

## Chapter 02

# Labour Supply: Individual Attachment to the Labour Market

### Multiple Choice Questions

1. Consider figure 2.98 in the textbook. Given a wage increase from  $W_0$  to  $W_1$ , the distance between  $I'$  and  $I_1$  represents:

- A. The substitution effect
- B.** The income effect
- C. The net effect of both the substitution effect and the income effect
- D. The equilibrium choice for hours worked
- E. The equilibrium choice for leisure

*Blooms: Analyze*

*Difficulty: Medium*

*Learning Objective: 02-04 Explain, using diagrams, how an increase in the wage rate leads to offsetting income and substitution effects, and how this yields an ambiguous effect of wage changes on labour supply.*

*Topic: 02-11 Comparative Statics*

2. Empirical literature on labour supply patterns for married women tends to find all of the following, except:

- A. Labour market participation rate for married women was highest in the 35-44 age group.
- B. Women with children have lower rates of labour force participation.
- C. The higher the education level, the higher the labour force participation rate.
- D.** The higher the husband's income, the higher the labour force participation rate.
- E. Participation rate for all women is around 76 percent.

*Blooms: Analyze*

*Difficulty: Easy*

*Learning Objective: 02-05 Interpret the economic and other factors affecting a married woman's decision to work, and show how this decision can be captured within the income-leisure (labour supply) model.*

*Topic: 02-16 Participation, Married Women*

3. Which of the following statements concerning the elasticity of labour supply is false?

- A.** The overall labour supply for both sexes is likely to be downward sloping.
- B. It is generally higher for women than for men.
- C. The compensated elasticity (reflecting the substitution effect) tends to be higher in magnitude than the uncompensated, gross elasticity.
- D. The overall labour supply for both sexes is likely to be upward sloping
- E. The elasticity of labour supply with respect to income is negative.

*Blooms: Understand*

*Difficulty: Medium*

*Learning Objective: 02-05 Interpret the economic and other factors affecting a married woman's decision to work, and show how this decision can be captured within the income-leisure (labour supply) model.*

*Topic: 02-17 Evidence of the Elasticity of Labour Supply*

4. Which of the following statements is false?

- A. In periods of high unemployment, discouraged workers tend to withdraw from the labour force.
- B. In periods of low unemployment, discouraged workers tend to re-enter the labour force.
- C. In periods of high unemployment, added workers (particularly married women) tend to enter the labour force.
- D. Discouraged workers contribute to the phenomenon of hidden unemployment.
- E.** In periods of high unemployment, added workers may increase labour market participation rate.

*Blooms: Apply*

*Difficulty: Medium*

*Learning Objective: 02-05 Interpret the economic and other factors affecting a married woman's decision to work, and show how this decision can be captured within the income-leisure (labour supply) model.*

*Topic: 02-19 Added and Discouraged Worker Effects*

5. Suppose a worker is observed to be working but is forced to work fewer hours than she really wants to work. Which of the following statements is true?
- A. The indifference curve that she is on is tangent to the budget line.
  - B.** She is on an indifference curve which is lower than the one which is tangent to the budget line.
  - C. She is on an indifference curve which is higher than the one which is tangent to the budget line.
  - D. She is on an indifference curve which is lower than the one which passes through the point on the budget line corresponding to zero hours of work.
  - E. She is not on an indifference curve.

*Blooms: Analyze*

*Difficulty: Hard*

*Learning Objective: 02-02 Illustrate graphically how the income-leisure model reflects the trade-offs that consumers face in deciding whether and how much to work.*

*Learning Objective: 02-03 Distinguish theoretically between the work choices made by individuals and the economic opportunities that they choose from.*

*Topic: 02-10 The Consumer's Optimum*

6. The slope of the indifference curve at the lower left-hand corner of the income/leisure diagram, where zero hours are supplied to the labour market, is equal to:
- A. the prevailing market wage.
  - B.** the reservation wage.
  - C. the level of non-market income.
  - D. the slope of the budget constraint.
  - E. the difference between the market wage and the reservation wage

*Blooms: Remember*

*Difficulty: Easy*

*Learning Objective: 02-02 Illustrate graphically how the income-leisure model reflects the trade-offs that consumers face in deciding whether and how much to work.*

*Learning Objective: 02-03 Distinguish theoretically between the work choices made by individuals and the economic opportunities that they choose from.*

*Topic: 02-10 The Consumer's Optimum*

7. The reservation wage is defined as:

- A. the wage of the reservation clerk in the tourism industry.
- B. the maximum wage that an employer is willing to pay a worker for a given job.
- C.** the minimum wage that an employee is willing to accept for a given job.
- D. the equilibrium wage.
- E. the wage rate at which zero hours of labour is supplied by the workers.

*Blooms: Remember*

*Difficulty: Easy*

*Learning Objective: 02-03 Distinguish theoretically between the work choices made by individuals and the economic opportunities that they choose from.*

*Topic: 02-10 The Consumer's Optimum*

8. All of the following patterns of labour market behaviour can be analyzed with the income-leisure framework, except:

- A. moonlighting
- B. overtime work
- C. labour force participation
- D. underemployment
- E.** worksharing

*Blooms: Understand*

*Difficulty: Easy*

*Learning Objective: 02-05 Interpret the economic and other factors affecting a married woman's decision to work, and show how this decision can be captured within the income-leisure (labour supply) model.*

*Topic: 02-21 Moonlighting, Overtime, and Flexible Working Hours*

*Topic: 02-22 Moonlighting and Underemployment*

*Topic: 02-23 Overtime and Overemployment*

9. Consider the situation of a worker who is 'at the corner equilibrium' i.e., he or she is supplying zero hours of work and consuming 16 hours of leisure. In context of the income-leisure framework, which of the following statements is false?

- A. The indifference curve is steeper than the budget line.
- B. The marginal rate of substitution is greater than the wage rate in absolute value terms.
- C.** The indifference curve is flatter than the budget line.
- D. The rate at which the worker is willing to exchange income for leisure is not equal to the market rate for the exchange of income for leisure.
- E. Marginally, the worker values an hour of leisure more than she values an hour's worth of income.

*Blooms: Analyze*

*Difficulty: Hard*

*Learning Objective: 02-02 Illustrate graphically how the income-leisure model reflects the trade-offs that consumers face in deciding whether and how much to work.*

*Topic: 02-10 The Consumer's Optimum*

10. Which one of the following regarding to an individual's budget constraint is correct?

- A.** The slope of the budget constraint is determined by the market wage rate.
- B. The level of non-labour income determines the intercept of the budget constraint.
- C. The slope of the budget constraint is determined by the reservation wage rate
- D. The level of non-labour income is higher for a part-time worker than for a full-time worker
- E. The slope of the budget constraint is higher for a full-time worker than for a part-time worker.

*Blooms: Understand*

*Difficulty: Easy*

*Learning Objective: 02-02 Illustrate graphically how the income-leisure model reflects the trade-offs that consumers face in deciding whether and how much to work.*

*Learning Objective: 02-03 Distinguish theoretically between the work choices made by individuals and the economic opportunities that they choose from.*

*Topic: 02-09 Constraints*

11. In the neo-classical model of labour supply, which of the following is always true?
- A. If leisure is a normal good, a wage increase causes an increase in hours worked.
  - B. If leisure is a normal good, a wage increase causes a decrease in hours worked.
  - C. The income effect and the substitution effect work in the same direction.
  - D.** The substitution effect causes the worker to work more hours if wages increase.
  - E. The income effect causes the worker to work more hours if wage increase.

*Blooms: Analyze*

*Difficulty: Medium*

*Learning Objective: 02-04 Explain, using diagrams, how an increase in the wage rate leads to offsetting income and substitution effects, and how this yields an ambiguous effect of wage changes on labour supply.*

*Topic: 02-12 Hours of Work for Participants*

12. Over the backward bending portion of the labour supply curve,
- A. The substitution effect of a wage change dominates the income effect.
  - B. Leisure becomes an inferior good.
  - C. The wage elasticity of labour demand is inelastic.
  - D. There is no longer a trade-off between income and leisure.
  - E.** The wage elasticity of labour supply is negative.

*Blooms: Analyze*

*Difficulty: Medium*

*Learning Objective: 02-04 Explain, using diagrams, how an increase in the wage rate leads to offsetting income and substitution effects, and how this yields an ambiguous effect of wage changes on labour supply.*

*Topic: 02-14 Deriving the Individual Supply Curve of Labour*

13. For a worker who is deciding how many hours of labour to supply, all of the following are true except that:
- A. The marginal rate of substitution between income and leisure is equal to the wage rate.
  - B. The rate at which she is willing to exchange leisure for income equals the rate at which the market allows her to do it.
  - C. The slope of the budget line equals the slope of the indifference curve.
  - D.** The income effect of a wage change equals the substitution effect.
  - E. The worker cannot increase total utility by working more or fewer hours.

*Blooms: Analyze*

*Difficulty: Hard*

*Learning Objective: 02-04 Explain, using diagrams, how an increase in the wage rate leads to offsetting income and substitution effects, and how this yields an ambiguous effect of wage changes on labour supply.*

*Topic: 02-12 Hours of Work for Participants*

14. Which of the following statements most closely applies to the labour force participation decision?

- A.** It consists of the choice to allocate a portion of one's time to labour market activities as opposed to non-market activities.
- B. It occurs when one accepts an employment position and is working.
- C. It occurs when one is actively seeking work.
- D. It includes paid and unpaid work.
- E. It doesn't include unemployed workers.

*Blooms: Understand*

*Difficulty: Easy*

*Learning Objective: 02-01 Define the key elements of labour force measurement—employment, unemployment, labour force participation, and hours worked—and explain how they are measured and reported by Statistics Canada.*

*Topic: 02-05 Labour Force Participation*

15. The portion of the population that is surveyed as potential labour force participants consists of:

- A. the civilian non-institutional population.
- B. the unemployed plus the employed population.
- C.** the entire civilian population that is 15 years of age or older.
- D. the entire population excluding the Northern territories and those living on native reserves.
- E. the entire population of Canada.

*Blooms: Remember*

*Difficulty: Easy*

*Learning Objective: 02-01 Define the key elements of labour force measurement—employment, unemployment, labour force participation, and hours worked—and explain how they are measured and reported by Statistics Canada.*

*Topic: 02-05 Labour Force Participation*

16. Which of the following statements applies to the unemployed population?

- A. They are either unable to work, or are on strike.
- B. They are jobless.
- C.** They are jobless but are actively seeking work.
- D. They are working fewer hours than they would like to.
- E. They are working but are underpaid.

*Blooms: Understand*

*Difficulty: Easy*

*Learning Objective: 02-01 Define the key elements of labour force measurement—employment, unemployment, labour force participation, and hours worked—and explain how they are measured and reported by Statistics Canada.*

*Topic: 02-05 Labour Force Participation*

17. Which of the following groups of workers are considered to be part of the labour force?

- A. Full-time students
- B. The hard-core unemployed**
- C. Discouraged workers
- D. Members of the Canadian military
- E. Homemakers

*Blooms: Understand*

*Difficulty: Easy*

*Learning Objective: 02-01 Define the key elements of labour force measurement—employment, unemployment, labour force participation, and hours worked—and explain how they are measured and reported by Statistics Canada.*

*Topic: 02-05 Labour Force Participation*

18. How often is the Canadian census conducted by Statistics Canada?

- A. Every year
- B. Every two years
- C. Every five years**
- D. There is no regular cycle for taking the census.
- E. The census has been discontinued in favour of the Labour Force Survey.

*Blooms: Remember*

*Difficulty: Easy*

*Learning Objective: 02-01 Define the key elements of labour force measurement—employment, unemployment, labour force participation, and hours worked—and explain how they are measured and reported by Statistics Canada.*

*Topic: 02-05 Labour Force Participation*

19. Which among the following countries tends to have the lowest labour force participation rates?

- A. France**
- B. Canada
- C. United States
- D. United Kingdom
- E. There is no enduring ranking, as in some years one country will have higher rates, but in other years another country's rates will surpass them.

*Blooms: Remember*

*Difficulty: Easy*

*Learning Objective: 02-01 Define the key elements of labour force measurement—employment, unemployment, labour force participation, and hours worked—and explain how they are measured and reported by Statistics Canada.*

*Topic: 02-05 Labour Force Participation*



20. The equation for the unemployment rate (UR) is:

- A.  $UR = (\text{employed} - \text{unemployed}) / \text{unemployed}$
- B.  $UR = (\text{employed} - \text{unemployed}) / \text{labour force}$
- C.**  $UR = (\text{unemployed}) / \text{labour force}$
- D.  $UR = (\text{unemployed} / \text{employed})$
- E.  $UR = (\text{unemployed} / \text{population})$

*Blooms: Understand*

*Difficulty: Easy*

*Learning Objective: 02-01 Define the key elements of labour force measurement—employment, unemployment, labour force participation, and hours worked—and explain how they are measured and reported by Statistics Canada.*

*Topic: 02-05 Labour Force Participation*

21. The wage rate at which the individual worker is indifferent between participating and not participating in the labour force is called the:

- A. indifference wage.
- B. minimum wage.
- C.** reservation wage.
- D. utility wage.
- E. participating wage.

*Blooms: Remember*

*Difficulty: Easy*

*Learning Objective: 02-02 Illustrate graphically how the income-leisure model reflects the trade-offs that consumers face in deciding whether and how much to work.*

*Learning Objective: 02-03 Distinguish theoretically between the work choices made by individuals and the economic opportunities that they choose from.*

*Topic: 02-10 The Consumer's Optimum*

22. An increase in non-market income will have which of the following effects?

- A.** An upward shift in the income constraint
- B. A downward shift in the income constraint
- C. A clockwise rotation in the income constraint, making it steeper
- D. A counter-clockwise rotation in the income constraint, making it flatter
- E. There is no change to the income constraint.

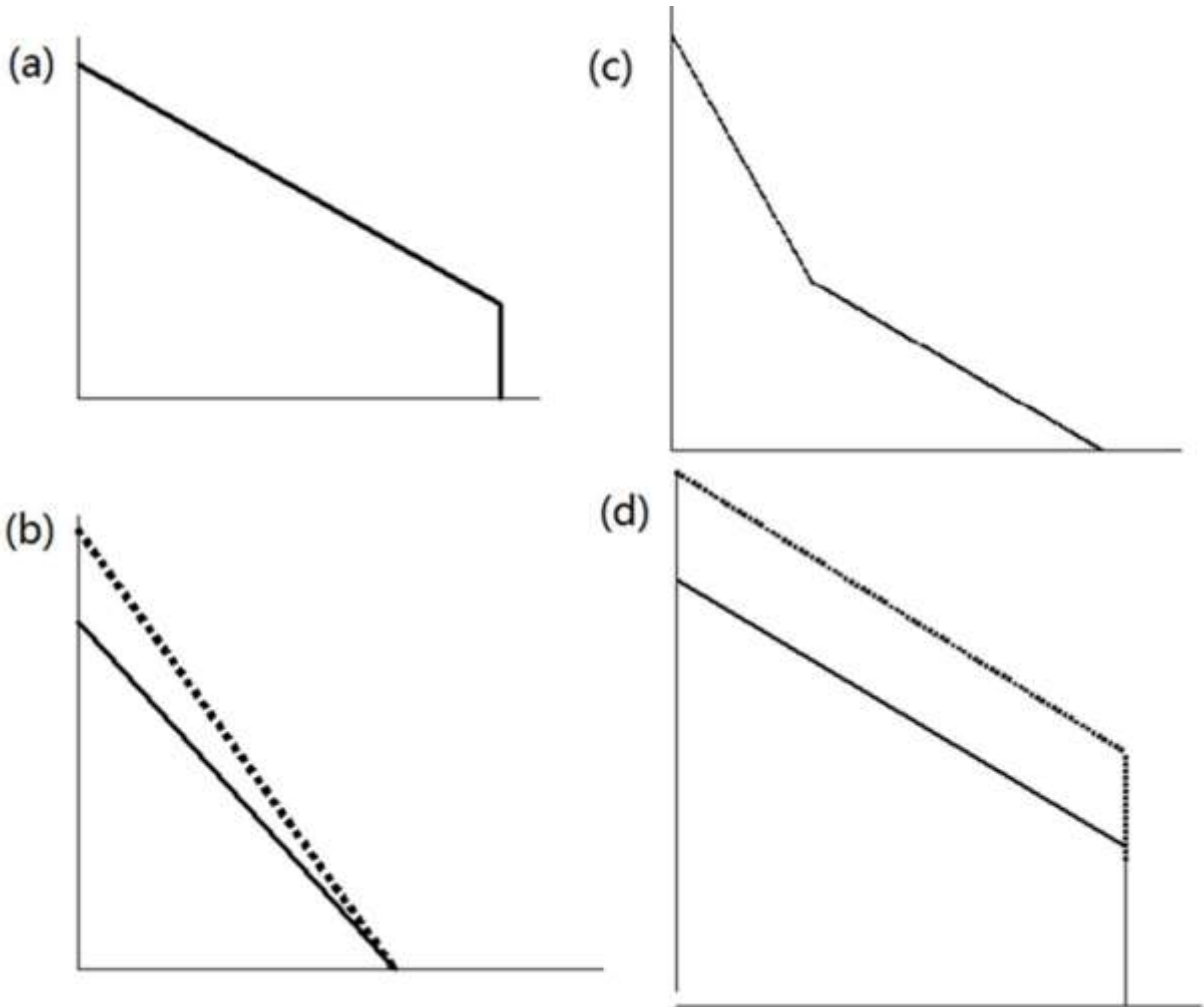
*Blooms: Analyze*

*Difficulty: Medium*

*Learning Objective: 02-04 Explain, using diagrams, how an increase in the wage rate leads to offsetting income and substitution effects, and how this yields an ambiguous effect of wage changes on labour supply.*

*Topic: 02-12 Hours of Work for Participants*

23. Which of the following diagrams corresponds to a budget line that involves overtime hours with a wage premium?



- A. (a)
- B. (b)
- C. (c)**
- D. (d)

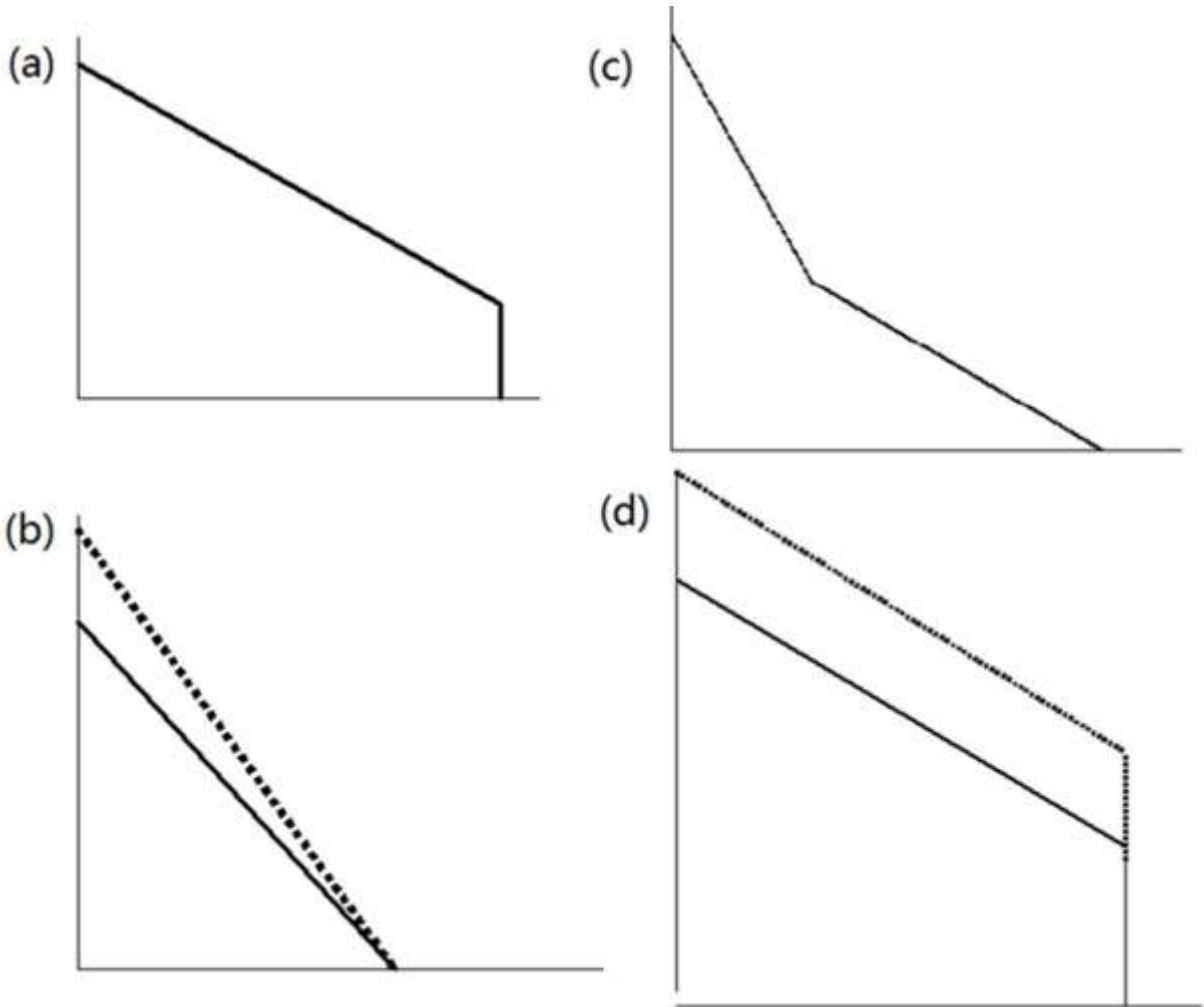
*Blooms: Analyze*

*Difficulty: Medium*

*Learning Objective: 02-05 Interpret the economic and other factors affecting a married woman's decision to work, and show how this decision can be captured within the income-leisure (labour supply) model.*

*Topic: 02-24 Overtime Premium versus Straight-Time Equivalent*

24. Which of the diagrams given below corresponds to a budget line with some nonlabour income?



- A.** (a)
- B. (b)
- C. (c)
- D. (d)

*Blooms: Analyze*

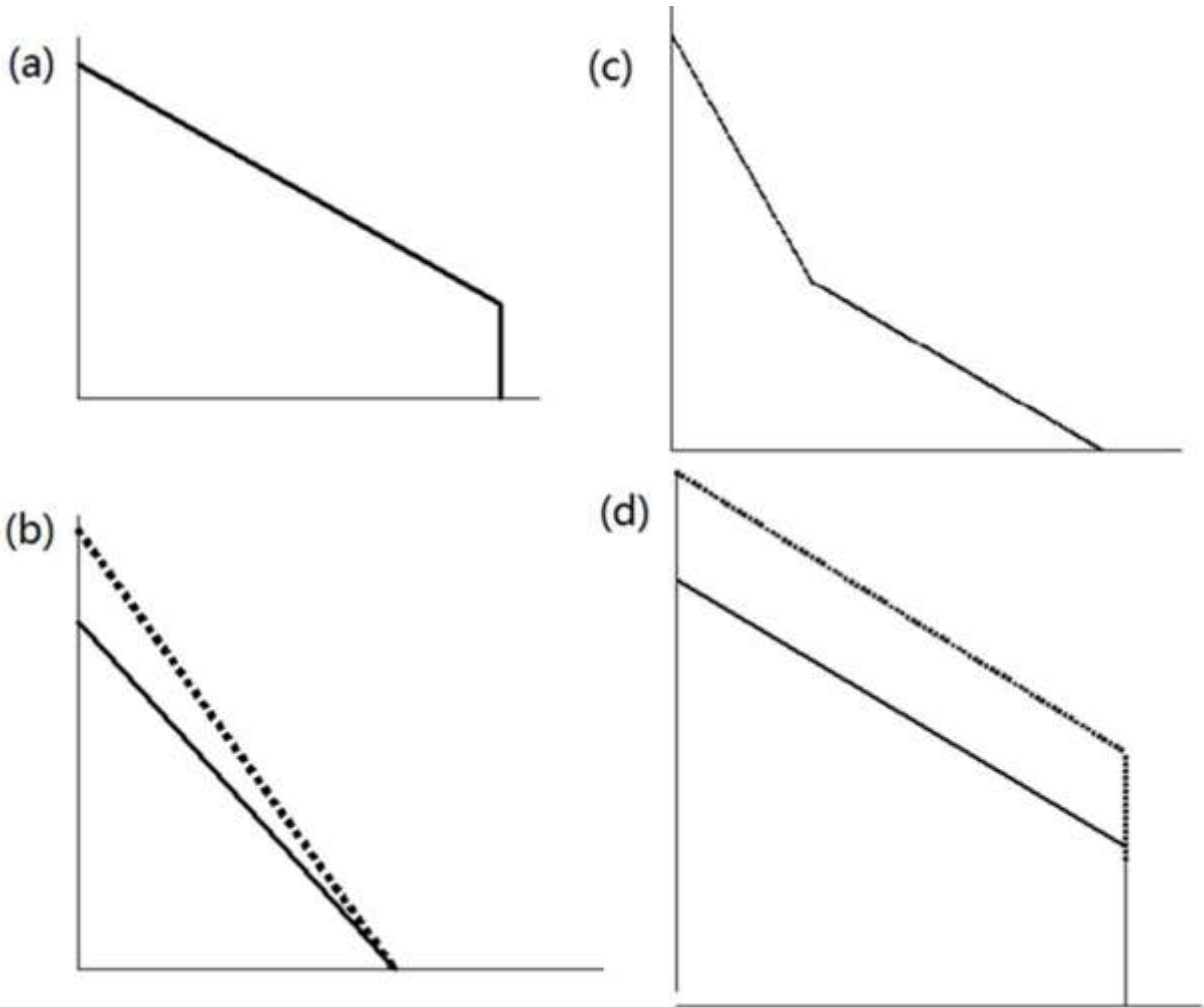
*Difficulty: Medium*

*Learning Objective: 02-02 Illustrate graphically how the income-leisure model reflects the trade-offs that consumers face in deciding whether and how much to work.*

*Learning Objective: 02-03 Distinguish theoretically between the work choices made by individuals and the economic opportunities that they choose from.*

*Topic: 02-09 Constraints*

25. Which of the diagrams given below corresponds to a budget line that involves a wage increase?



- A. (a)
- B. (b)**
- C. (c)
- D. (d)

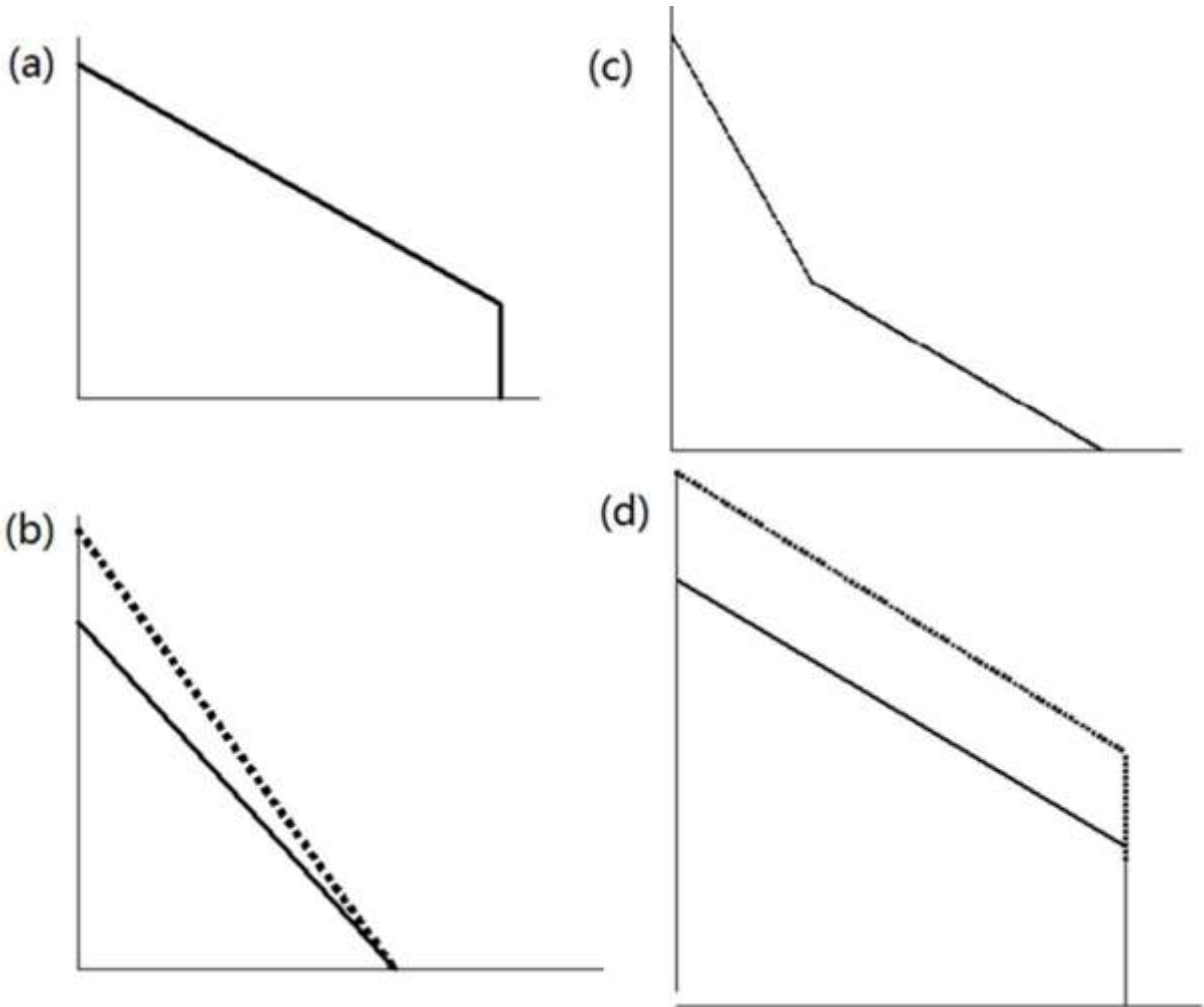
Blooms: Analyze

Difficulty: Medium

Learning Objective: 02-04 Explain, using diagrams, how an increase in the wage rate leads to offsetting income and substitution effects, and how this yields an ambiguous effect of wage changes on labour supply.

Topic: 02-11 Comparative Statics

26. Which of the diagrams given below corresponds to a budget line that involves an increase in nonlabour income?



- A. (a)
- B. (b)
- C. (c)
- D.** (d)

*Blooms: Analyze*

*Difficulty: Medium*

*Learning Objective: 02-04 Explain, using diagrams, how an increase in the wage rate leads to offsetting income and substitution effects, and how this yields an ambiguous effect of wage changes on labour supply.*

*Topic: 02-11 Comparative Statics*

27. What is indicated by a parallel shift of the budget line?
- A. The substitution effect
  - B. The total effect of a price change
  - C. A change in the preferences
  - D. The income effect of either a price change or an income change**

*Blooms: Analyze*

*Difficulty: Medium*

*Learning Objective: 02-04 Explain, using diagrams, how an increase in the wage rate leads to offsetting income and substitution effects, and how this yields an ambiguous effect of wage changes on labour supply.*

*Topic: 02-11 Comparative Statics*

28. Our income-leisure model suggests that moonlighting may be caused by:
- A. underemployment.**
  - B. unemployment.
  - C. overtime premium.
  - D. overemployment.

*Blooms: Apply*

*Difficulty: Medium*

*Learning Objective: 02-05 Interpret the economic and other factors affecting a married woman's decision to work, and show how this decision can be captured within the income-leisure (labour supply) model.*

*Topic: 02-22 Moonlighting and Underemployment*

29. Our income-leisure model suggests that a worker works overtime because:
- A. He is underemployed.
  - B. He is overemployed.**
  - C. If he is paid the straight-time equivalent, he will work more hours than over-time hours.
  - D. He earns over-time premium, which leads to a greater income effect than substitution effect.

*Blooms: Apply*

*Difficulty: Medium*

*Learning Objective: 02-05 Interpret the economic and other factors affecting a married woman's decision to work, and show how this decision can be captured within the income-leisure (labour supply) model.*

*Topic: 02-23 Overtime and Overemployment*

30. Figure 2.5 (b) in the text explains that:

- A. If an individual has a lower valuation of leisure, then the slope of his indifference curve is steeper.
- B. If an individual has a lower valuation of leisure, then the marginal rate of substitution of consumption over leisure is higher.
- C.** If an individual has a higher valuation of consumption, then the slope of his indifference curve is flatter.
- D. If an individual has a higher valuation of consumption, then the marginal rate of substitution of consumption over leisure is higher.

*Blooms: Analyze*

*Difficulty: Hard*

*Learning Objective: 02-02 Illustrate graphically how the income-leisure model reflects the trade-offs that consumers face in deciding whether and how much to work.*

*Learning Objective: 02-03 Distinguish theoretically between the work choices made by individuals and the economic opportunities that they choose from.*

*Topic: 02-08 Preferences*

## **Essay Questions**

31. A major and recurring theme of this textbook is the role of empirical research in labour economics. Conceptual models exist to analyze many labour market phenomena, but often the predictions that emerge are ambiguous. It is the objective of empirical research to test the validity of these predictions, and to try to sort out the multiple effects, which may work simultaneously. Such is the case for the theory of individual labour supply. Discuss the major conceptual implications of this model as well as the results from the empirical literature with correspond to them. The key is to link the predictions, which flow from the model, to the hypotheses that have been examined in the literature. In particular, your response can follow the following outline:

- Without getting bogged down in technical details (i.e., don't give a graph), explain intuitively the role of preferences and constraints in determining the optimal choice of hours worked.
- What is the impact on the choice of hours worked by an individual if the level of non-market income changes?
- Briefly describe the income effect and the substitution effect of a wage change, and relate this to the backward bending supply curve.
- A large number of econometric studies have estimated the shape of the labour supply curve, the sign of the wage elasticity of labour supply, and the income elasticity of labour supply. What have they found, generally speaking, regarding the slope of the supply curve? Does the slope differ between men and women?
- Figure 2.3 in the textbook shows what appears to be a slight negative empirical relationship across countries between per capita national income and male labour force participation rates, coupled with a slight positive empirical relationship across countries between per capita national income and female labour force participation rates. It might be possible to interpret these observed empirical patterns in terms of substitution effects and income effects.



The consumer choice model is used to analyze an individual's labour supply decision. Consumers' preferences are represented by the indifference curve of consumption and leisure. Consumers' constraints are given by their wage income from working hours as well as a time constraint which is a combination of working hours and leisure hours. Consumers' objective is to maximize their total utility from consumption by choose their preferred combination of income/consumption and leisure, as represented by their opportunity set or budget constraint. If this optimum occurs at zero hours of work, the individual does not participate. If optimal hours are positive, the individual participates, and the marginal rate of substitution between leisure and consumption equals to the wage rate.

The reservation wage is given by the marginal rate of substitution between leisure and consumption, at zero hours of work, which is a critical wage in determining the participation decision. For wage above the reservation wage, the consumer will choose to work. Otherwise, the consumer will not participate.

The budget constraint of a consumer is composed of two parts: non-labour income and wage income from total working hours. Therefore the change of non-labour income and wage rate will affect a consumer's labour supply decision. If non-labour income increases, there will be a pure income effect, an individual who choose not to participate before will remain out of participation and an individual who has positive working hours will reduce his/her working hours and enjoy more leisure time. The change of the wage rate, however, will have a more complex effect on one's labour supply decision. For those who do not participate before, if the increase of the wage rate exceeds the reservation wage, they will choose to participate and the working hours is determined by the marginal rate of substitution of consumption and leisure and the wage rate. For those individuals who already work positive hours, a wage increase will have both income and substitution effect. An income effect from wage increase will induce more leisure and less working hours and a substitution effect (from the increase of the opportunity cost of leisure) will induce more working hours and less leisure. The overall effect of labour supply depends on the relative magnitudes of the two. This result is important to explain why labour supply curve can be backward binding. For an individual, the initial small increase of the wage rate may have a dominated substitution effect, which leads him/her to work more hours, however, as wage grows higher and higher, income effect grows larger and may become greater in magnitudes than the substitution effect, therefore, the individual will eventually reduce his/her working hours.

The empirical evidences on the estimate of elasticity of labour supply have further proved the results from income-leisure model. The shape of the labour supply curve really depends on the relative magnitudes of the income elasticity and compensated (substitution effect) elasticity. For example, Hansson and Stuart (1985) have summarized that, the overall elasticity of labour supply from a wage change is 0.10, uncompensated elasticity is about 0.25 and income elasticity is about -0.15. However, male and female may have a different labour supply schedule. Generally, for males, the labour supply schedule is likely to be slightly backward bending. For females, the labour supply schedule is more strongly forward sloping, shown a strong positive substitution elasticity outweighing the weak negative income elasticity. This empirical evidence can also be used in explaining the fact that the male participation rate is generally declining with national income and women's participation rises with nation income (Figure 2.3). For countries that average income is higher, higher wage rate induced strong income elasticity for males and strong substitution elasticity for females, which leads to lower participation rate for males and higher participation rate for females.

*Blooms: Analyze*

*Blooms: Apply*

*Blooms: Understand*

*Difficulty: Medium*

*Learning Objective: 02-02 Illustrate graphically how the income-leisure model reflects the trade-offs that consumers face in deciding whether and how much to work.*

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*Topic: 02-07 Basic Income-Leisure Model*

*Topic: 02-08 Preferences*

*Topic: 02-09 Constraints*

*Topic: 02-10 The Consumer's Optimum*

*Topic: 02-11 Comparative Statics*

*Topic: 02-12 Hours of Work for Participants*

*Topic: 02-13 Participation*

*Topic: 02-14 Deriving the Individual Supply Curve of Labour*

*Topic: 02-15 Empirical Evidence*