

## Chapter 2 Demand

# China Mobile



	2010	2009	2008
Growth in subscribers	12%	14%	24%
Growth in ARPU	-5%	-7%	-7%

# China Mobile



- ▶ The largest mobile service provider in the world.
  - ▶ Around 70% of market shares
- ▶ Positive growth in subscribers, but ARPU (average revenue per user) declines over time.

# China Mobile



- ▶ Chairman Wang Jianzhou, 2010:
  - ▶ Added 62 million new customers, “a large part of whom continued to come from rural and migrant markets”
- ▶ Is the growth of rural and migrant subscribers related to the decline of ARPU?
- ▶ Challenges
  - ▶ Declining ARPU
  - ▶ How to price calling plans?

# Learning objectives

- ▶ Distinguish consumer demand for normal products and inferior products.
- ▶ Appreciate the impact on demand of changes in the prices of substitutes and complements.
- ▶ Understand the differences between consumer and business demand.
- ▶ Appreciate the concept of buyer surplus.
- ▶ Apply package deals and **two-part pricing** to extract buyer surplus.

# Outline

- ▶ **Individual demand**
- ▶ Demand and income
- ▶ Other factors in demand
- ▶ Business demand
- ▶ Buyer surplus
- ▶ Market demand

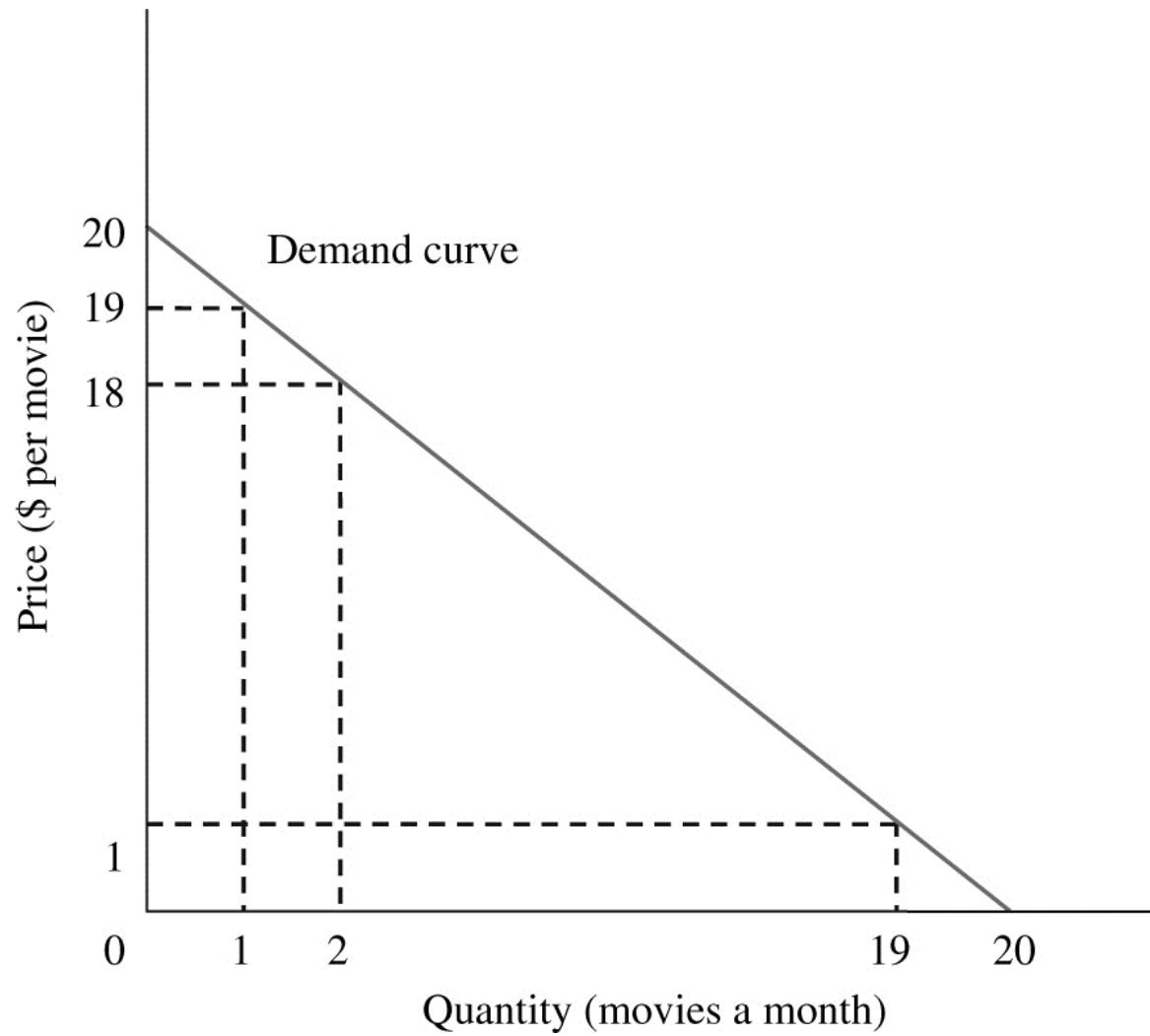
# Individual demand

- ▶ Definition: graph of quantity that buyer will purchase at every possible price
- ▶ Construction – “Other things equal, how many would you buy at a price of ....?”
  - ▶ Vertical axis – price
  - ▶ Horizontal axis – quantity

Table 2.1 Individual demand

Price (\$ per movie)	Quantity (movies a month)
20	0
19	1
18	2
...	...
0	20

# Individual demand





# Individual demand

- ▶ Two views of demand curve
  - ▶ For every possible price, demand curve shows the **quantity demanded**
  - ▶ For each unit of item, demand curve shows the maximum price that the buyer is willing to pay

# Individual demand: Marginal benefit

- ▶ Definition: benefit provided by additional unit of item
- ▶ Principle of Diminishing marginal benefit – each additional unit of consumption/usage provides less benefit than the preceding unit
  - ▶ Demand curve slopes downward

# Individual demand: Consumer differences

- ▶ Individual preferences → different demand curves
  - ▶ Changes in consumer's preferences, eg, age
    - ▷ Internet access, 3c products
- ▶ Different consumers, e.g, gender, purpose of consumption
  - ▷ Demand if women and men for jewelry
  - ▷ Demand of business vs leisure travellers

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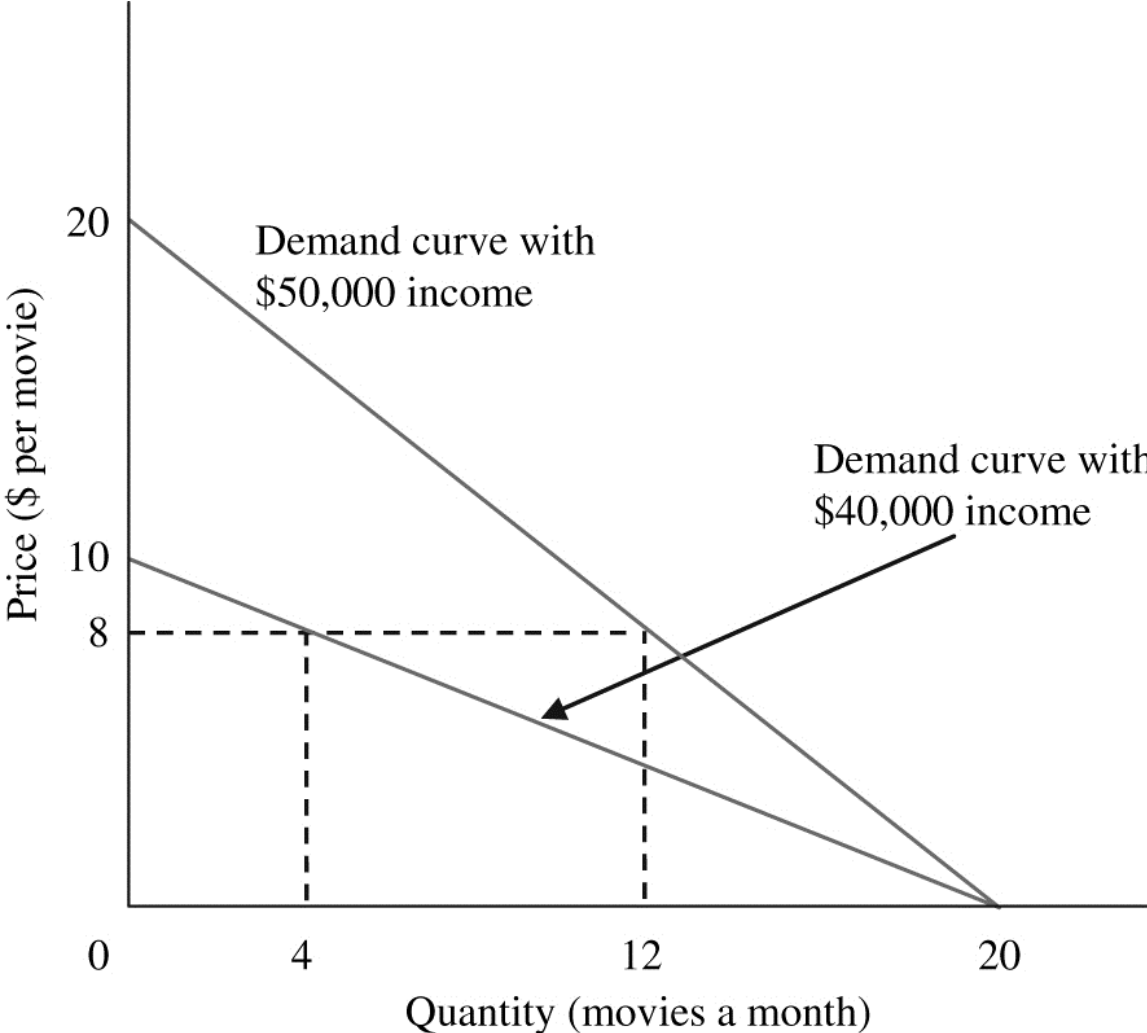
# Demand and income

- ▶ Construction – “Suppose that your income is [...] per year. Other things equal, how many would you buy at a price of ....?”
  - ▶ Vertical axis – price
  - ▶ Horizontal axis – quantity
- ▶ Different demand curve for each income level

Table 2.2 Individual demand with lower income

Price (\$ per movie)	Quantity (movies a month)
20	0
19	0
...	0
10	0
9	2
8	4
...	...
0	20

# Demand and income



# Demand and income

- ▶ Changes in price *vis-a-vis* income
  - ▶ **Normal product** – demand increases with income
  - ▶ **Inferior product** – demand falls with income

# China Mobile

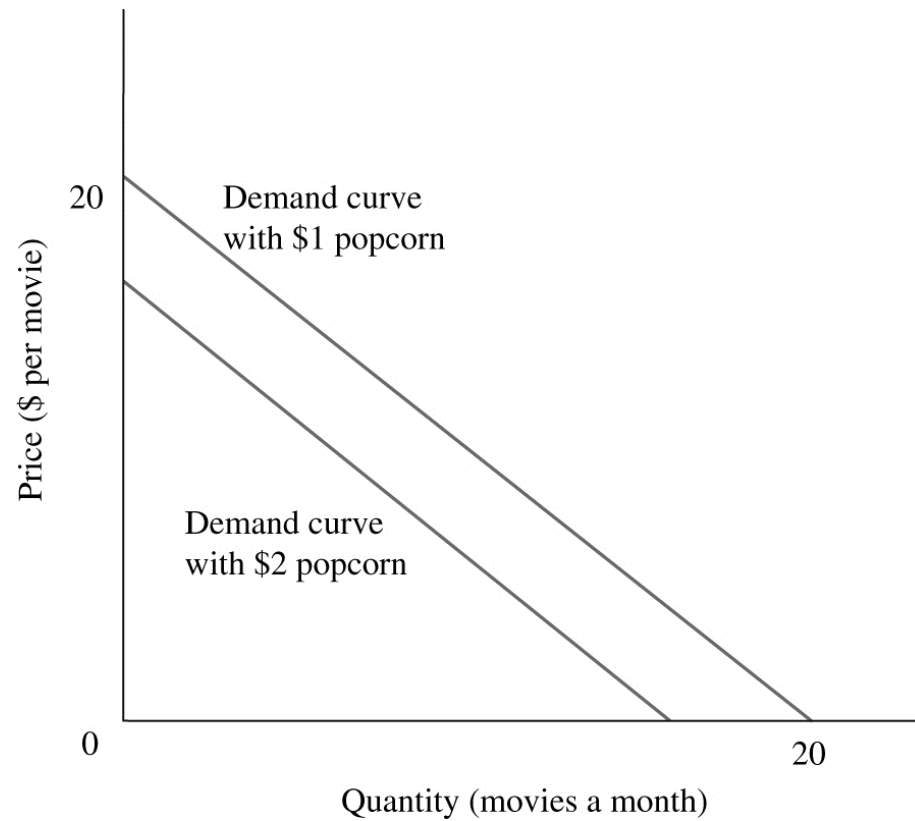
- ▶ Pre-paid service
  - ▶ 2011: Over 90% of subscribers
  - ▶ 2001: 48% of subscribers
- ▶ Push to rural and migrant consumers
  - ▶ Lower income
  - ▶ Subscribe to pre-paid service
  - ▶ Lower ARPU (average revenue per user)
- ▶ Result: Growth in customer base + declining ARPU



# Outline

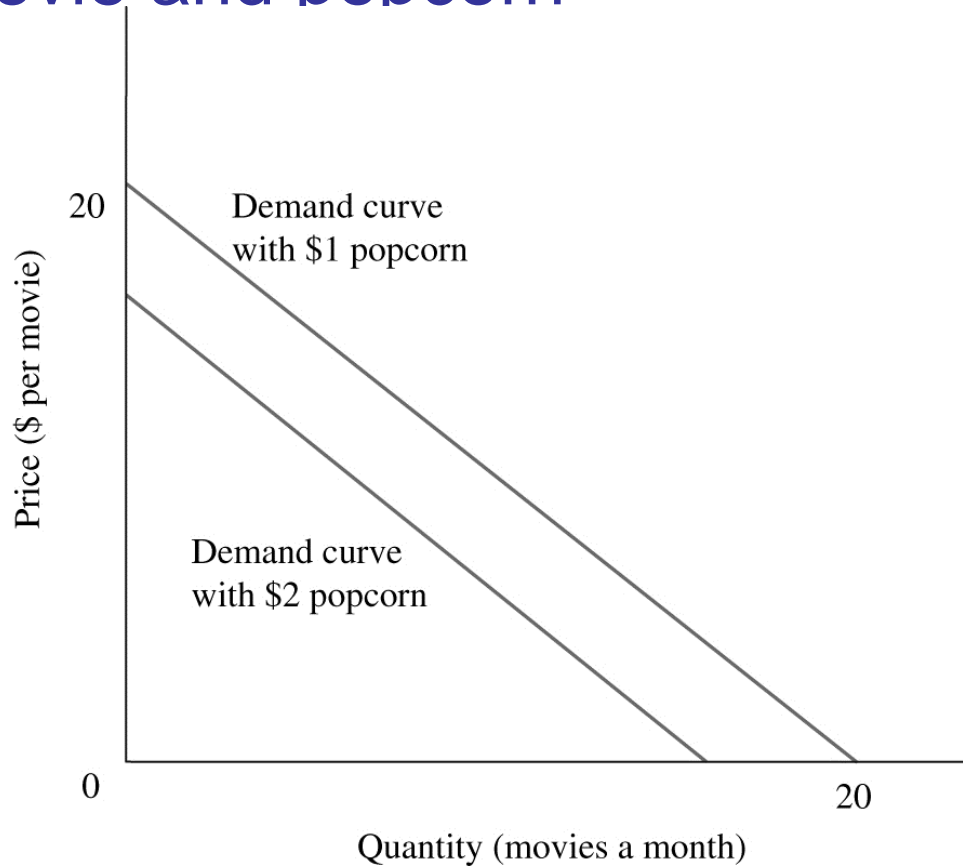
- ▶ Individual demand
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# Other demand factors: Complements



# Other demand factors: Complements

- ▶ Demand decreases with the price of complements
  - ▶ Movie and popcorn



# Other demand factors: Substitutes

- ▶ Direct substitutes
  - ▶ MBA education: Dartmouth / NYU / USC
  - ▶ Transportation: American Airlines / British Airways
- ▶ Functional substitutes
  - ▶ MBA education – residential / distance learning
  - ▶ Communication: airline / train / video-conferencing / mail

# Other demand factors: Substitutes

- ▶ Internal provision
  - ▶ Especially for business customers – “Make or buy”
    - ▷ Physical inputs – vertical integration
    - ▷ Services – HR, payroll, finance, IT

## Other demand factors: Durable goods

- ▶ *Expectations* about future prices and income
- ▶ Financing costs
- ▶ Prices of used models
  - ▶ Substitute for new good
  - ▶ Future value of new good

# Outline

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# Business demand

- ▶ Consumer demand vs business demand
  - ▶ Final consumption vs further production
- ▶ Business demands items as inputs into further production, not for consumption
  - ▶ Finished/semi-finished components --
  - ▶ Raw materials and energy
  - ▶ Labor and other services
  - ▶ Capital



# Business demand

- ▶ Demand factors
  - ▶ Quantity of final output
  - ▶ Prices of complements and substitutes in production
  - ▶ Does not depend on income

# Examples of business demand

- ▶ Banks: hiring tellers or use ATMs (automated teller machines )
  - ▶ Increase in wages → teller service became increasingly costly
  
- ▶ Banks used ATMs to substitute for tellers
  - ▷ Compare use of ATMs in U.S. vs Mexico
    - ▷ Labor costs
    - ▷ infrastructure (telecommunication network)

# Bombardier: What material to use?

- ▶ Aluminium vis-à-vis carbon composite
  - ▶ Weight → carbon composite is lighter
    - ▷ Fuel consumption
    - ▷ Emissions
  
- ▶ Price

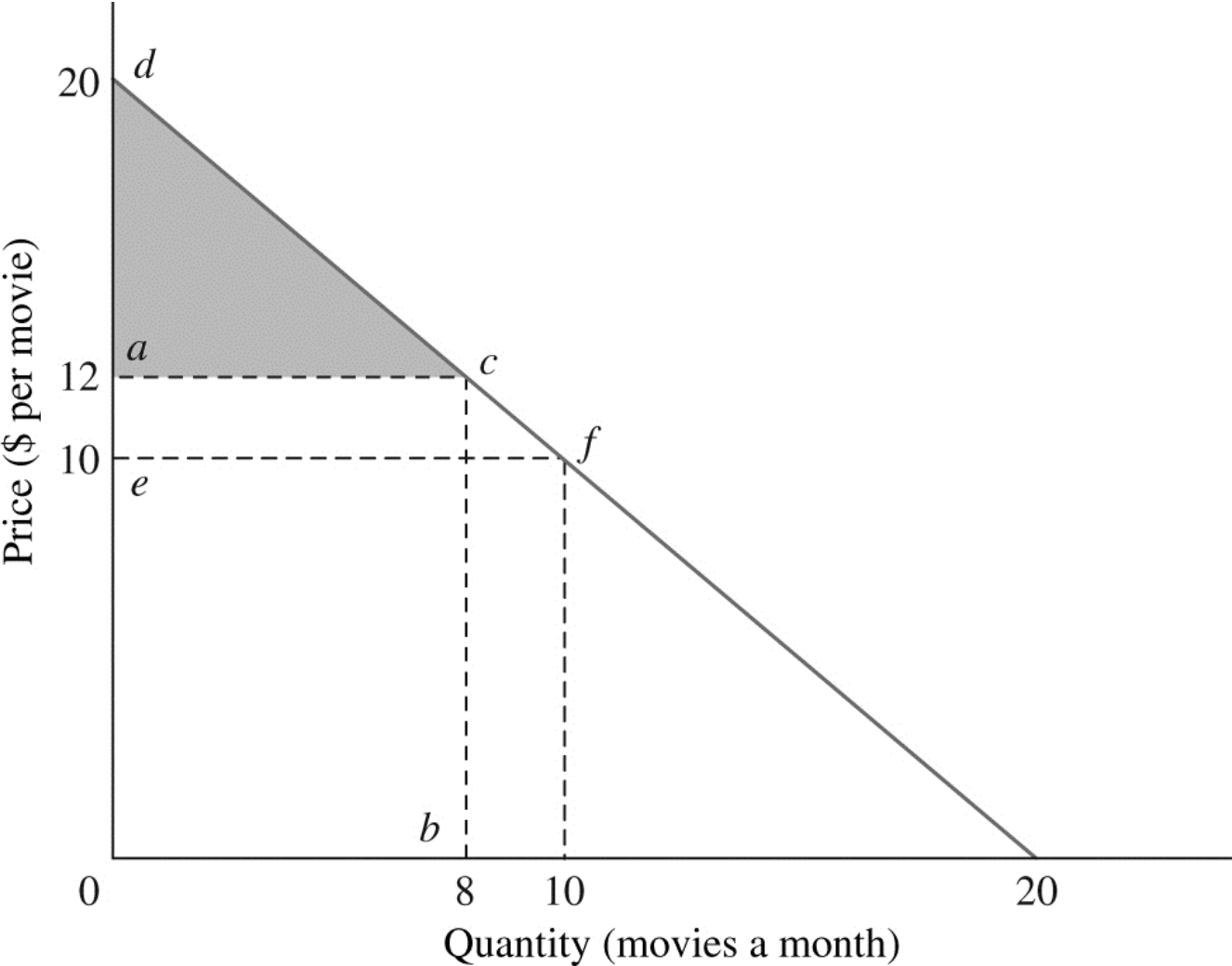
# Outline

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## Two views of demand curve

- ▶ For every possible price, demand curve shows the quantity demanded
- ▶ For each unit of item, demand curve shows the maximum price that the buyer is willing to pay
  - ▶ Individual **buyer surplus**: buyer's benefit *minus* price must pay for the item

# Buyer surplus: Individual



# Buyer surplus: Gains from price cut

- ▶ Lower price on the quantity that he/she would have purchased at the original price (infra-marginal units)
- ▶ He/she can buy more (marginal units)

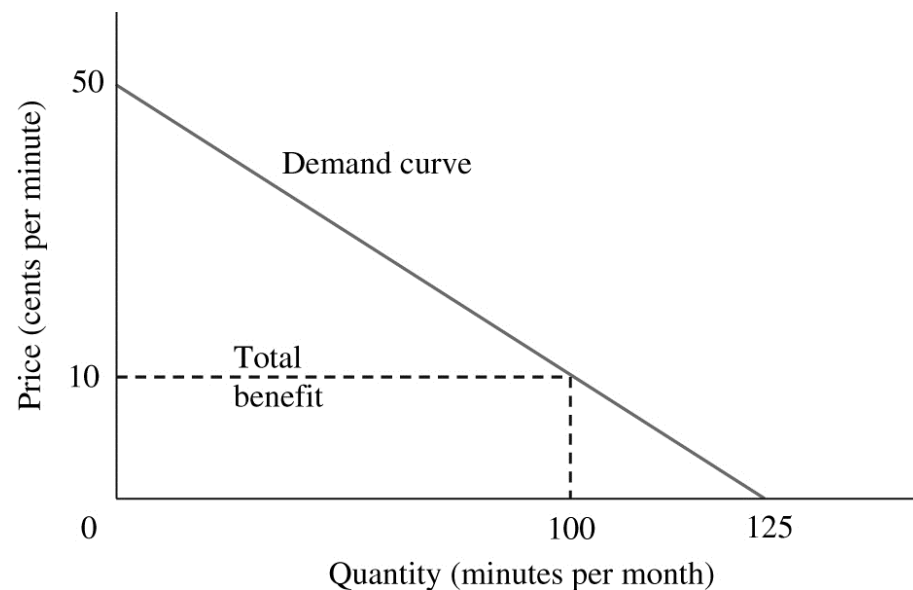
## Buyer surplus: Package deal

- ▶ Package deal: a pricing scheme comprising a fixed payment for a fixed quantity of consumption
  - ▶ Mobile service plan, e.g, \$39 for 1000 minutes per month
  - ▶ Car rental, e.g, \$49 per day with free miles



# Buyer surplus: Package deal

- ▶ Charge buyer just a little less than her/his total benefit
- ▶ Leave buyer with almost zero surplus

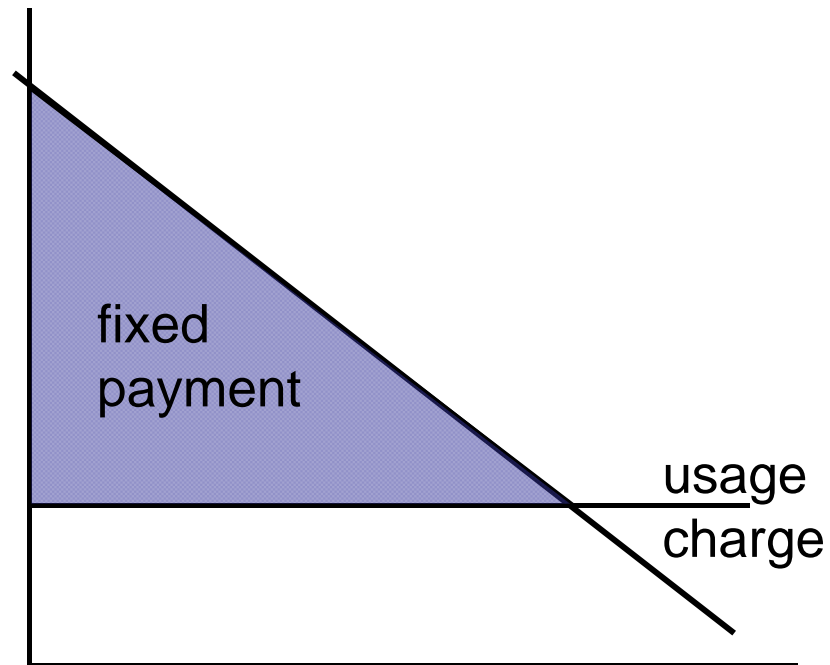


# Buyer surplus: Two-part pricing

- ▶ Two part pricing
  - ▶ Fixed payment + Usage charge
  
- ▶ E.g., mobile service plan: monthly fee plus  
airtime charge
  
- ▶ E.g, gym: membership fee + monthly charge

# Buyer surplus: Two-part pricing

- ▶ Leave buyer with almost zero surplus



# Buyer surplus: Public policy

- ▶ Whether to build new hospital, water plant, bridge, road?
- ▶ How much to invest in primary education?
  - ▶ May price the service below marginal cost, even zero
- ▶ Evaluate
  - ▶ Net present value of future stream of total benefit less total cost

How much to spend on mosquito nets?

# Outline

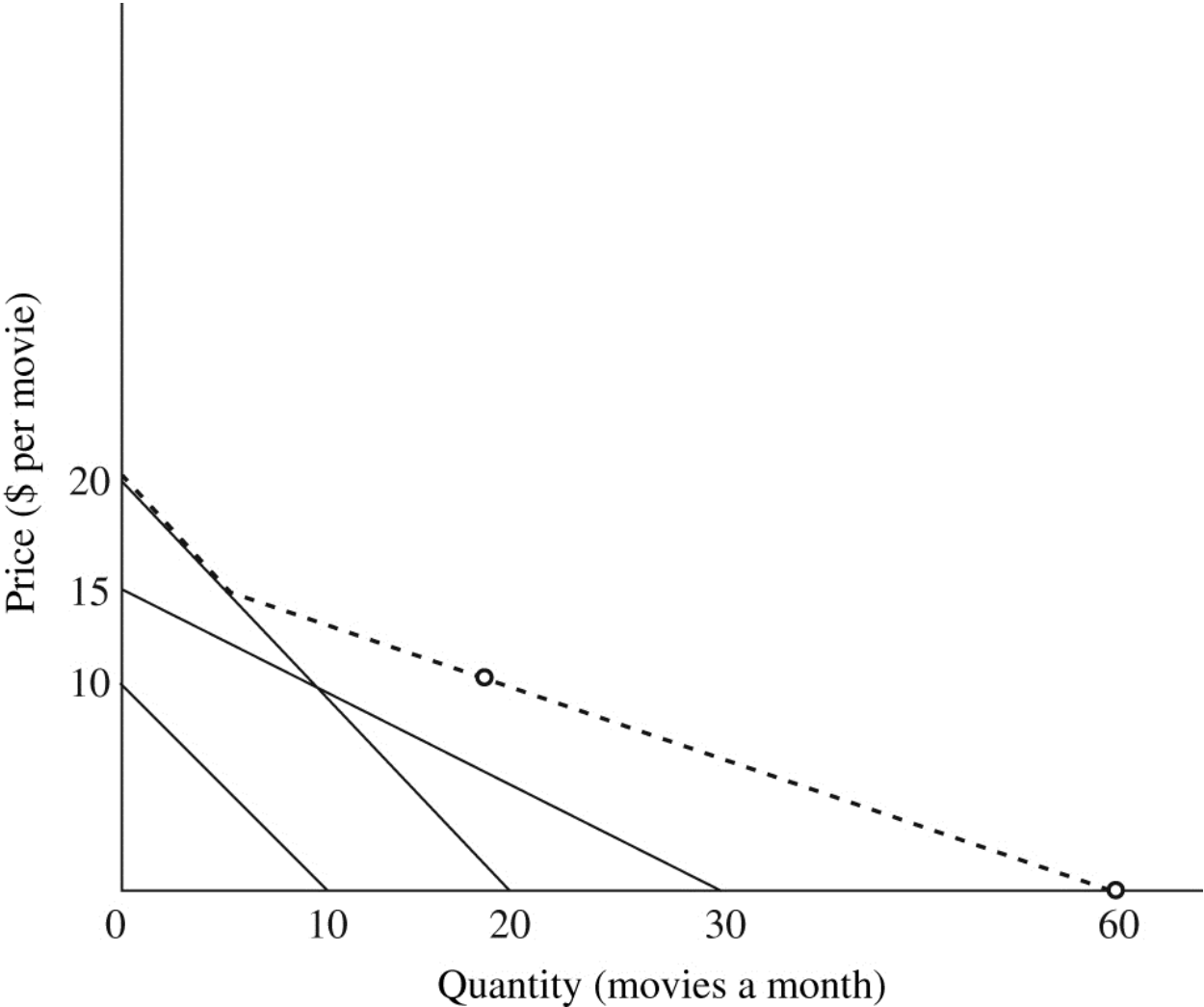
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# Market demand

Table 2.3 Market demand

Price (\$ per movie)	Joy	Max	Lucas	Market
20	0	0	0	0
19	1	0	0	1
18	2	0	0	2
...	...	0	0	...
10	10	10	0	20
8	12	14	2	28
...	...	...	...	...
0	20	30	10	60

# Market demand: Construction



# Key takeaways

- ▶ Owing to diminishing marginal benefit, consumers and business buyers buy more at lower prices.
- ▶ Consumer demand for normal products increases with income, while consumer demand for inferior products decreases with income.
- ▶ The demand for a product increases with the price of a substitute, and decreases with the price of a complement.
- ▶ Business demand increases with the output of the item being produced.
- ▶ Buyer surplus is the difference between the buyers' total benefit from consumption and the buyers' actual expenditure.
- ▶ A seller can extract the buyers' surplus and raise profit by selling through package deals and two-part pricing.