Chapter 10
Work and Wealth

Chapter Overview

- Introduction
- Automation and employment
- Workplace changes
- Globalization
- The digital divide
- The "winner-take-all society"

10.1 Introduction

- **Information technology and automation affecting workplace**
  - Increases in productivity
  - Globalization of job market
  - Organization of companies
  - Telework
  - Workplace monitoring

- **Impacts of information technology on society**
  - Digital divide
  - Winner-take-all effects

# 10.2 Automation and Employment

Automation and Job Destruction

- Between 1979 and 2011…
  - U.S. population increased 39%
  - Manufacturing employment dropped 40%, from 19.4 million jobs to 11.7 million jobs
- Lost white-collar jobs
  - Secretarial and clerical positions
  - Accountants and bookkeepers
  - Middle managers
- Juliet Schor: Work week got longer between 1979 and 1990

General Motors Exited Bankruptcy in 2009 with 30% Fewer Employees

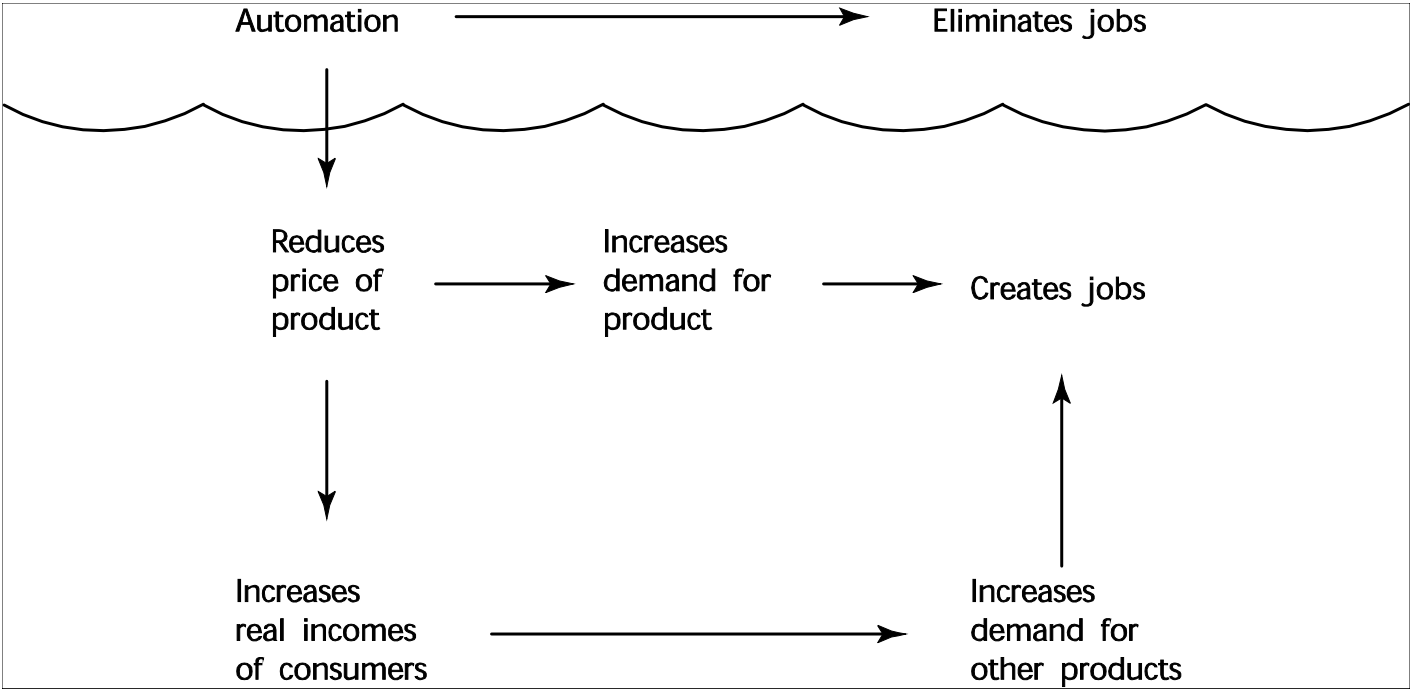Danny Lenman / Corbis

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Layoffs May Increase Stress on Remaining White-Collar Workers
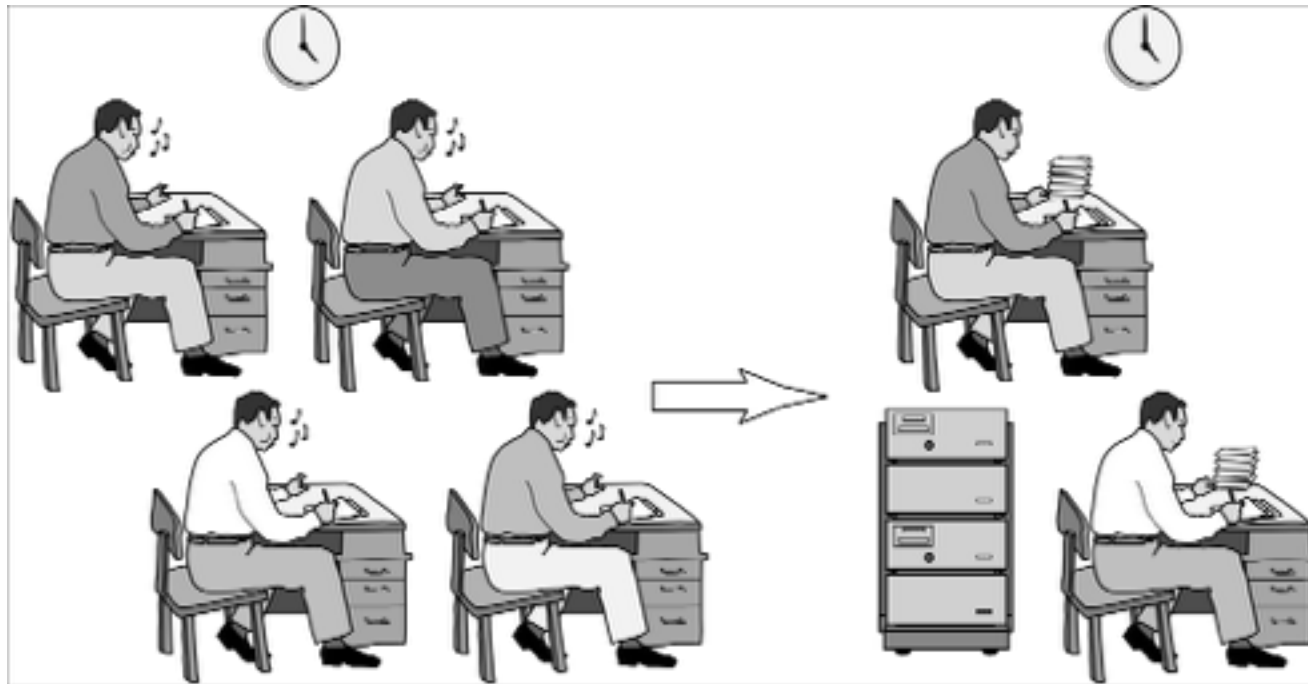
Automation and Job Creation

- Automation lowers prices
- That increases demand for the product
- It also increases real incomes, increasing demand for other products
- Increased demand → more jobs
- Number of manufacturing jobs worldwide is increasing
- Martin Carnoy: Workers today work less than workers 100 years ago

Automation Can Create Jobs, Too

Automation → Eliminates jobs

Reduces price of product → Increases demand for product → Creates jobs

Increases real incomes of consumers → Increases demand for other products

Effects of Increase in Productivity

- We have used higher productivity to achieve a higher material standard of living
- This is in contrast to medieval or ancient times (before modern capitalism)
- In medieval or ancient times
  - Low caloric intake meant pace of work was slow
  - Work was seasonal and intermittent
  - Laborers resisted working if they had enough money (i.e., they weren't *consumers*)
  - When wages rose, laborers worked less

Rise of the Robots?

- Some experts suggest most jobs will be taken over by machines

- Artificial intelligence: Field of computer science focusing on intelligent behavior by machines

- Rapid increases in microprocessor speeds have led to various successes in AI

- What will happen as computers continue to increase in speed?

Notable Achievements in AI since 1995

- Computer-controlled minivan "drove" on freeways across USA in 1995

- IBM supercomputer Deep Blue defeated chess champion Gary Kasparov in 1997

- Honda's ASIMO android can climb and descend stairs and respond to human gestures and postures

- Electrolux introduced robotic vacuum cleaner in 2001

- Five autonomous vehicles successfully completed 128-mile course in Nevada desert in 2005

- Watson trounced two most successful human *Jeopardy!* champions in 2011

Stanley, the Autonomous Vehicle

© Gene Blevins/Reuters/Corbis

Watson Wins *Jeopardy!* Challenge

© AP Photo/Seth Wenig

Moral Question Related to Robotics

- Is it wrong to create machines capable of making human labor obsolete?
- Would intelligent robots demoralize humanity?
- Is it wrong to work on an intelligent machine if it can't be guaranteed the machine will be benevolent toward humans?
- What if a malevolent human puts intelligent machines to an evil use?
- How would creative computers change our ideas about intellectual property?

10.3 Workplace Changes

Organizational Changes

- Information technology integration into firms
  - Automating back office functions (e.g., payroll)
  - Improving manufacturing
  - Improving communication among business units
- Results
  - Flattened organizational structures
  - Eliminating transactional middlemen (supply-chain automation)

Inexpensive Interactions Lead to Flexible Information Flow

(a) (b)
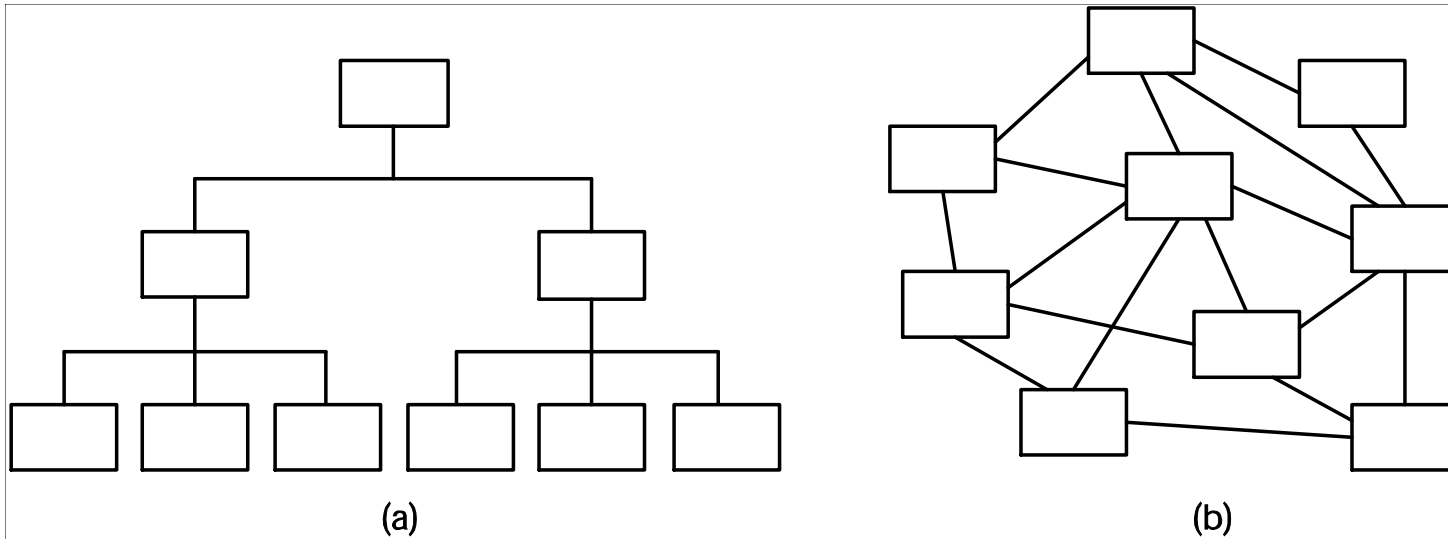
Winners, Losers in the Workplace of the Future

Higher Demand	Lower Demand
Computer engineers	Bank clerks
Computer support specialists	Procurement specialists
Systems analysts	Financial records processing staff
Database administrators	Secretaries, stenographers, and typists
Desktop publishing specialists	Communications equipment operators
	Computer operators

Telework

- Employees work away from traditional place of work
- Examples
  - Home office
  - Commuting to a telecenter
  - Salespersons with no office
- About 20% of Americans do some telework

Advantages of Telework

- Increases productivity
- Reduces absenteeism
- Improves morale
- Helps recruitment and retention of top employees
- Saves overhead
- Improves company resilience
- Helps environment
- Saves employees money

Disadvantages of Telework

- Threatens managers' control and authority
- Makes face-to-face meetings impossible
- Sensitive information less secure
- Team meetings more difficult
- Teleworkers less visible
- Teleworkers "out of the loop"
- Isolation of teleworkers
- Teleworkers work longer hours for same pay

Temporary Work

- Companies less committed to employees
- Lay-offs not taboo as they once were
- Companies hiring more temporary employees
  - Saves money on benefits
  - Makes it easier to downsize
- Long-term employment for one firm less common

Monitoring

- 82% of companies monitor employees in some way
  - Purpose: Identify inappropriate use of company resources
  - Can also detect illegal activities
- Other uses of monitoring
  - Gauge productivity (10% of firms)
  - Improve productivity
  - Improve security

Computers Direct Movement of Workers in This Amazon Warehouse

Multinational Teams

- Software development teams in India since 1980s
- Advantages of multinational teams
  - Company has people on duty more hours per day
  - Cost savings
- Disadvantage of multinational teams
  - Poorer infrastructure in less developed countries

10.4 Globalization

Globalization Basics

- Globalization: Process of creating a worldwide network of businesses and markets

- Globalization causes a greater mobility of goods, services, and capital around the world

- Globalization made possible through rapidly decreasing cost of information technology

Declines in Computing & Communication Costs Spurred Globalization
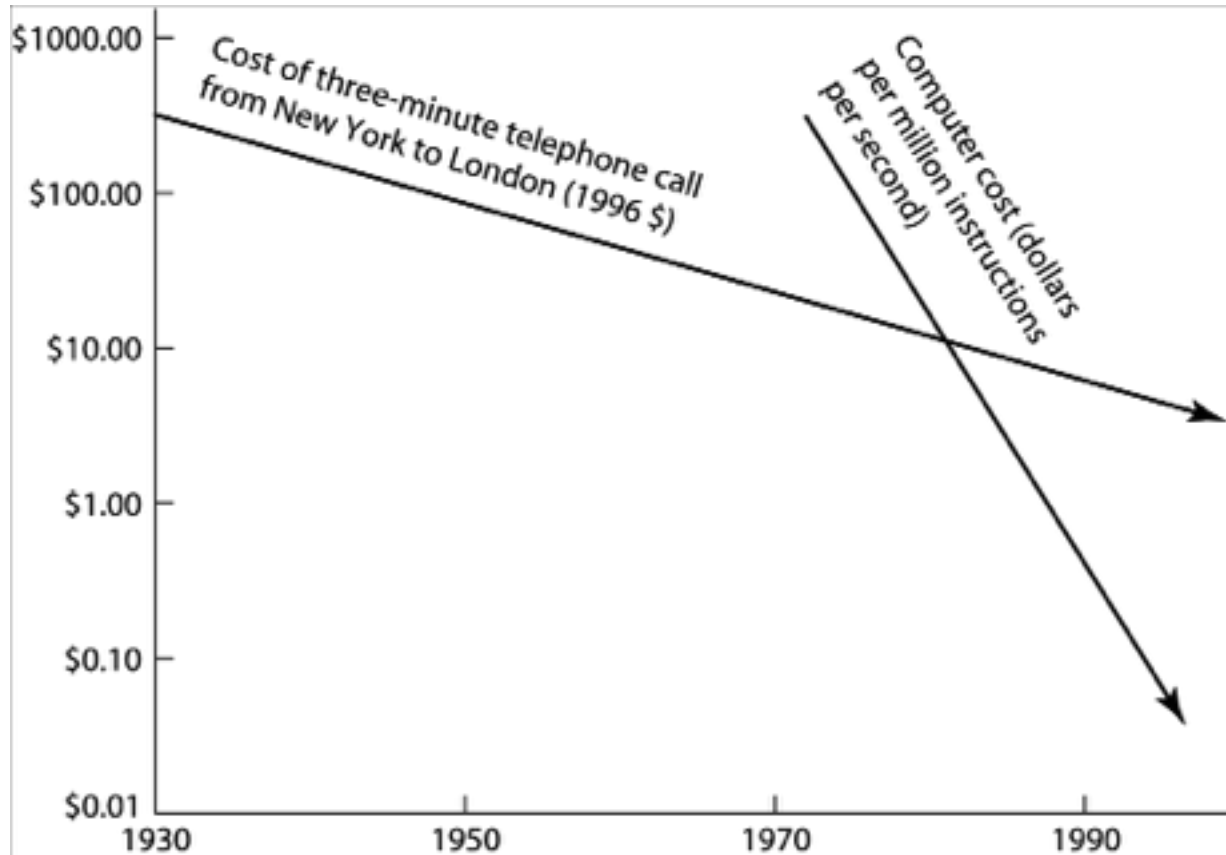
Arguments for Globalization

- Increases competition
- People in poorer countries deserve jobs, too
- It is a tried-and-true route for a poor country to become prosperous
- Global jobs reduce unrest and increase stability

Arguments against Globalization

- Makes the United States subordinate to the World Trade Organization

- Forces American workers to compete with foreigners who do not get decent wages and benefits

- Accelerates exodus of manufacturing and white-collar jobs from United States

- Hurts workers in foreign countries

Dot-Com Bust Increases IT Sector Unemployment

- Dot-com: Internet-related start-up company
- Early 2000: stock prices of dot-coms fell sharply
- Hundreds of dot-coms went out of business
- Half a million high-tech jobs lost

Foreign Workers in the IT Industry

- Visas allow foreigners to work inside U.S.
- H-1B
  - Right to work up in United States to six years
  - Company must show no qualified Americans available
  - Congress still authorizes 65,000 H-1B visas per year, plus 20,000 more for foreigners with advanced degrees
  - Quota not filled in 2009 due to economic downturn
- L-1
  - Allows a company to transfer a worker from an overseas facility to the United States
  - Workers do not need to be paid the prevailing wage
  - In 2006 about 50,000 foreigners in U.S. under L-1 visa

Foreign Competition

- China is world's number one producer of computer hardware
- IT outsourcing to India is growing rapidly
- Number of college students in China increasing rapidly
- ACM Collegiate Programming Contest provides evidence of global competition

# Growth of China's Computer-Hardware Industry
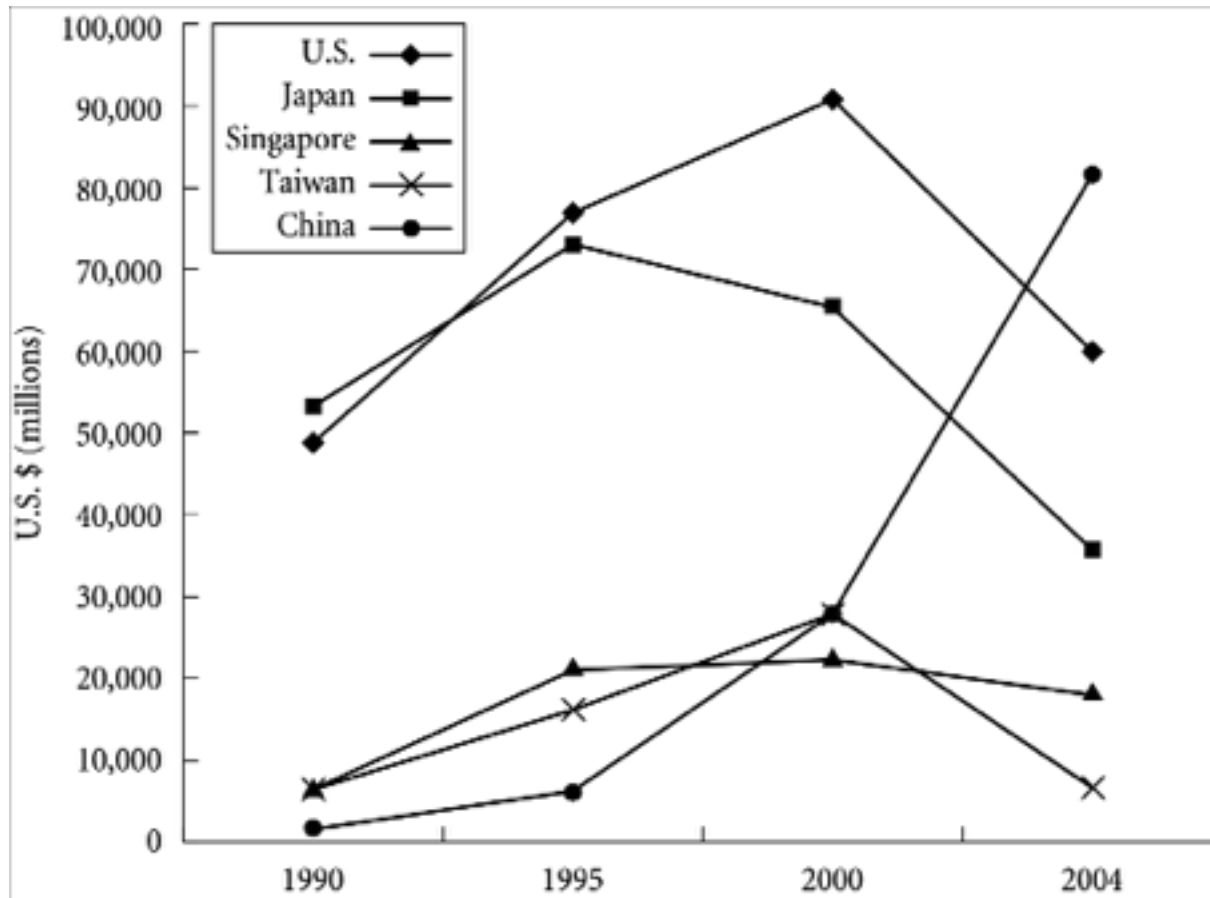
10.5 The Digital Divide

Concept of the Digital Divide

- Digital divide: Some people have access to modern information technology while others do not

- Underlying assumption: people with access to telephones, computers, Internet have opportunities denied to those without access

- Concept of digital divide became popular with emergence of World Wide Web

Evidence of the Digital Divide

- Global divide
  - Access higher in wealthy countries
  - Access higher where IT infrastructure good
  - Access higher where literacy higher
  - Access higher in English-speaking countries
  - Access higher where it is culturally valued
- Social divide
  - Access higher for young people
 - Access higher for well-educated people

Percentage of People with Internet Access, by World Region

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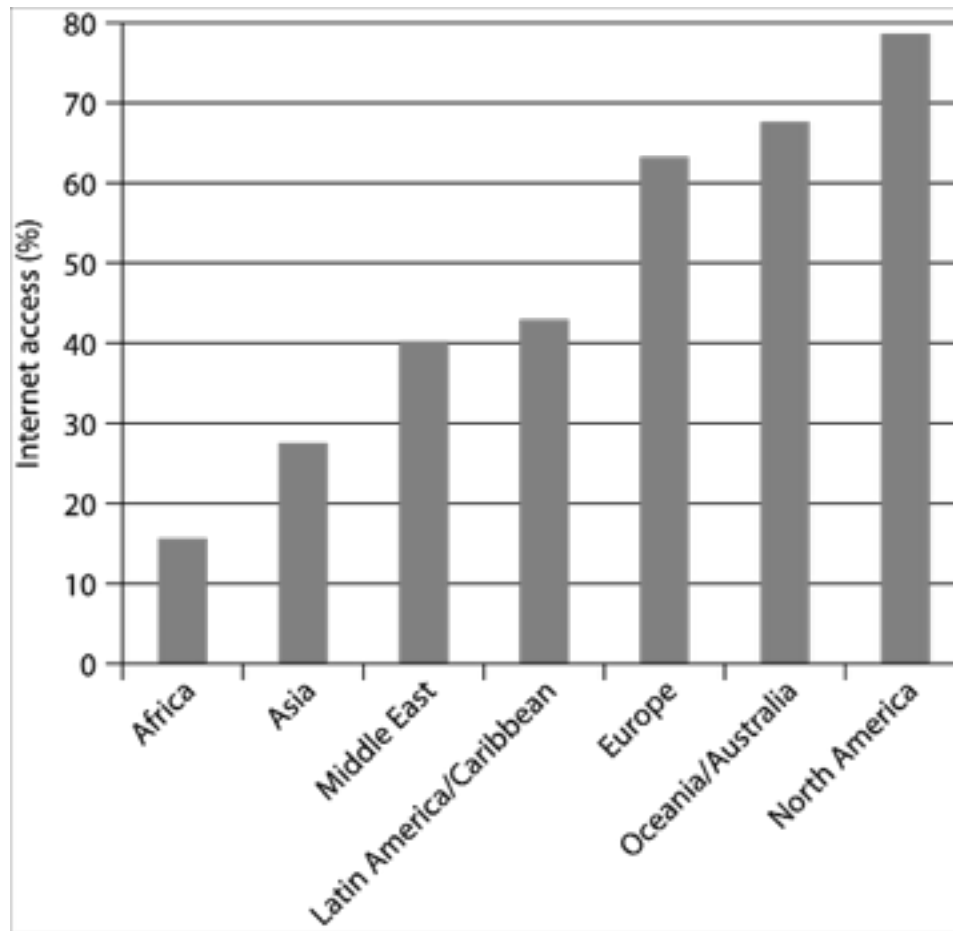
Models of Technological Diffusion

- Technological diffusion: rate at which a new technology is assimilated
  - Group A: highest socioeconomic status
  - Group B: middle socioeconomic status
  - Group C: lowest socioeconomic status
- Normalization model
  - Group A adopts first, then Group B, finally Group C
  - Eventually A use = B use = C use
- Stratification model
  - Group A adopts first, then Group B, finally Group C
  - A use > B use > C use forever

Two Models for Technological Diffusion

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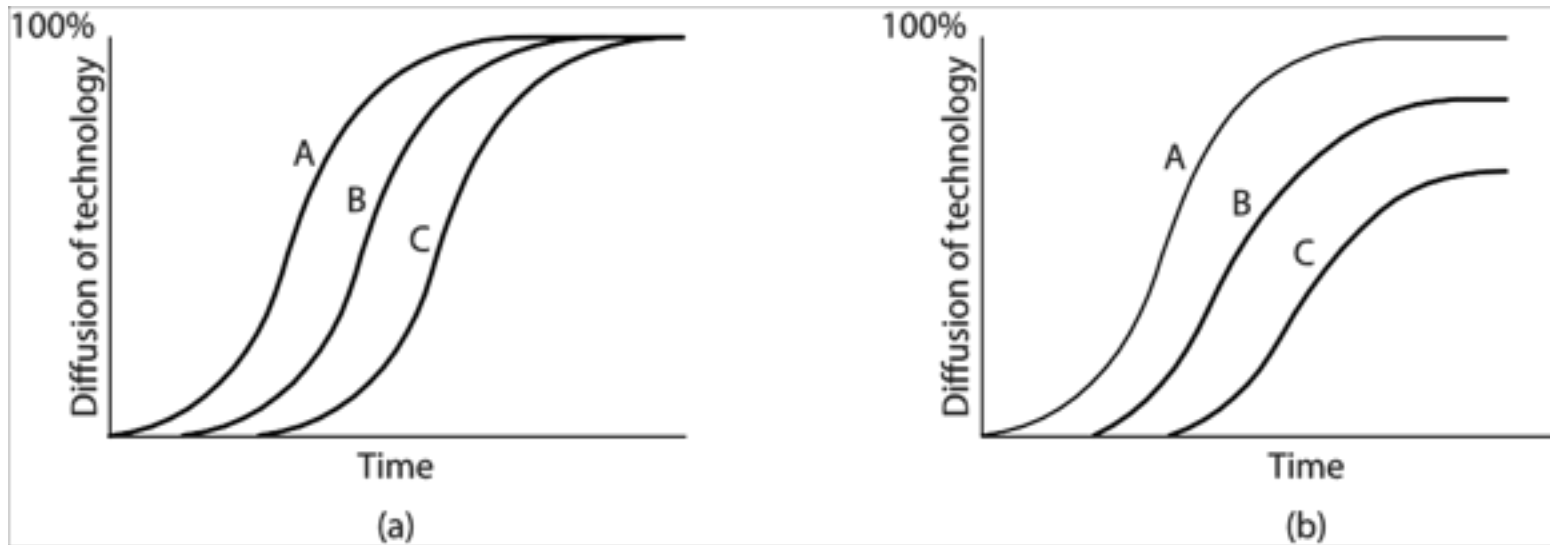
Critiques of the Digital Divide

- DD talk suggests the difference between "haves" and "have nots" is simply about access
- DD talk puts everyone in two categories, but reality is a continuum
- DD implies lack of access leads to less advantaged social position, but maybe it is the other way around
- Internet is not the pinnacle of information technology

Street Scene in Ennis, Ireland

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Massive Open Online Courses

- Rate of tuition increases at US universities has exceeded inflation for several decades

- Financing college education increasingly difficult for poorer families

- Free massive open online courses (MOOCs) promoted as a way to make higher education more affordable

- Study by Community College Research Center
    - Students less likely to complete and do well in MOOCs than traditional courses
    - MOOCs widen achievement gap between white and black students and between those with higher GPAs and those with lower GPAs

Net Neutrality

- Tiered service: Charging more for high-priority routing of Internet packets

- Supporters of tiered service say it is needed to support Voice-over-IP and other services

- Opponents to tiered service (e.g., Google, Yahoo!) say it would hurt small start-up companies and lower innovation

- Others think companies controlling Internet might favor some content over other content

- Net neutrality legislation would require all Internet packets be treated the same

- Opponents of proposed legislation say consumers should be able to pay more to get higher quality service

10.6 The "Winner-Take-All Society"

The Winner-Take-All Phenomenon

- Winner-take-all: a few top performers have disproportionate share of wealth

- Causes
  - IT and efficient transportation systems
  - Network economies
  - Dominance of English language
  - Changing business norms

CEO Pay v. Production Worker Pay, 1980 and 2003
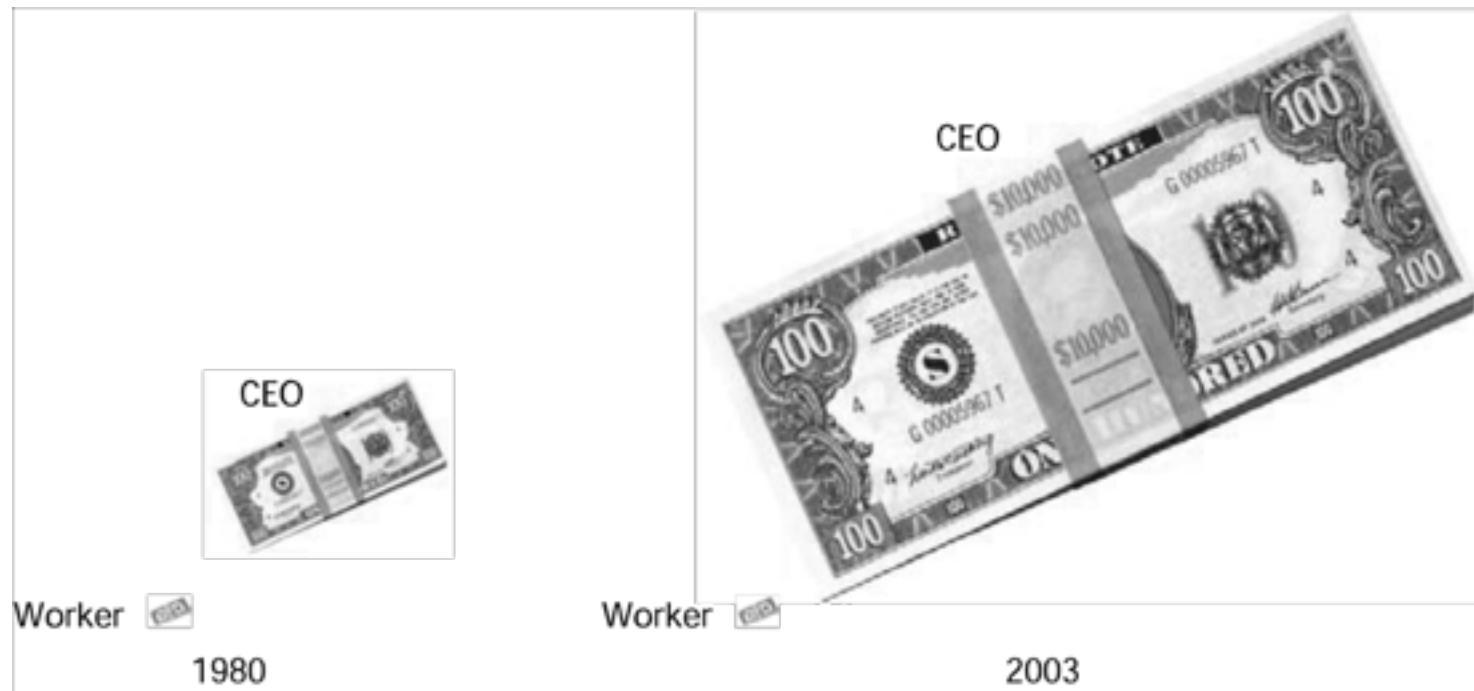
Golfer Jim Furyk Earned 99 Times More Than Brian Bateman in 2009; Is He 99 Times Better?

Metric	Brian Bateman	Jim Furyk
Driving distance (yards)	289.1	278.1
Driving accuracy (%)	56.23	70.24
Greens in regulation (%)	63.95	64.67
Putts/round	29.42	28.17
Scoring average	71.89	70.24
Tournaments entered	21	21
Winnings	$35,379	$3,514,215

Reducing Winner-Take-All Effects

- Limit number of hours that stores remain open
- Businesses form cooperative agreements to reduce positional arms races
  - Example: salary caps on pro sports teams
- More progressive tax structures
- Campaign finance reform