GLOBAL EDITION

Principles of Microeconomics

THIRTEENTH EDITION

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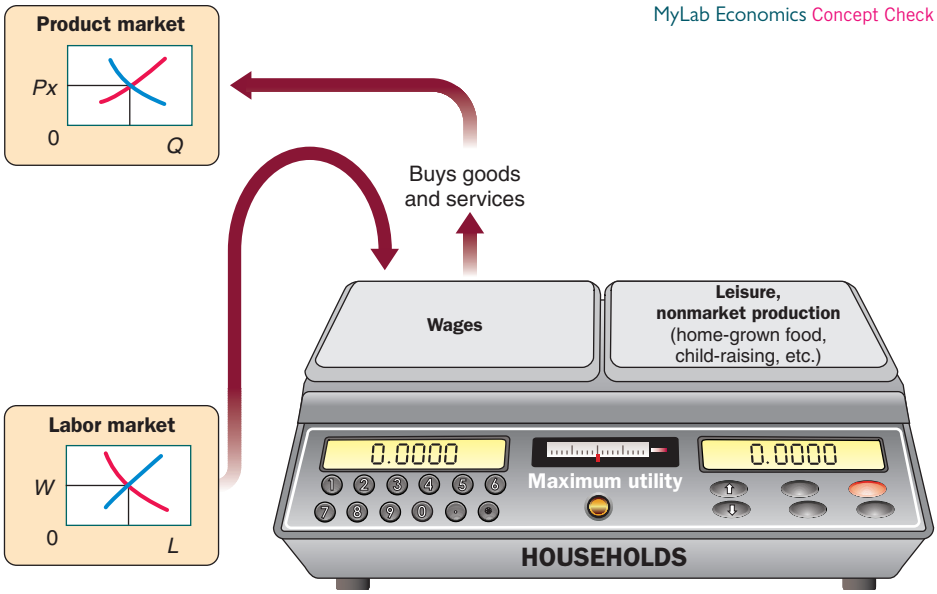
FIGURE 6.6
The Trade-Off Facing Households
The decision to enter the workforce involves a trade-off between wages (and the goods and services that wages will buy) on the one hand and leisure and the value of nonmarket production on the other hand.



MyLab Economics Concept Check

Conditions in the labor market determine the budget constraints and final opportunity sets that households face. The availability of jobs and these job wage rates determine the final combinations of goods and services that a household can afford. The final choice within these constraints depends on the unique tastes and preferences of each household.

Income and Substitution Effects of a Wage Change MyLab Economics Concept Check

labor supply curve A graph that illustrates the amount of labor that households want to supply at each given wage rate.

A **labor supply curve** shows the quantity of labor supplied at different wage rates. The shape of the labor supply curve depends on how households react to changes in the wage rate.

How would we expect individuals to react to a possible increase in their hourly wages? First, an increase in wages makes them better off. If they work the same number of hours—that is, if they supply the same amount of labor—they will earn higher incomes and be able to buy more goods and services. They can also buy more leisure. If leisure is a normal good—that is, a good for which demand increases as income increases—an increase in income will lead to a higher demand for leisure and a lower labor supply. This is the *income effect of a wage increase*.

However, there is also a potential *substitution effect of a wage increase*. A higher wage rate means that leisure is more expensive. If you think of the wage rate as the price of leisure, each individual hour of leisure consumed at a higher wage costs more in forgone wages. As a result, we would expect households to substitute other goods for leisure. This means working more, or a lower quantity demanded of leisure and a higher quantity supplied of labor.

Note that in the labor market, the income and substitution effects work in *opposite* directions when leisure is a normal good. The income effect of a wage increase implies buying more leisure and working less; the substitution effect implies buying less leisure and working more. Whether households will supply more labor overall or less labor overall when wages rise depends on the relative strength of both the income and the substitution effects.

If the substitution effect is greater than the income effect, the wage increase will increase labor supply. This suggests that the labor supply curve slopes upward, or has a positive slope, like the one in Figure 6.7(a). If the income effect outweighs the substitution effect, however, a higher wage will lead to added consumption of leisure and labor supply will decrease. This implies that the labor supply curve "bends back," as the one in Figure 6.7(b) does.

During the early years of the Industrial Revolution in late eighteenth-century Great Britain, the textile industry operated under what was called the "putting-out" system. Spinning and weaving were done in small cottages to supplement the family farm income—hence the term *cottage industry*. During that period, wages and household incomes rose considerably. Some economic historians claim that this higher income actually led many households to take more leisure and work fewer hours; the empirical evidence suggests a backward-bending labor supply curve.

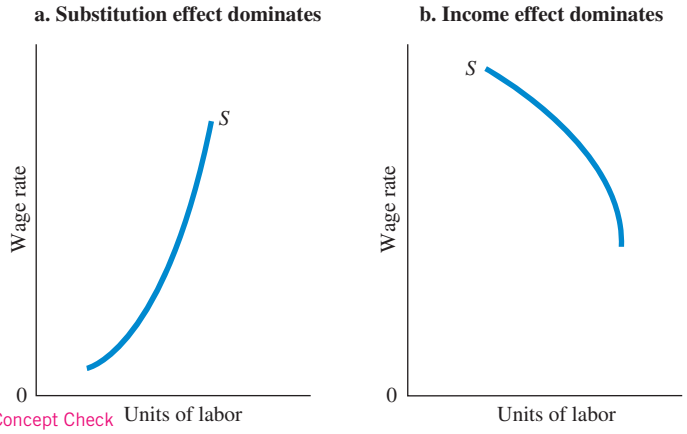


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FIGURE 6.7 Two Labor Supply Curves
When the substitution effect outweighs the income effect, the labor supply curve slopes upward (a). When the income effect outweighs the substitution effect, the result is a "backward-bending" labor supply curve: the labor supply curve slopes downward (b).

Just as income and substitution effects helped us understand household choices in output markets, they now help us understand household choices in input markets. The point here is simple: When leisure is added to the choice set, the line between input and output market decisions becomes blurred. In fact, households decide simultaneously how much of each good to consume and how much leisure to consume.

ECONOMICS IN PRACTICE

Part-Time Employment for Students

In spite of the financial support that many countries' governments offer their students, many undergraduates and graduates feel the need to take up part-time jobs for additional income. Since they tend to be inexperienced and relatively low-skilled or unskilled employees, employers pay minimum wages to students.

The minimum wage is mandated by governments to protect their employed population from poverty. It is set as a floor on hourly wages, below which employers are not allowed to hire. New Zealand was the first country in the world to implement a minimum wage in 1894, followed by Australia in 1896, Britain in 1909, and the United States in 1938.

As of 2018, New Zealand's minimum wage is among the highest in the world, and the government plans to further increase it. Depending on your age and experience, you may be paid the adult minimum wage, the starting-out minimum wage, or the training minimum wage. The adult full-time minimum wage is expected to be increased from NZ$16.5 an hour to NZ$20 an hour by 2021. During the same period, the starting-out and training wage rates are expected to increase from NZ$13.2 an hour to NZ$15.7 an hour.

Theoretically, on the demand side, employers would either hire fewer workers or reduce their weekly hours. The increased wage should encourage existing employees to work for longer hours or encourage them out of voluntary unemployment. But when it comes to students who work part-time, how would these changes in minimum wage rates impact their labor supply decision? The increased hourly pay would tempt students to work longer hours only if any hike in their expenditure outweighs the rise in pay. Yet, students would not be interested in working for longer hours if they end up earning higher real income, i.e., after accounting for inflation.

A recent study by Westpac Bank estimates that by 2021, the change in the minimum wage will affect a quarter of New Zealand's workforce, mostly part-time employees. Since the aim of the government is to raise living standards, it has indexed minimum wage hikes at a rate higher than inflation. Thus, the net effect is a rise in real income of part-time minimum wage earners, which is estimated to reduce the hours of 8,500 part-time employees, mostly students. The study estimates that this would raise unemployment by 0.2 percent.[1]

CRITICAL THINKING

1. Why do labor unions insist that governments and employers index wages against inflation?

[1]Michael Gordon, 2018. "Raising the Bar - The Impact of Minimum Wage Hikes," Westpac Banking Corporation–New Zealand, April 12.

Saving and Borrowing: Present versus Future Consumption MyLab Economics Concept Check

So far, in considering how households make decisions we have talked about only the current period—the allocation of current income among alternative uses and the work/leisure choice *today*. Households can also use present income to finance future spending—they can *save*—or use future income to finance present spending—they can *borrow*.

When a household decides to save, it is using current income to finance future consumption. Individuals put money into a pension plan while they are young, and use the earnings from those plans when they are older and perhaps no longer working. Most people cannot finance large purchases—a house or condominium, for example—out of current income and savings. They almost always borrow money and sign a mortgage. When a household borrows, it is in essence financing a current purchase with future income. It pays back the loan out of future income. Saving and borrowing move income over different time periods in one's life.

Even in simple economies such as the two-person desert-island economy of Colleen and Bill (see Chapter 2); people must make decisions about *present versus future consumption*. Colleen and Bill could produce goods for today's consumption by hunting and gathering; consume leisure by sleeping on the beach, or work on projects to enhance future consumption opportunities. Building a house or a boat that will last many years is trading present consumption for future consumption. As with all of the other choices we have examined in this chapter, the broad principle will be to look at marginal utilities and prices. How much do individuals and households value having something now versus waiting for the future? How much do they gain by waiting?

When a household saves, it usually puts the money into something that will generate income, for example savings accounts, money market funds, or corporate and government bonds. A number of these financial instruments are nearly risk free. When you put your money in any of these places, you are actually lending it out and the borrower pays you a fee for its use. This fee usually takes the form of *interest*.

Just as changes in wage rates affect household behavior in the labor market, changes in interest rates affect household behavior in capital markets. Higher interest rates mean that borrowing is more expensive—required monthly payments on a newly purchased house or car will be higher. Higher interest rates also mean that saving will earn a higher return: $1,000 deposited in a 5 percent savings account or bond yields $50 per year. If rates rise to 10 percent, the annual interest will rise to $100.

What impact do interest rates have on saving behavior? As with the effect of wage changes on labor supply, the effect of changes in interest rates on saving can best be understood in terms of income and substitution effects. Suppose, for example, that I have been saving for a number of years for retirement. Will an increase in interest rates lead to an increase or a decrease in my saving? The answer is not obvious. First, because each dollar saved will earn a higher rate of return, the "price" of spending today in terms of forgone future spending is higher. That is, each dollar that I spend today (instead of saving) costs me more in terms of future consumption because my saving will now earn a higher return. On this score, I will be led to *save more*, which is the substitution effect at work.

However, higher interest rates mean more than that. Higher interest rates mean that it will take less saving today to reach a specific target amount of savings tomorrow. I will not need to save as much for retirement or future consumption as I did before. One hundred dollars put into a savings account with 5 percent compound interest will double in 14 years. If interest was paid at a rate of 10 percent, I would have my $200 in just 7 years. Consequently, I may be led to save less, which is the income effect at work. Higher interest rates mean savers are better off; so higher interest rates may lead to less saving. The final impact of a change in interest rates on saving depends on the relative size of the income and substitution effects. Most empirical evidence indicates that saving tends to increase as the interest rate rises. In other words, the substitution effect is larger than the income effect.

financial capital market
The complex set of institutions in which suppliers of capital (households that save) and the demand for capital (firms wanting to invest) interact.

Saving and investment decisions involve a huge and complex set of institutions, the **financial capital market**, in which the suppliers of capital (households that save) and the demand for capital (firms that want to invest) interact. The amount of capital investment in an economy is constrained in the long run by that economy's saving rate. You can think of household *saving*

as the economy's supply of capital. When a firm borrows to finance a capital acquisition, it is almost as if households have supplied the capital in exchange for the fee we call interest. We explain capital markets in detail in Chapter 11.[6]

A Review: Households in Output and Input Markets

In probing the behavior of households in both input and output markets and examining the nature of constrained choice, we went behind the household demand curve using the simplifying assumption that income was fixed and given. Income, wealth, and prices set the limits, or *constraints*, within which households make their choices in output markets. Within those limits, households make their choices on the basis of personal tastes and preferences.

The notion of *utility* helps explain the process of choice. The law of *diminishing marginal utility* partly explains why people seem to spread their incomes over many different goods and services and why demand curves have a negative slope. Another important explanation behind the negative relationship between price and quantity demanded lies in *income effects* and *substitution effects*.

As we turned to input markets, we relaxed the assumption that income was fixed and given. In the labor market, households are forced to weigh the value of leisure against the value of goods and services that can be bought with wage income. Once again, we found household preferences for goods and leisure operating within a set of constraints imposed by the market. Households also face the problem of allocating income and consumption over more than one period of time. They can finance spending in the future with today's income by saving and earning interest, or they can spend tomorrow's income today by borrowing.

We now have a rough sketch of the factors that determine output demand and input supply. (You can review these in Figure II.1 on p. 141.) In the next three chapters, we turn to firm behavior and explore in detail the factors that affect output supply and input demand.

SUMMARY

6.1 HOUSEHOLD CHOICE IN OUTPUT MARKETS *p. 145*

1. Every household must make three basic decisions: (1) how much of each product, or output, to demand; (2) how much labor to supply; and (3) how much to spend today and how much to save for the future.
2. Income, wealth, and prices define a household *budget constraint*. The budget constraint separates those combinations of goods and services that are available from those that are not. All of the points below and to the left of a graph of a household budget constraint make up the *choice set*, or *opportunity set*.
3. It is best to think of the household choice problem as one of allocating income over a large number of goods and services. A change in the price of one good may change the entire allocation. Demand for some goods may rise, while demand for others may fall.
4. As long as a household faces a limited income, the real cost of any single good or service is the value of the next preferred *other* goods and services that could have been purchased with the same amount of spending.
5. Within the constraints of prices, income, and wealth, household decisions ultimately depend on preferences—likes, dislikes, and tastes.

6.2 THE BASIS OF CHOICE: UTILITY *p. 149*

6. Whether one item is preferable to another depends on how much *utility*, or satisfaction, it yields relative to its alternatives.
7. The *law of diminishing marginal utility* says that the more of any good we consume in a given period of time, the less satisfaction, or utility, we get out of each additional (or marginal) unit of that good.

[6]Here in Chapter 6, we are looking at a country as if it were isolated from the rest of the world. Often, however, capital investment is financed by funds loaned or provided by foreign citizens or governments. For example, in recent years, a substantial amount of foreign savings has found its way into the United States for the purchase of stocks, bonds, and other financial instruments. In part, these flows finance capital investment. Also, the United States and other countries that contribute funds to the World Bank and the International Monetary Fund have provided billions in outright grants and loans to help developing countries produce capital. For more information on these institutions, see Chapter 21.

8. Households allocate income among goods and services to maximize utility. This implies choosing activities that yield the highest marginal utility per dollar. In a two-good world, households will choose to equate the marginal utility per dollar spent on *X* with the marginal utility per dollar spent on *Y*. This is the *utility-maximizing rule*.

6.3 INCOME AND SUBSTITUTION EFFECTS *p. 154*

9. The fact that demand curves have a negative slope can be explained in two ways: (1) Marginal utility for all goods diminishes. (2) For most normal goods, both the *income and the substitution effects* of a price decline lead to more consumption of the good.

6.4 HOUSEHOLD CHOICE IN INPUT MARKETS *p. 156*

10. In the labor market, a trade-off exists between the value of the goods and services that can be bought in the market or produced at home and the value that one places on leisure. The opportunity cost of paid work is leisure and unpaid work. The wage rate is the price, or opportunity cost, of the benefits of unpaid work or leisure.

11. The income and substitution effects of a change in the wage rate work in opposite directions. Higher wages mean that (1) leisure is more expensive (likely response: people work *more*—substitution effect) and (2) more income is earned in a given number of hours, so some time may be spent on leisure (likely response: people work *less*—income effect).

12. In addition to deciding how to allocate its present income among goods and services, a household may also decide to save or borrow. When a household decides to save part of its current income, it is using current income to finance future spending. When a household borrows, it finances current purchases with future income.

13. An increase in interest rates has a positive effect on saving if the substitution effect dominates the income effect and a negative effect if the income effect dominates the substitution effect. Most empirical evidence shows that the substitution effect dominates here.

REVIEW TERMS AND CONCEPTS

budget constraint, *p. 145*

choice set *or* opportunity set, *p. 146*

diamond/water paradox, *p. 153*

financial capital market, *p. 160*

homogeneous products, *p. 143*

labor supply curve, *p. 158*

law of diminishing marginal utility, *p. 149*

marginal utility (MU), *p. 150*

perfect competition, *p. 143*

perfect knowledge, *p. 143*

real income, *p. 148*

total utility, *p. 150*

utility, *p. 149*

utility-maximizing rule, *p. 152*

PROBLEMS

All problems are available on MyLab Economics.

6.1 HOUSEHOLD CHOICE IN OUTPUT MARKETS

LEARNING OBJECTIVE: Explain where the budget constraint comes from and the role it plays in household demand.

1.1 Sketch the following budget constraints:

	P_X	P_Y	Income
a.	$ 100	$ 25	$ 5,000.00
b.	200	125	5,000.00
c.	50	400	2,000.00
d.	40	16	800.00
e.	3	2	12.00
f.	0.125	0.75	3.00
g.	0.75	0.125	3.00

1.2 On January 1, Professor Smith made a resolution to lose some weight and save some money. He decided that he would strictly budget $100 for lunches each month. For lunch, he has only two choices: the faculty club, where the price of a lunch is $5, and Alice's Restaurant, where the price of a lunch is $10. Every day that he does not eat lunch, he runs five miles.

a. Assuming that Professor Smith spends the $100 each month at either Alice's or the club, sketch his budget constraint. Show actual numbers on the axes.

b. Last month Professor Smith chose to eat at the club ten times and at Alice's five times. Does this choice fit within his budget constraint? Explain your answer.

c. Last month Alice ran a half-price lunch special all month. All lunches were reduced to $5. Show the effect on Professor Smith's budget constraint.

1.3 Assume that Diego has $400 per month to divide between playing paintball and playing golf. Assume that playing paintball costs $40 and playing golf costs $20. Suppose Diego plays paintball six times per month and plays golf eight times per month.

a. Draw Diego's budget constraint and show that he can afford six games of paintball and eight rounds of golf.

b. Assume that Diego has some unexpected expenses one month and can only spend $320 that month. Draw his new budget constraint.

c. As a result of the decrease in income, Diego decides to play 11 rounds of golf and two games of paintball. What kind of a good is paintball? What kind of a good is golf?

d. Assume Diego has his original $400 per month to spend and the price of paintball is still $40, but the price of golf doubles. Draw his new budget constraint.

1.4 Suppose the price of *X* is $5 and the price of *Y* is $10 and a hypothetical household has $500 to spend per month on goods *X* and *Y*.

a. Sketch the household budget constraint.

b. Assume that the household splits its income equally between *X* and *Y*. Show where the household ends up on the budget constraint.

c. Suppose the household income doubles to $1,000. Sketch the new budget constraint facing the household.

d. Suppose after the change the household spends $200 on *Y* and $800 on *X*. Does this imply that *X* is a normal or an inferior good? What about *Y*?

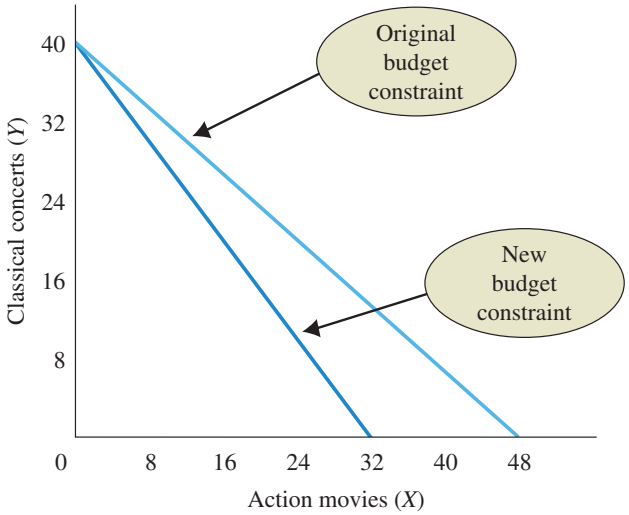
1.5 Kristine is a fan of both action movies and classical concerts. This month she has €480 to spend on the two activities. The original budget constraint is shown in the graph below. Let *X* represent action movies and *Y* represent classical concerts.

a. What is the equation of the original budget constraint?

b. What is the price of a ticket to an action movie? A classical concert?

c. Assume a price change occurs and Kristine now faces the new budget constraint. What is the equation of the new budget constraint?

d. With the new budget constraint, what is the price of a ticket to an action movie? A classical concert?



6.2 THE BASIS OF CHOICE: UTILITY

LEARNING OBJECTIVE: Understand how the utility maximizing rule works in household choice of products.

2.1 The following table gives a hypothetical total utility schedule for the Cookie Monster (CM):

# of Cookies Per Day	Total Utility per Day
0	0
1	100
2	200
3	275
4	325
5	350
6	360
7	360

Calculate the CM's marginal utility schedule. Draw a graph of total and marginal utility. If cookies cost the CM 5 cents each and CM had a good income, what is the maximum number of cookies he would most likely eat in a day?

2.2 **[Related to the *Economics in Practice* on *p. 153*]** At the beginning of 2012, a U.S. Department of Transportation regulation requiring airlines to include all mandatory taxes and fees in published airfares went into effect. Prior to this "full-fare advertising" rule, airlines were allowed to advertise tickets without disclosing these taxes and fees, resulting in advertised fares which could be less than half the actual price that was paid. Legislation proposed in the FAA Reauthorization Act of 2018 would rescind this full-fare advertising rule, again allowing airlines to initially quote low ticket prices, while disclosing mandatory taxes and fees separately before payment is required. How might the rescinding of this rule affect the demand for airline tickets? Explain if this rule would make these airline taxes and fees more salient or less salient for consumers? What are some other charges airlines impose that are not usually disclosed in published airfares, and how do they impact price salience for air travel?

2.3 For this problem, assume that Kendrick has $144 to spend on cigars and brandy each month and that both goods must be purchased whole (no fractional units). Cigars cost $6 each, and brandy costs $30 per bottle. Kendrick's preferences for cigars and brandy are summarized by the following information:

Cigars				Brandy			
No. per Month	*TU*	*MU*	*MU/S*	Bottles per Month	*TU*	*MU*	*MU/S*
1	28	__	__	1	150	__	__
2	46	__	__	2	270	__	__
3	62	__	__	3	360	__	__
4	74	__	__	4	420	__	__
5	80	__	__	5	450	__	__
6	84	__	__	6	470	__	__
7	86	__	__	7	480	__	__

a. Fill in the figures for marginal utility and marginal utility per dollar for both cigars and brandy.

b. Are these preferences consistent with the law of diminishing marginal utility? Explain briefly.