



## Chapter 16

# Government Taxation and Expenditure

# Outline

1. **Government Control of the Economy (Ch. 16 A)**
  1. **Function (p. 306)**
  2. **Tools (p. 304)**
2. **Economic Aspects of Taxation (Ch. 16 C)**
  1. **Principles of Taxation**
  2. **Income Tax**
  3. **Consumption Tax**



# 1. The Function and Tools of Government Policies

Issues	Function of Government	Tools of Government Policy
Market failures due to 1. Market power (Ch. 9) 2. Existence of externalities (Ch. 14) 3. Asymmetric information (Ch. 11)	Improving economic efficiency	1. Expenditure (e.g., roads, education, or police protection) 2. Regulations or controls (e.g. limit the amount of pollution, divide up the radio spectrum)
Efficiency v.s. Equality	Reducing economic inequality	1. Taxation (on income and goods and service) 2. Expenditure 3. Transfer payments (e.g., social security, food stamps)

Other functions include:

1. Stabilizing the economy through macroeconomic policies (Ch. 31.C)
2. Conducting international economic policy (Ch. 27 & 28)

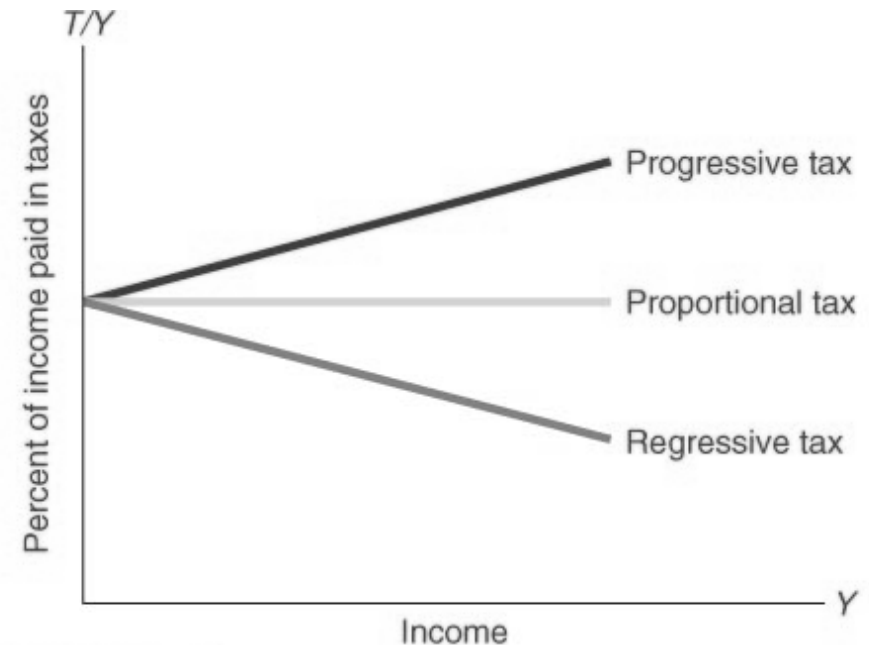
# 2.1 Principles of Taxation

- The benefit principle:
  - Individuals to be taxed in proportion to the benefit they receive from government program
- The ability-to-pay principle:
  - The amount of taxes people pay should relate to their income or wealth
  - Redistributive tax system: raise funds from the higher-income people to increase the incomes and consumption of poorer groups



## 2.2 Income Tax: Progressive v.s. Regressive

- Progressive income taxes:
  - Not only does the higher-income family pay a larger income tax, but it in fact pays a higher fraction of its income
  - Most personal income taxes are progressive
- Proportional tax:
  - All taxpayers pay exactly the same proportion of income
- Regressive tax:
  - A larger fraction of income is taxed from poor families than the richer ones
  - Commodity tax on the inferior goods (income elasticity < 0)



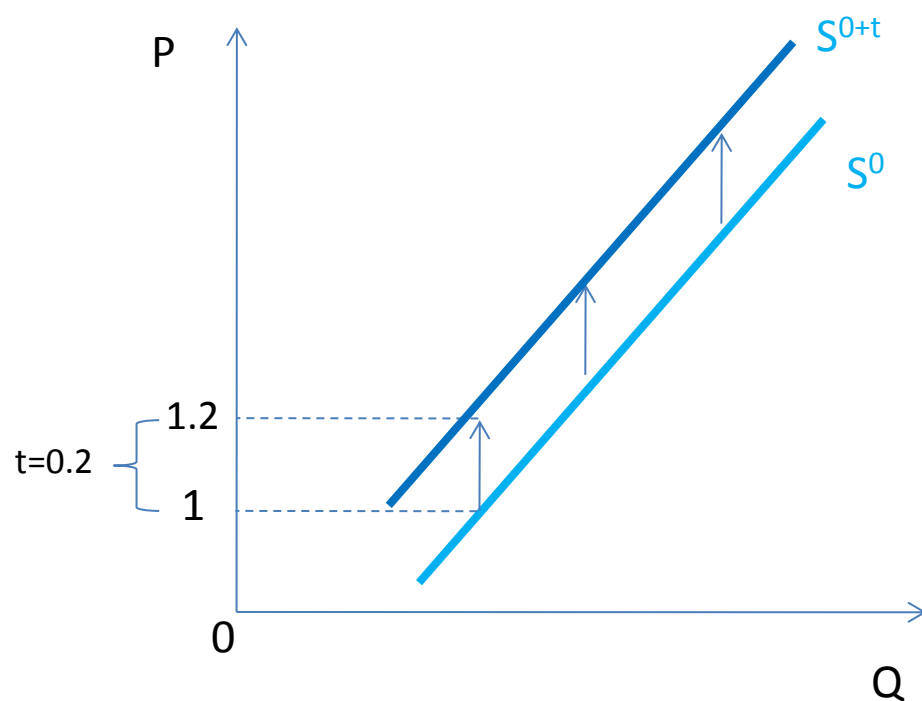
**FIGURE 16-4.** Progressive, Proportional, and Regressive Taxes

## 2011年个税改革纳税人各阶段收入税负增减对比

月收入 (扣除 “三险一金”后)	现应 缴税 (元)	税负	税法修 改后应 缴税 (元)	税负	税额 增减	税负 增减 幅度
3500	125	3.57%	0	0.00%	-125	-100.00%
4000	175	4.38%	15	0.38%	-160	-91.43%
4500	250	5.56%	30	0.67%	-220	-88.00%
5000	325	6.50%	45	0.90%	-280	-86.15%
6000	475	7.92%	145	2.42%	-330	-69.47%
8000	825	10.31%	345	4.31%	-480	-58.18%
10000	1225	12.25%	745	7.45%	-480	-39.18%
15000	2225	14.83%	1870	12.47%	-355	-15.96%
20000	3225	16.13%	3120	15.60%	-105	-3.26%
30000	5625	18.75%	5620	18.73%	-5	-0.09%
38600	7775	20.14%	7775	20.14%	0	0.00%
40000	8125	20.31%	8195	20.49%	70	0.86%
50000	11025	22.05%	11195	22.39%	170	1.54%
60000	14025	23.38%	14270	23.78%	245	1.75%
70000	17425	24.89%	17770	25.39%	345	1.98%
80000	20925	26.16%	21270	26.59%	345	1.65%
90000	24825	27.58%	25420	28.24%	595	2.40%
100000	28825	28.83%	29920	29.92%	1095	3.80%

## 2.3 Sale Taxes

- **Sales tax** is calculated by multiplying the purchase price by the applicable tax rate
- Sales taxes, including those imposed by local governments, are generally administered at the state level
- States imposing sales tax require retail sellers to collect tax from customers, file returns, and remit the tax to the state
- Tax rates vary widely by jurisdiction and range from less than 1% to over 10%





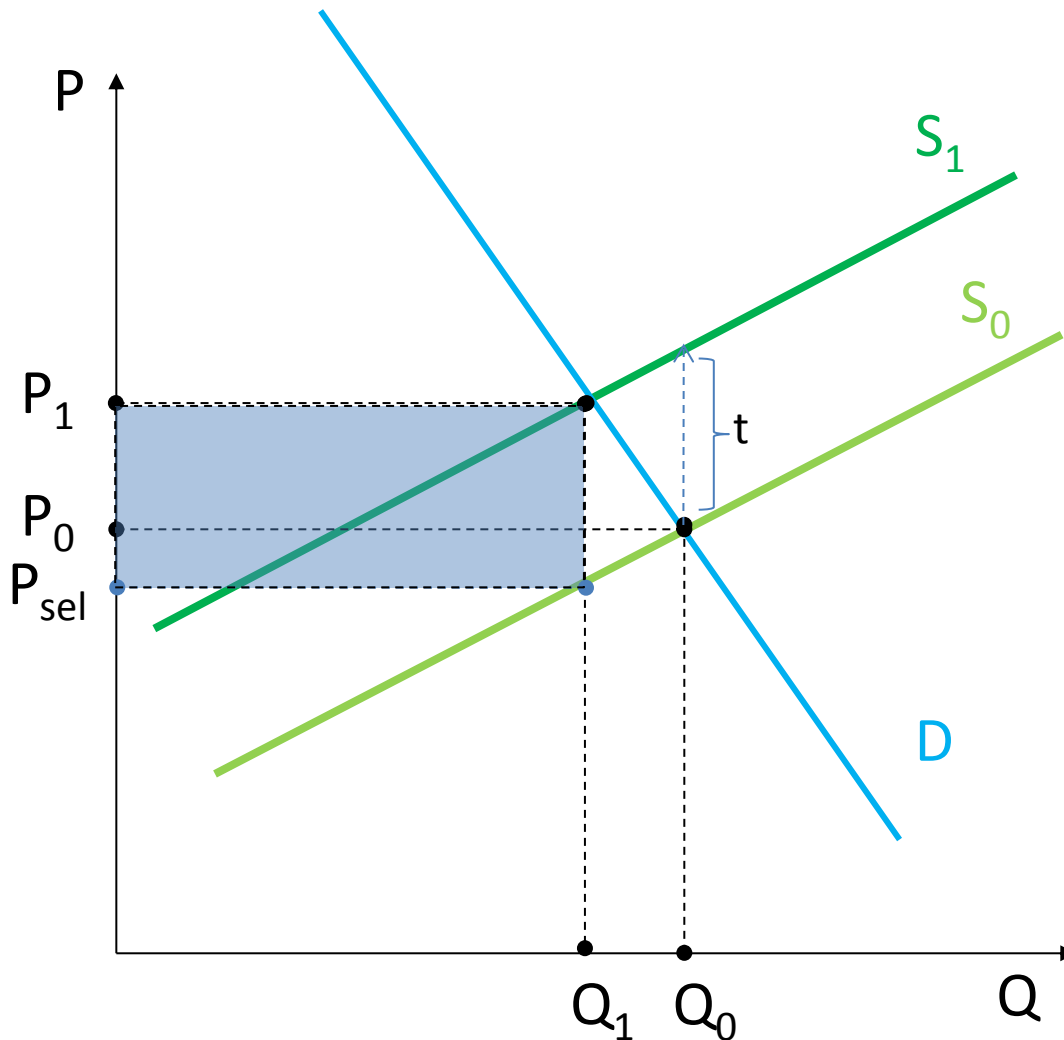
# Question

- Consider an apartment that can be traded at a price of \$1 million
- Now the government impose a transaction tax of \$100k
- Who should go to the government agency to pay the \$100k tax?
  - The seller of the apartment (individual who earns money during the transaction)
- How this \$100k tax is shared by the seller and the buyer?
  - After the bargaining, the deal is \$1.07 million
  - Seller's share:  $100 - (107 - 10) = 3$
  - Buyer's share:  $107 - 100 = 7$
- What determines the share of the taxation?





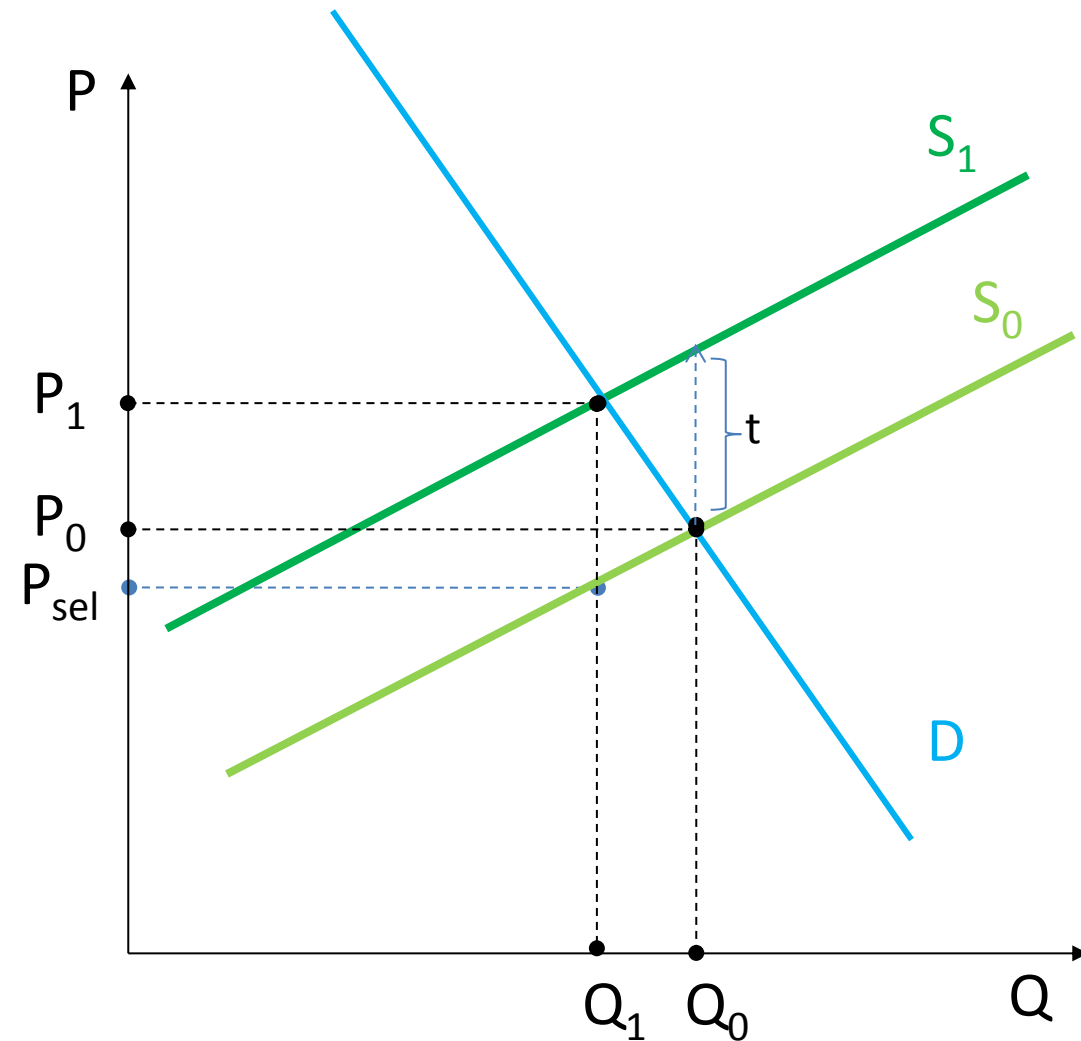
# Burden of the Taxation



- Price increase  $P_0 \rightarrow P_1$
- Consumer Price ( $P_1$ ): Actual price paid by consumer in order to obtain each unit of commodity
- Producer Price ( $P_{sel}$ ): Price received by the firm from selling each unit of commodity
- Tax revenue of the government:  

$$R = t \cdot Q_1 = (P_1 - P_{sel}) \cdot Q_1$$
- Burden of the consumers:  $P_1 - P_0$
- Burden of producers:  $P_0 - P_{sel}$

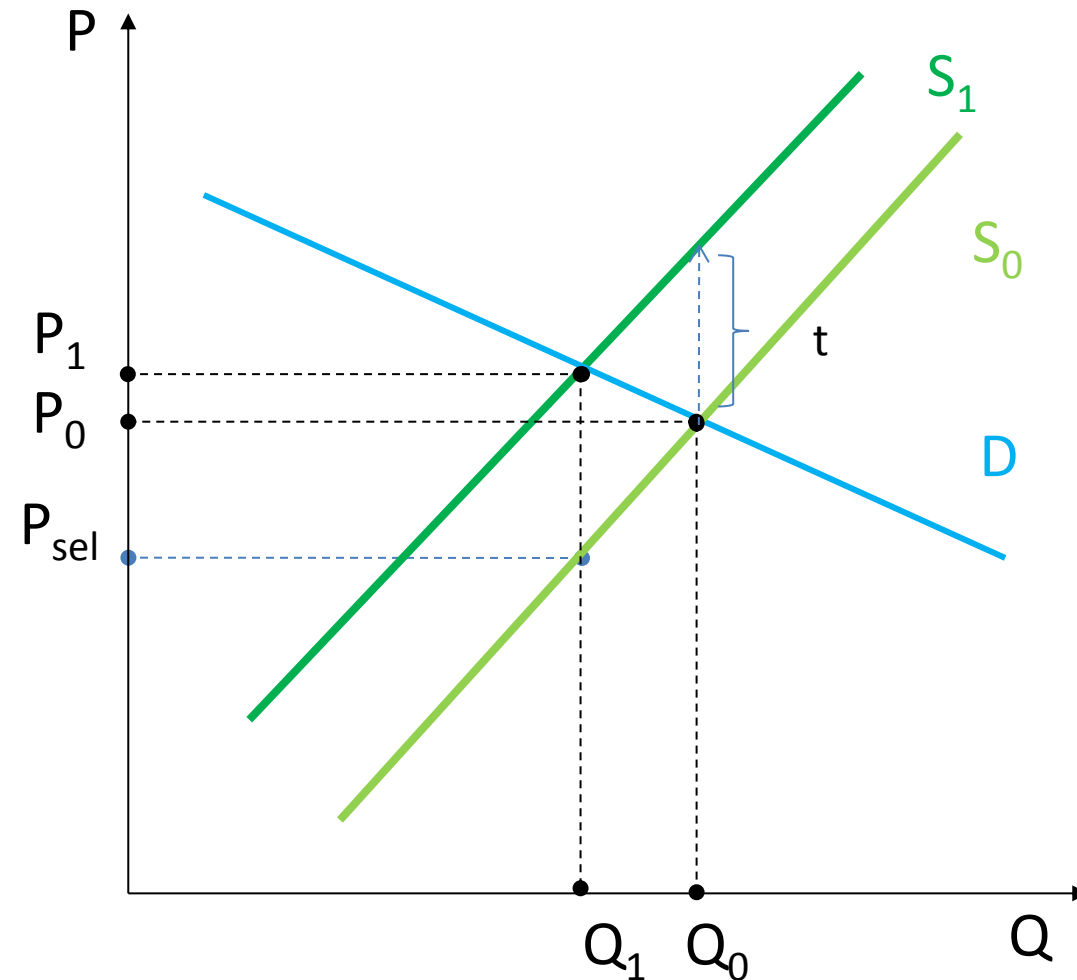
# What Determines the Share of Taxation (1)



- When supply is more elastic than demand:

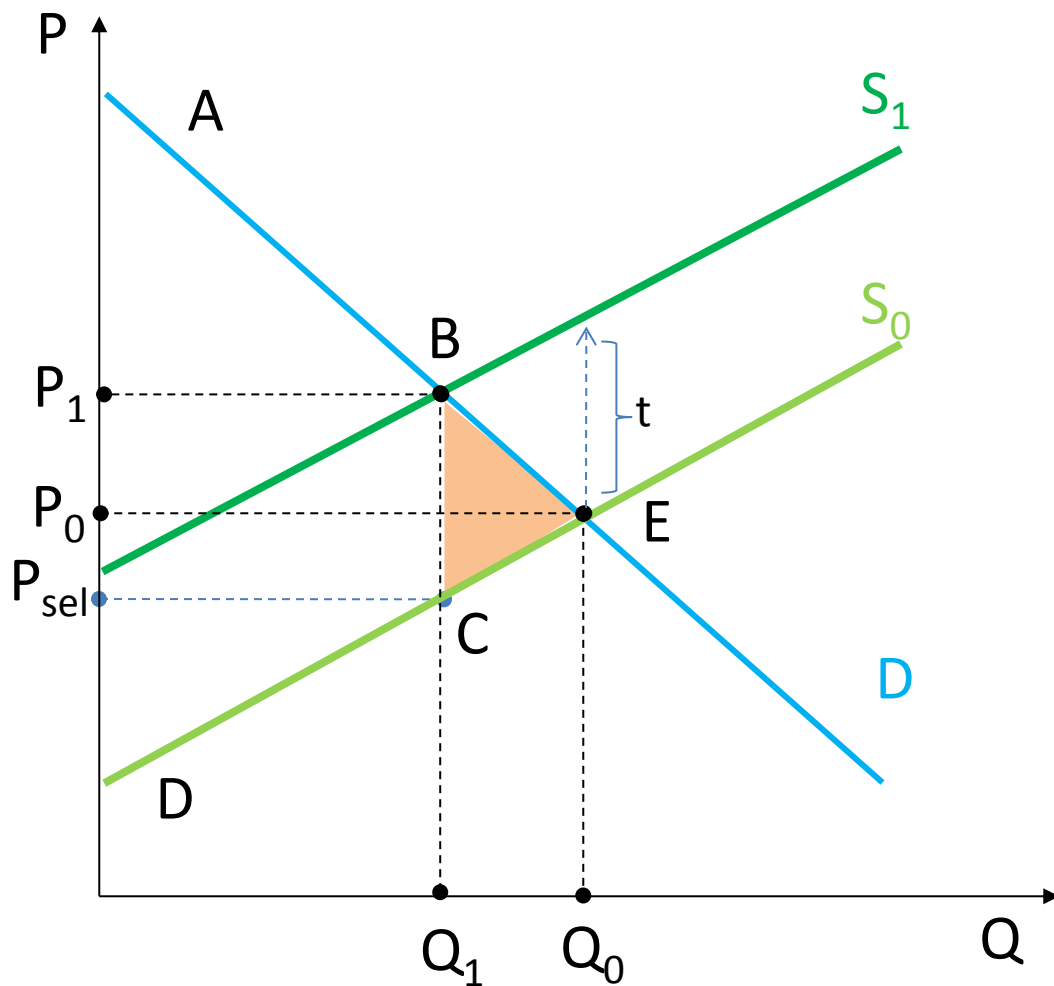
$$P_1 - P_0 > P_0 - P_{sel}$$

# What Determines the Share of Taxation (2)



- When demand is more elastic than supply:
- $P_1 - P_0 < P_0 - P_{sel}$

# Dead Weight Loss in Consumption Tax



- At the competitive equilibrium point E:
  - CS:  $AP_0E$
  - PS:  $P_0ED$
  - Social surplus:  $ADE$
- After the taxation:
  - CS:  $AP_1B$
  - PS:  $P_{sel}CD$
  - Tax Revenue:  $P_1BCP_{sel}$
  - DWL:  $BCE$  (loss in social surplus)
$$0.5 \times (Q_0 - Q_1) \times (P_d - P_s)$$

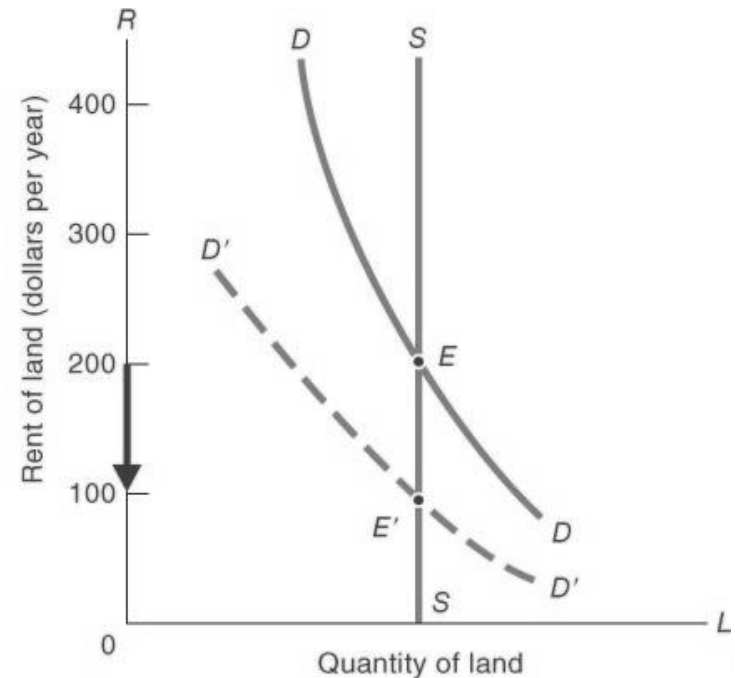
# A Numerical Example

- Demand Function:  $Q^d=40-2P$
- Supply Function:  $Q^s=10+P$
- Initial equilibrium price:  
 $Q^d = Q^s \rightarrow P_0=10 \text{ \& } Q_0=20$
- Quantity tax  $t=3$ :  
 $Q^s=10+P_s=10+P_1-3$   
 $Q^d = Q^s \rightarrow P_1=11 \text{ \& } Q_1=18 \text{ } (P_s=P_1-3=8)$
- Government's Tax Revenue:  
 $Q_1 \times t=18 \times 3=54$
- Dead Weight Loss:  
 $DWL = 0.5 \times (Q_0-Q_1) \times (P_d-P_s) = 0.5 \times (20-18) \times 3 = 3$



# Taxation on Land Rent

- As discussed in Ch. 8, land owner obtain pure economic rent since the supply of land is fixed (a vertical line)
- Now suppose that the government introduce a 50% tax on all land rents
- Burden of farmers:  
 $P_1 = \$200 = P_0 \rightarrow P_1 - P_0 = 0$
- Burden of landowners:  
 $P_{sel} = \$100 \rightarrow P_0 - P_{sel} = \$100 = t$
- Visualization: the effect is just the same as it would be if the farmer is charged 50% of their payment to the landowner
  - Demand for land is shifted down from  $DD$  to  $D'D'$
- The land owner carry all the burden (demand is more elastic than the supply)



**FIGURE 14-2.** Tax on Fixed Land Is Shifted Back to Landowners, with Government Skimming Off Pure Economic Rent

- Deadweight loss = 0
- ***A tax on pure economic rent will lead to no distortions or inefficiency***