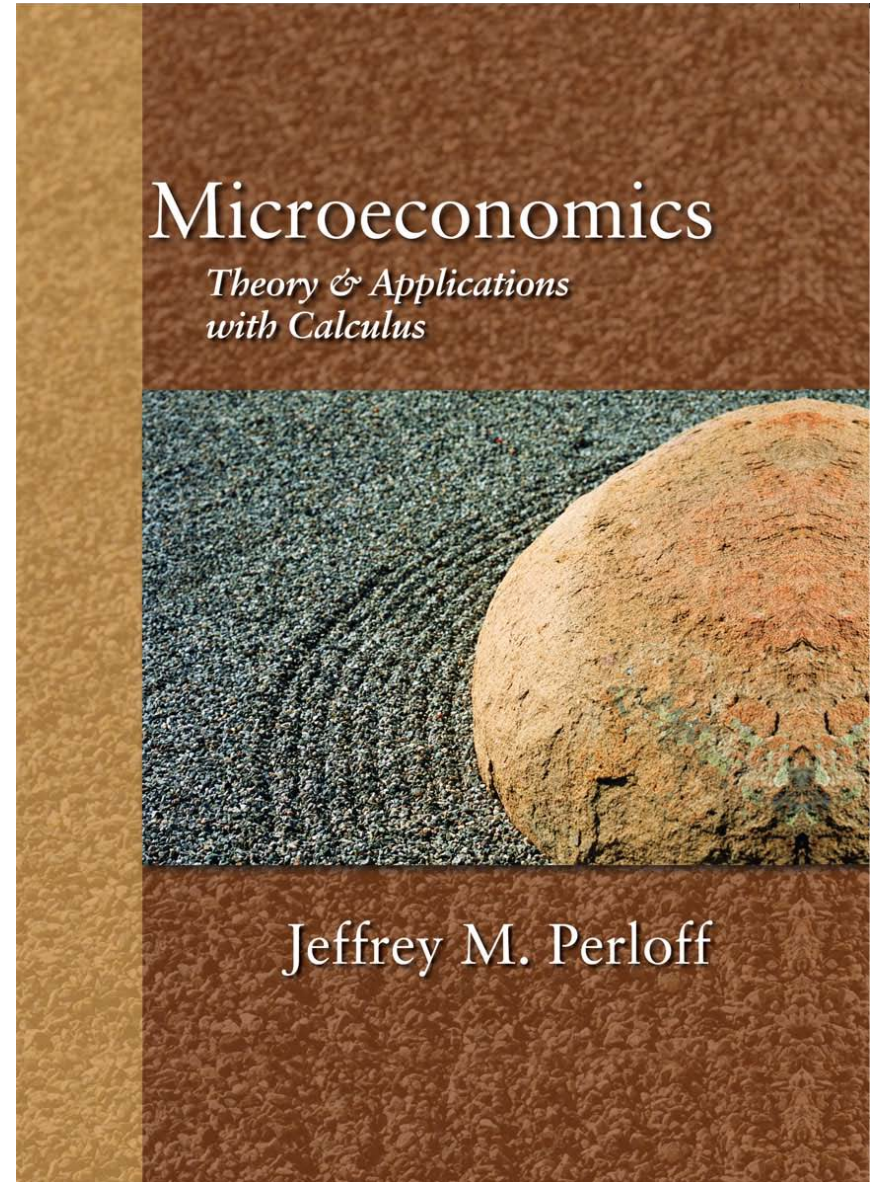


Chapter Five

Consumer Welfare and Policy Analysis

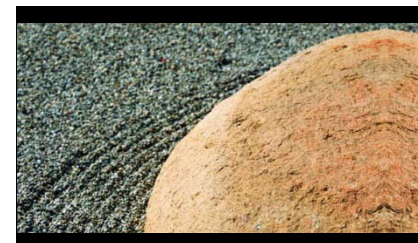


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每月補助1萬5 上班族考慮生小孩

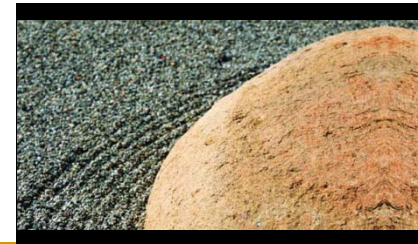
2010年10月17日 壹蘋果



yes123求職網問卷調查3630名上班族，八成表示不會因現有政府獎勵制度而生子或多生，近兩成不打算生養。錢不夠、教育差、社會亂是不生三大原因。

15.5%認為家庭月收入9到10萬元才有能力養小孩，主計處公佈七月平均薪資41530元，雙薪家庭還低於心中平均生得起的所得門檻。以大學生起薪22624元、一年調薪5%計算，工作13年達35歲的雙薪家庭才能生。近六成認為養一個小孩每月基本開銷1到3萬元，63.8%認為政府補助再多點才願生。按月發育兒津貼(81.52%)、補助托育費(68.7%)，幼兒教育津貼(68.0%)是最有幫助前三名。育兒津貼期待平均值15356元，現規劃3000到5000元明顯低。

Consumer Welfare and Policy Analysis



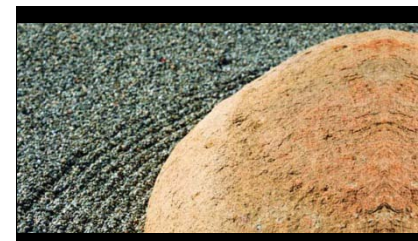
- **In this chapter, we examine five topics**
 1. Consumer Welfare
 2. Expenditure Function and Consumer Welfare
 3. Market Consumer Surplus
 4. Effects of Government Policies on Consumer Welfare
 5. Deriving Labor Supply Curves

Consumer Welfare



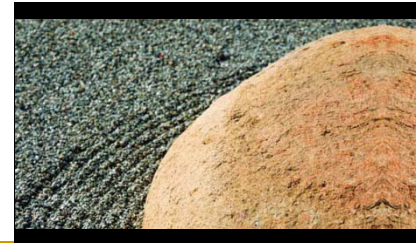
- **Measuring consumer welfare using a demand curve**
 - Consumer welfare from a good is the benefit a consumer gets from consuming that good minus what the consumer paid to buy the good.
- **(Inverse) Demand Curve**
 - It contains the information we need to measure how much more you'd be willing to pay than you actually paid

Marginal Willingness to Pay



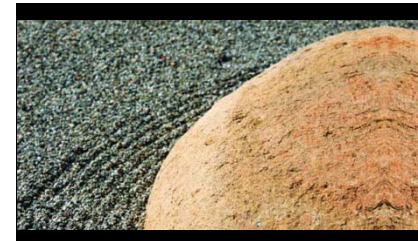
- The (inverse) demand curve reflects a consumer's **marginal willingness to pay**: the maximum amount a consumer will spend for an extra unit.
- The consumer's marginal willingness to pay is the ***marginal value*** the consumer places on the last unit of output.

Consumer Surplus

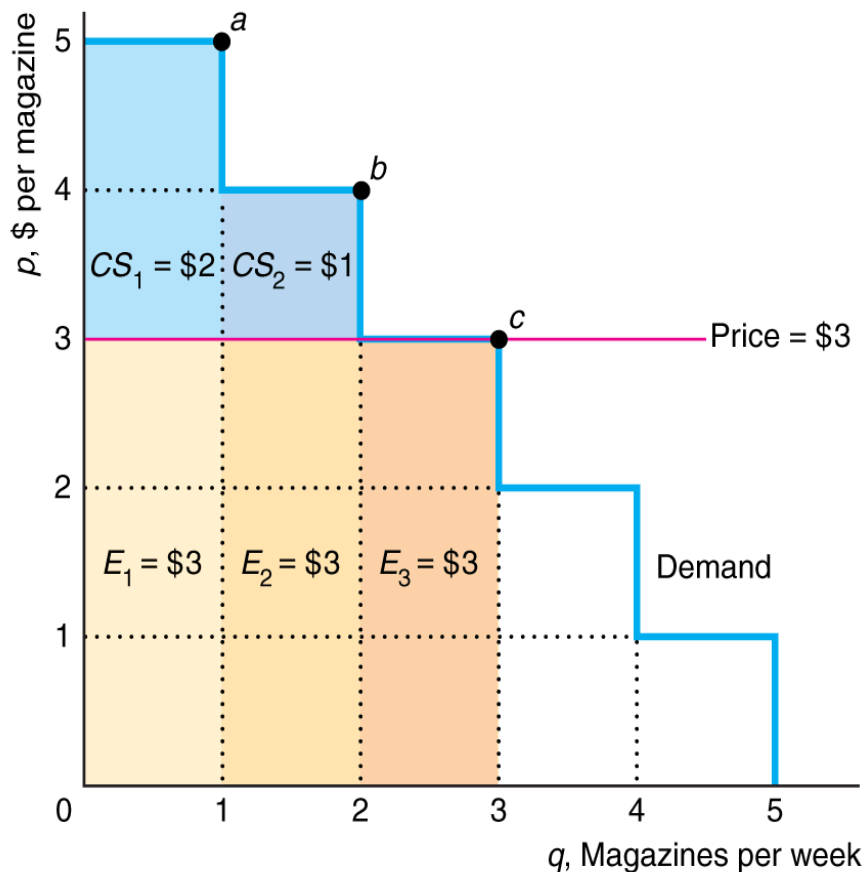


- The monetary difference between what a consumer is willing to pay for the quantity of the good purchased and what the good actually costs is called **consumer surplus (CS)**.

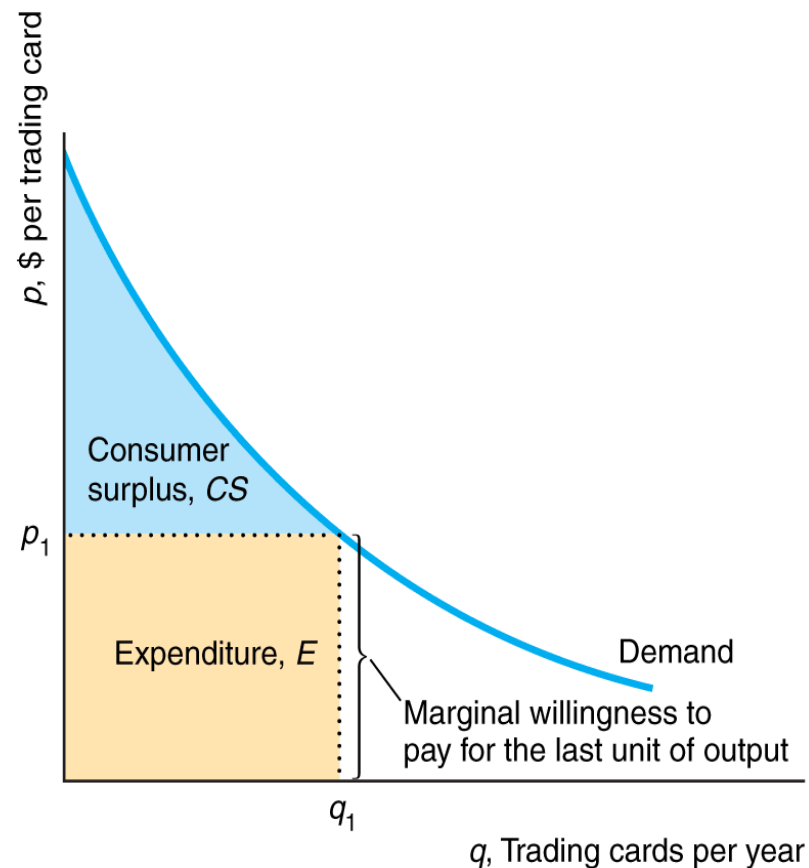
Figure 5.1 Consumer Surplus



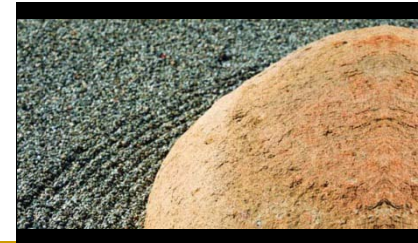
(a) David's Consumer Surplus



(b) Steven's Consumer Surplus



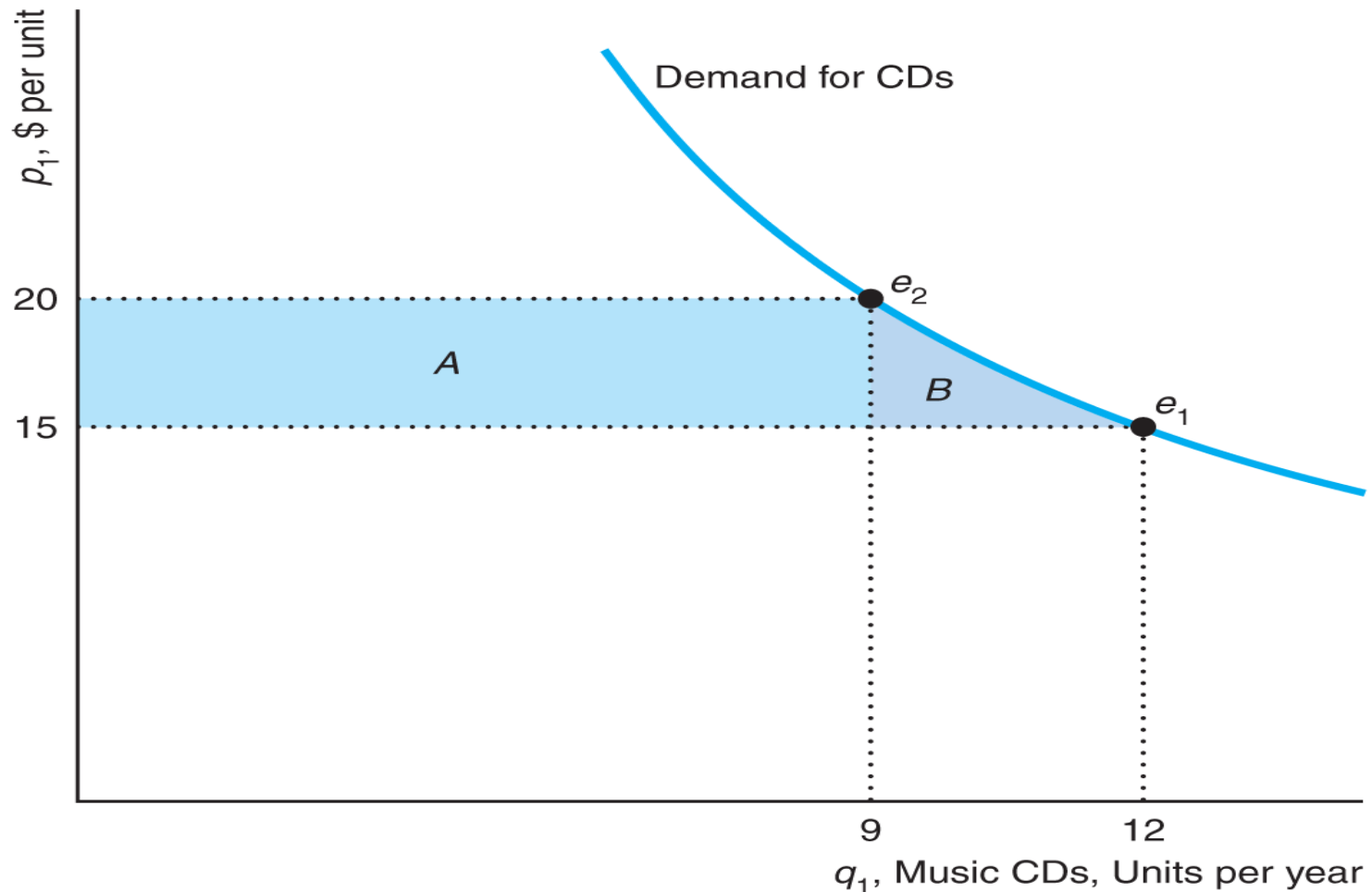
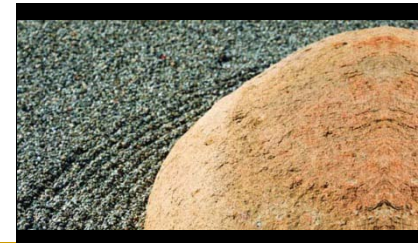
Effect of a Price Change on Consumer Surplus



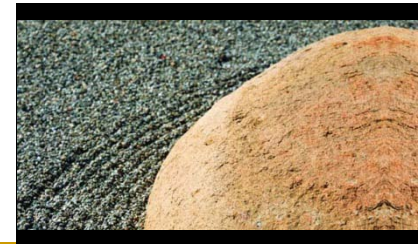
- **Consumer surplus loss from a higher price.**
 - In Figure 5.2, as the price increases from 15 to 20, Jackie loses consumer surplus equal to areas $A + B$.

Figure 5.2

Change in Consumer Surplus



Expenditure Function and Consumer Welfare



- The **expenditure function** is the minimal expenditure necessary to achieve a specific utility level, \bar{U} , for a given set of prices as shown in equation (5.1)
- **Equation 5.1**

$$E = E(p_1, p_2, \bar{U})$$

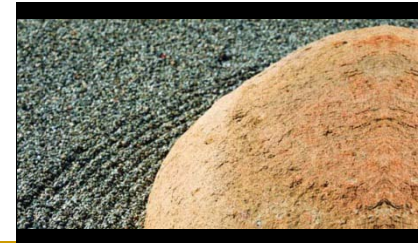
Expenditure Function and Consumer Welfare



- We can evaluate the **consumer surplus loss** of a price increase from p_1 to p_1^* as the difference between the expenditures at these two prices as shown in equation (5.2).
- **Equation 5.2**

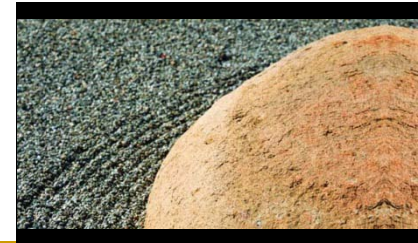
$$\text{welfare change} = E(p_1, p_2, \bar{U}) - E(p_1^*, p_2, \bar{U})$$

Expenditure Function and Consumer Welfare



- **Compensating Variation (CV)**
 - CV is the amount of money one would have to **give** a consumer to offset completely the harm from a price increase — to **keep the consumer on the original indifference curve**.
 - CV measure is the income involved in the income effect.

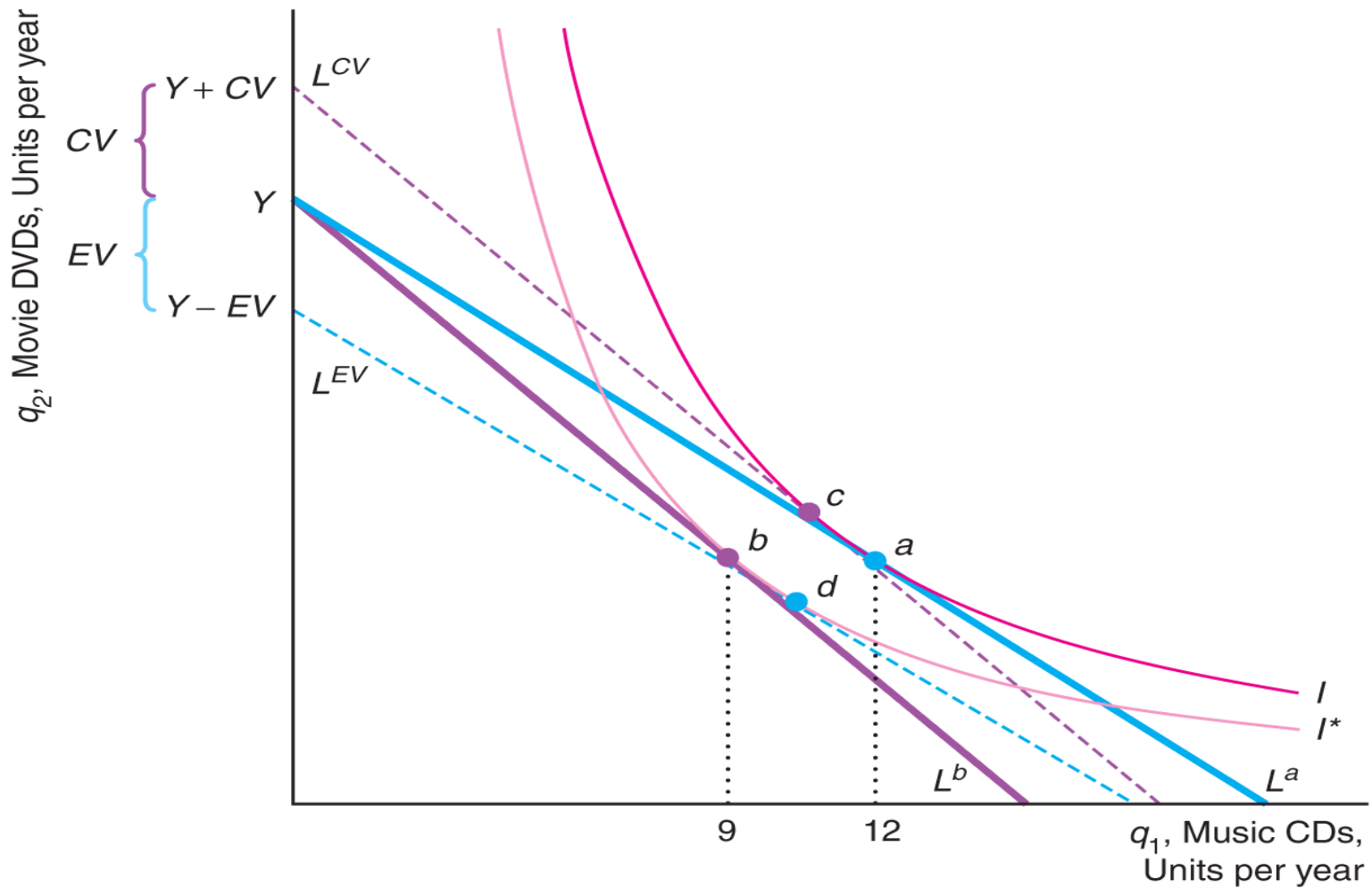
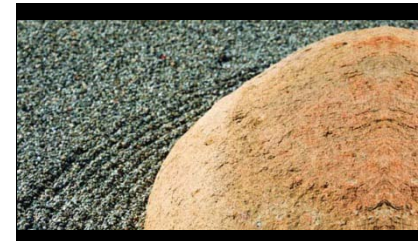
Expenditure Function and Consumer Welfare



- **Equivalent Variation (EV)**
 - EV is the amount of money one would have to **take from** a consumer to harm the consumer by as much as the price increase. It moves the consumer to the new indifference curve.

Figure 5.3

Compensating Variation and Equivalent Variation



Comparing the Three Welfare Measures



- As shown in Figure 5.4 of a **Price Increase**:

ΔCS : areas A + B

CV : areas A + B + C

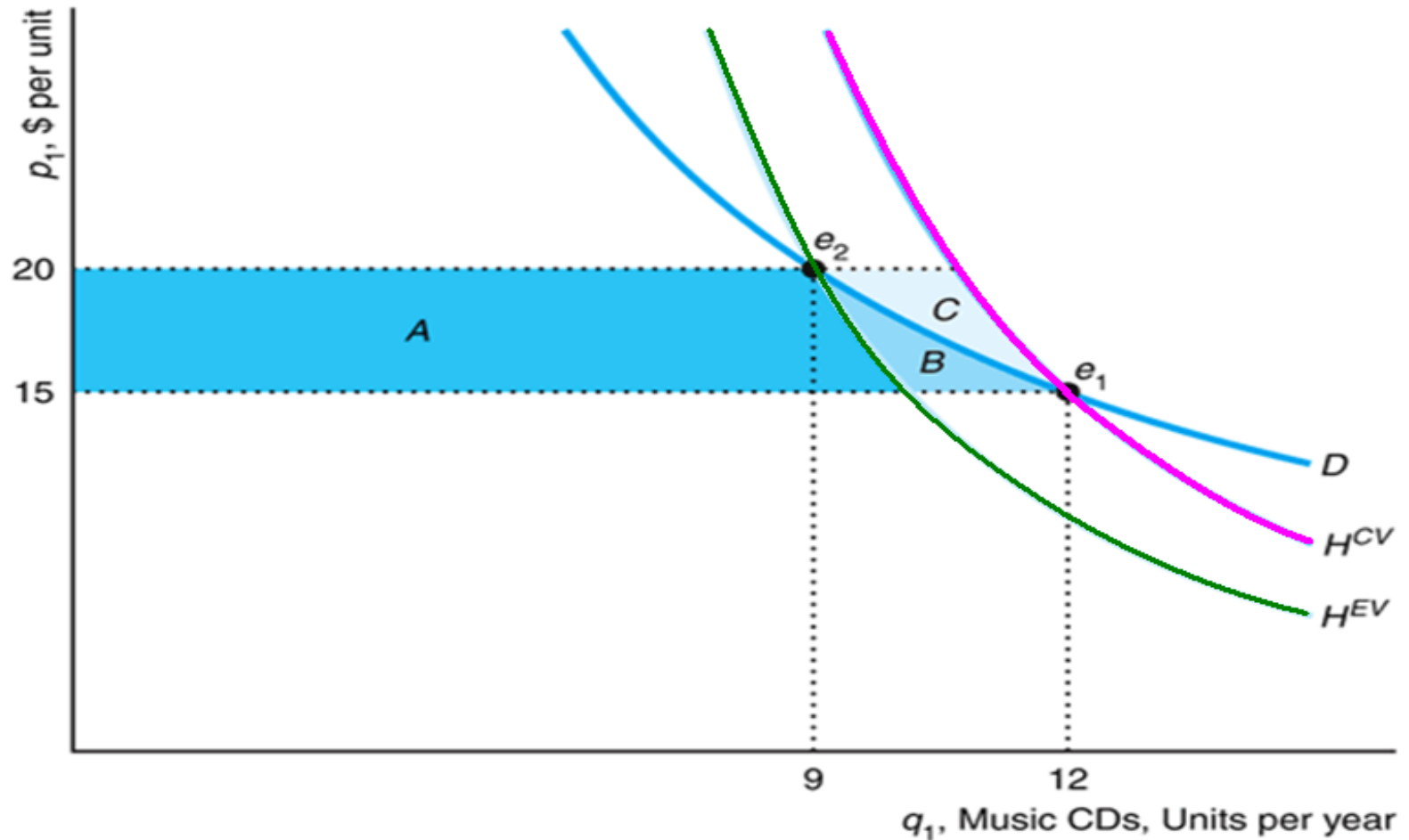
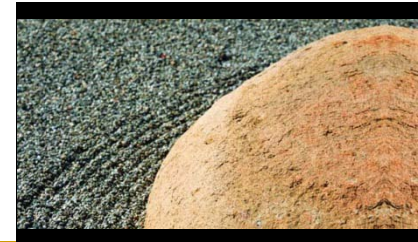
EV : area A

→ If the good is **normal**, $|CV| > |\Delta CS| > |EV|$;

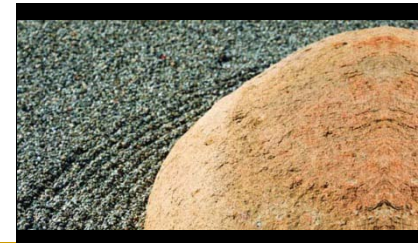
→ If the good is **inferior**, $|CV| < |\Delta CS| < |EV|$;

Figure 5.4

Compare CV, EV, and ΔCS



Little Difference Between the Three Measures



- According to the **Slutsky equation**, the uncompensated elasticity of demand, ε , equals the compensated elasticity of demand, ε^* , minus the budget share of the good, θ , times the income elasticity, ξ . (equation 4.9)
- The smaller the income elasticity or budget share, the closer the three welfare measure are to each other.

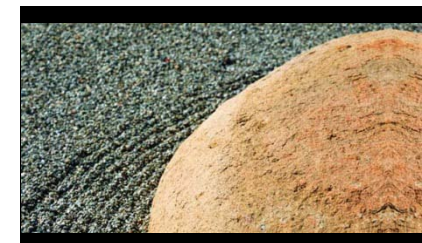
家庭消費支出按支出形態分

單位：%

年別	合計	食品、飲料及菸草	衣著、鞋襪類	住宅服務、電氣及燃料	家具設備及家務服務	醫療保健	運輸交通及通訊	休閒、文化及教育費	餐廳及旅館	什項消費
80	100.0	25.4	6.0	25.8	3.2	5.4	9.4	11.3	7.6	5.9
85	100.0	19.7	4.5	25.6	3.3	9.8	10.7	11.5	8.4	6.5
86	100.0	19.2	4.5	25.5	3.1	9.9	10.9	11.7	8.7	6.6
87	100.0	19.0	4.5	25.6	2.8	10.3	11.0	11.5	8.9	6.4
88	100.0	18.2	4.1	25.3	2.8	10.9	11.6	11.6	8.9	6.6
89	100.0	17.3	3.9	25.6	2.7	11.0	11.9	12.1	8.9	6.7
90	100.0	17.3	3.7	25.1	2.6	11.4	12.1	12.0	9.0	6.8
91	100.0	17.2	3.6	24.2	2.5	12.2	12.7	12.2	8.8	6.8
92	100.0	16.9	3.5	24.4	2.4	12.5	12.5	12.0	8.9	6.9
93	100.0	16.4	3.5	23.5	2.6	12.7	13.0	12.1	9.1	7.1
94	100.0	16.2	3.4	23.8	2.5	13.2	13.0	11.8	9.3	6.9
95	100.0	16.1	3.4	23.7	2.4	13.8	12.8	11.5	9.3	7.0
96	100.0	16.5	3.3	23.9	2.5	14.1	12.9	11.2	9.7	6.0
97	100.0	16.4	3.2	24.2	2.5	14.4	12.4	11.3	10.1	5.6
98	100.0	16.7	3.2	24.3	2.5	14.5	12.7	11.0	9.4	5.7

來源：主計處家庭收支調查報告

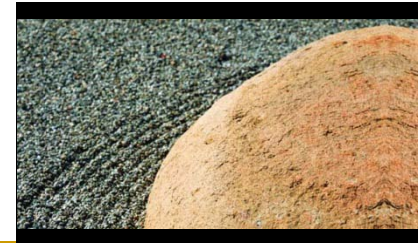
台灣地區擁屋者家計單位消費支出的所得彈性



戶長年齡	食品	衣著	房租	交通	教育
小於24歲	0.37	0.81	0.55	0.97	1.14
25 ≤ 年齡 ≤ 34	0.35	0.78	0.51	0.93	1.14
35 ≤ 年齡 ≤ 44	0.35	0.78	0.52	0.92	1.15
45 ≤ 年齡 ≤ 54	0.35	0.77	0.52	0.91	1.15
55 ≤ 年齡 ≤ 64	0.33	0.76	0.51	0.89	1.14
65 ≤ 年齡	0.34	0.76	0.51	0.89	1.15

來源：薛立敏、陳綉里，〈住宅租擁選擇下家計消費支出之比較〉，住宅學報，第七期，1998年。

Market Consumer Surplus



- **Market consumer surplus** is the area under the market demand curve above the market price up to the quantity consumers buy.

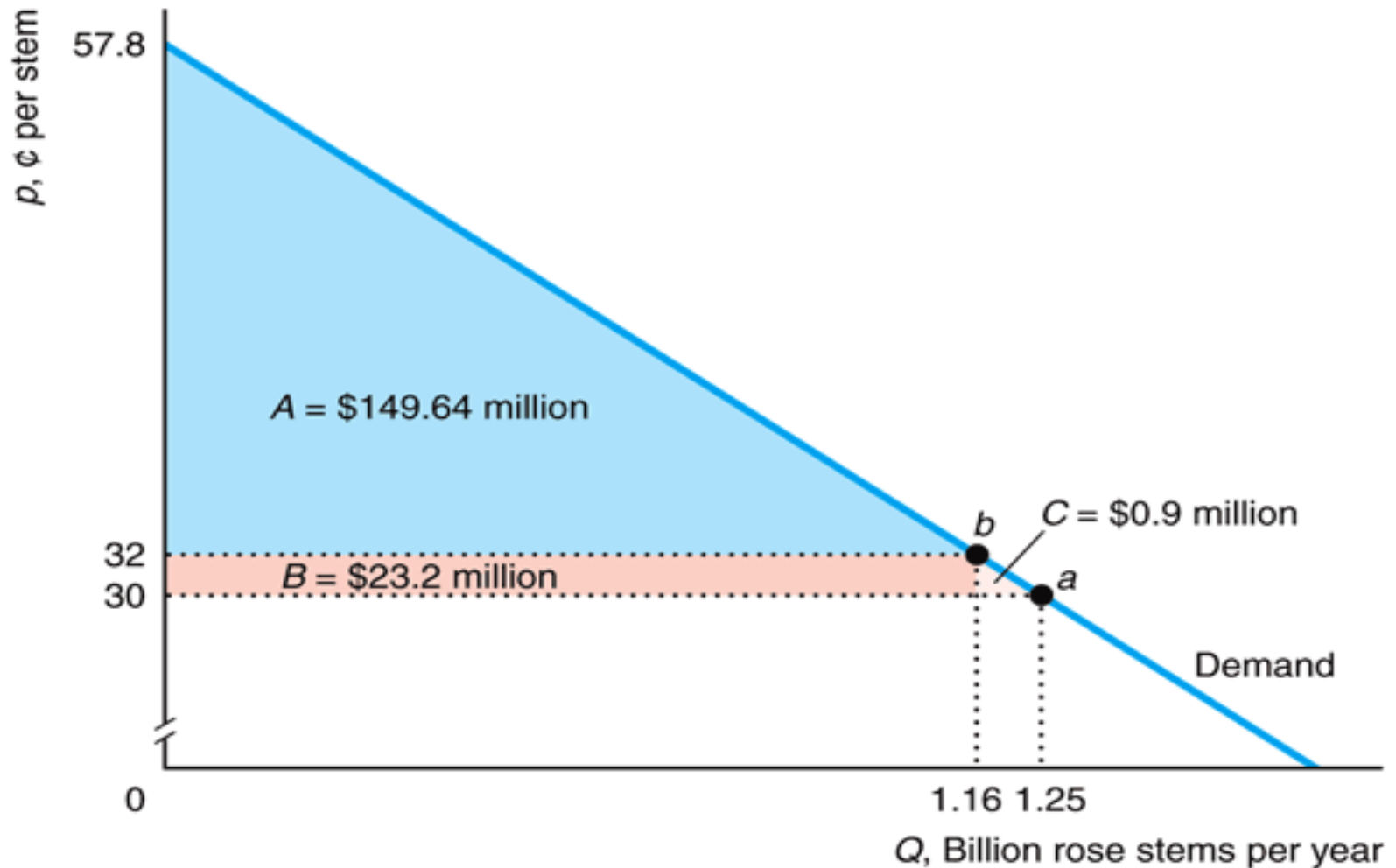
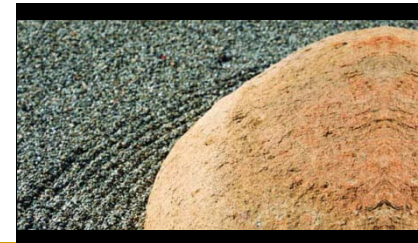
Loss of Market Consumer Surplus from A Higher Price



- In general, as the price increases, consumer surplus falls more,
 - 1) the greater the initial revenues spent on the good,
 - 2) the less elastic the demand curve.

Figure 5.5

Fall in Market Consumer Surplus as the Price of Roses Rises



Effects of Government Policies on Consumer Welfare



- The various consumer welfare measures are used to answer questions about **the effect on consumers of government programs and other events that shift consumers' budget constraints.**

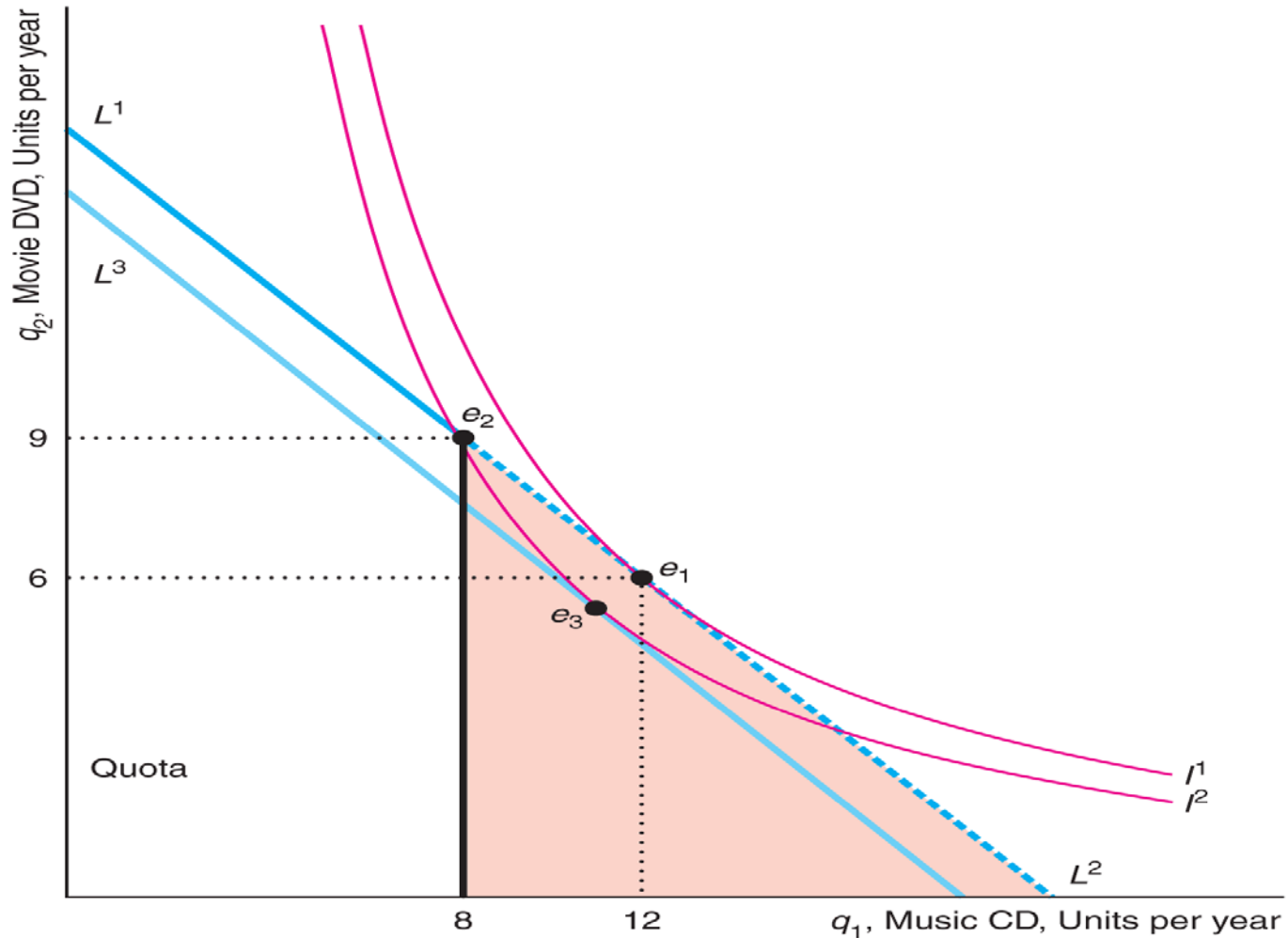
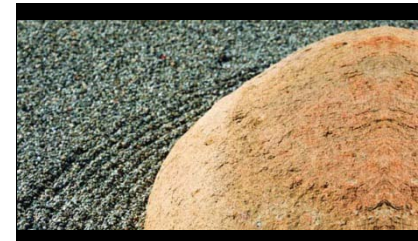
Quotas



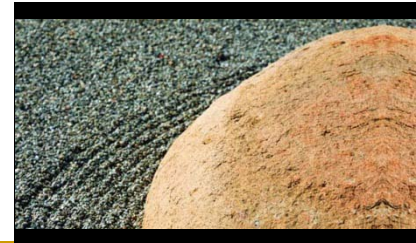
- Consumers **welfare is reduced** if they cannot buy as many units of a good as they want.
- Firms and government frequently **limit how much of a good one can buy by setting a quota.**

Figure 5.6

Quota

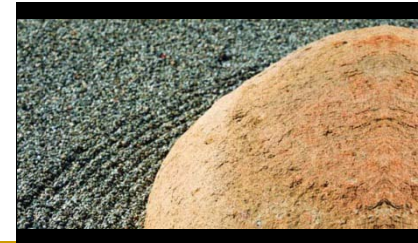


Quota



- As shown in Fig. 5.6, the quota harms a consumer because he/she has moved from a higher indifference curve, I^1 , to a lower indifference curve, I^2 .
- The difference between the expenditure on the original budget line and the new expenditure is this **consumer's equivalent variation**.

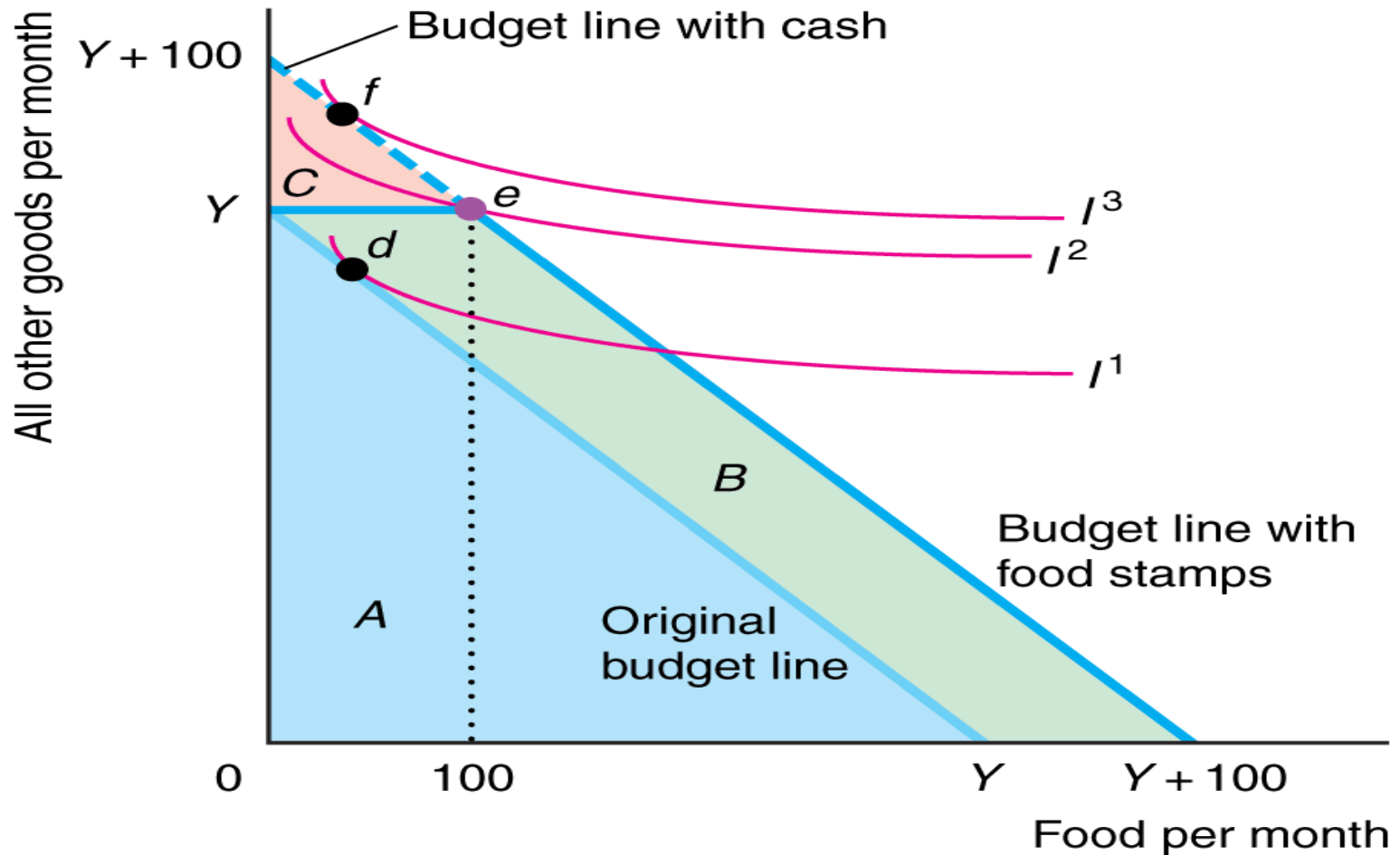
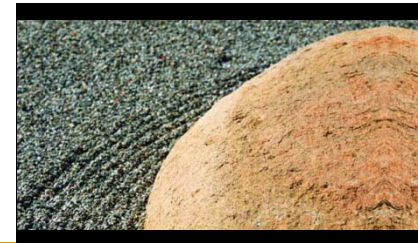
Food Stamps



- **Why cash is preferred to food stamps**
 - Poor people who receive cash **have more choices** than those who receive a comparable amount of food stamps.
- As shown in Fig. 5.7, if we draw a budget line with the same slope as the original that is tangent to I^2 , we can calculate the **equivalent variation**.

Figure 5.7

Food Stamps Versus Cash

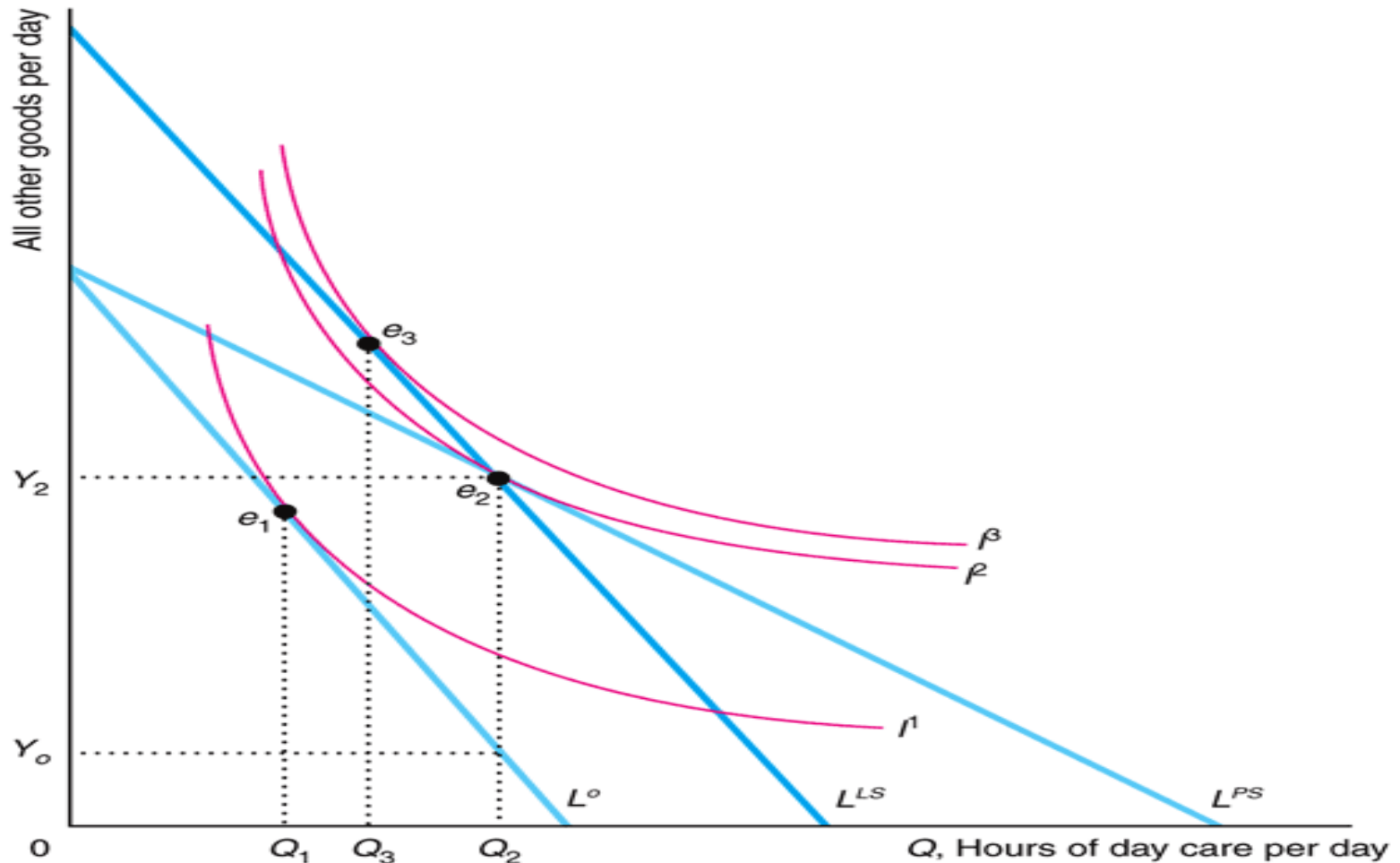
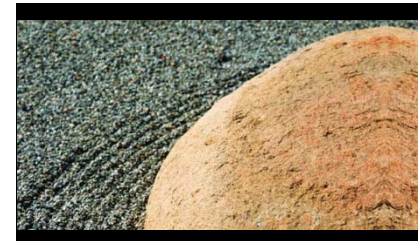


Child-Care Subsidies

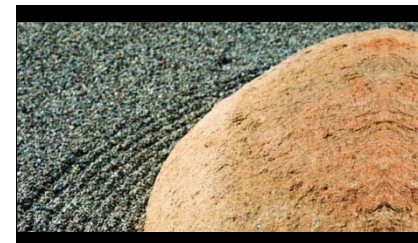


- Would a price subsidy or a lump-sum subsidy provide greater benefit to recipients for a given government expenditure?
- Fig. 5.8 shows that the family is better off with the lump sum than with the price subsidy of child-care.

Figure 5.8 Child-Care Subsidies



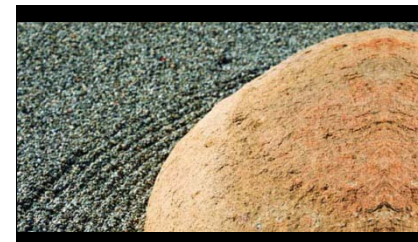
Deriving Labor Supply Curve



- **Labor-Leisure Choice**
 - People choose between working to earn money to buy goods and services and consuming leisure: all their time spent not working for pay.
 - **Equation 5.6**

$$U = U(Y, N)$$

Deriving Labor Supply Curve



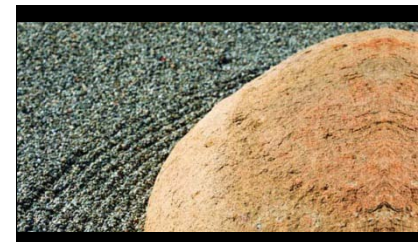
- Demand of leisure time is linked to the supply of labor time.
- Equation 5.7

$$H = 24 - N$$

- Equation 5.8

$$Y = wH + Y^*$$

Deriving Labor Supply Curves



- We can derive the **labor supply curve** by *solving for the leisure demand* with the *utility-maximizing problem* as we derive the demand curve for any good or service.
- **Equation 5.9**

$$\max_H U = U(Y, N) = U(wH, 24 - H)$$

Deriving Labor Supply Curves



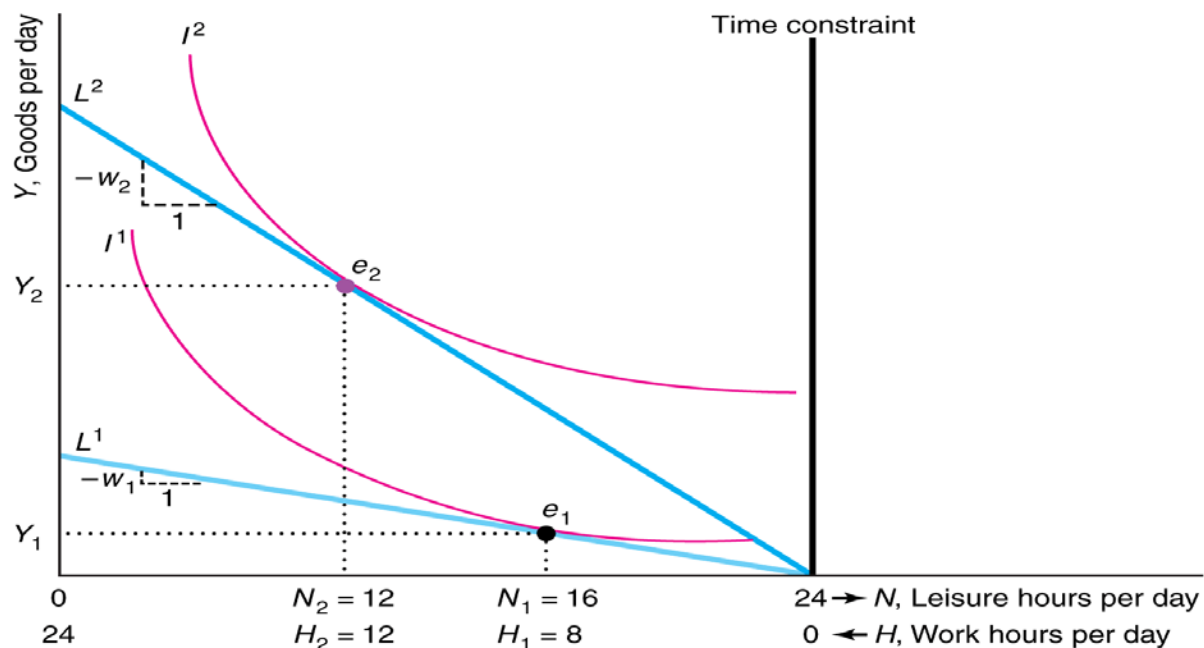
- The optimal solution of this utility-maximization is characterized by equating the marginal rate of substitution of income for leisure, MRS , to the marginal rate of transformation of income for leisure, MRT , as indicated in equation (5.11).
- **Equation 5.11**

$$MRS = -\frac{U_N}{U_Y} = -w = MRT$$

Figure 5.9

Demand for Leisure

(a) Indifference Curves and Constraints



(b) Demand Curve

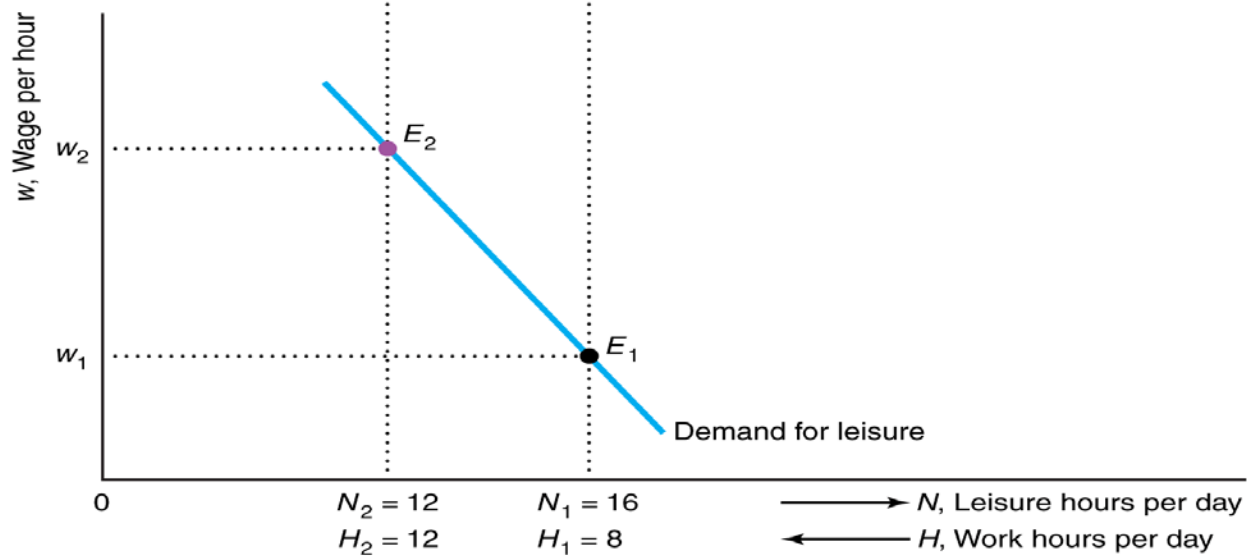
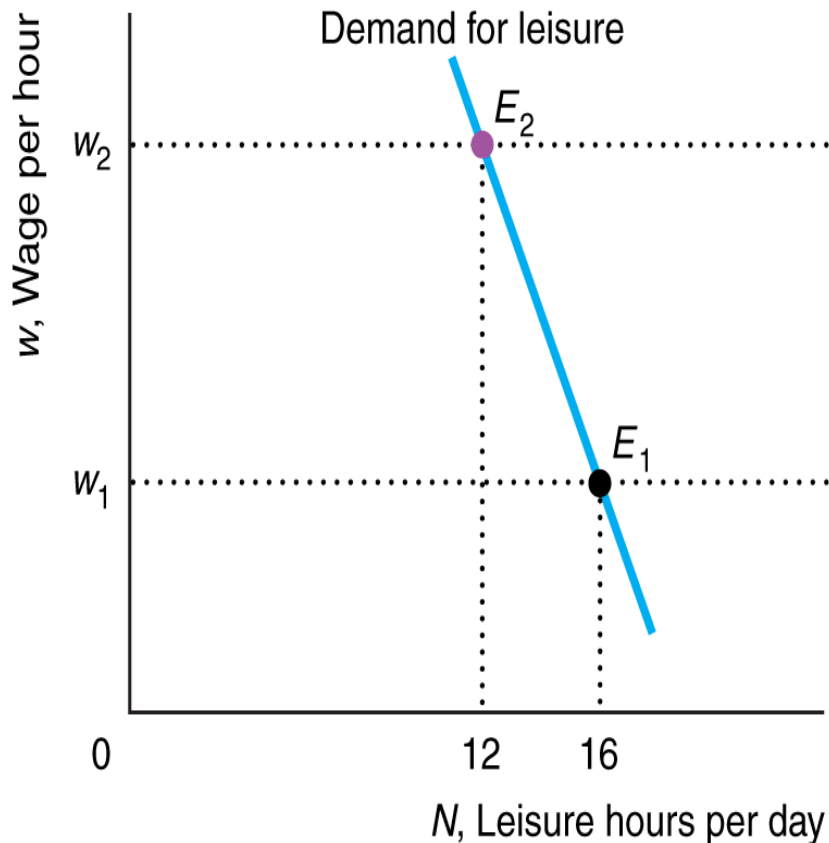


Figure 5.10

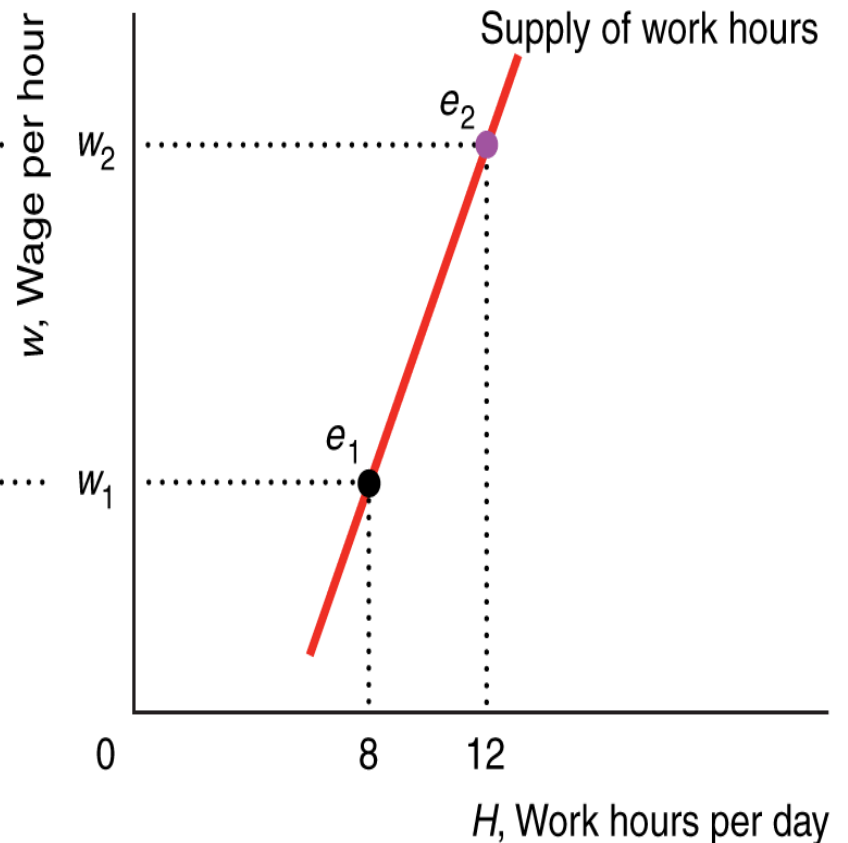
Supply Curve of Labor



(a) Leisure Demand



(b) Labor Supply



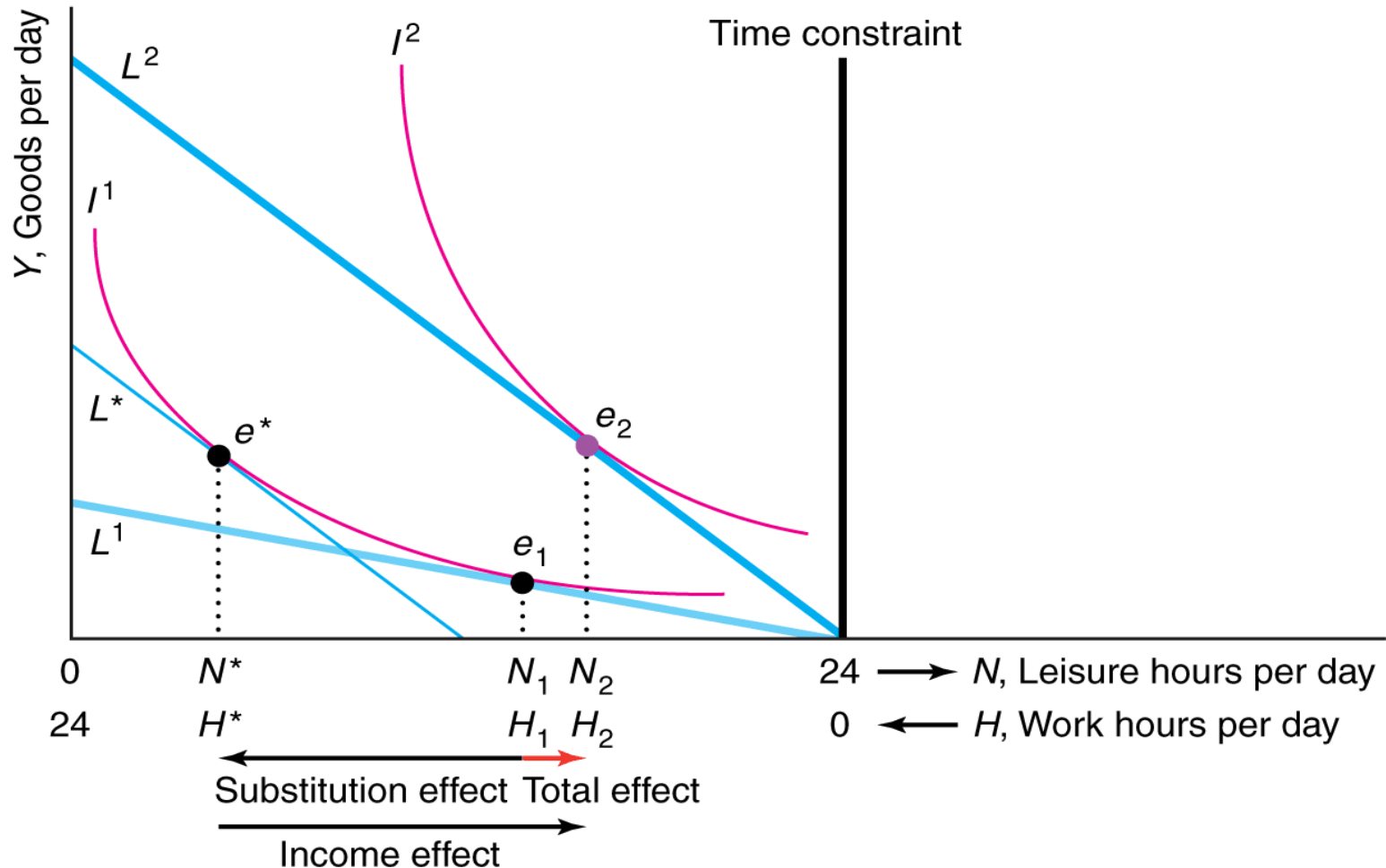
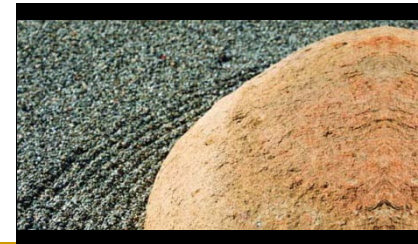
Income and Substitution Effects



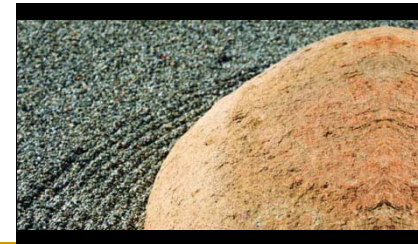
- When leisure is a **normal good**, the **substitution and income effects work in opposite directions**, so whether leisure demand increases or not depends on which effect is larger.
- If leisure is an **inferior good**, both the **substitution and income effect work in the same direction**, a wage increase unambiguously causes the hours worked to rise.

Figure 5.11

Income and Substitution Effects of a Wage Change



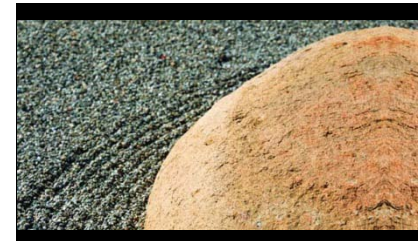
Shape of the Labor Supply Curve



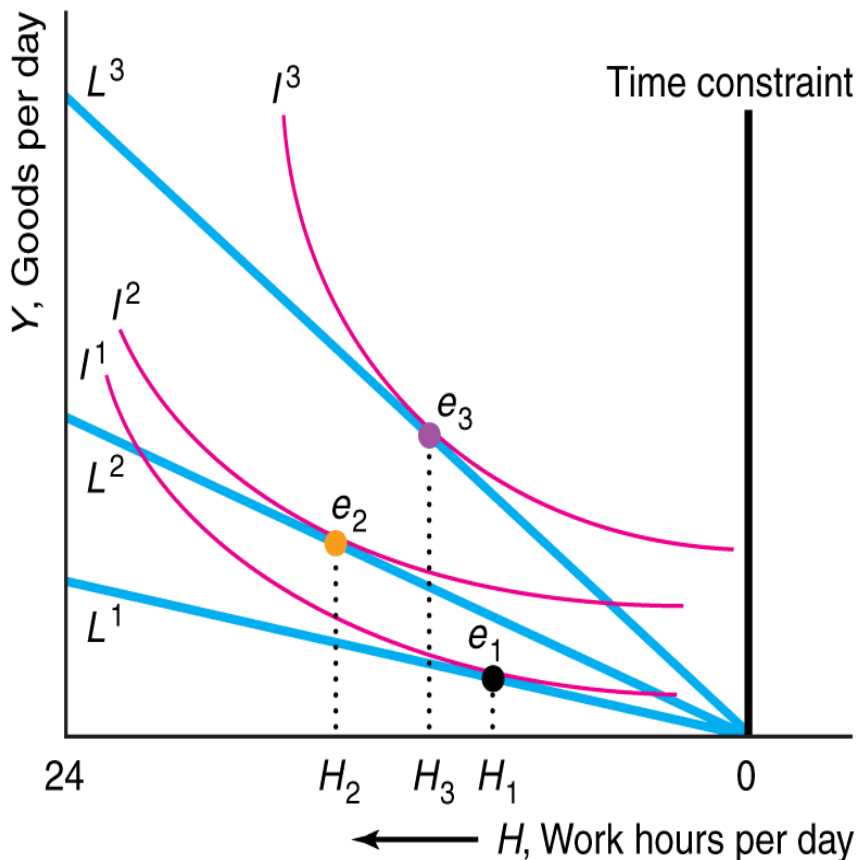
- The labor supply curve can slope upward, bend backward, or have sections with both properties **depending on the income elasticity of leisure**.
- At low wages, the substitution effect—work more hours—**dominates** the income effect—work fewer hours—while **the opposite occurs** at higher wages.

Figure 5.12

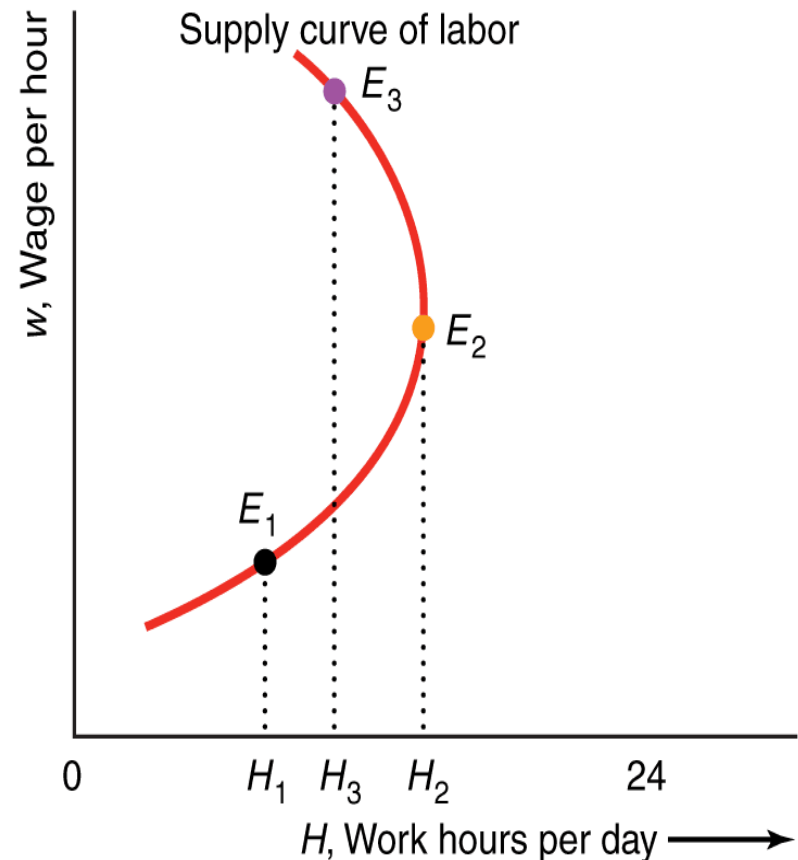
Labor Supply Curve That Slopes Upward and Then Bends Backward



(a) Labor-Leisure Choice



(b) Supply Curve of Labor



Income Tax and Labor Supply



- Taxes on earnings are an unattractive way of collecting money for the government **if supply curves are upward sloping**, because **the taxes cause people to work fewer hours**, reducing the amount of goods that society produces and raising less tax revenue than if the supply curve were **vertical** or **backward bending**.

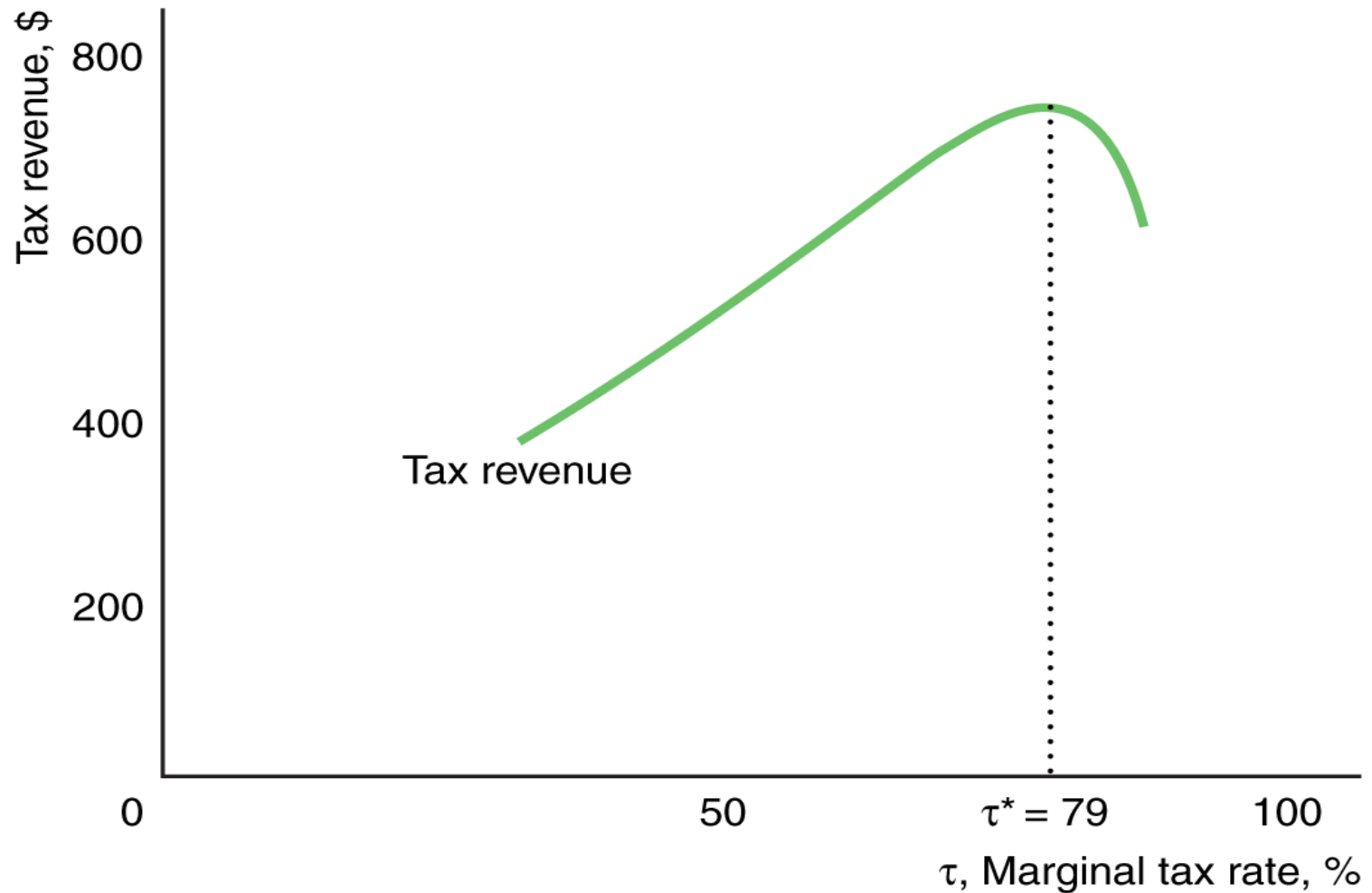
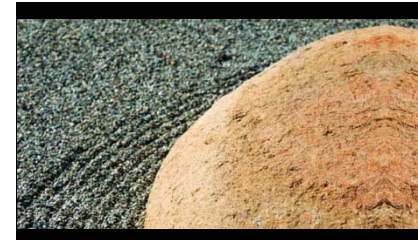
Income Tax and Labor Supply



- If the worker is in the **backward-bending section** of the labor supply curve, the relationship between the marginal tax rate and tax revenue is **bell-shaped**, as in Fig. 5.13.

Figure 5.13

Relationship of Tax Revenue to Tax Rates

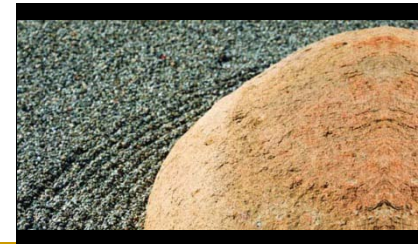


Income Tax and Labor Supply



- At first, if the tax rate **rises a little more**, tax revenue must rise even higher, for two reasons.
 - 1) The government collects a larger percentage of every dollar earned because the tax rate is higher.
 - 2) Employees **work more hours** as the tax rate rises **because workers are in the backward-bending section**.

Income Tax and Labor Supply



- As the tax rate **rises far enough**, the workers are in the upward-sloping section.
- In the **upward-sloping section**, an increase in the tax rate reduces the number of hours worked.
- When the reduction in hours worked more than offsets the gain from the higher tax rate, so tax revenue falls.