

America's Technology Future at Risk

Broadband and Investment Strategies
to Refire Innovation

Innovation Key to U.S. Economic Success

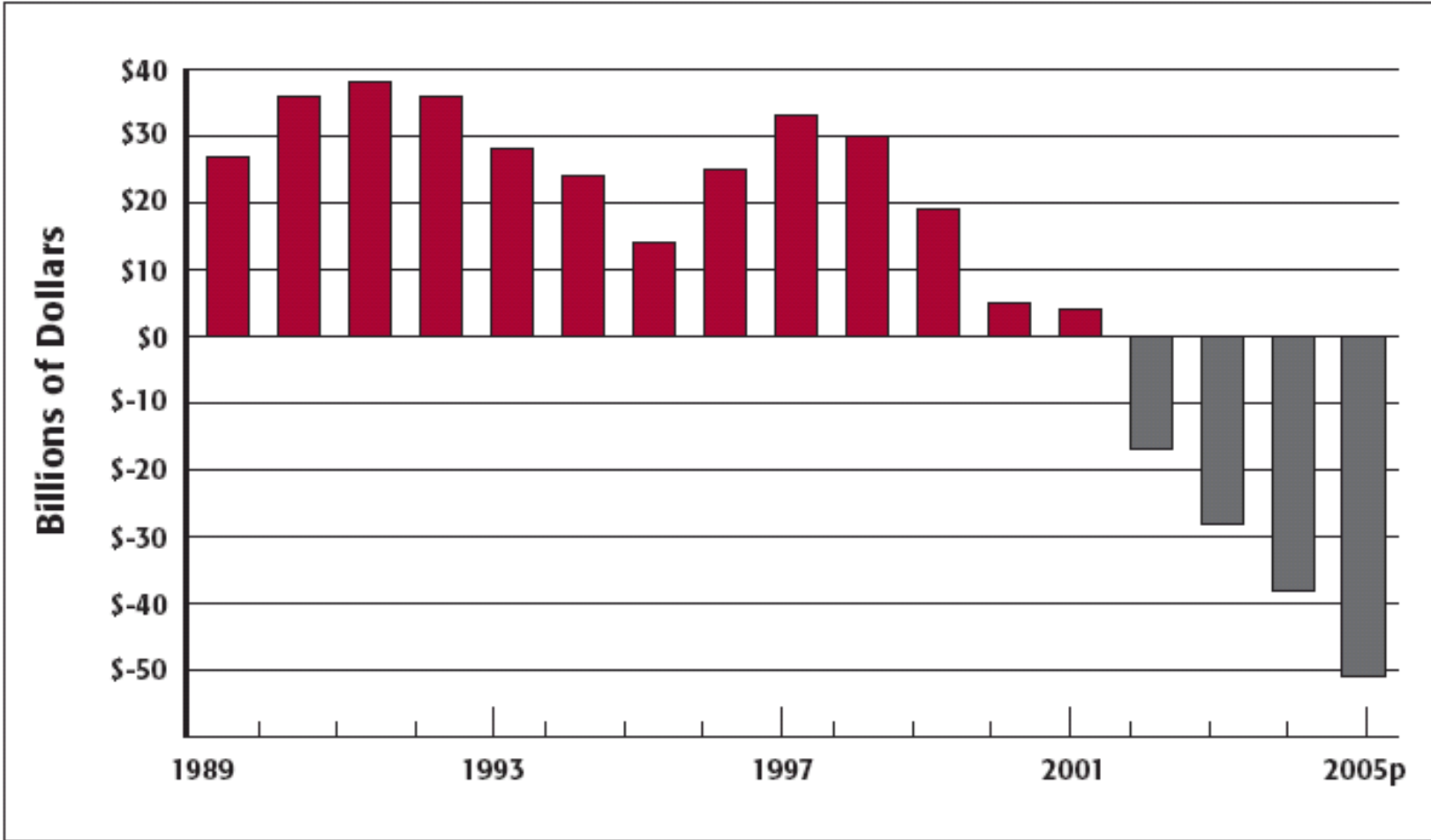
- American wealth, economic growth and national security have long been based on technological leadership.
- High productivity levels – often the result of technological innovation, have been key to our economic success.
- For more than half a century America's broad technological leadership has been unchallenged.

Telecoms Play a Vital Role

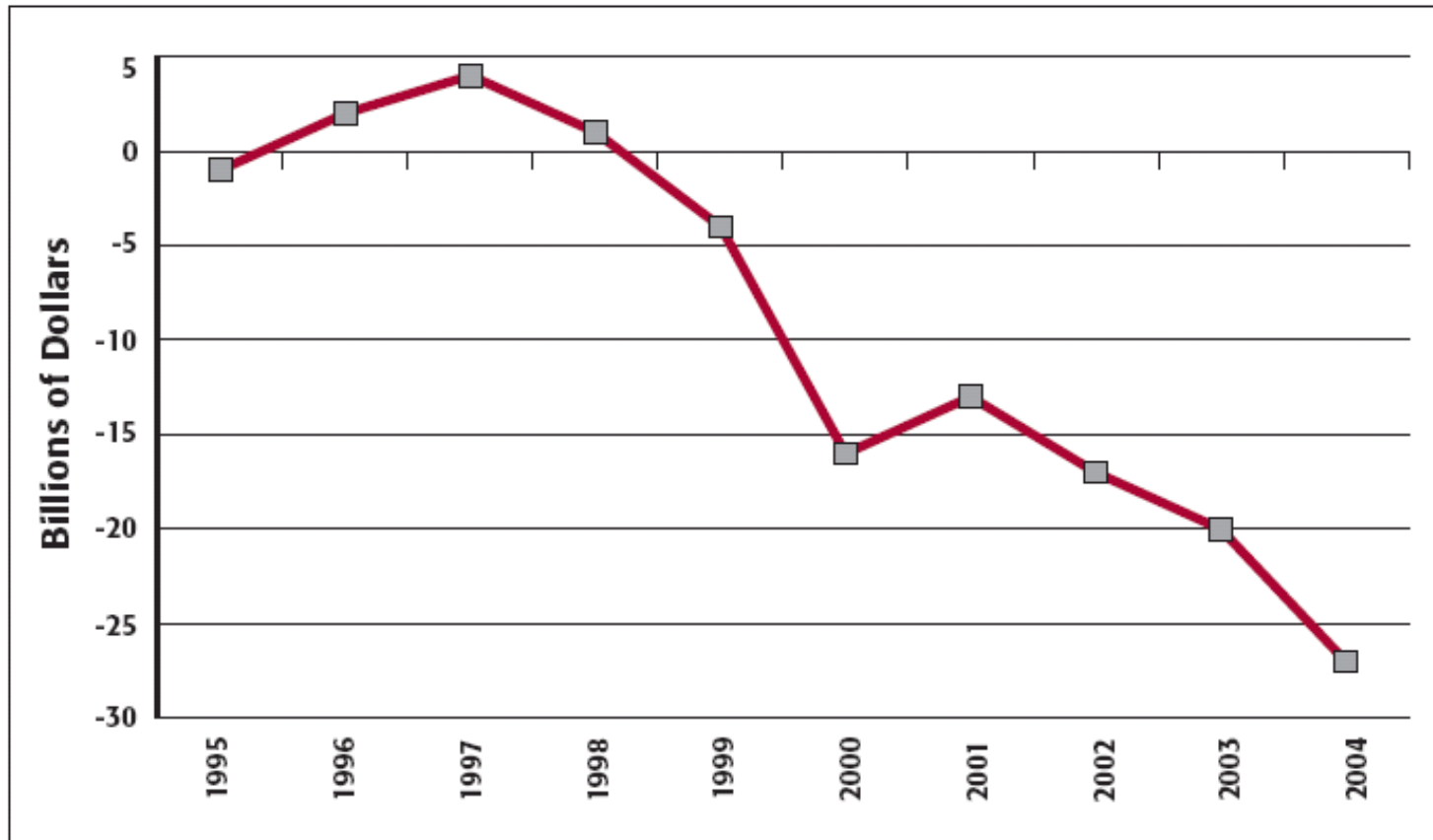
- The Federal Reserve Board has shown that about two-thirds of U.S. productivity gains since 1995 have been due to the impact of communications and computer technology.
- Telecommunications leadership is also the cornerstone of America's national security.

US Trade in Advanced Technology

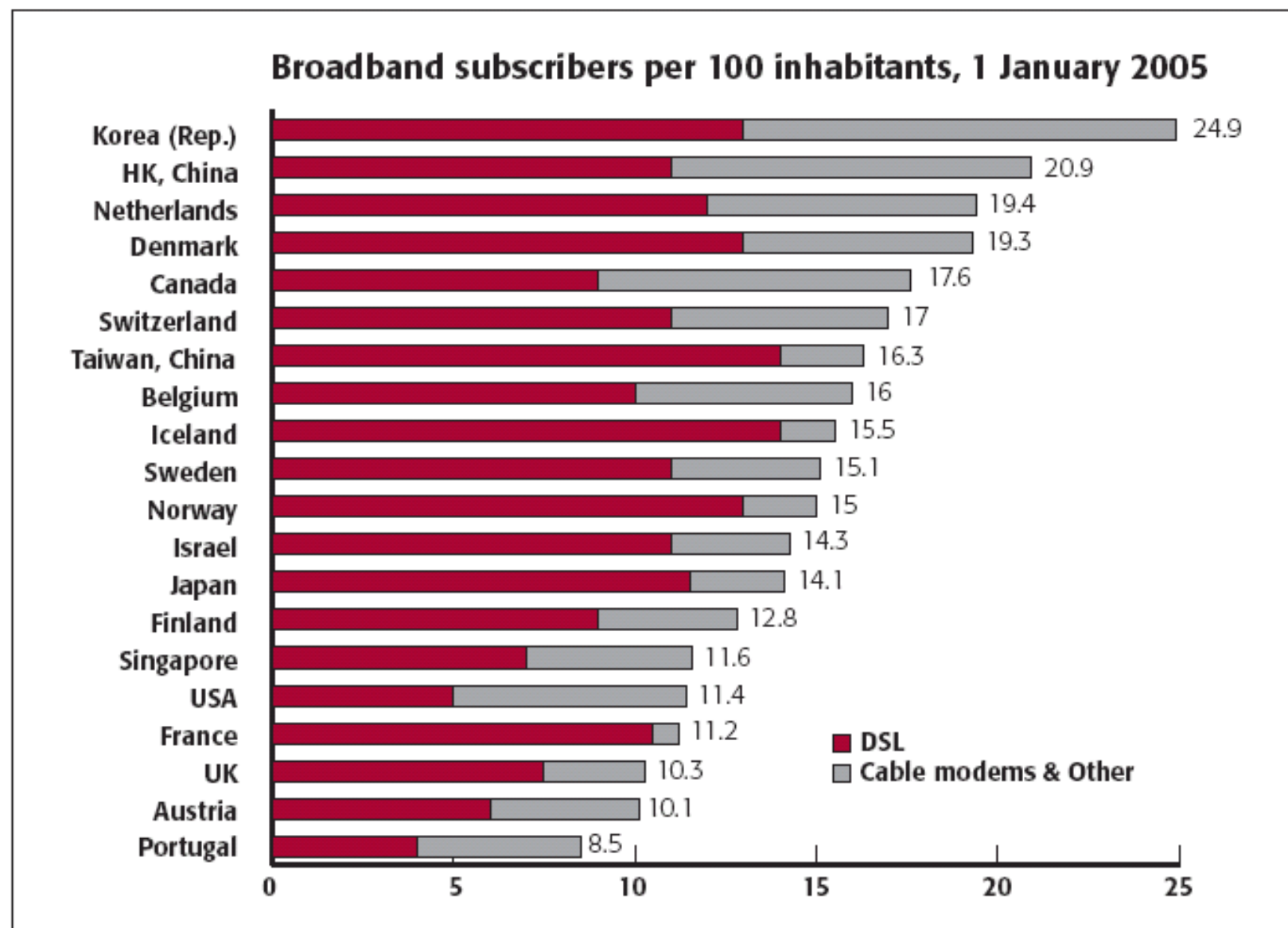
Traditional Large Surplus now Even Larger Losses



U.S. Trade Deficit in Telecom Equipment



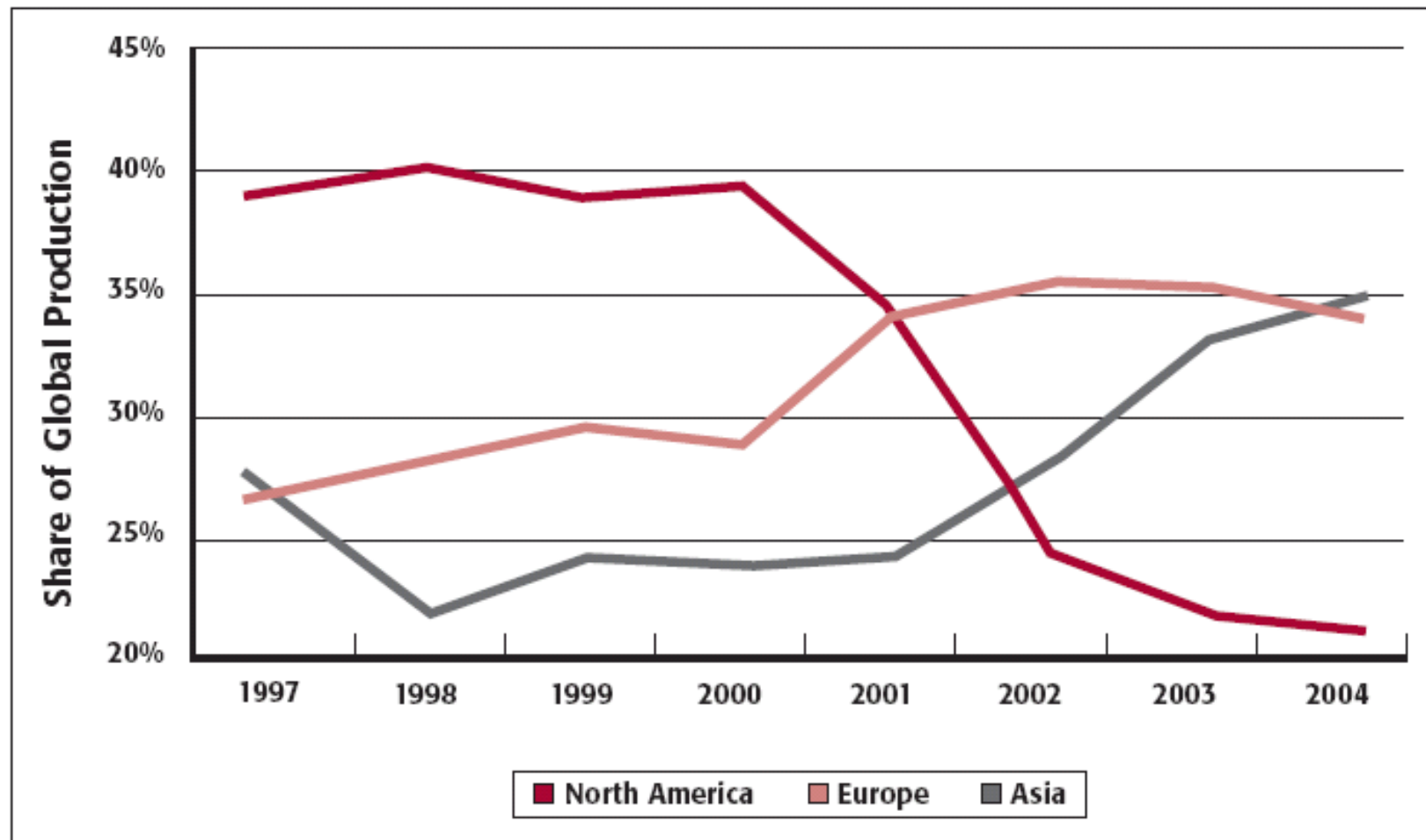
Broadband Penetration by Technology, Top 20 Economies Worldwide, 1 January 2005



Subscribers to 3G Networks by Year End 2005

| | |
|----------------|--------------------|
| Japan | 40 Million |
| South Korea | 36 Million |
| European Union | 10 Million |
| Australia | 750,000 |
| Hong Kong | 450,000 |
| United States | 200,000 to 250,000 |

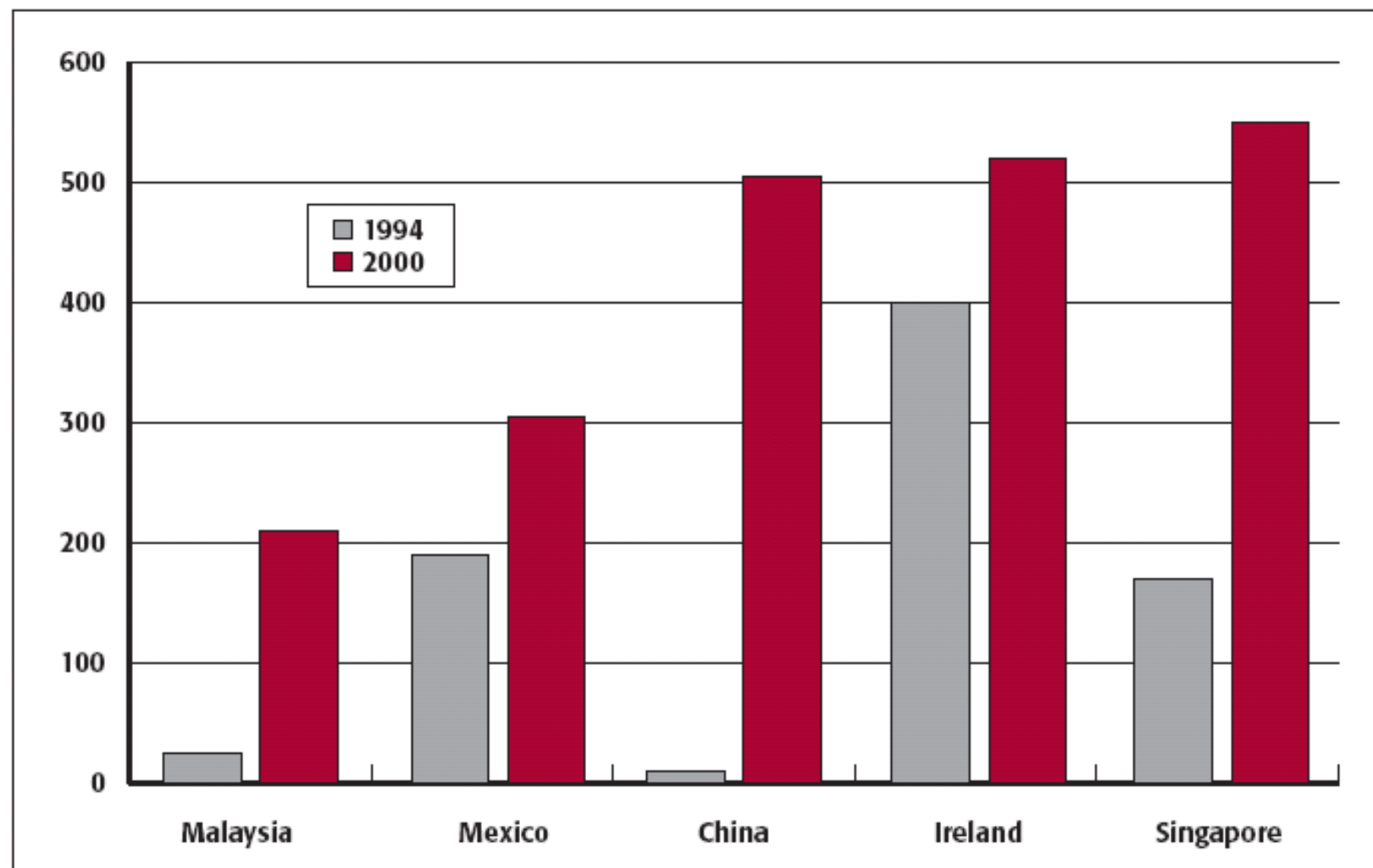
Share of Global Communications Equipment Production by Region, 1997-2004



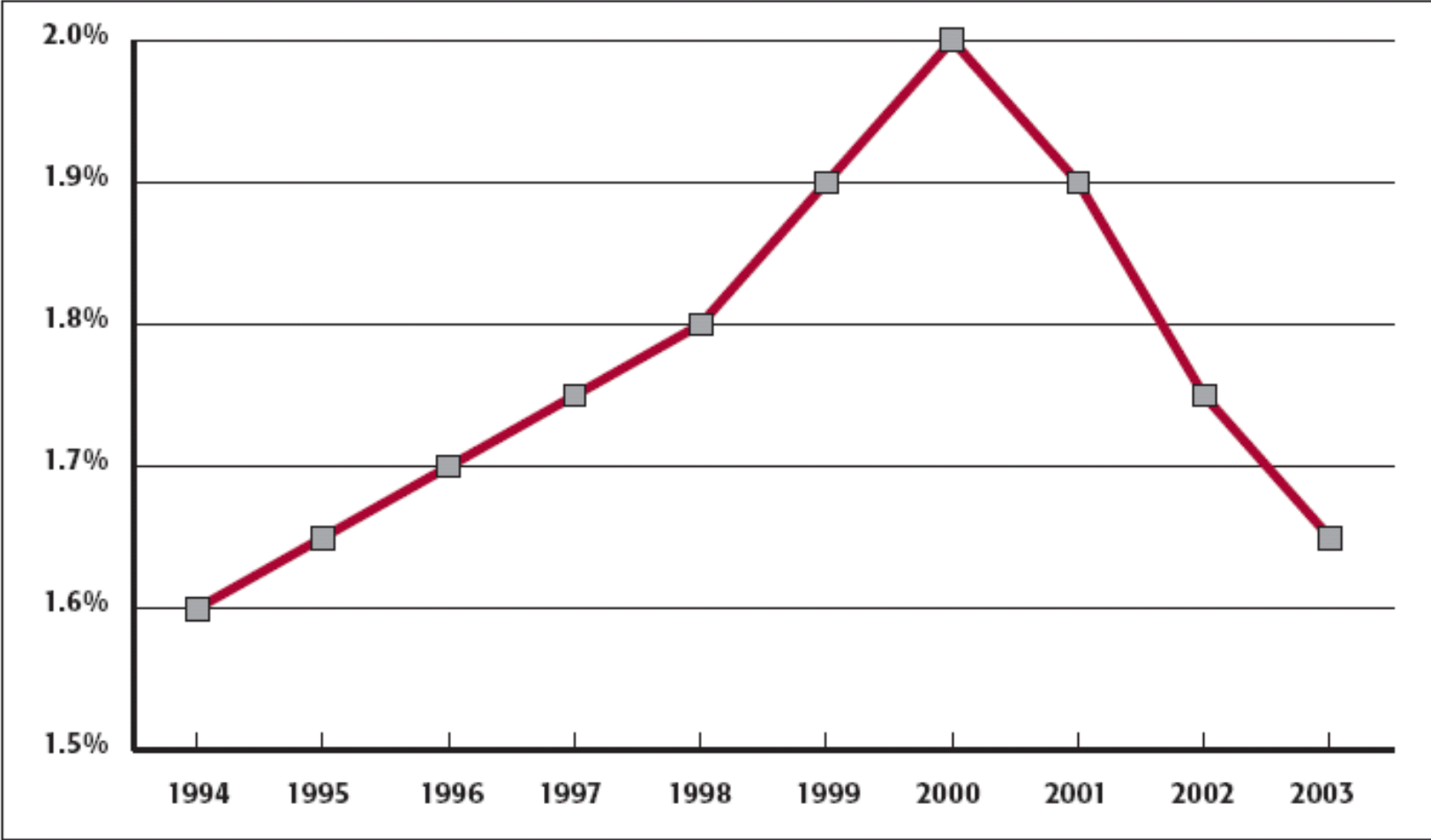
R&D Heading Offshore

- The lack of ultra high-speed networks in the U.S. makes it impossible for U.S. companies to enter key new business sectors. U.S. venture capitalists are pressing start-up firms to move R&D to Asia.
- Declining market shares and revenues have caused many U.S. telecom and technology companies to cut vital R&D spending by 10-40 percent. Federal R&D spending in these areas has also fallen by over 30 percent.
- Foreign companies make up the majority of the top ten recipients of U.S. patents each

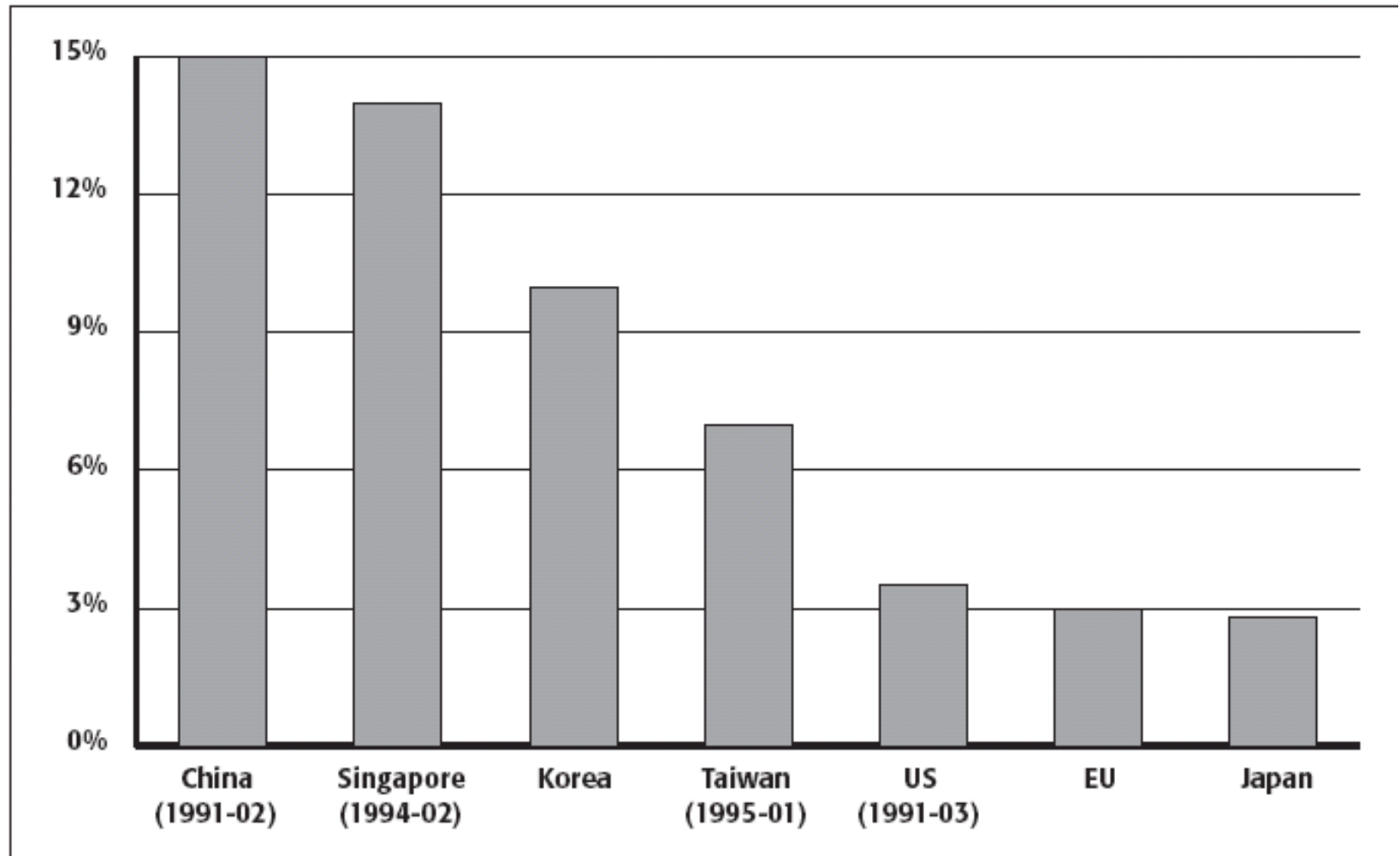
R&D Performed Overseas by Majority-Owned Foreign Affiliates of U.S. Companies, 1994 & 2000 (in Millions)



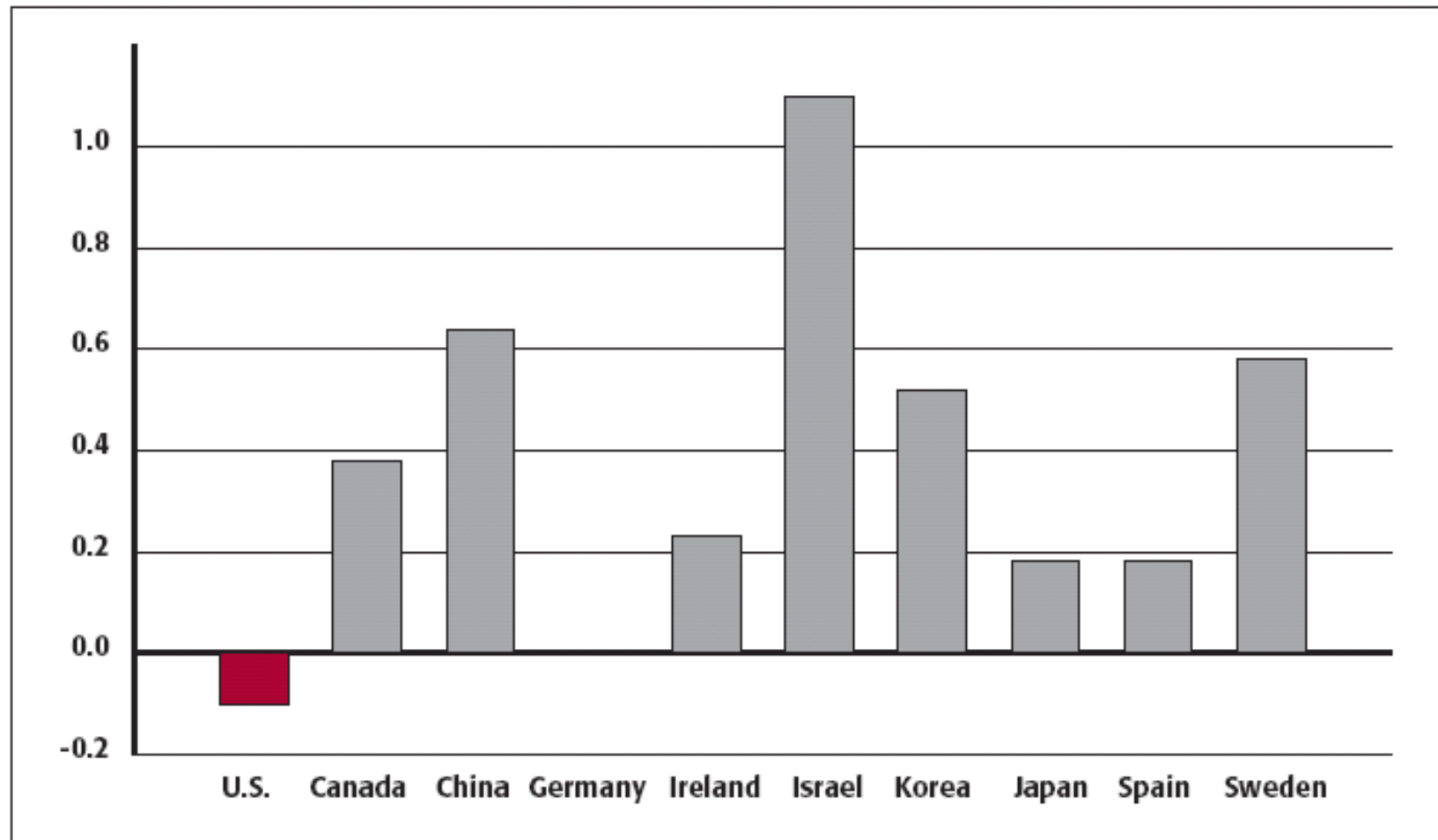
U.S. Industry R&D as a Share of GDP



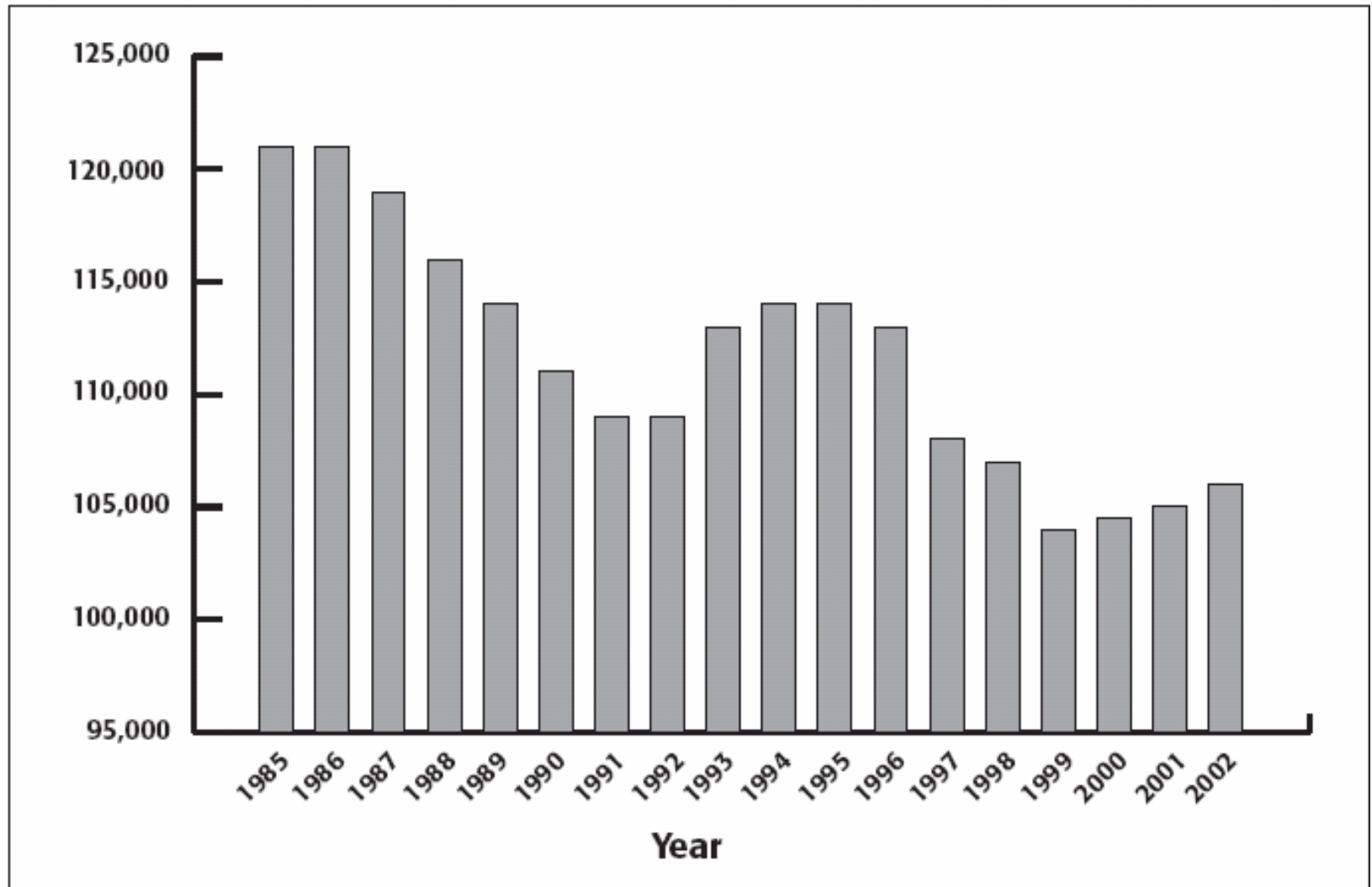
Growth of R&D Expenditures, Annual Growth Rate 1991-2001 (Based on National Currencies in Constant Prices)



R&D/GDP Growth Ratio, 1991-2003



Engineering Degrees Awarded in U.S. 1985-2002



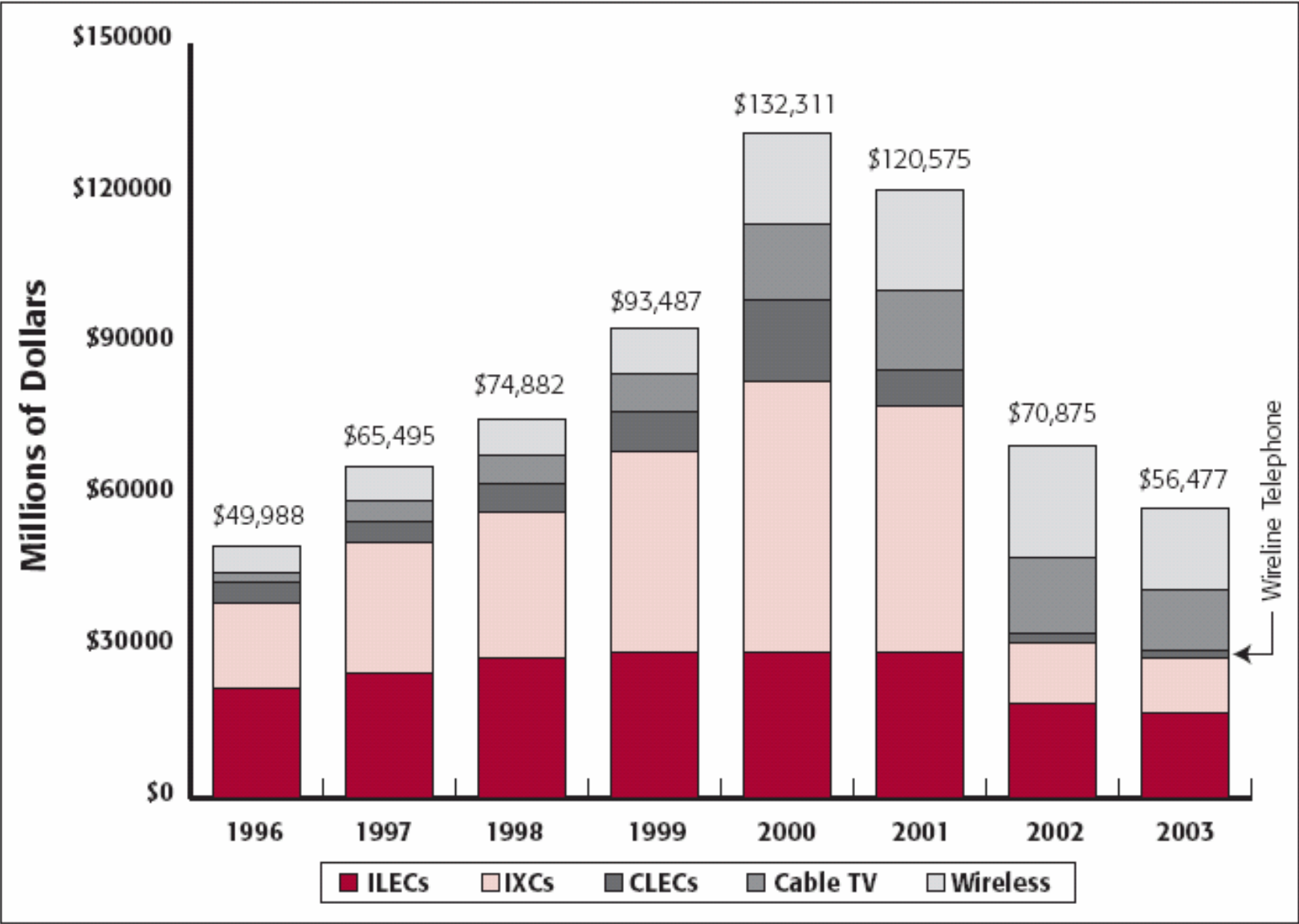
Flawed Regulatory Policies

- Focus on ‘manufacturing’ competition as sole means of stimulating new technology.
- Competition itself does not create demand or investment.
- Little interest in encouraging deployment of new technologies.
- Distorted investment signals sent to market.

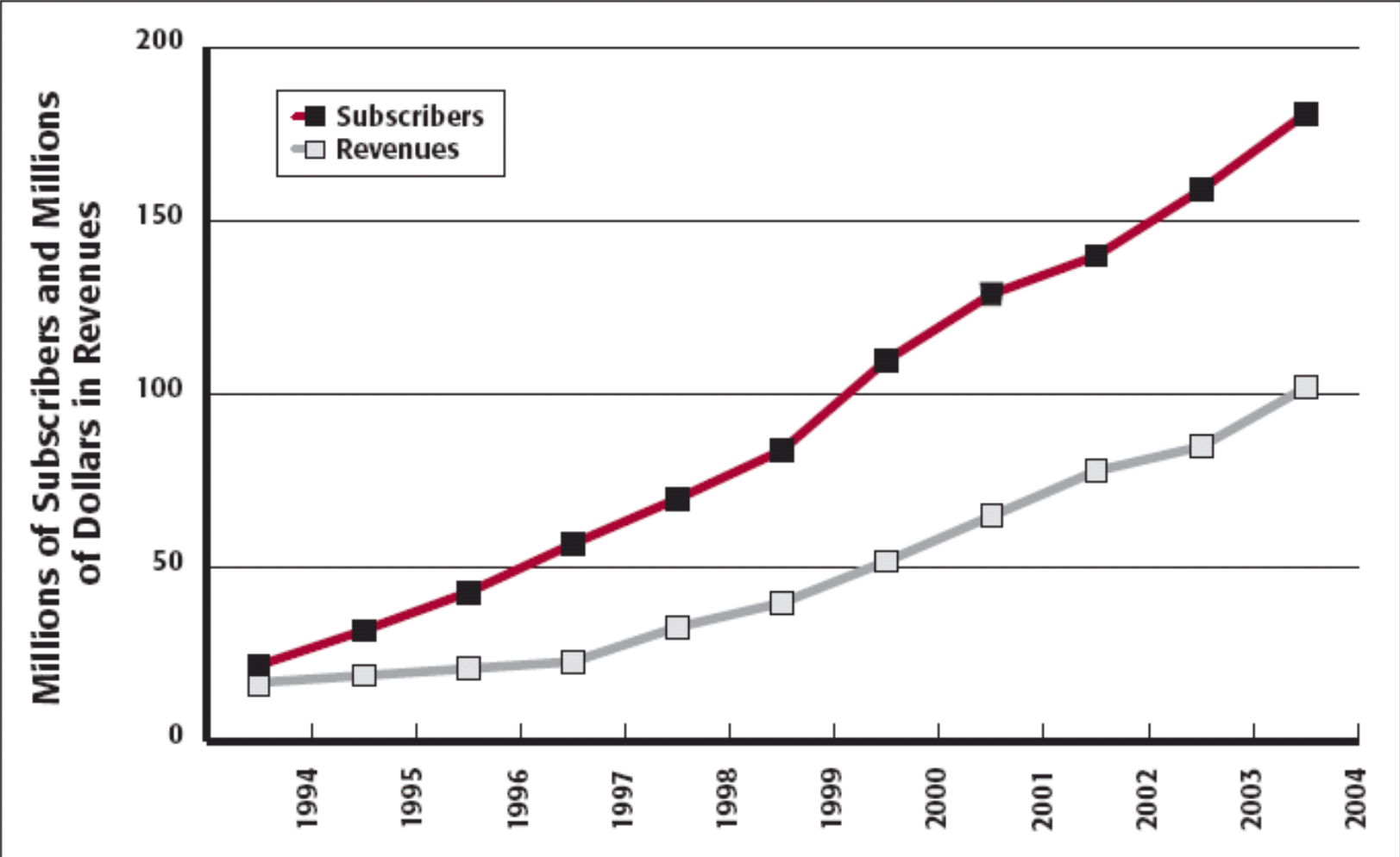
Four Major Developments

- Massive expansion of fiber optic capacity in the long distance network backbone.
- The founding of a legion of new CLECs.
- Continued expansion of wireless capacity.
- Further expansion of the reach of cable.

U.S. Telecom Service Providers Capital Expenditures, 1996-2003



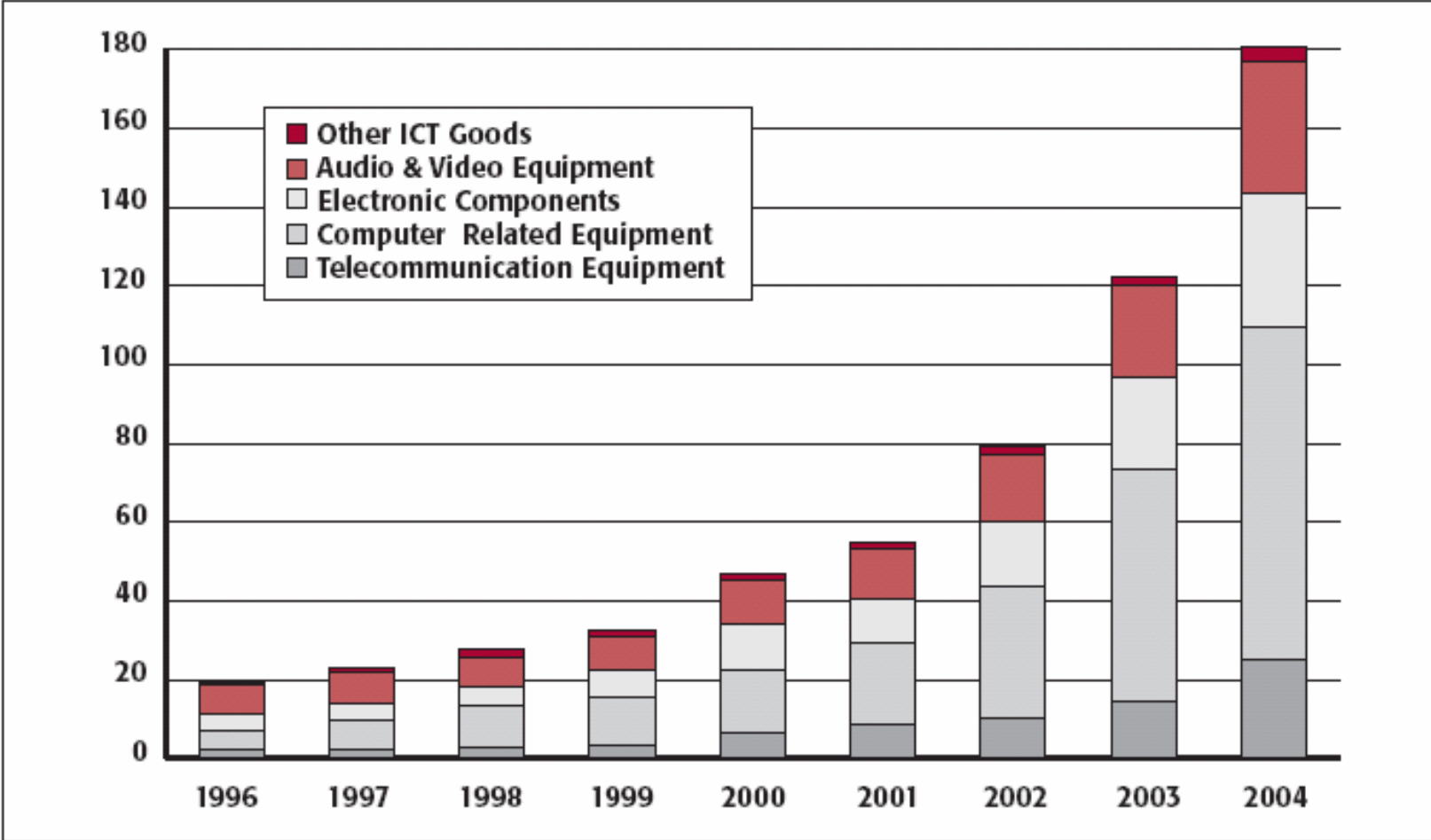
Wireless Subscribers and Revenues, 1994-2004



U.S. International Economic Policies

- Many countries pursue strategic trade and export led growth strategies, managing their exchange rates against the dollar to keep their currencies undervalued and their exports inexpensive. The chronically overvalued dollar renders American made products, services, and R&D uncompetitive.

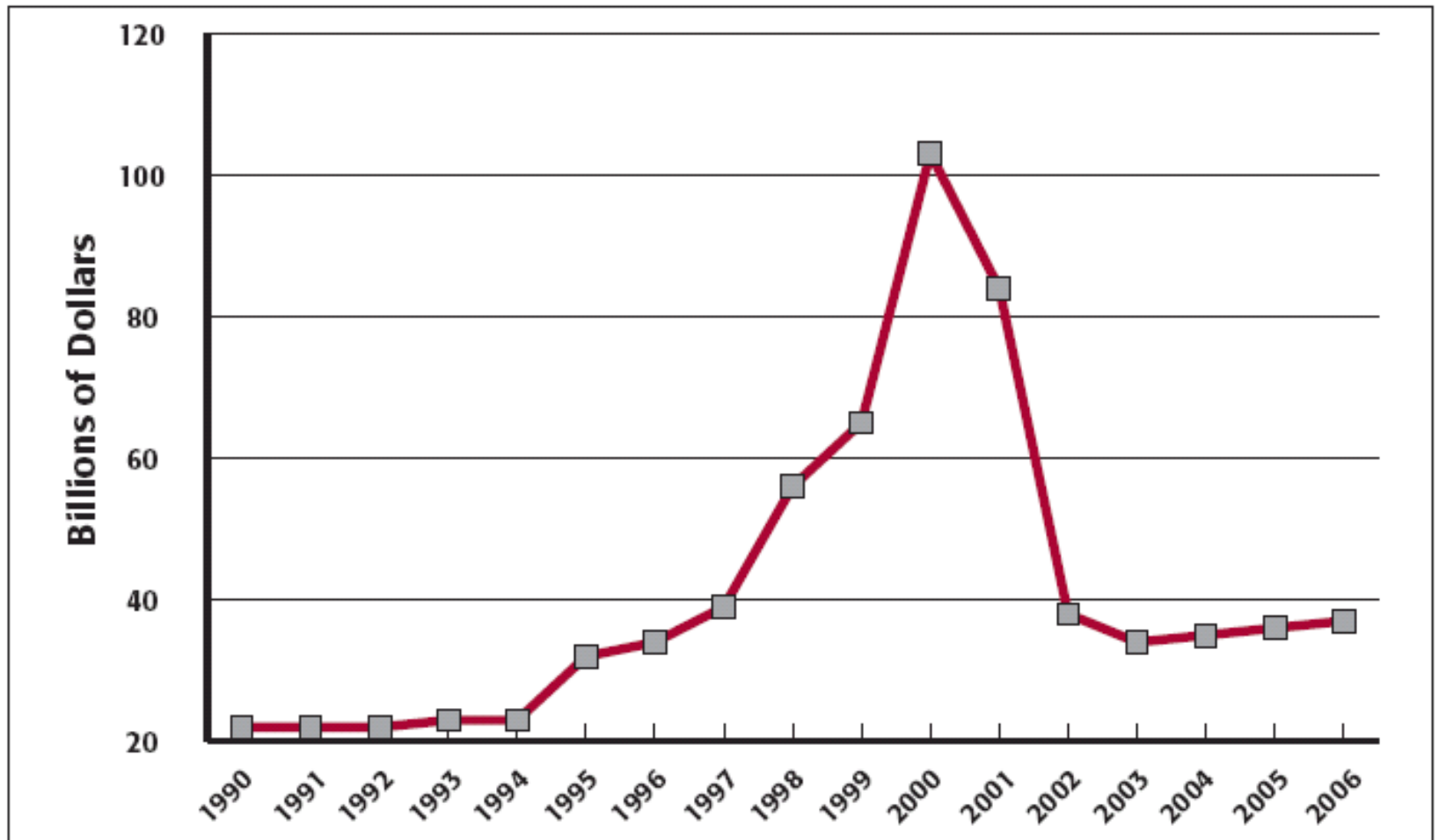
China's Exports of High-Tech Goods: 1996 -2004, In Billions of Dollars



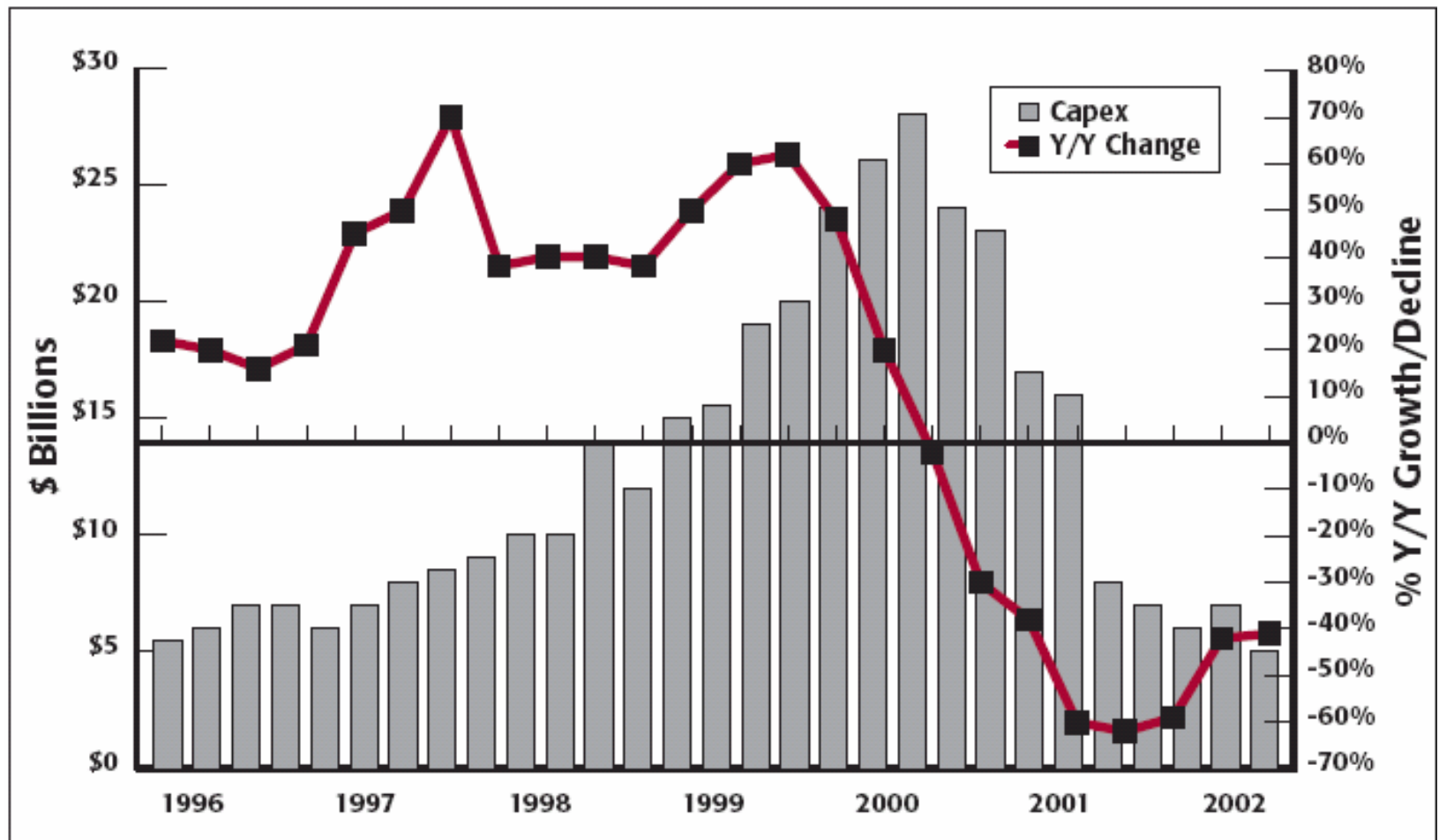
Boom Turns to Bust

- The inevitable bust came in 2001 when many of the CLECs and long distance carriers collapsed, taking \$600 billion of invested capital, several hundred million dollars worth of excess equipment and vendor loans, and nearly \$2 trillion in market capitalization with them.

North American Capex 1990-2006 in Billions of Dollars



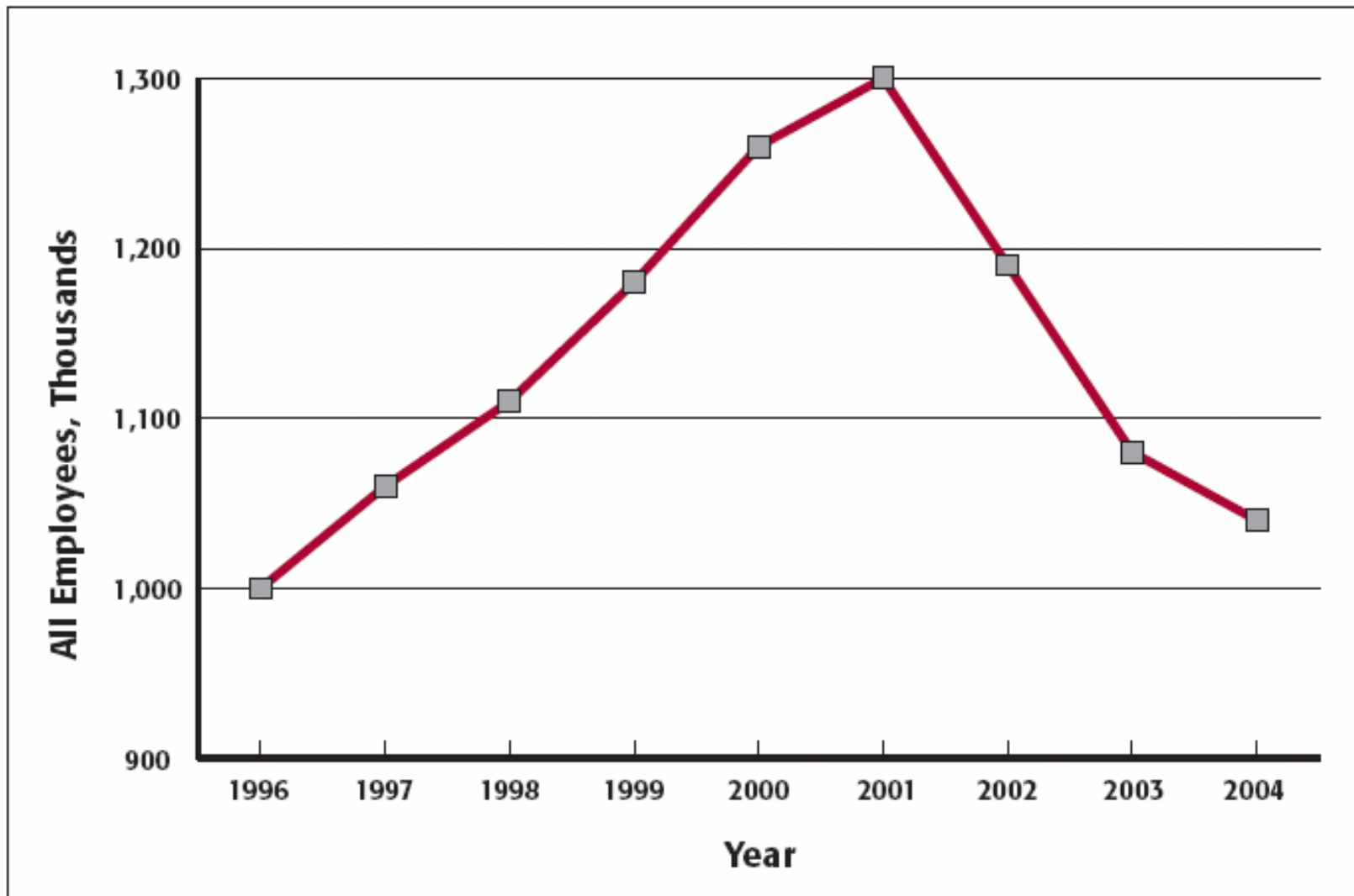
North American Capital Spending, 1996-2002, by Quarters



Manufacturing Collapses

- The bust was particularly devastating to U.S. telecom equipment makers who were forced to close factories, slash employment, and outsource to Asia.

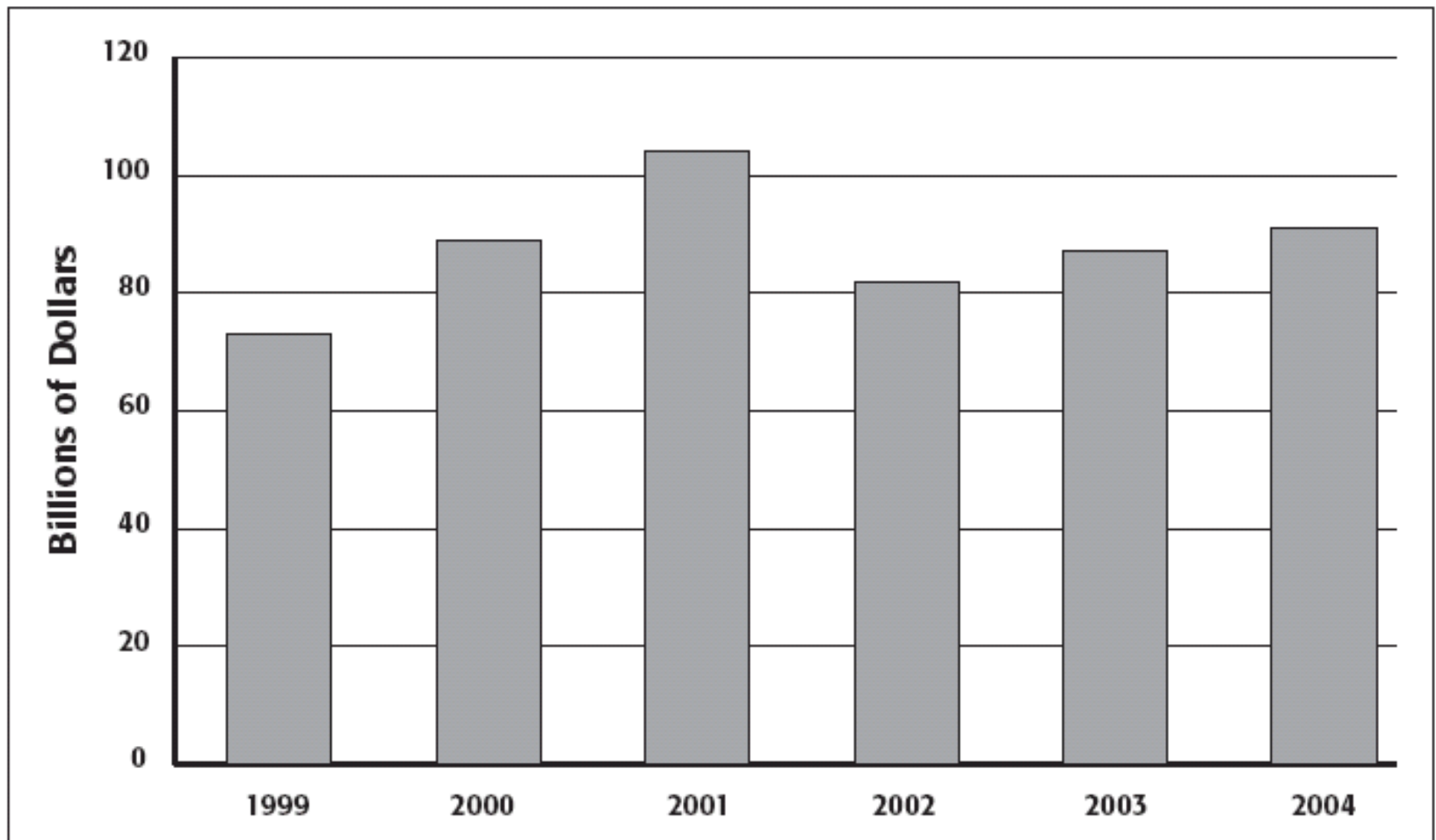
Total Employment - Telecommunications Industry – Bureau of Labor Statistics



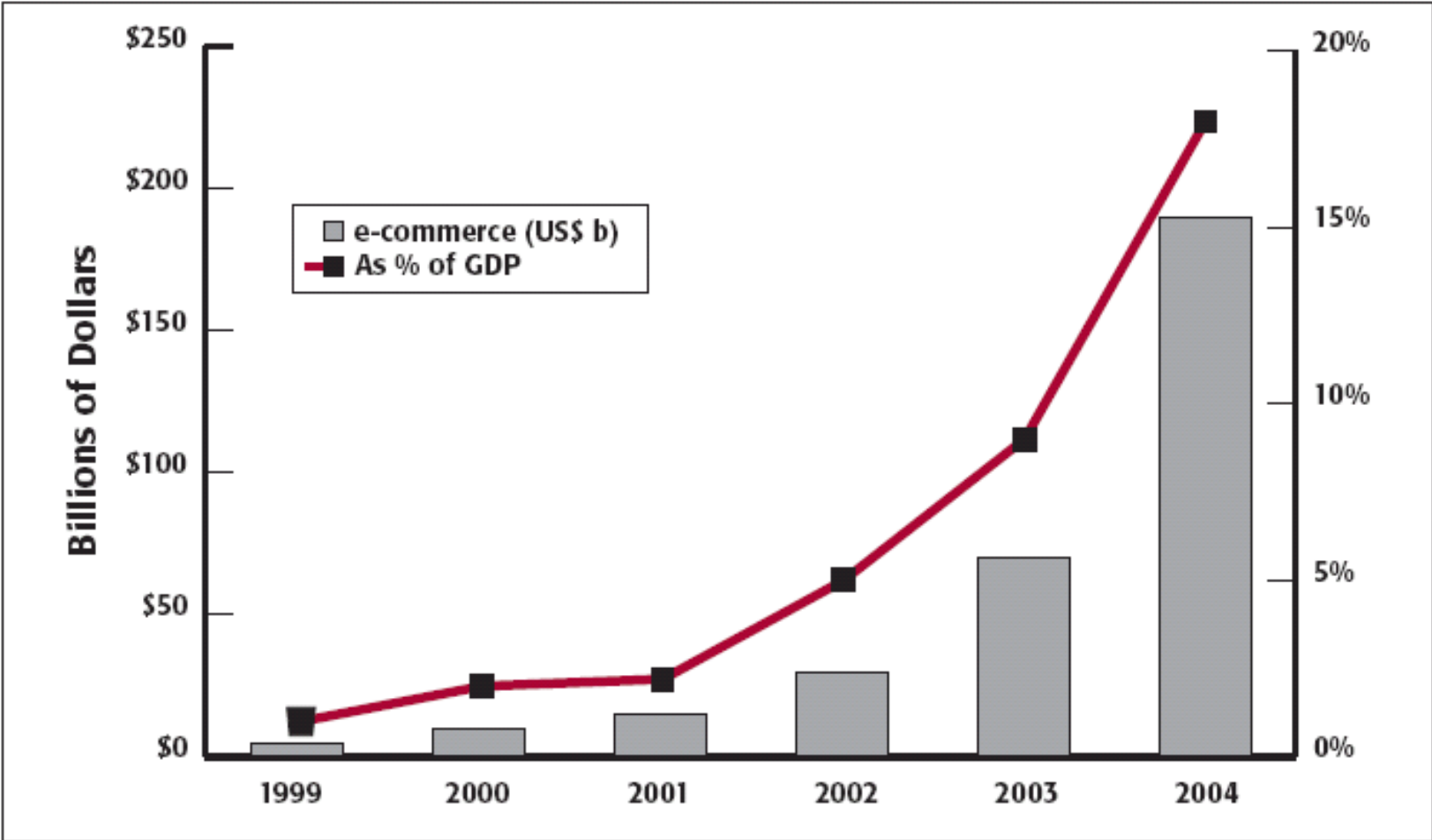
Foreign Regulatory Policies

- The E.U. and countries like Korea, Japan, and China not only deregulated and spurred competition, but also created strategic plans and established incentives to stimulate investment both in technology deployment and in end demand.
- Telecom investment has remained robust across Asia and the E.U.
- China is becoming the global center for manufacturing – not just in telecom equipment, but across the range of high-tech goods

Asian Telecom Capital Spending, 1999 to 2004



Korean E-commerce Trends



New Shape of U.S. Telecoms

- Real, facilities based competition has now emerged, thanks to the growth of cable, wireless and satellite.
- The old RBOCs and long distance carriers have merged and consolidated.
- Wireless, Cable, VoIP, and Satellite are threatening to wipe out the value of the traditional phone lines.

Three New Themes

- A contest between the reconstituted Bells and the cable companies to be one-stop-shops providing voice, data, wireless and television services all in one package.
- Disagreement between the owners of facilities and the software service providers over how to share the use and costs of facilities and how to charge end customers.
- A move by some municipalities to use Wi-Max to provide wireless broadband access citywide.

Recommendations

- The U.S. telecommunications market should be deregulated to the maximum possible extent. The FCC should just forget about the business of “manufacturing” competition.
- The Hippocratic oath injunction to “first, do no harm” would be a good guide to new legislation and regulatory policies.
- All market participants should face a roughly equal and minimal set of regulatory requirements.

Give the FCC a New Mission

- The main task of the FCC should be to maximize the deployment of broadband access and other advanced communications technologies for the purposes of maintaining high rates of overall innovation and productivity growth.

Give the FCC a New Mission

- The FCC, in keeping with its new role as a proponent and sponsor of new communications technologies, should monitor America's communications networks to ensure that the free flow of information continues unabated and that consumer choice – in terms of both access to services and applications over the Internet and broadband connectivity, drives the market.

Dollar Policy

- The chronically strong dollar is inexorably moving the production of both tradable goods and services out of the United States.
- The United States should take steps to halt the manipulation of exchange rates by foreign governments aiming to improve the competitive position of their exports in U.S. markets. It should call on the I.M.F. to review the actions of other governments in this respect and to issue appropriate guidelines.