consumption.*** An examination of consumption, however, also entails a study of saving because saving is simply the part of disposable income that is not consumed. This section develops consumption and saving schedules and describes their main characteristics. Other key concepts are also presented: average propensities to consume (APC), and save (APS), marginal propensities to consume (MPC), and save (MPS), and the nonincome determinants of consumption and saving.

Investment is the subject of the next section of the chapter. The purchase of capital goods depends on the rate of return that business firms expect to earn from an investment and on the real rate of interest they have to pay for the use of money. Because firms are anxious to make profitable investments and to avoid unprofitable ones, they undertake all investments that have an expected rate of return greater than (or equal to) the real rate of interest and do not undertake an investment when the expected rate of return is less than the real interest rate. This relationship between the real interest rate and the level of investment spending is an inverse one: the lower the interest rate, the greater the investment spending. It is illustrated by an ***investment demand curve*** which is downsloping. This curve can also be shifted by five factors that can change the expected rate of return on investment.

The investment decisions of individual firms can be aggregated to construct an ***investment schedule,*** which shows the amount firms collectively intend to invest at each possible level of GDP. A simplifying assumption is made that investment is independent of GDP. Unlike the consumption schedule, which is relatively stable over time, the investment schedule is unstable for several reasons and often shifts upward or downward.

The next section of the chapter explains the ***equilibrium GDP*** with tables and graphs by using the expenditures–output approach. It is important for you to know, given the consumption (or saving) schedule and the level of investment expenditures, what real GDP will tend to be produced and why this will be the real GDP that will be produced.

The final section discusses two other features of the aggregate expenditures model. ***Saving*** and ***actual investment*** are always equal because they are defined in exactly the same way: the output of the economy minus its consumption. But saving and planned investment are not equal by definition. Saving and ***planned investment*** are equal only when real GDP is at its equilibrium level. When real GDP is *not* at its equilibrium level, saving and planned investment are *not* equal and there are ***unplanned changes in inventories.*** Equilibrium real GDP is achieved when saving and *planned* investment are equal and there are no unplanned changes in inventories.

The tools and ideas explained in Chapter 9 are important because they are used to form a complete picture of how aggregate expenditures determine the level of GDP, which will be discussed in the next chapter.

■ CHECKLIST

When you have studied this chapter you should be able to

☐ Describe the simplifying assumptions in this chapter for building the aggregate expenditures model and two implications of those assumptions.
☐ State what determines the amount of goods and services produced and the level of employment in the aggregate expenditures model.
☐ Explain how consumption and saving are related to disposable income.
☐ Draw a graph to illustrate the relationship among consumption, saving, and disposable income.
☐ Construct a hypothetical consumption schedule.
☐ Construct a hypothetical saving schedule, and identify the level of break-even income.
☐ Compute the four propensities (APC, APS, MPC, and MPS) when given the necessary data.
☐ State the relationship between the APC and the APS as income increases.
☐ Demonstrate that the MPC is the slope of the consumption schedule and the MPS is the slope of the saving schedule.
☐ Explain how each of the four nonincome determinants of consumption and saving affects the consumption and saving schedules.
☐ Explain the difference between a change in the amount consumed (or saved) and a change in the consumption (or saving) schedule.

☐ Explain how the expected rate of return affects investment decisions.
☐ Describe the influence of the real interest rate on an investment decision.
☐ Draw a graph of an investment demand curve for the business sector and explain what it shows.
☐ Explain how each of the five noninterest determinants of investment will shift the investment demand curve.
☐ Construct an investment schedule showing the relationship between intended investment and GDP.
☐ Give three reasons why investment spending tends to be unstable.
☐ When given the necessary data, use a table or graph to find equilibrium GDP using the aggregate expenditures–domestic output approach.
☐ Explain why the economy will tend to produce its equilibrium GDP rather than some smaller or larger level real GDP.
☐ Describe the relationship between saving and planned investment at equilibrium GDP.
☐ State the conditions for inventories at equilibrium GDP.

■ CHAPTER OUTLINE

1. To simplify the explanation of the ***aggregate expenditures model,*** four assumptions are made: The economy is "closed," government neither spends nor collects taxes, all saving is personal saving, and depreciation and net foreign factor income earned in the United States are zero.

a. These assumptions have two important implications: Only consumption and investment are considered in the model, and output or income measures (GDP, NI, PI, DI) are treated as equal to each other.
b. Aggregate output and employment in the aggregate expenditures model are directly related to the level of total or aggregate expenditures in the economy.
c. An assumption is made that the economy has excess production capacity and unemployed labor. The price level is constant.

2. ***Consumption*** is the largest component of aggregate expenditures. ***Saving*** is disposable income not spent for consumer goods.

a. Disposable income is the most important determinant of both consumption and saving; the relationships between income and consumption and between income and saving are both direct (positive) ones.
b. The ***consumption schedule*** shows the amounts that households plan to spend for consumer goods at various levels of income, given a price level.
c. The ***saving schedule*** indicates the amounts households plan to save at different income levels, given a price level.
d. The average propensity to consume (**APC**) and the average propensity to save (**APS**) and the marginal propensity to consume (**MPC**) and the marginal propensity to (**MPS**) save can be computed from the consumption and saving schedules.
(1) The APC and the APS are, respectively, the percentages of income spent for consumption and saved, and their sum is equal to 1.
(2) The MPC and the MPS are, respectively, the percentages of additional income spent for consumption and saved; and their sum is equal to 1.
(3) The MPC is the slope of the consumption schedule, and the MPS is the slope of the saving schedule when the two schedules are graphed.
e. In addition to income, there are several other important determinants of consumption and saving. Changes in these nonincome determinants will cause the consumption and saving schedules to change. The four nonincome determinants are wealth, expectations, taxation, and household debt.
f. Three other considerations need to be noted:
(1) A change in the amount consumed (or saved) is not the same thing as a change in the consumption (or saving) schedule.
(2) Changes in wealth, expectations, and household debt shift consumption and saving schedules in opposite directions; taxation shifts them in the same direction.
(3) Both consumption and saving schedules tend to be stable over time.

3. The two important determinants of the level of ***investment spending*** in the economy are the expected rate of return (r) from the purchase of additional capital goods and the real rate of interest (i).

a. The ***expected rate of return*** is directly related to the net profits (revenues less operating costs) that are expected to result from an investment. It is the marginal benefit of investment for a business.
b. The ***real rate of interest*** is the price paid for the use of money. It is the marginal cost of investment for a business. When the expected real rate of return is greater (less) than the real rate of interest, a business will (will not) invest because the investment will be profitable (unprofitable).
c. For this reason, the lower (higher) the real rate of interest, the greater (smaller) will be the level of investment spending in the economy; the ***investment demand curve*** (schedule) indicates this inverse relationship between the real rate of interest and the level of spending for capital goods. The amount of investment by the business sector is determined at the point where the marginal benefit of investment (r) equals the marginal cost (i).
d. There are at least five noninterest determinants of investment demand, and a change in any of these determinants will shift the investment demand curve (schedule). These determinants include acquisition, maintenance, and operating costs; business taxes; technological change; the stock of capital on hand; and expectations.
e. The investment decisions of businesses in an economy can be aggregated to form an investment schedule that shows the amounts business firms collectively plan to invest at each possible level of GDP. A simpli-

fying assumption is made that investment is independent of disposable income or real GDP.

f. Investment is inherently unstable, and the investment schedule will shift up or down. Factors that contribute to this variability are the durability of capital goods, the variability of expectations, and the irregularity of innovations.

4. Employing the aggregate expenditures—domestic output approach, the ***equilibrium GDP*** is the real GDP at which

a. aggregate expenditures (consumption plus planned investment) equal the real GDP, or

b. in graphical terms, the aggregate expenditures curve crosses the 45 degree line. The slope of this curve is equal to the marginal propensity to consume.

5. The ***investment schedule*** indicates what investors plan to do. Actual investment consists of both planned and unplanned investment (unplanned changes in inventories).

a. At above equilibrium levels of GDP, ***saving*** is greater than ***planned investment,*** and there will be unintended or unplanned investment through increases in inventories. At below equilibrium levels of GDP, planned investment is greater than saving, and there will be unintended or unplanned disinvestment through a decrease in inventories.

b. Equilibrium is achieved when planned investment equals saving and there are no ***unplanned changes in inventories.***

■ HINTS AND TIPS

1. An important graph in the chapter is the ***consumption schedule*** (see Key Graph 9–2). Know how to interpret it. There are two lines on the graph. The 45 degree reference line shows all points where disposable income equals consumption (there is no saving). The consumption schedule line shows the total amount of disposal income spent on consumption at each and every income level. Where the two lines *intersect,* all disposable income is spent (consumed). At all income levels to the right of the intersection, the consumption line lies below the 45 degree line, and not all disposable income is spent (there is saving). To the left of the intersection, the consumption line lies above the 45 degree line and consumption exceeds disposable income (there is dissaving).

2. Always remember that ***marginal propensities*** sum to 1 (MPC + MPS = 1). The same is true for average propensities (APC + APS = 1). Thus, if you know the value of one marginal propensity (e.g., MPC), you can always figure out the value of the other one (e.g., 1 − MPC = MPS).

3. Do not confuse the ***investment demand curve*** for the business sector with the ***investment schedule*** for an economy. The former shows the inverse relationship between the real interest rate and the amount of total investment by the business sector, whereas the latter shows the collective investment intentions of business firms at each possible level of disposable income or real GDP.

4. The distinction between ***actual investment, planned investment,*** and ***unplanned investment*** is important for determining the equilibrium level of real GDP. Actual investment includes both planned and unplanned investment. At any level of real GDP, saving and actual investment will always be equal by definition, but saving and planned investment may not equal real GDP because there may be unplanned investment (unplanned changes in inventories). Only at the equilibrium level of real GDP will saving and planned investment be equal (there is no unplanned investment).

■ IMPORTANT TERMS

consumption schedule
saving schedule
break-even income
average propensity to consume (APC)
average propensity to save (APS)
marginal propensity to consume (MPC)
marginal propensity to save (MPS)
expected rate of return
real rate of interest
investment demand curve
investment schedule
planned investment
aggregate expenditures schedule
equilibrium GDP
45 degree line
leakage
injection
unplanned changes in inventories
actual investment

SELF-TEST

■ FILL-IN QUESTIONS

1. Four simplifying assumptions used throughout most of the chapter are that the economy is (an open, a closed) _____ economy, the economy is (private, public) _____, all saving is (personal, business) _____ saving, and depreciation and net foreign factor income earned in the United States are (positive, negative, zero).

2. Two implications of these assumptions are

a. Aggregate spending = _____ + _____

b. GDP = _____ = _____ = _____

3. Another assumption is that the economy has (no, excess) _____ production capacity, (fully employed, unemployed) _____ labor, and a (constant, variable) _____ price level.

4. In an economy, domestic output and employment depend on the level of (marginal, aggregate) _____ expenditures. The most important determinant of consumption and saving is the economy's disposable (production, income) _____ .

5. The consumption schedule shows the various amounts that households plan to (save, consume) _____ at various levels of disposable income, while the saving schedule shows the various amounts that households plan to _____.

6. Both consumption and saving are (directly, indirectly) _____ related to the level of disposable income. At lower levels of disposable income, households tend to spend a (smaller, larger) _____ proportion of this income and save a _____ proportion, but at higher levels of disposable income, they tend to spend a (smaller, larger) _____ proportion of this income and save a _____ proportion. At the break-even income, consumption is (greater than, less than, equal to) _____ disposable income.

7. As disposable income falls, the average propensity to consume (APC) will (rise, fall) _____ and the average propensity to save (APS) will _____. The sum of APC and APS is equal to (0, 1) _____.

8. The marginal propensity to consume (MPC) is the change in (consumption, saving, income) _____ divided by the change in _____; it is the numerical value of the slope of the _____ schedule.

9. The marginal propensity to save (MPS) is the change in (consumption, saving, income) _____ divided by the change in _____; it is the numerical value of the slope of the _____ schedule. The sum of MPC and MPS is equal to (0, 1) _____.

10. The most important determinants of consumption spending, other than the level of income, are

a. _____

b. _____

c. _____

d. _____

11. A change in the consumption (or saving) schedule means that the amount consumers plan to consume (save) will (be the same, change) _____ at every level of income, but a change in the amount consumed (or saved) means that the level of income has (stayed the same, changed) _____ and that consumers will (not change, change) _____ their planned consumption (saving) as a result.

12. Investment is defined as spending for additional (consumer, capital) _____ goods, and the total amount of investment spending in the economy depends on the expected rate of (interest, return) _____ and the real rate of _____. A business firm will increase its amount of investment if the expected rate of (interest, return) _____ on this investment is (greater, less) _____ than the real rate of (interest, return) _____ it must pay for the use of money.

13. The relationship between the rate of interest and the total amount of investment in the economy is (direct, inverse) _____ and is shown in the investment (supply, demand) _____ curve. This curve shows that if the real rate of interest rises, the quantity of investment will (increase, decrease) _____, but if the real rate of interest falls, the quantity of investment will _____.

14. Five noninterest determinants of investment demand are

a. _____

b. _____

c. _____

d. _____

e. _____

15. A schedule showing the amounts business firms collectively intend to invest at each possible level of GDP is the (consumption, investment) _____ schedule. For this schedule, it is assumed that planned (saving, investment) _____ is independent of the level of current disposable income or real output.

16. The consumption schedule and the saving schedule tend to be (stable, unstable) _____, while investment demand tends to be _____.

17. The demand for new capital goods tends to be unstable because of the (durability, nondurability) _____ of capital goods, the (regularity, irregularity) _____ of innovation, and the (stability, variability) _____ of current and expected profits.

18. Assuming a private and closed economy, the equilibrium level of real GDP is determined where aggregate expenditures are (greater than, less than, equal to) _____ real domestic output, consumption plus investment is _____ real domestic output, and the aggregate expenditures schedule or curve

intersects the (90 degree, 45 degree) _____ line.

19. A leakage is (an addition to, a withdrawal from) _____ the income expenditure stream, whereas an injection is _____ the income expenditure stream. In this chapter, an example of a leakage is (investment, saving) _____, and an example of an injection is _____.

20. At every level of GDP, saving is equal to (planned, actual) _____ investment.

a. If aggregate expenditures are greater than the real domestic output, saving is (greater than, less than, equal to) _____ planned investment, there are unplanned (increases, decreases) _____ in inventories, and real GDP will (rise, fall) _____.

b. If aggregate expenditures are less than the real domestic output, saving is (greater than, less than, equal to) _____ planned investment, there are unplanned (increases, decreases) _____ in inventories, and real GDP will (rise, fall) _____.

c. If aggregate expenditures are equal to the real domestic output, saving is (greater than, less than, equal to) _____ planned investment, unplanned changes in inventories are (negative, positive, zero) _____, and real GDP will neither rise nor fall.

■ TRUE–FALSE QUESTIONS

Circle T if the statement is true, F if it is false.

1. The basic premise of the aggregate expenditures model is that the amount of goods and services produced and the level of employment depend directly on the level of total spending. **T F**

2. In the aggregate expenditures model of the economy, the price level is assumed to be constant. **T F**

3. Consumption equals disposable income plus saving. **T F**

4. The most significant determinant of the level of consumer spending is disposable income. **T F**

5. Historical data suggest that the level of consumption expenditures is directly related to the level of disposable income. **T F**

6. Consumption rises and saving falls when disposable income increases. **T F**

7. Empirical data suggest that households tend to spend a similar proportion of a small disposable income than of a larger disposable income. **T F**

8. The break-even income is the income level at which business begins to make a profit. **T F**

9. The average propensity to save is equal to the level of saving divided by the level of consumption. **T F**

10. The marginal propensity to consume is the change in consumption divided by the change in income. **T F**

11. The slope of the saving schedule is equal to the average propensity to save. **T F**

12. An increase in wealth will increase the consumption schedule (shift the consumption curve upward). **T F**

13. An increase in the taxes paid by consumers will decrease both the amount they spend for consumption and the amount they save. **T F**

14. Both the consumption schedule and the saving schedule tend to be relatively stable over time. **T F**

15. The real interest rate is the nominal interest rate minus the rate of inflation. **T F**

16. A business firm will purchase additional capital goods if the real rate of interest it must pay exceeds the expected rate of return from the investment. **T F**

17. An increase in the stock of capital goods on hand will decrease the investment-demand curve. **T F**

18. The relationship between the rate of interest and the level of investment spending is called the investment schedule. **T F**

19. The investment schedule tends to be relatively stable over time. **T F**

20. The irregularity of innovations and the variability of business profits contribute to the instability of investment expenditures. **T F**

21. The equilibrium level of GDP is that GDP level corresponding to the intersection of the aggregate expenditures schedule with the 45 degree line. **T F**

22. Saving is an injection into and investment is a leakage from the income expenditures stream. **T F**

23. The investment schedule is a schedule of planned investment rather than a schedule of actual investment. **T F**

24. Saving and actual investment are always equal. **T F**

25. Saving at any level of real GDP equals planned investment plus unplanned changes in inventories. **T F**

■ MULTIPLE-CHOICE QUESTIONS

Circle the letter that corresponds to the best answer.

1. If the economy is closed, government neither taxes nor spends, all saving done in the economy is personal saving, and depreciation and net foreign factor income earned in the United States are zero, then
(a) gross domestic product equals personal consumption expenditures
(b) gross domestic product equals personal saving
(c) gross domestic product equals disposable income
(d) disposable income equals personal consumption expenditures

2. The level of output and employment in the economy depends
(a) directly on the level of total expenditures
(b) inversely on the quantity of resources available
(c) inversely on the level of disposable income
(d) directly on the rate of interest

3. In the aggregate expenditures model, saving equals
(a) investment plus consumption
(b) investment minus consumption
(c) disposable income minus consumption
(d) disposable income plus consumption

4. As disposable income decreases, *ceteris paribus,*
(a) both consumption and saving increase
(b) consumption increases and saving decreases
(c) consumption decreases and saving increases
(d) both consumption and saving decrease

5. Households tend to spend a larger portion of
(a) a small disposable income than a large disposable income
(b) a large disposable income than a small disposable income
(c) their saving than their disposable income when the rate of return is low
(d) their disposable income on saving when the rate of return is high

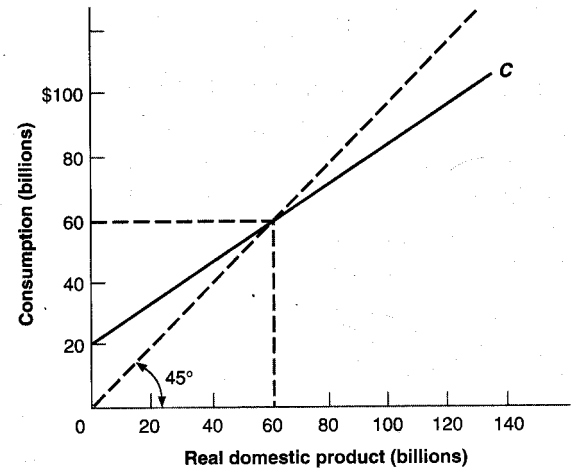
6. If consumption spending increases from $358 to $367 billion when disposable income increases from $412 to $427 billion, it can be concluded that the marginal propensity to consume is
(a) 0.4
(b) 0.6
(c) 0.8
(d) 0.9

7. If disposable income is $375 billion when the average propensity to consume is 0.8, it can be concluded that
(a) the marginal propensity to consume is also 0.8
(b) consumption is $325 billion
(c) saving is $75 billion
(d) the marginal propensity to save is 0.2

8. As the disposable income of the economy increases
(a) both the APC and the APS rise
(b) the APC rises and the APS falls
(c) the APC falls and the APS rises
(d) both the APC and the APS fall

9. The slope of the consumption schedule or line for a given economy is the
(a) marginal propensity to consume
(b) average propensity to consume
(c) marginal propensity to save
(d) average propensity to save

Answer Questions 10 and 11 on the basis of the following diagram.



10. This diagram indicates that
(a) consumption decreases after the $60 billion level of GDP
(b) the marginal propensity to consume decreases after the $60 billion level of GDP
(c) consumption decreases as a percentage of GDP as GDP increases
(d) consumption increases as GDP decreases

11. If the relevant saving schedule were constructed, one would find that
(a) the marginal propensity to save is negative up to the $60 billion level of GDP
(b) the marginal propensity to save increases after the $60 billion level of GDP
(c) saving is zero at the $60 billion level of GDP
(d) saving is $20 billion at the $0 level of GDP

*Answer Questions 12, 13, and 14 on the basis of the following disposable income (**DI**) and consumption (**C**) schedules for a private, closed economy. All figures are in billions of dollars.*

DI	*C*
$ 0	$ 4
40	40
80	76
120	112
160	148
200	184

12. If plotted on a graph, the slope of the consumption schedule would be
(a) 0.6
(b) 0.7

(c) 0.8
(d) 0.9

13. At the $160 billion level of disposable income, the average propensity to save is
(a) 0.015
(b) 0.075
(c) 0.335
(d) 0.925

14. If consumption increases by $5 billion at each level of disposable income, then the marginal propensity to consume will
(a) change, but the average propensity to consume will not change
(b) change, and the average propensity to consume will change
(c) not change, but the average propensity to consume will change
(d) not change, and the average propensity to consume will not change

15. If the slope of a linear saving schedule decreases in a private, closed economy, then it can be concluded that the
(a) MPS has decreased
(b) MPC has decreased
(c) income has decreased
(d) income has increased

16. Which relationship is an inverse one?
(a) consumption spending and disposable income
(b) investment spending and the rate of interest
(c) saving and the rate of interest
(d) investment spending and gross domestic product

17. A decrease in the level of investment spending would be a consequence of a decline in
(a) the rate of interest
(b) the level of wages paid
(c) business taxes
(d) expected future sales

18. Which would increase investment demand?
(a) an increase in business taxes
(b) an increase in the cost of acquiring capital goods
(c) a decrease in the rate of technological change
(d) a decrease in the stock of capital goods on hand

19. Which best explains the variability of investment?
(a) the predictable useful life of capital goods
(b) constancy or regularities in business innovations
(c) instabilities in the level of profits
(d) business pessimism about the future

20. On a graph, the equilibrium real GDP is found at the intersection of the 45 degree line and the
(a) consumption curve
(b) investment demand curve
(c) saving curve
(d) aggregate expenditures curve

21. Which is an injection of spending into the income expenditures stream?
(a) investment
(b) saving
(c) taxes
(d) imports

22. When the economy's real GDP exceeds its equilibrium real GDP,
(a) there is unplanned investment in the economy
(b) planned investment exceeds saving
(c) aggregate expenditures exceed the real domestic output
(d) leakages equal injections

23. If real GDP is $275 billion, consumption is $250 billion, and investment is $30 billion, real GDP
(a) will tend to remain constant
(b) will tend to increase
(c) will tend to decrease
(d) equals aggregate expenditures

24. If saving is greater than planned investment
(a) businesses will be motivated to increase their investments
(b) aggregate expenditures will be greater than the real domestic output
(c) real GDP will be greater than planned investment plus consumption
(d) saving will tend to increase

25. At the equilibrium level of GDP,
(a) actual investment is zero
(b) unplanned changes in inventories are zero
(c) saving is greater than planned investment
(d) saving is less than planned investment

■ PROBLEMS

1. The following table is a consumption schedule. Assume taxes and transfer payments are zero and that all saving is personal saving.

GDP	C	S	APC	APS
$1500	$1540	$_____	1.027	−.027
1600	1620	_____	1.013	−.013
1700	1700	_____	_____	_____
1800	1780	_____	.989	.011
1900	1860	_____	.979	.021
2000	1940	_____	_____	_____
2100	2020	_____	.962	.038
2200	2100	_____	_____	_____

a. Compute saving at each of the eight levels of GDP and the missing average propensities to consume and to save.

b. The break-even level of income (GDP) is $_____.

c. As GDP rises, the marginal propensity to consume remains constant. Between each two GDPs the MPC can be found by dividing $_____ by $_____, and is equal to _____.

d. The marginal propensity to save also remains constant when the GDP rises. Between each two GDPs the MPS is equal to $_____ divided by $_____, or to _____.

e. Plot the consumption schedule, the saving schedule, and the 45 degree line on the graph below.

(1) The numerical value of the slope of the consumption schedule is _____, and the term that is used to describe it is the _____.

(2) If the relevant saving schedule were constructed, the numerical value of the slope of the saving schedule would be _____, and the term that is used to describe it would be the _____.

2. Indicate in the space to the right of each of the following events whether the event will tend to increase (+) or decrease (−) the saving schedule.

a. Development of consumer expectations that prices will be higher in the future _____

b. Gradual shrinkage in the quantity of real assets owned by consumers _____

c. Increase in the volume of consumer indebtedness _____

d. Growing belief that disposable income will be lower in the future _____

e. Expectations that there will be a current shortage of consumer goods _____

f. Rise in the actual level of disposable income _____

g. An increase in the financial assets owned by consumers _____

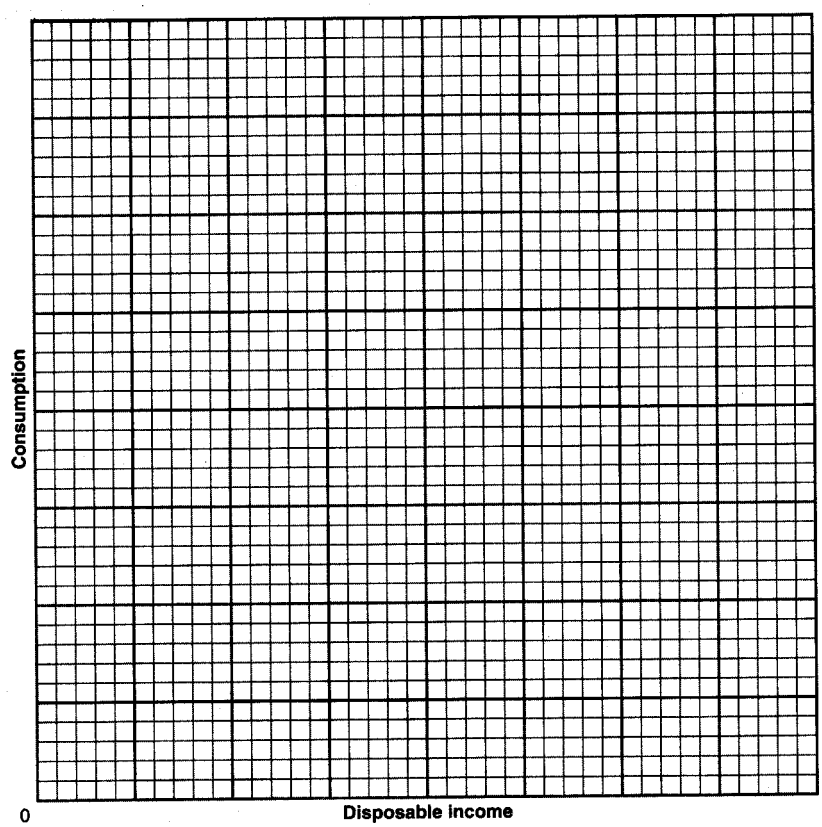
h. Development of a belief by consumers that the Federal government can and will prevent recessions in the future _____

3. The following schedule has eight different expected rates of return, and the dollar amounts of the investment projects expected to have each of these return rates.

Expected rate of return	Investment projects (billions)
18%	$ 0
16	10
14	20
12	30
10	40
8	50
6	60
4	70

a. If the real rate of interest in the economy were 18%, business firms would plan to spend $_____ billion for investment, but if the real interest rate were 16%, they would plan to spend $_____ for investment.

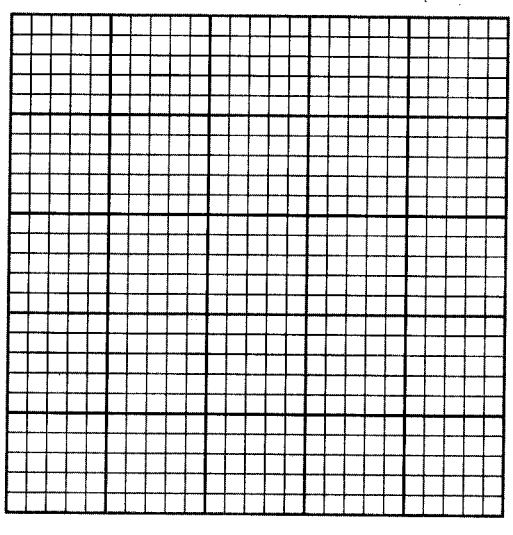
b. Should the real interest rate be 14%, they would still wish to make the investments they were willing to make at real interest rates of 18% and 16%, they would plan to spend an additional $_____ billion for investment,



and their total investment would be $_____ billion.
c. If the real rate of interest were 12%, they would make all the investments they had planned to make at higher real interest rates plus an additional $_____ billion, and their total investment spending would be $_____ billion.
d. Complete the following table by computing the amount of planned investment at the four remaining real interest rates.

Real rate of interest	Amount of investment (billions)
18%	$ 0
16	10
14	30
12	60
10	_____
8	_____
6	_____
4	_____

e. Graph the schedule you completed on the following graph. Plot the real rate of interest on the vertical axis and the amount of investment planned at each real rate of interest on the horizontal axis.



f. Both the graph and the table show that the relationship between the real rate of interest and the amount of investment spending in the economy is _____. This means that when the real rate of interest
(1) increases, investment will (increase, decrease) _____.
(2) decreases, investment will _____.
g. It also means that should we wish to
(1) increase investment, we would need to _____ the real rate of interest.
(2) decrease investment, we would have to _____ the real rate of interest.
h. This graph (or table) is the _____ _____ curve.

4. Indicate in the space to the right of the following events whether the event would tend to increase (+) or decrease (−) investment expenditures.

a. Rising stock market prices _____
b. Development of expectations by business executives that business taxes will be higher in the future _____
c. Step-up in the rates at which new products and new production processes are being introduced _____
d. Business belief that wage rates may be lower in the future and labor and capital are complementary resources _____
e. An expectation of a recession _____
f. A belief that business is "too good" and the economy is due for a period of "slow" consumer demand _____
g. Rising costs in the construction industry _____
h. A rapid increase in the size of the economy's population _____
i. A recent period of a high level of investment spending, which has resulted in productive capacity in excess of the current demand for goods and services _____

5. Following are two schedules showing several GDPs and the level of investment spending (*I*) at each GDP. (All figures are in billions of dollars.)

Schedule number 1		*Schedule number 2*	
GDP	***I***	**GDP**	***I***
$1850	$90	$1850	$ 75
1900	90	1900	80
1950	90	1950	85
2000	90	2000	90
2050	90	2050	95
2100	90	2100	100
2150	95	2150	105

a. Each schedule is an _____ schedule.
b. When such a schedule is drawn up, it is assumed that the real rate of interest is _____.
c. In schedule
(1) number 1, GDP and *I* are (unrelated, directly related) _____.
(2) number 2, GDP and *I* are _____.
d. Should the real rate of interest rise, investment spending at each GDP would (increase, decrease) _____ and the curve relating GDP and investment spending would shift (upward, downward) _____.

■ SHORT ANSWER AND ESSAY QUESTIONS

1. What are the simplifying assumptions used in this chapter, and what are the two implications of these assumptions?

2. What assumptions are made in this chapter about production capacity, unemployment, and the price level?

3. What is the most important determinant of consumer spending and personal saving? What is the relationship between consumer spending and personal saving?

4. Use a graph to illustrate the historical relationship between consumption and disposable income in the U.S. economy. Explain why the slope of the consumption line will be less than the 45 degree reference line.

5. Describe the relationship between consumption and disposable income, called the consumption schedule, and the one between saving and disposable income, known as the saving schedule.

6. Define the two average propensities and the two marginal propensities.

7. Explain briefly how the average propensity to consume and the average propensity to save vary as disposable income varies. Why do APC and APS behave this way? What happens to consumption and saving as disposable income varies?

8. Why do the sum of the APC and the APS and the sum of the MPC and the MPS always equal exactly 1?

9. What is the relationship between MPC and MPS and the consumption schedule and saving schedule?

10. Explain briefly and explicitly *how* changes in the four nonincome determinants will affect the consumption schedule and the saving schedule and *why* such changes will affect consumption and saving in the way you have indicated.

11. Explain the marginal cost and marginal benefit of an investment decision. How is the marginal cost and the marginal benefit of investment measured?

12. Draw an investment demand curve. Use it to explain why investment spending tends to rise when the real rate of interest falls, and vice versa.

13. Identify and explain how five noninterest determinants of investment spending can increase or decrease the amount of investment. Illustrate the changes with a graph.

14. What is the difference between an investment demand curve and an investment schedule?

15. What assumption is made about the relationship between investment and disposable income? Is this assumption a reasonable one?

16. Why does the level of investment spending tend to be highly unstable?

17. Explain why the amount consumers spend and the amount investors spend matter to the performance of the economy.

18. Why is the equilibrium level of real GDP that level of real GDP at which domestic output equals aggregate expenditures? What will cause real GDP to rise if it is below this level, and what will cause it to fall if it is above this level?

19. Explain what is meant by a leakage and by an injection. Which leakage and which injection are considered in this chapter? Why is the equilibrium real GDP the real GDP at which the leakages equal the injections?

20. Why is it important to distinguish between planned and actual investment in explaining how a private, closed economy achieves its equilibrium level of real GDP?