Jonathan Gruber
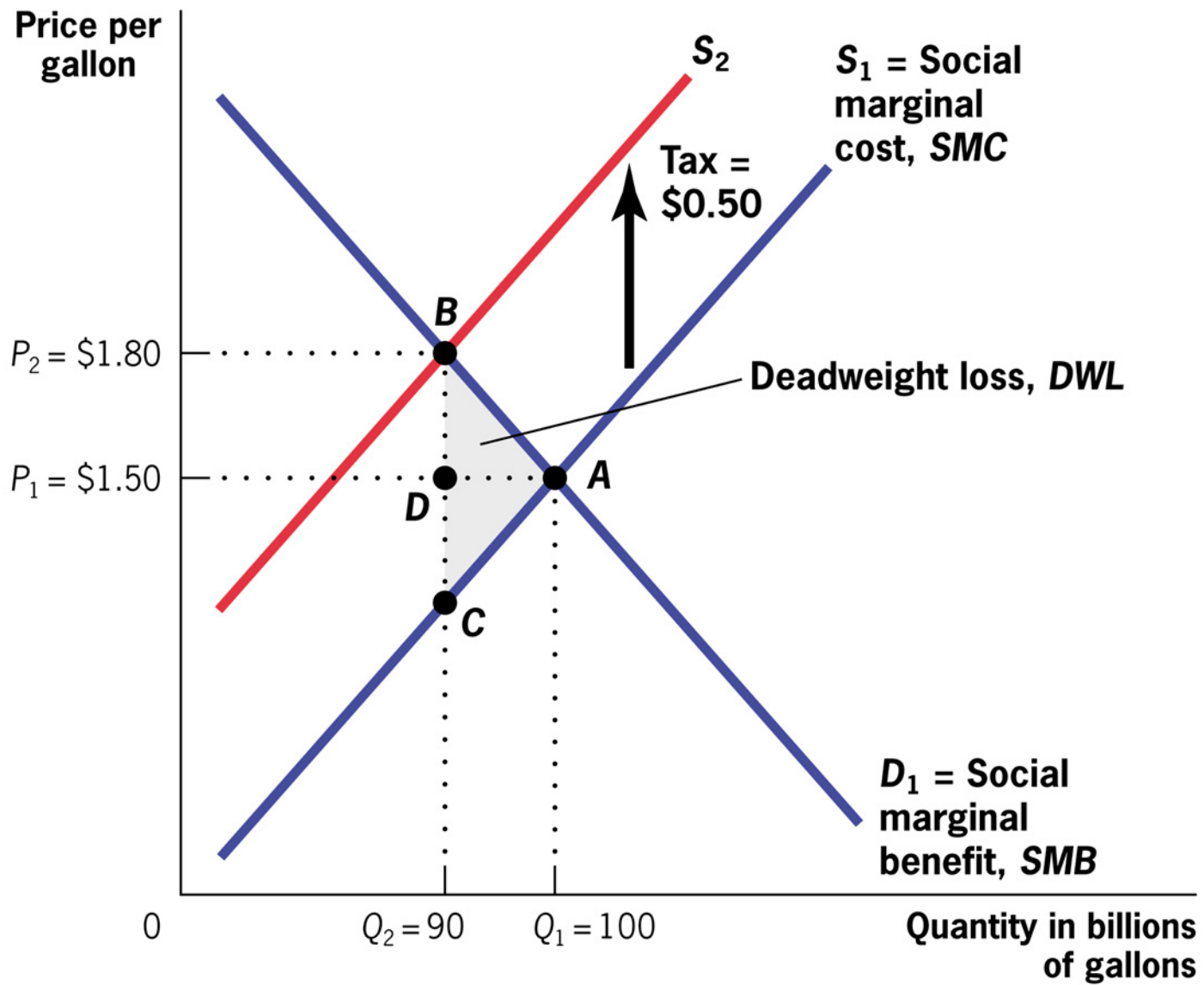
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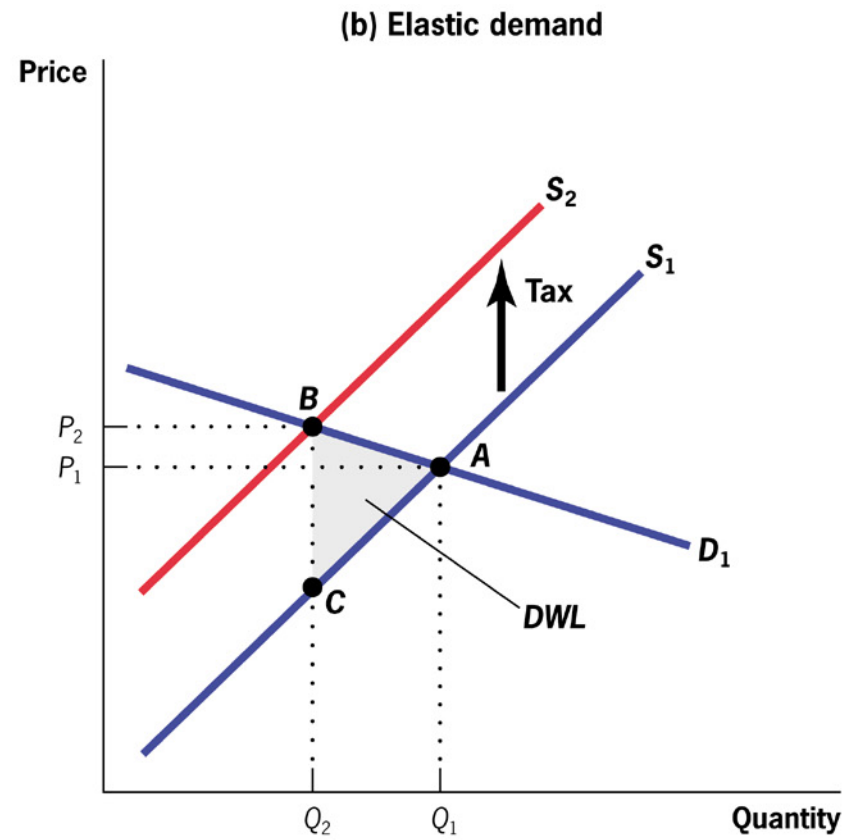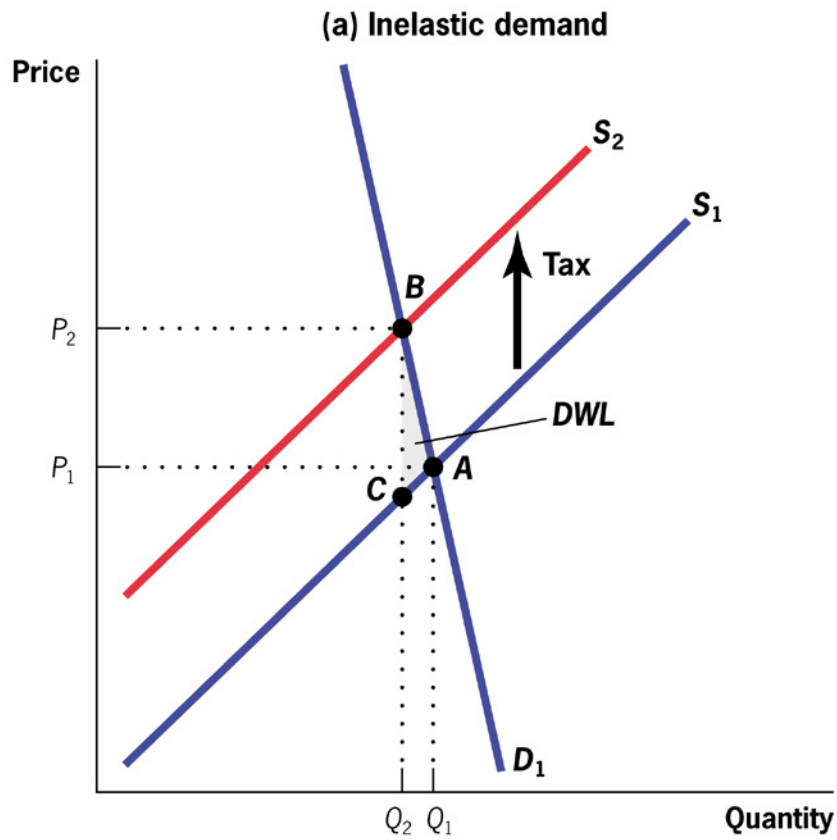## Chapter 20:
Tax Inefficiencies and Their Implications
for Optimal Taxation

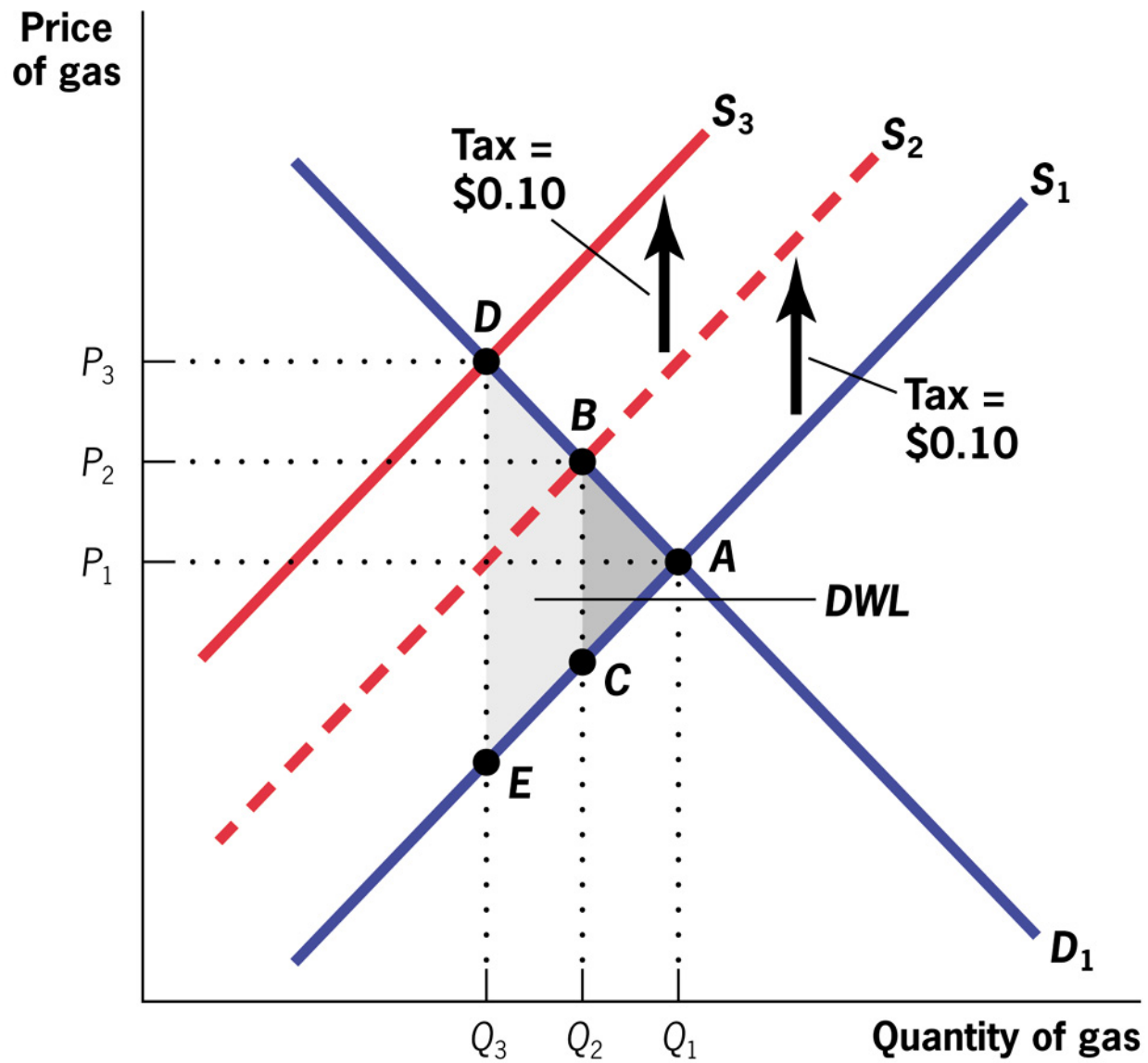**Figure 20.1** Deadweight Loss of a Tax
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(a) Inelastic demand

Price

S_2

S_1

Tax

B

P_2

DWL

P_1

C A

D_1

Q_2 Q_1 Quantity

(b) Elastic demand

Price

S_2

S_1

Tax

B

P_2

P_1 A

D_1

C

DWL

Q_2 Q_1 Quantity

Figure 20.2 Deadweight Loss Rises with Elasticities
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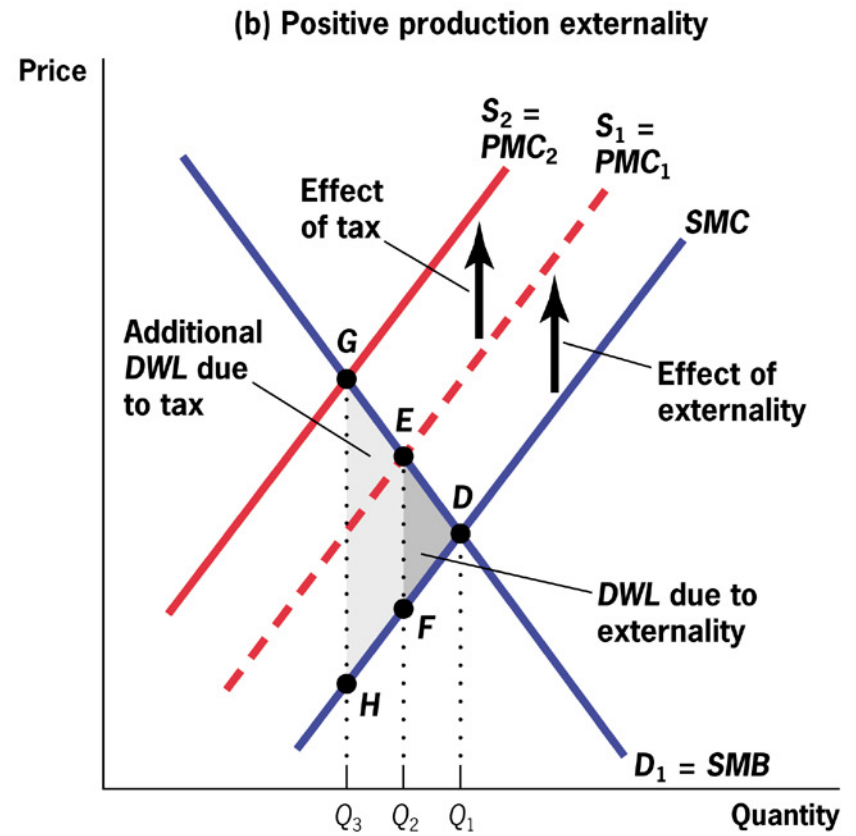Copyright © 2005 by Worth Publishers
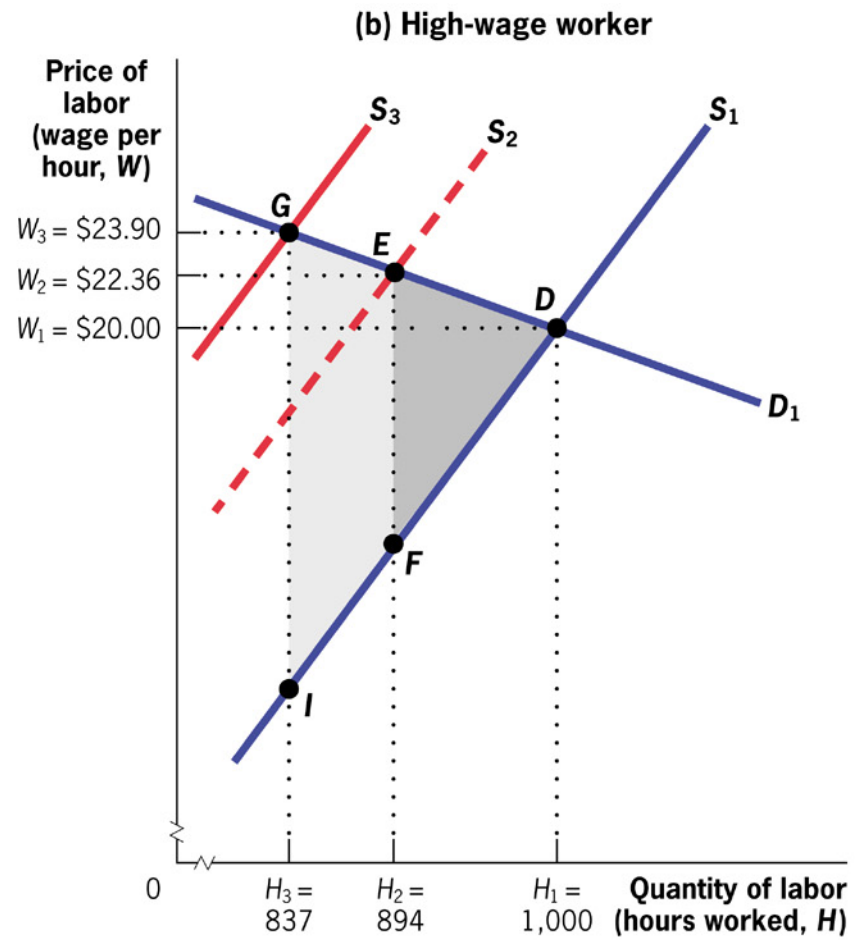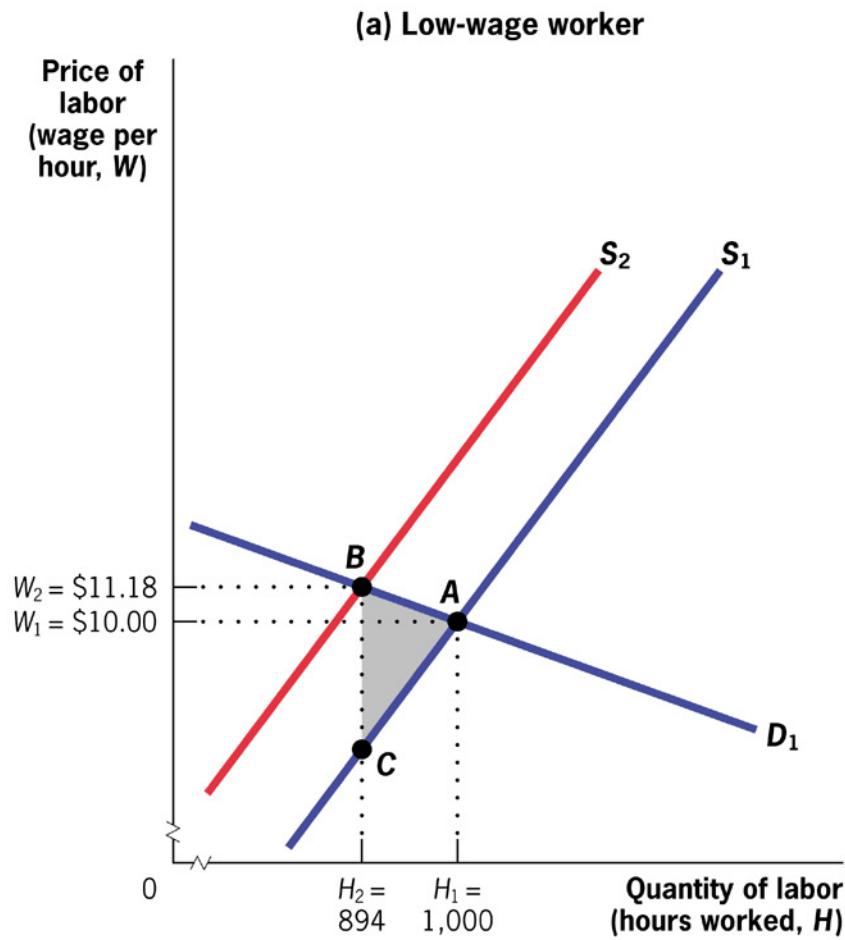
Figure 20.3 Marginal Deadweight Loss Rises with Tax Rate
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(a) No externality

Price

S_2 S_1

Tax

B

DWL due
to tax

A

C

D_1

Q_2 Q_1 Quantity

(b) Positive production externality

Price

$S_2 = PMC_2$ $S_1 = PMC_1$

Effect
of tax

SMC

Additional
DWL due
to tax

G

E

Effect of
externality

D

F

DWL due to
externality

H

$D_1 = SMB$

Q_3 Q_2 Q_1 Quantity
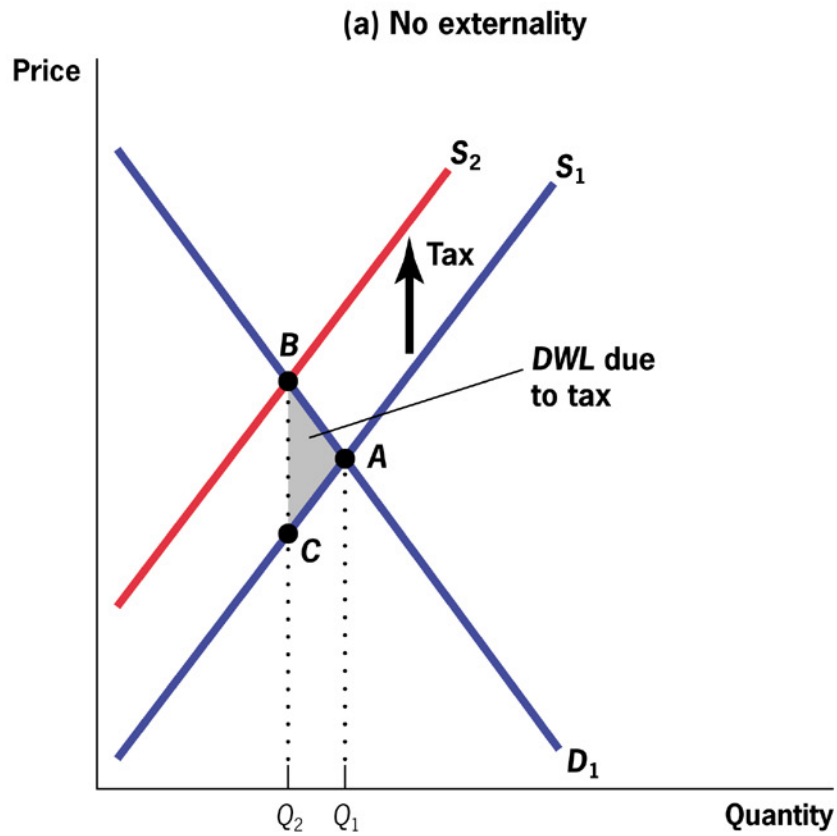
Figure 20.4 Preexisting Distortions Matter
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(a) Low-wage worker

Price of labor (wage per hour, W)

S_2 S_1

$W_2 = \$11.18$
$W_1 = \$10.00$

B   A

C

D_1

0

$H_2 =$ 894 $H_1 =$ 1,000

Quantity of labor (hours worked, H)

(b) High-wage worker

Price of labor (wage per hour, W)

S_3 S_2 S_1

$W_3 = \$23.90$
$W_2 = \$22.36$
$W_1 = \$20.00$

G   E   D

F

I

D_1

0

$H_3 =$ 837 $H_2 =$ 894 $H_1 =$ 1,000

Quantity of labor (hours worked, H)

Figure 20.5 (a, b) Low Rates Imposed on a Broad Base Are Desirable
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| | Tax rate below $10,000 | Tax rate above $10,000 | Low-Wage Worker (panel (a)) | | High-Wage Worker (panel (b)) | | Total deadweight loss |
			Hours of labor supply	Deadweight loss from taxation	Hours of labor supply	Deadweight loss from taxation	
No tax	0	0	1,000 (H_1)	0	1,000 (H_1)	0	0
Proportional tax	20%	20%	894 (H_2)	$115.71 (area *BAC*)	894 (H_2)	$231.42 (area *EDF*)	$347.13 (*BAC* + *EDF*)
Progressive tax	0%	60%	1,000 (H_1)	0	837 (H_3)	$566.75 (area *GDI*)	$566.75 (*EDF* + *GEFI*)

Figure 20.5 (c) Low Rates Imposed on a Broad Base Are Desirable
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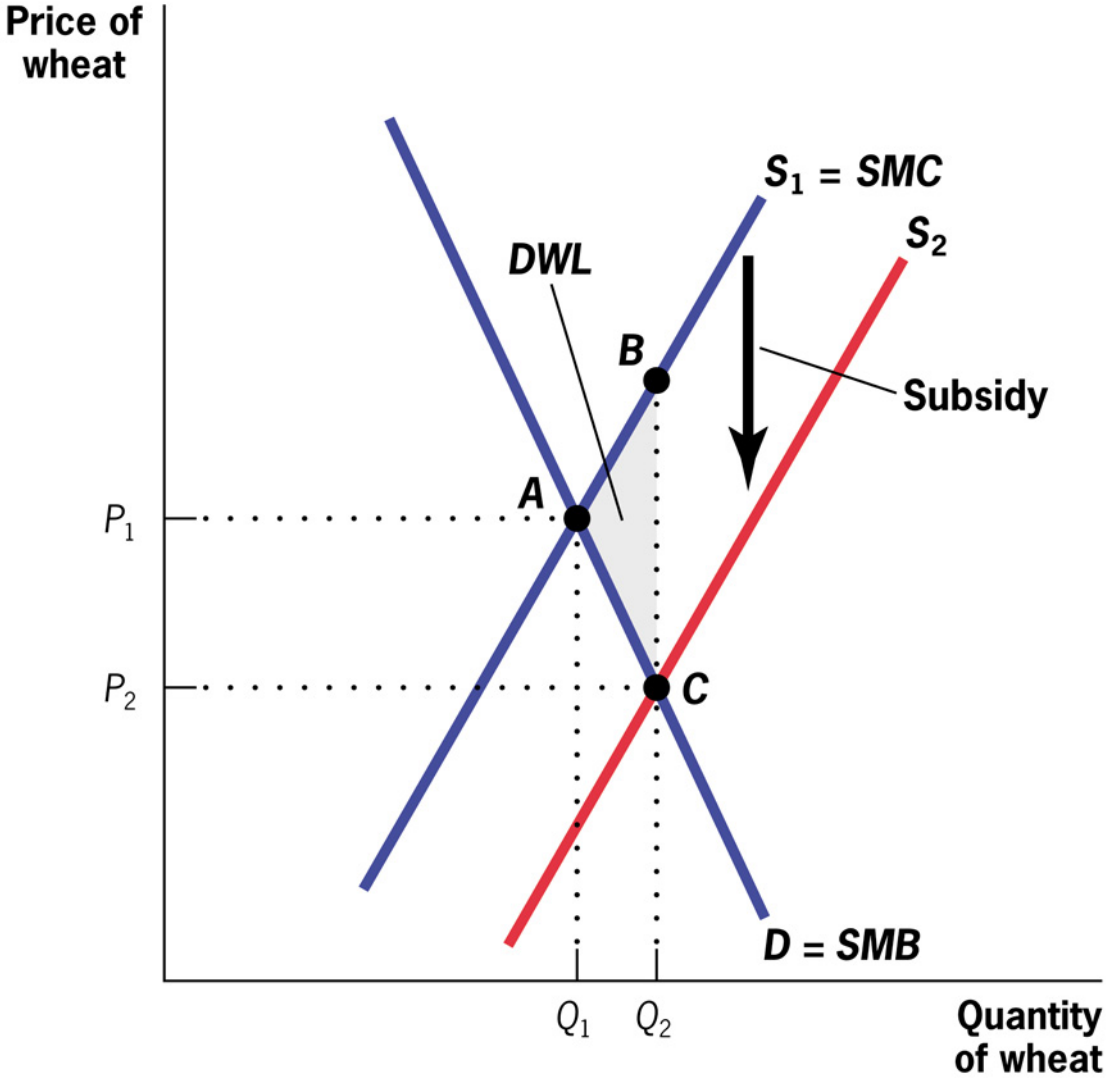
(a) Wheat (price inelastic demand)

Figure 20.6 (a) Efficiency Consequences of Subsidies and Taxes in Pakistan
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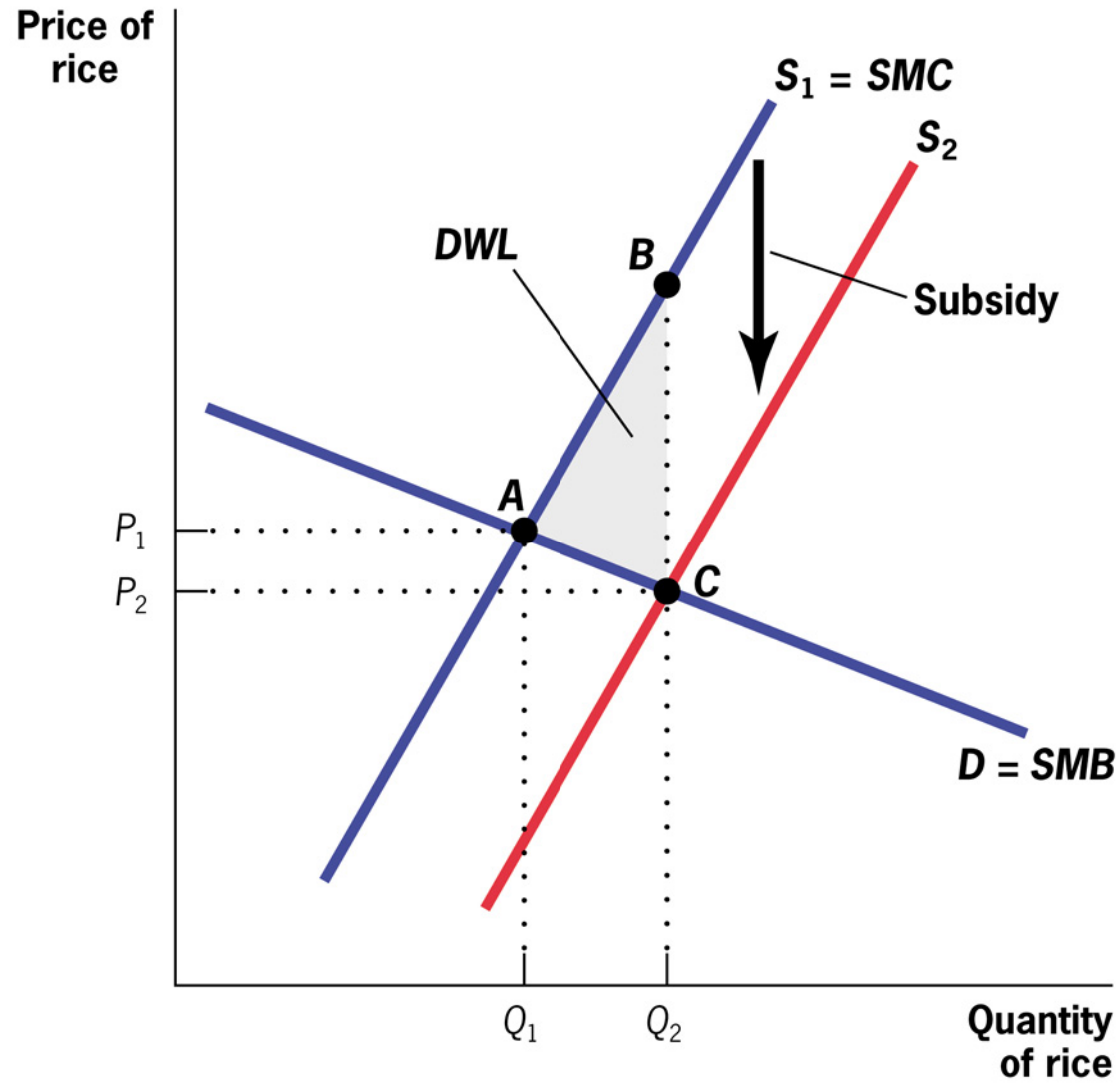
(b) Rice (price elastic demand)

$S_1 = SMC$

S_2

DWL

B

Subsidy

A

P_1

P_2

C

$D = SMB$

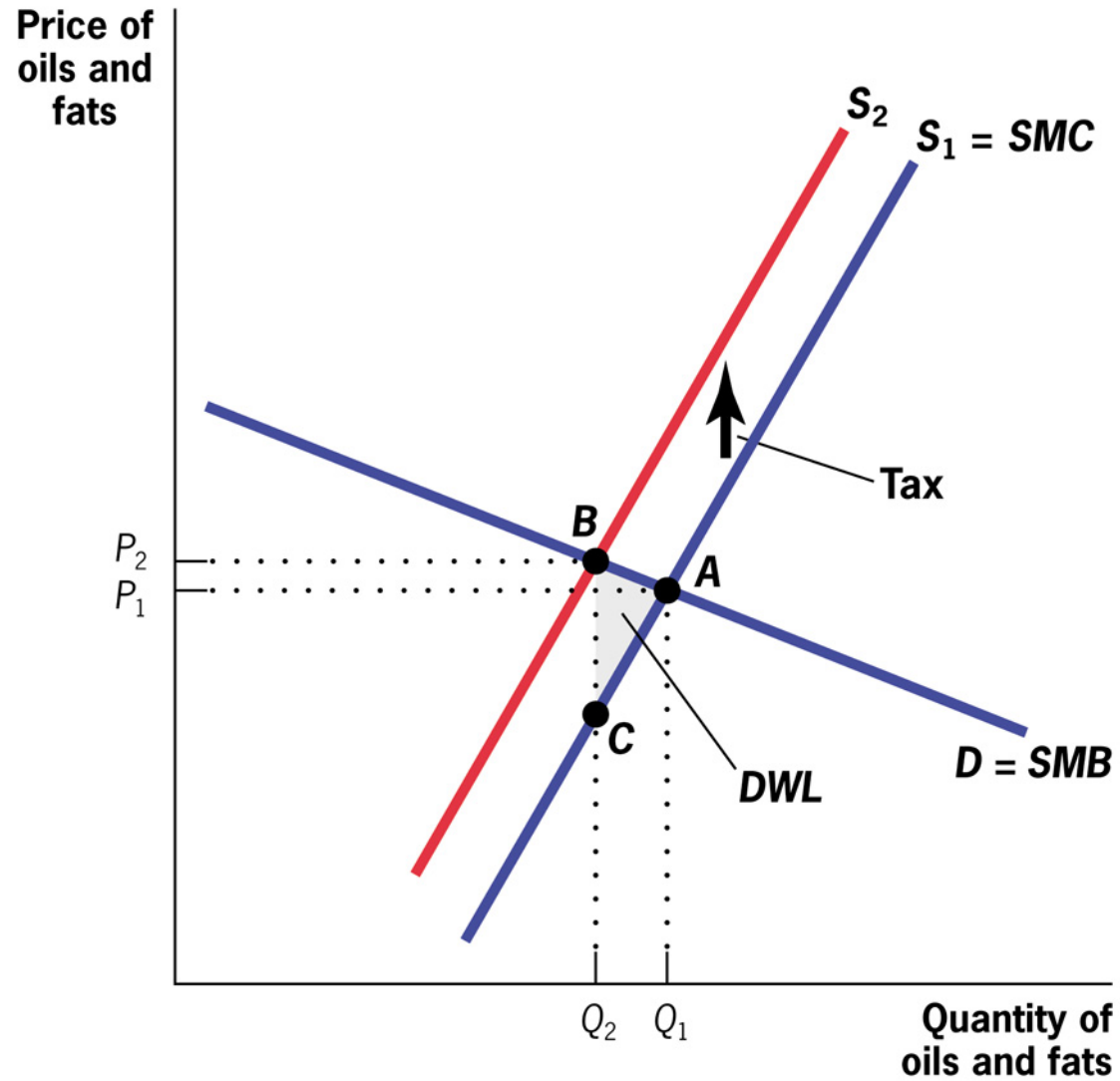Q_1 Q_2

Quantity of rice

Price of rice

Figure 20.6 (b) Efficiency Consequences of Subsidies and Taxes in Pakistan
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Figure 20.6 (c) Efficiency Consequences of Subsidies and Taxes in Pakistan
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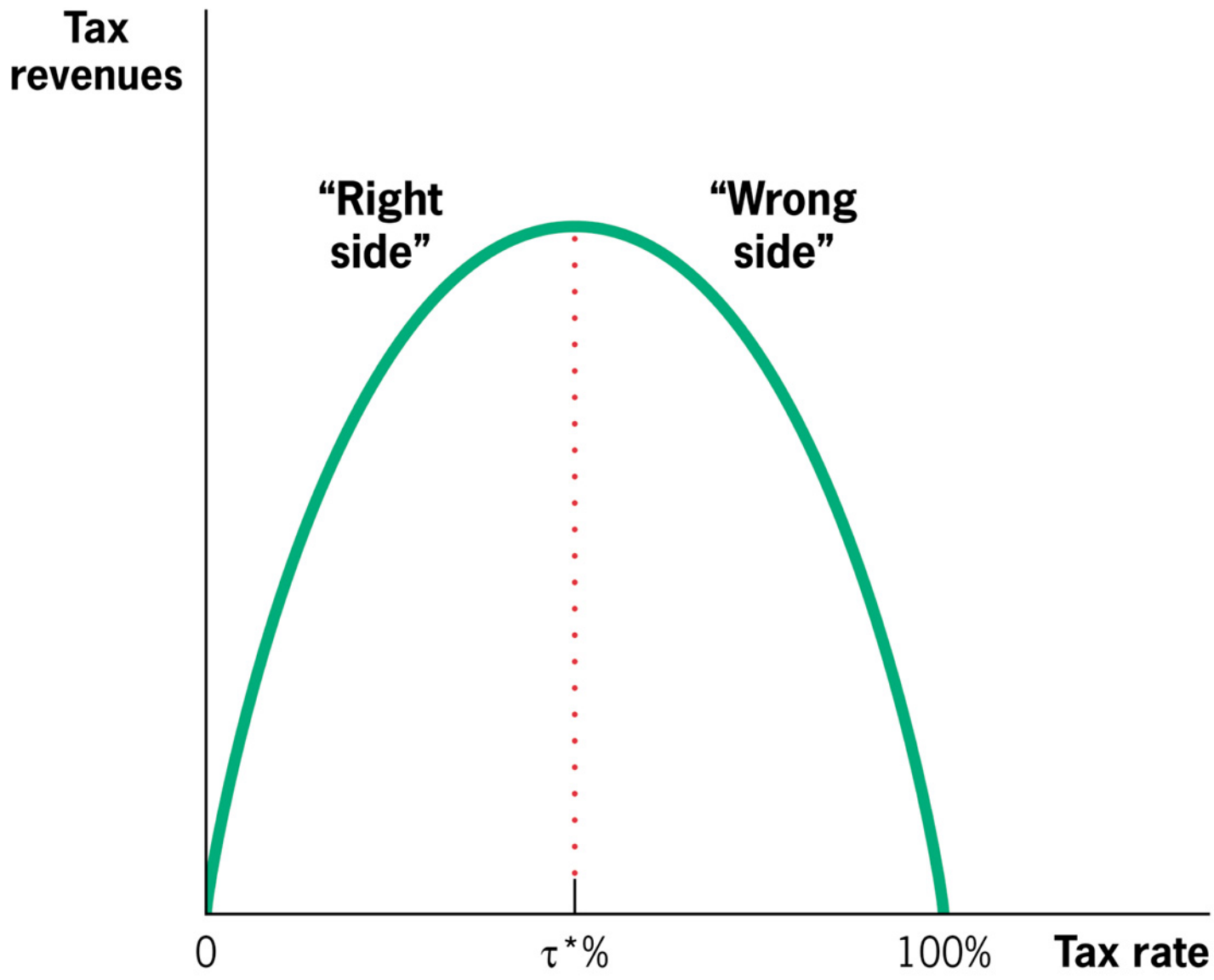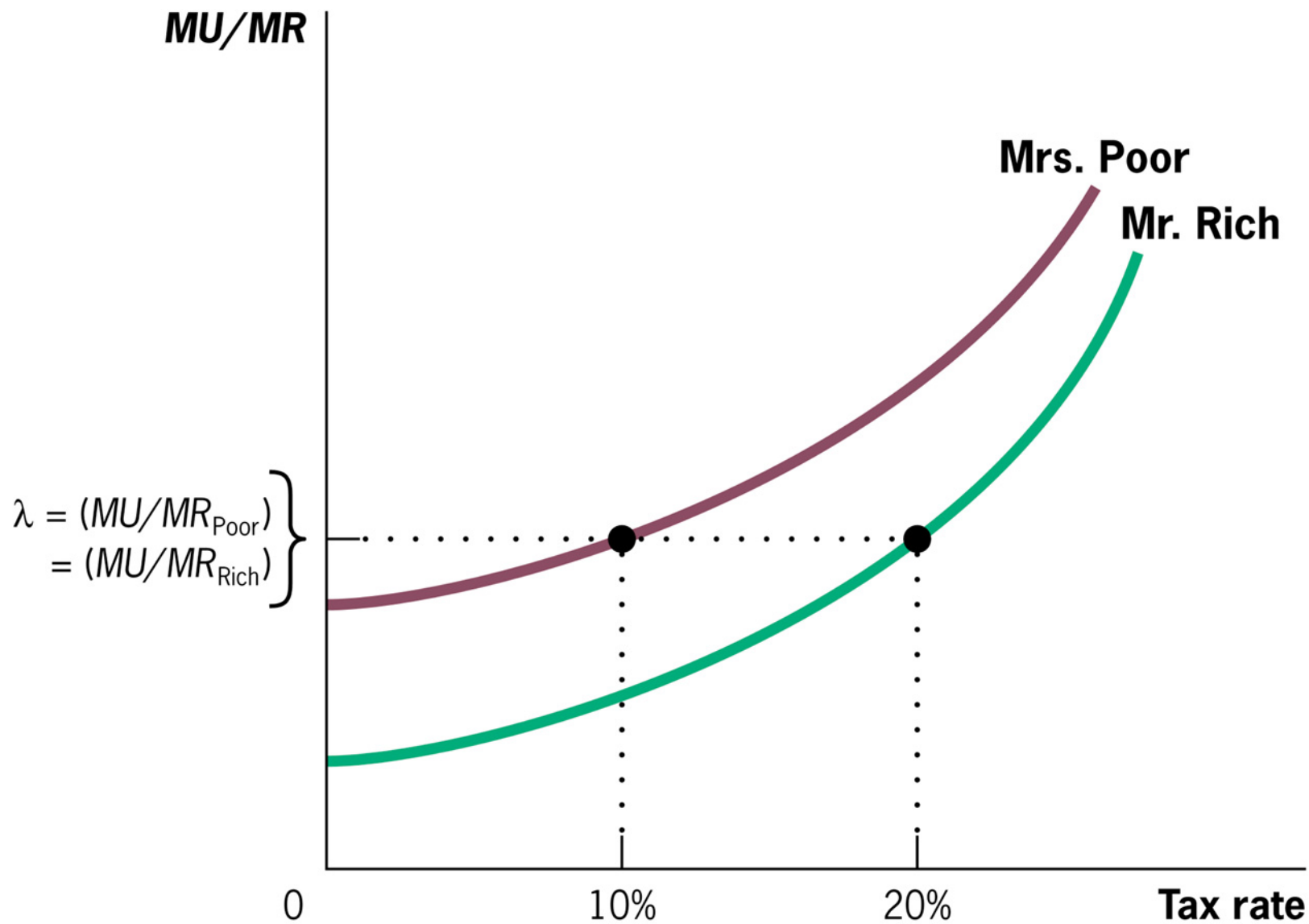Copyright © 2005 by Worth Publishers

Demand for Various Commodities in Pakistan

Good	Subsidy	Price elasticity	Policy change	Welfare gain	Include distributional concerns
Wheat	40%	−0.64	Reduce subsidy	Small	Don't reduce subsidy
Rice	40%	−2.08	Reduce subsidy	Large	Reduce subsidy
Oil/fat	−5%	−2.33	Reduce tax	Large	Reduce tax further

Deaton (1997).

Table 20.1
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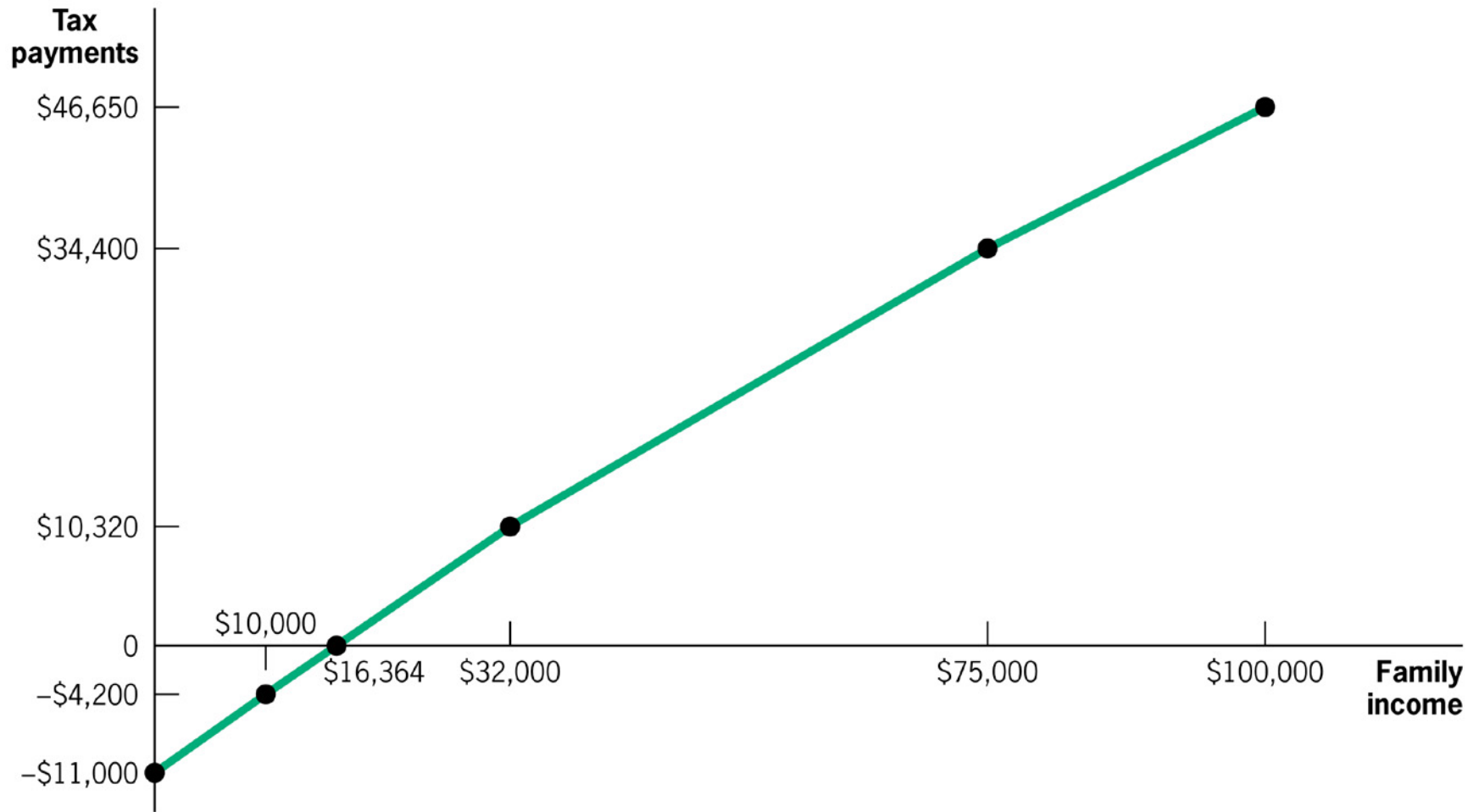
Figure 20.7 The Laffer Curve
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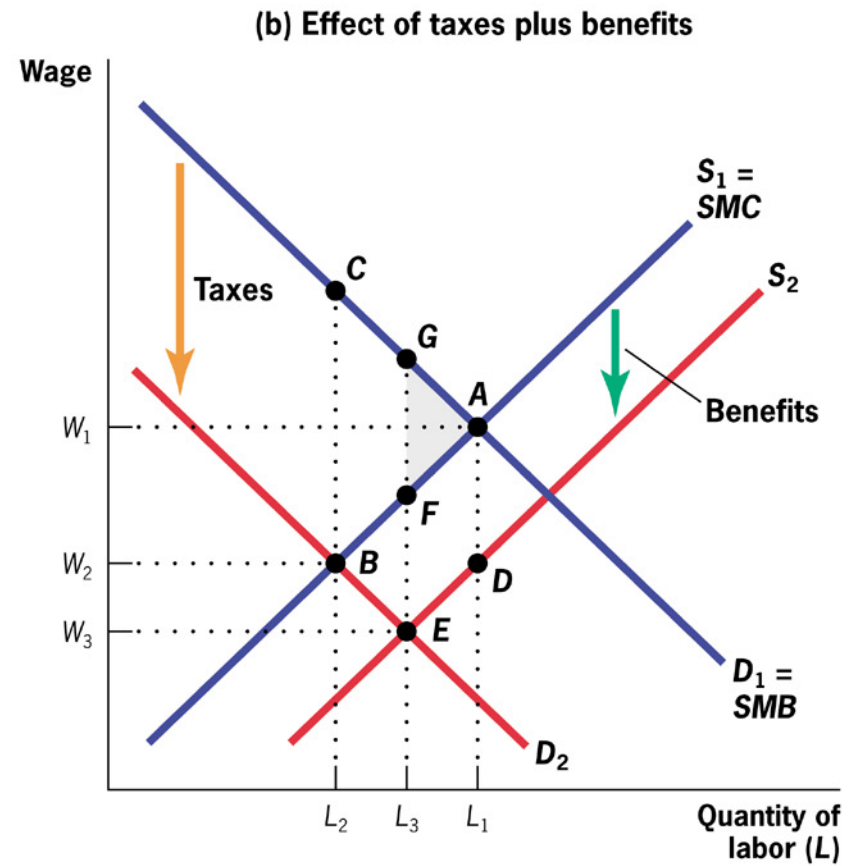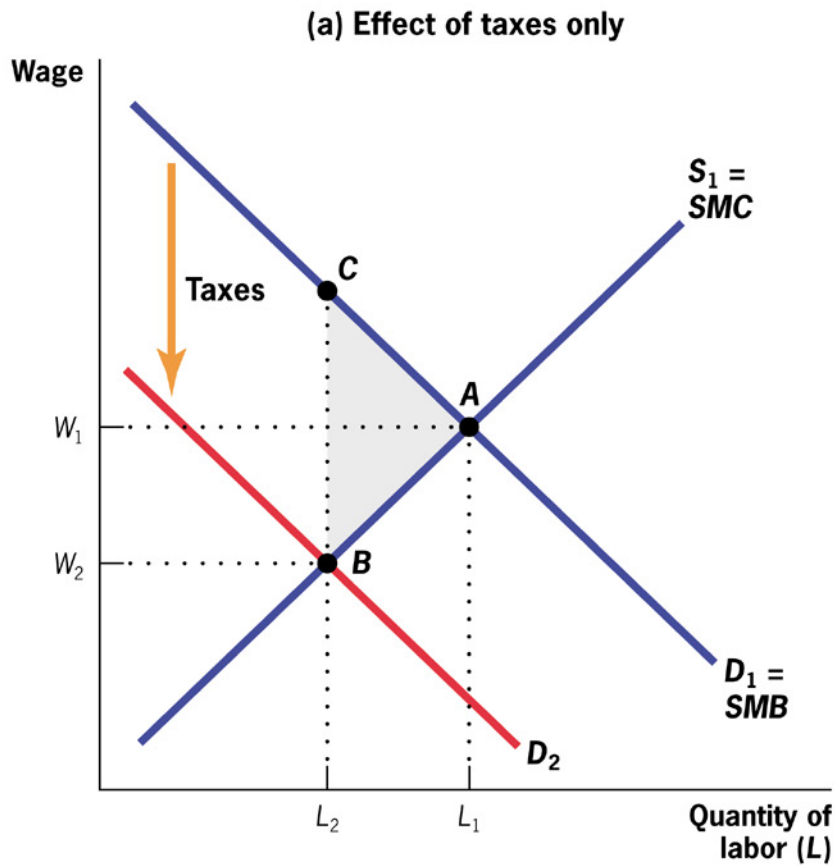Copyright © 2005 by Worth Publishers

Figure 20.8 Optimal Income Taxation
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Figure 20.9 (a) Simulations of Optimal Nonlinear Income Tax Rates
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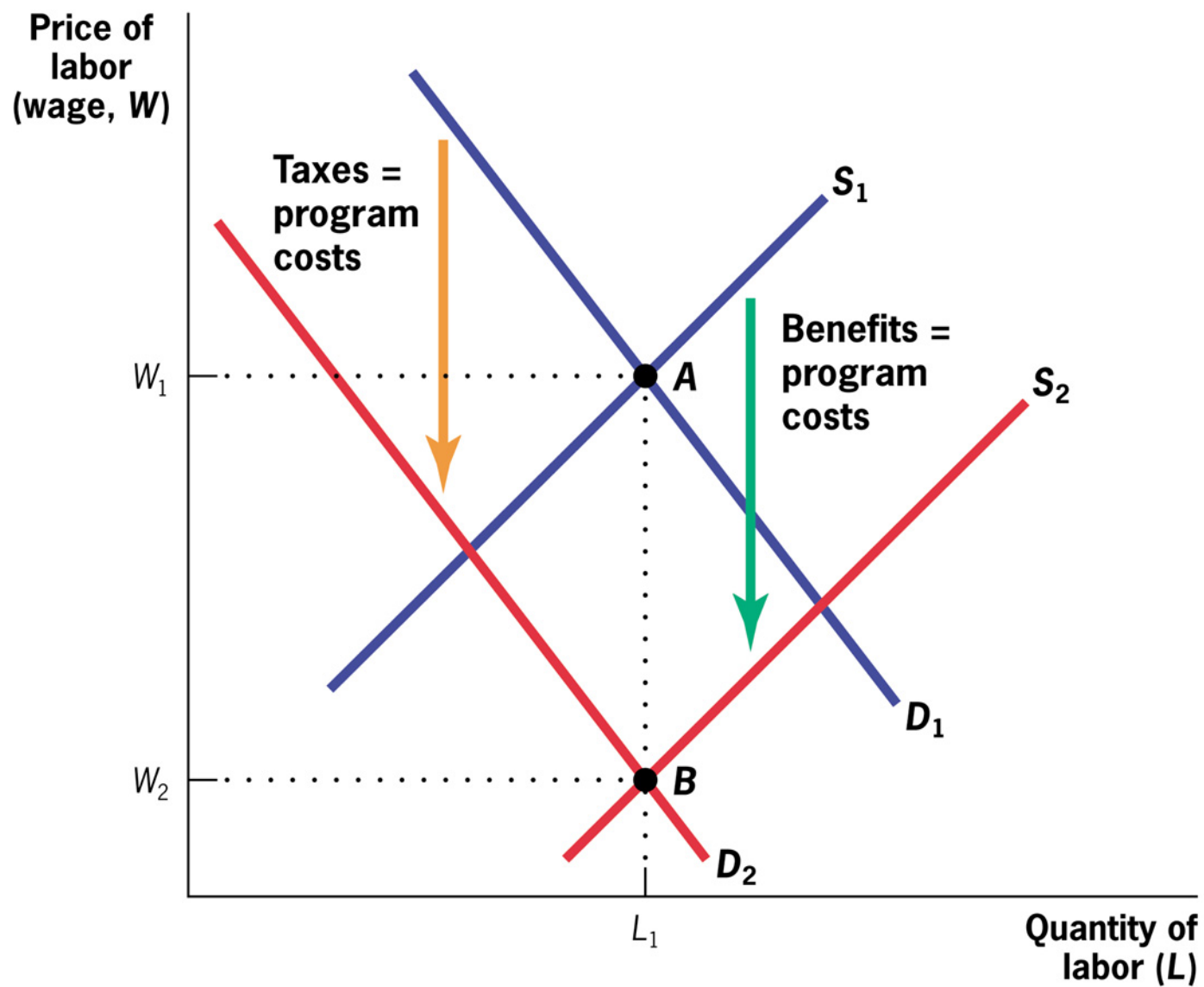Copyright © 2005 by Worth Publishers

Optimal Tax Results					
Income groups	$0–$10K	$10K–$32K	$32K–$75K	$75K and above	Guaranteed income level
Marginal tax rates	68%	66%	56%	49%	$11,000
Average tax rates	−161%	12%	40%	47%	

Figure 20.9 (b) Simulations of Optimal Nonlinear Income Tax Rates
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Figure 20.10 Tax-Benefit Linkages
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Figure 20.11 Taxation with No Deadweight Loss Due to Linkages
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