Fab America –
Keeping U.S. Leadership in Semiconductor Technology

Silicon Valley Tax Directors Group
Congressional Staff Visit
August 27, 2003

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SIA SEMICONDUCTOR INDUSTRY ASSOCIATION

Fab America

I. Overview of the U.S. chip industry

II. Potential trends to offshore manufacturing.

III. Foreign Government policies impacting the location of manufacturing and technology

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I. Industry Overview

- Semiconductors fuel economic productivity gains
- Semiconductors contribute to GDP & jobs
- Federal, state, & local governments benefit from declining semiconductor prices
- Information technology contributes to national and homeland security
- U.S. currently leads the world in semiconductors
- Leading edge manufacturing is closely linked to technology leadership

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Semiconductors fuel economic productivity gains, ….

- Congressional Budget Office assumes the "computer Quality" adjustment observed in late 1990's will continue:

CBO Macroeconomic Forecast	1991-1995	1996-2002	2003-2013
Potential GDP Increase	2.6%	3.3%	2.9%
Labor & Capital Contribution	1.5	2.0	1.7
Total Factor Productivity Contribution	1.1	1.3	1.2
•TFP Adjustments	.1	0.2	0.2
◆ Computer Quality	0	0.1	0.1

- Economists Attribute a large portion of the computer quality adjustment to an acceleration of semiconductor technology advances

Source: "The Budget and Economic Outlook: Fiscal Years 2004-2013" CBO, January 2003

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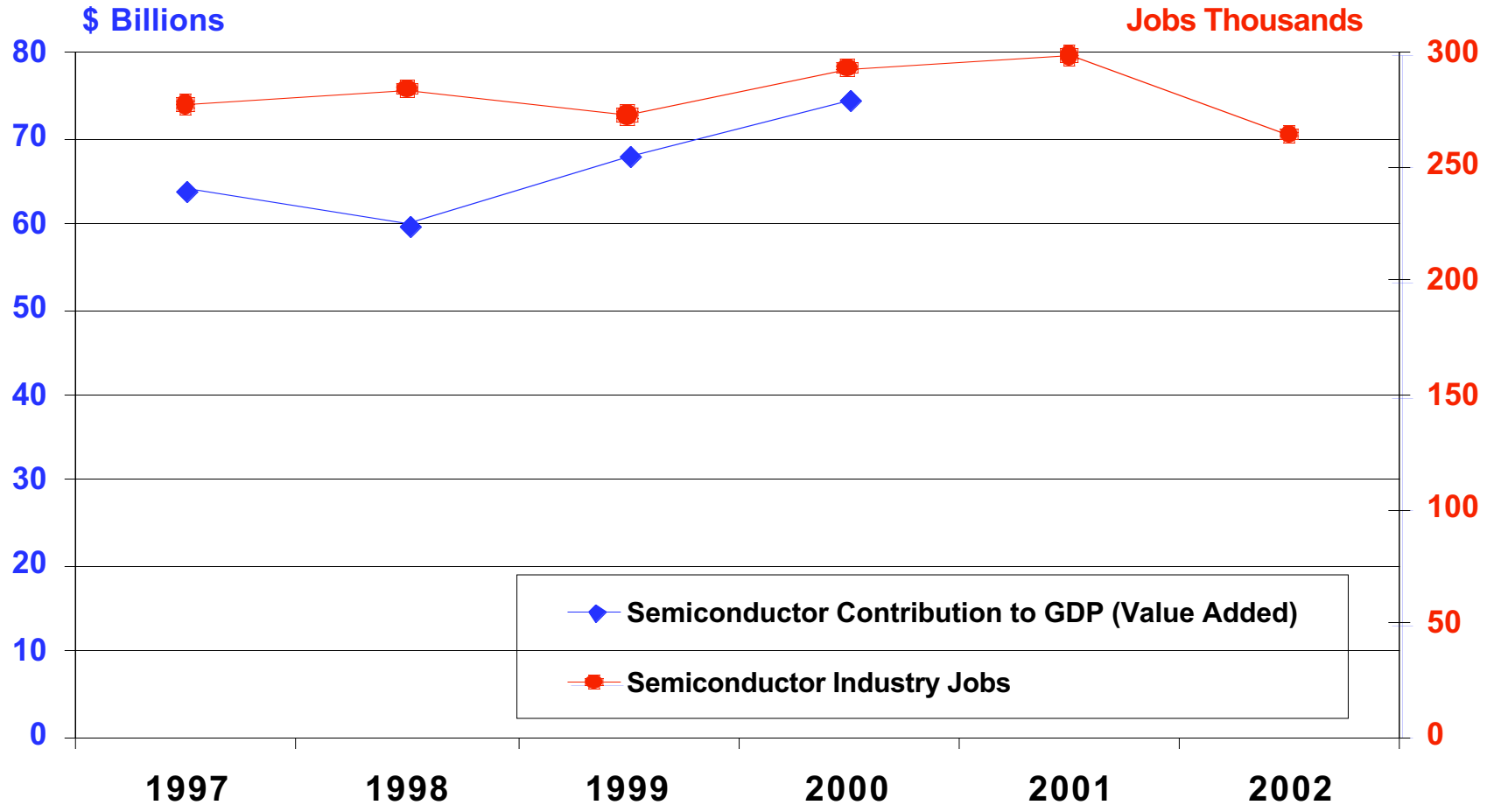
…. contribute more to U.S. GDP than any other manufacturing industry and support over 250,000 jobs, ….



Source: U.S. Census Annual Survey of Manufacturer Statistics for Industry Groups: 2000, February 2002; Bureau of Labor Statistics

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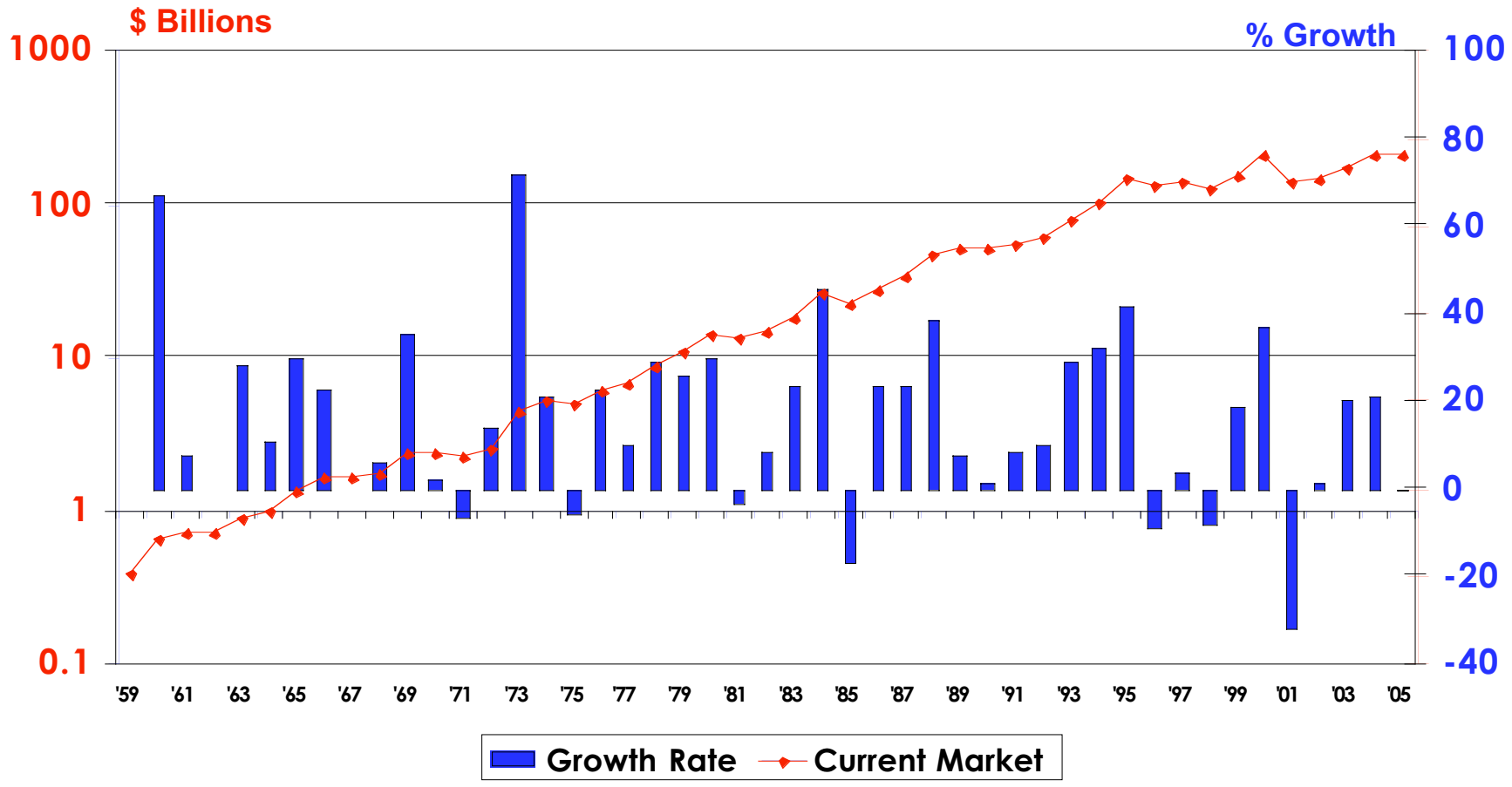
… exhibit above average long term growth rates…



Source: SIA November 2002 Forecast

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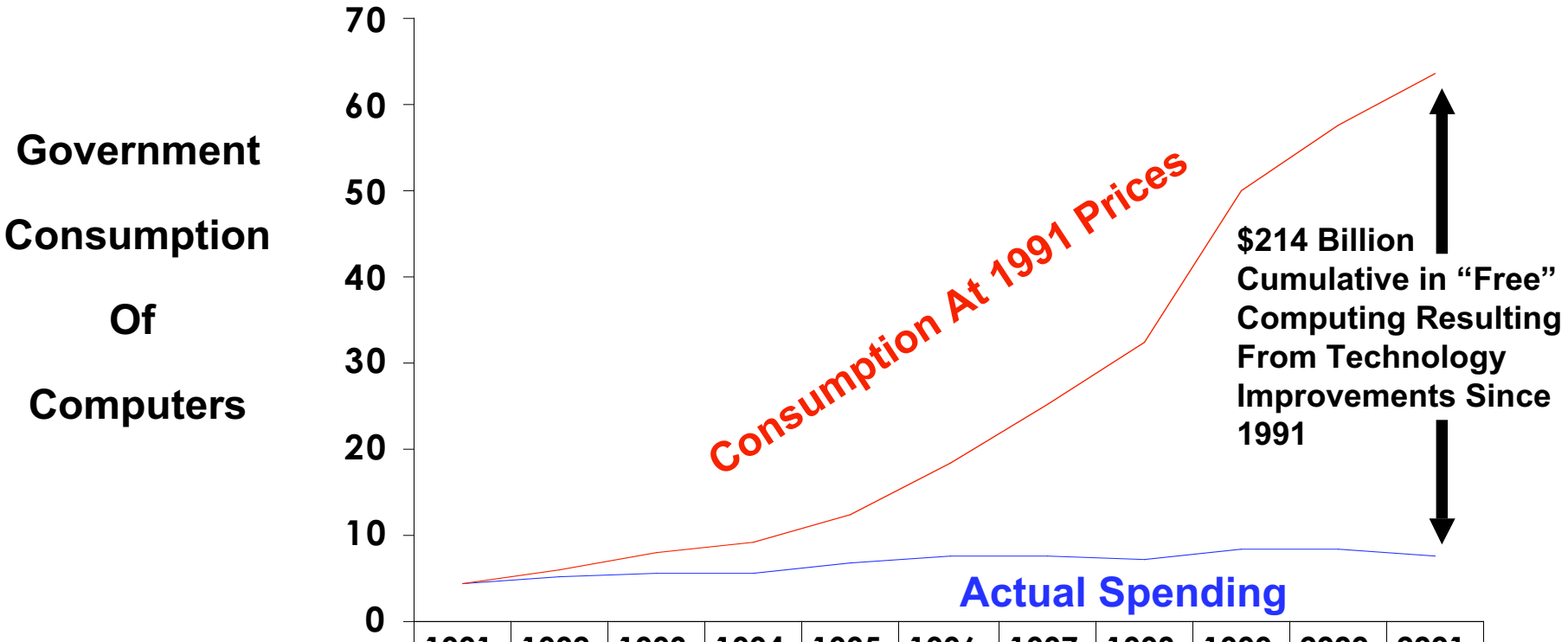
….. provide huge government benefits from computer price declines.



	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Actual Spending	4.5	5.1	5.4	5.6	6.6	7.4	7.7	7.2	8.4	8.4	7.4
at '91 Prices	4.5	6	7.8	9	12.2	18.5	25.2	32.5	50.2	57.5	63.7

Source: *Bureau of Economic Affairs (www.bea.gov/bea/dn/comp-gdp.xls*
Note: *Includes Federal, State, and Local Governments.*

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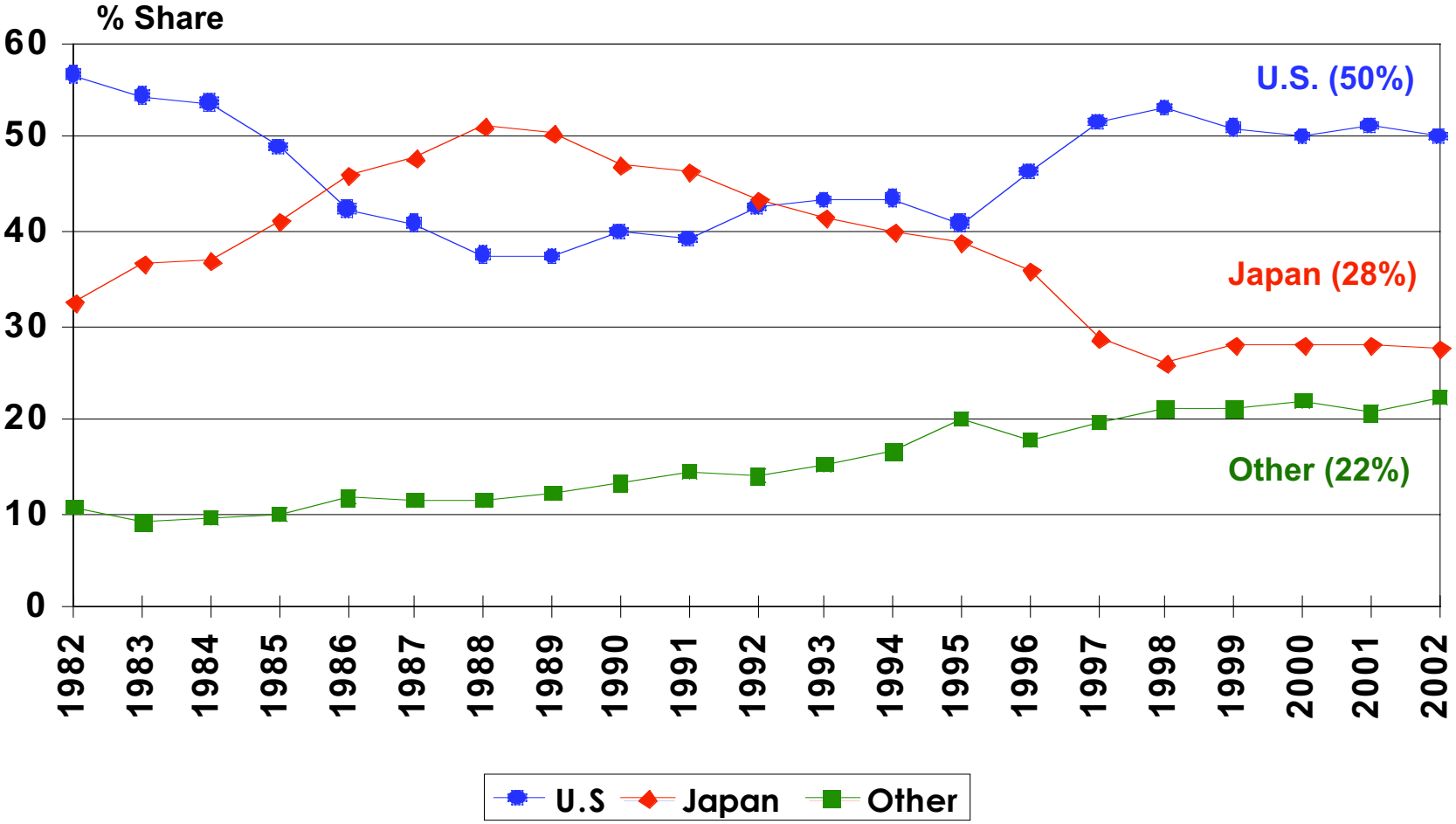
The U.S. leads the world in semiconductor market share, but ….



Source: SIA

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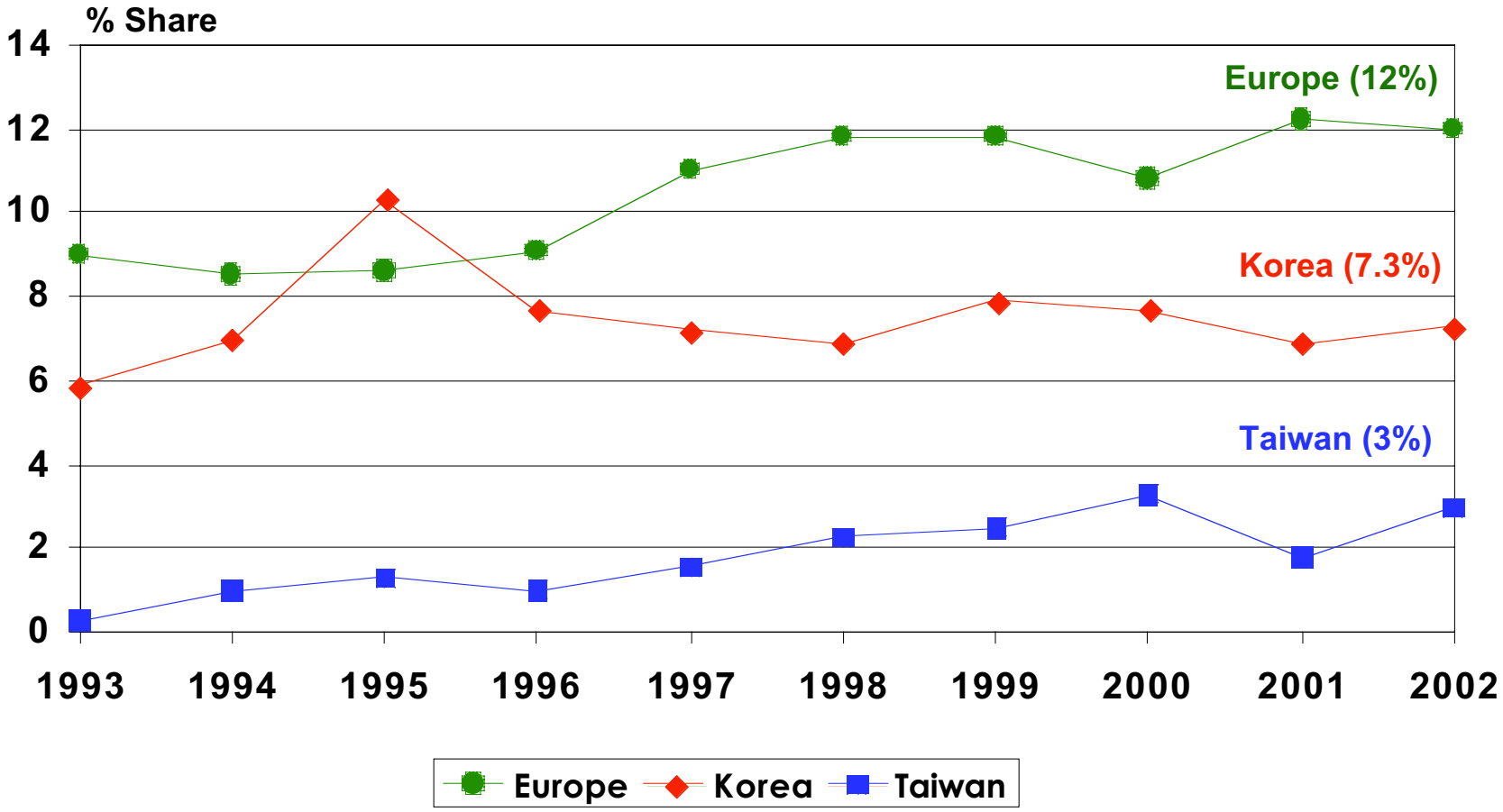
… Europe, Korea and Taiwan have made impressive gains.



Note: Market share is based on headquarter region of seller, i.e. foundry output does not count in Taiwanese market share.
Source: SIA

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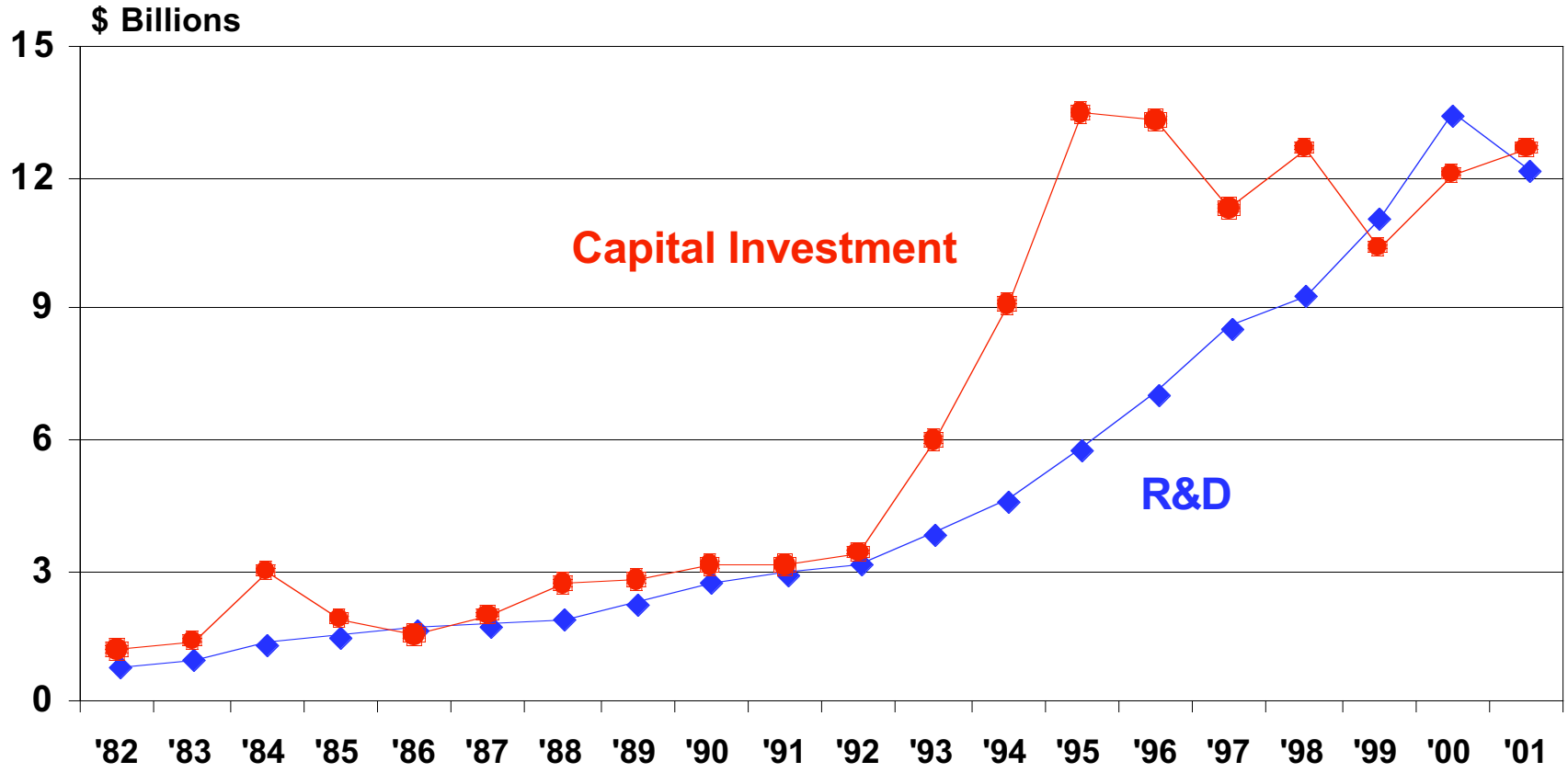
To maintain its leadership position, the U.S. semiconductor industry invests $24 billion, a third of industry revenues goes back for R&D and capital investment.



Source: SIA Databook, 2002

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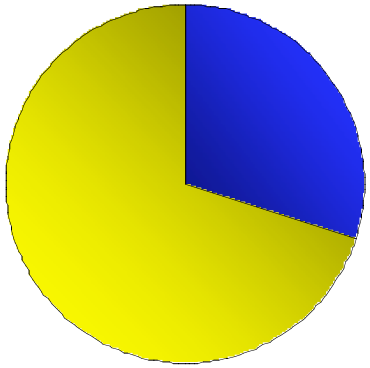
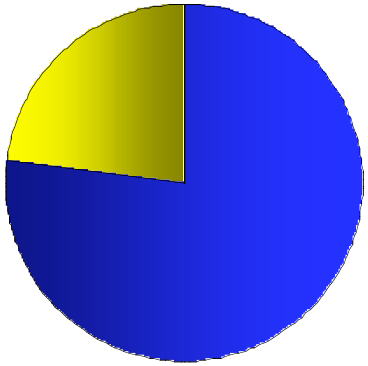
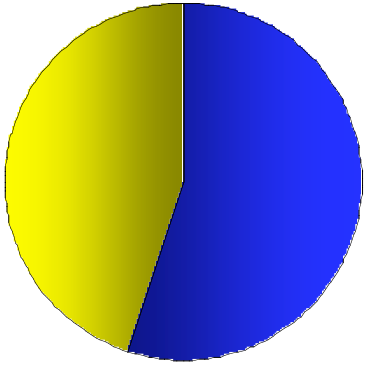
Although 70% of U.S. chip industry sales are outside the U.S. market, U.S. chip companies currently have most of their facilities and employment in the U.S.



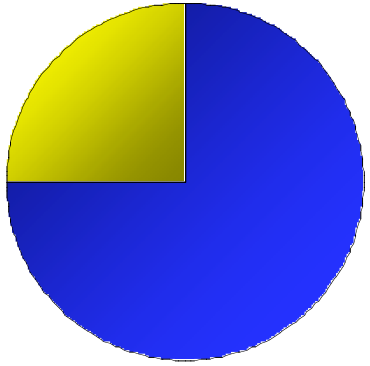
30% of Sales in U.S. Market



77% of U.S.-Owned Capacity in the U.S.



55% of U.S. Industry's Worldwide Employment in North America



75 % of U.S. Industry's Labor Compensation in North America

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Leading edge manufacturing is required to maintain technology leadership.

- Proximity facilitates technology transfer from lab to fab
- Industry helps supplement the research university base
- Absent a manufacturing base students interest in field will suffer

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II. Potential movement of manufacturing offshore

- Capital investment moving from U.S.
- Economic trends impact capital investment
  - Market trends
  - Fabless/foundry business model
  - human resources trends

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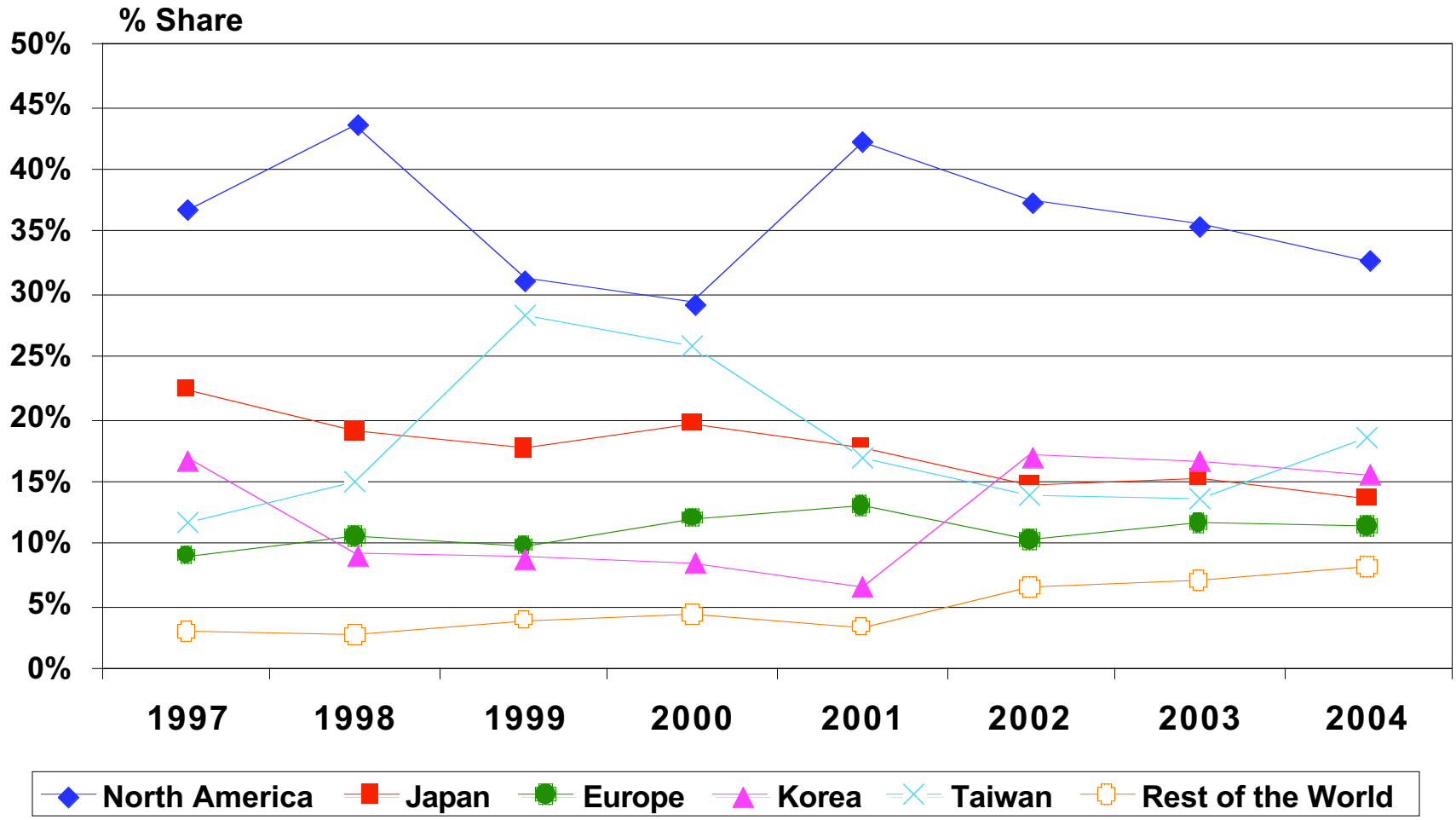
U.S. industry's share of capital expenditures falling….



Source: VLSI Research

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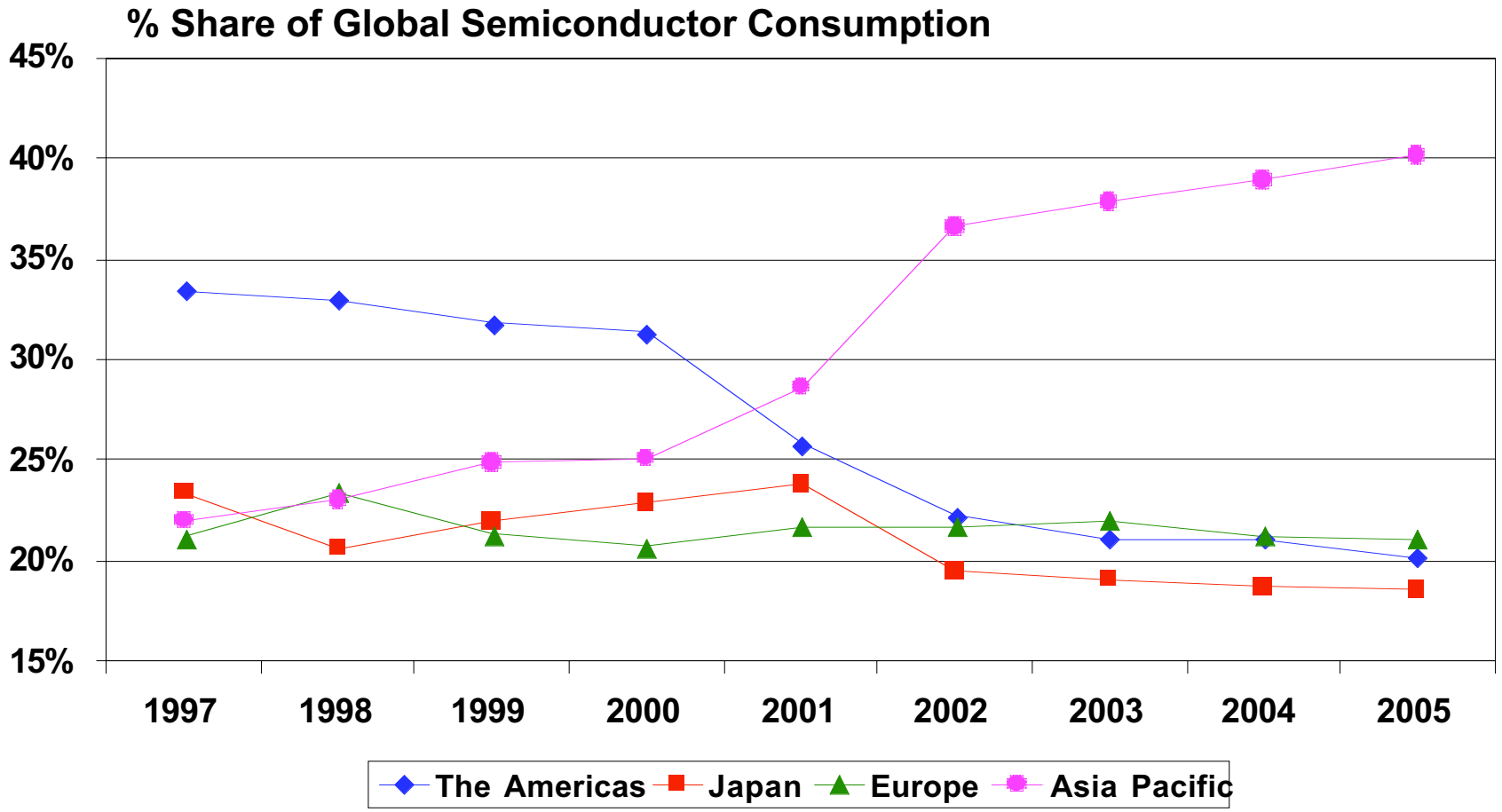
The Asia semiconductor market surpassed the U.S. market in 2001 and will widen the gap thereafter….



Source: WSTS/SIA

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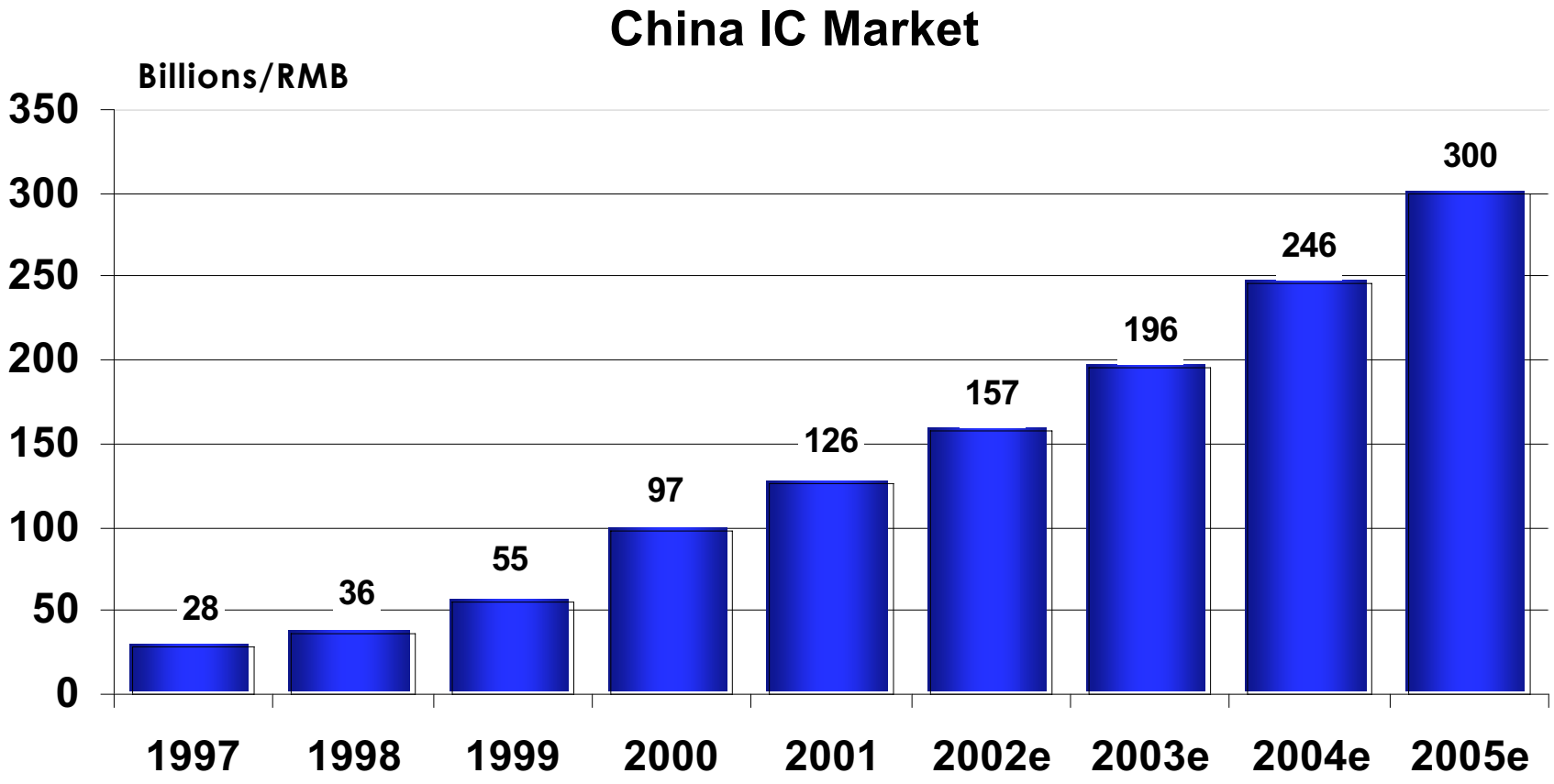
China's $15.2 billion IC market is growing rapidly.



2001 = 8.3 RMB/$

Source: CCID, USITO

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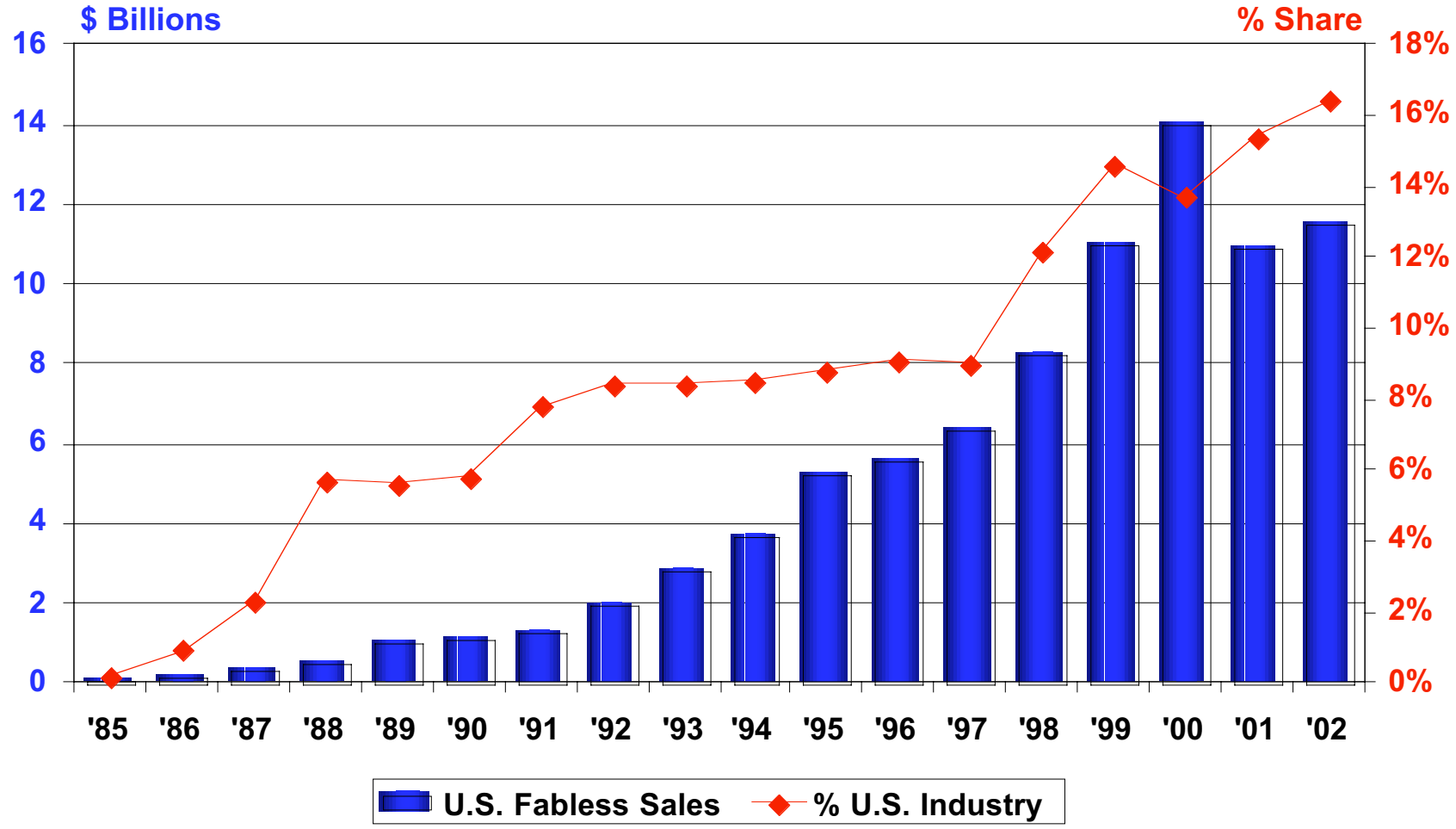
The fabless/foundry business model has grown to 16% of the U.S. chip industry.



Source: SIA

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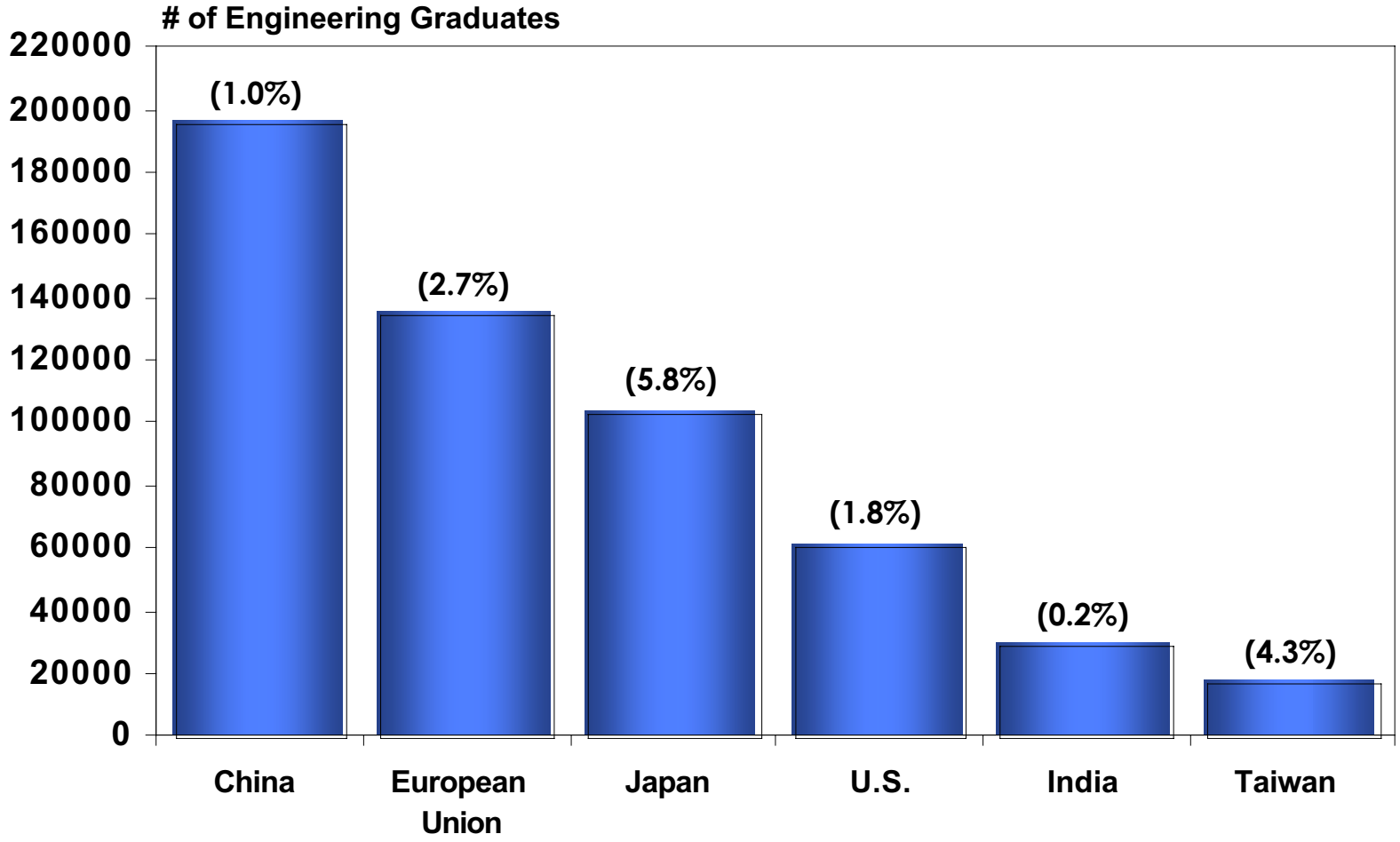
Human resources trends are of concern as other nations outpace U.S. in engineering graduates.



(%) = Percent of 24 year olds with engineering degrees
Source: National Science Board, "Science and Engineering Indicators – 2002"; Table 2-18

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III. Foreign Government Policies Also Impact the Location of Future Semiconductor Manufacturing and Technology Development

- China
- Japan
- Taiwan
- Korea
- Europe

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Foreign governments are supporting semiconductor manufacturing, ….

"With 5 to 10 years' effort…. Domestic integrated-circuit products will also satisfy most domestic demand and be exported as well while reducing the development and production technology gap with developed countries."

China State Council Document Number 18
June 24, 2000

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… for example China has adopted aggressive policies to promote domestic manufacturing.

- Income tax incentives
  - 5 year tax holiday plus 5 years at half tax for reinvested capital
  - Clock starts when profits start
- Free land in industrial parks
- VAT rebate system
  - 17% is normal VAT
  - Amount over 3-6% rebated for chips made in China
  - Waive VAT on inputs
  - Violates WTO commitments

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Taiwan authorities have adopted policies to encourage Taiwan companies to keep "roots in Taiwan."

- "Statute for Upgrading Industries" law allows authorities to support targeted industries.
- Taiwan's tax law provides five year tax holidays for semiconductors and other benefits – Taiwan's major semiconductor companies have paid little taxes for years.
- To help finance the significant costs to build a chip facility or start up a microelectronics related company, Taiwan has a number of government subsidy funds or government controlled banks.
- Taiwan's personal income tax laws allow employees at high tech firms to receive stock compensation virtually tax free, which enables Taiwanese companies to compete effectively for engineering talent.

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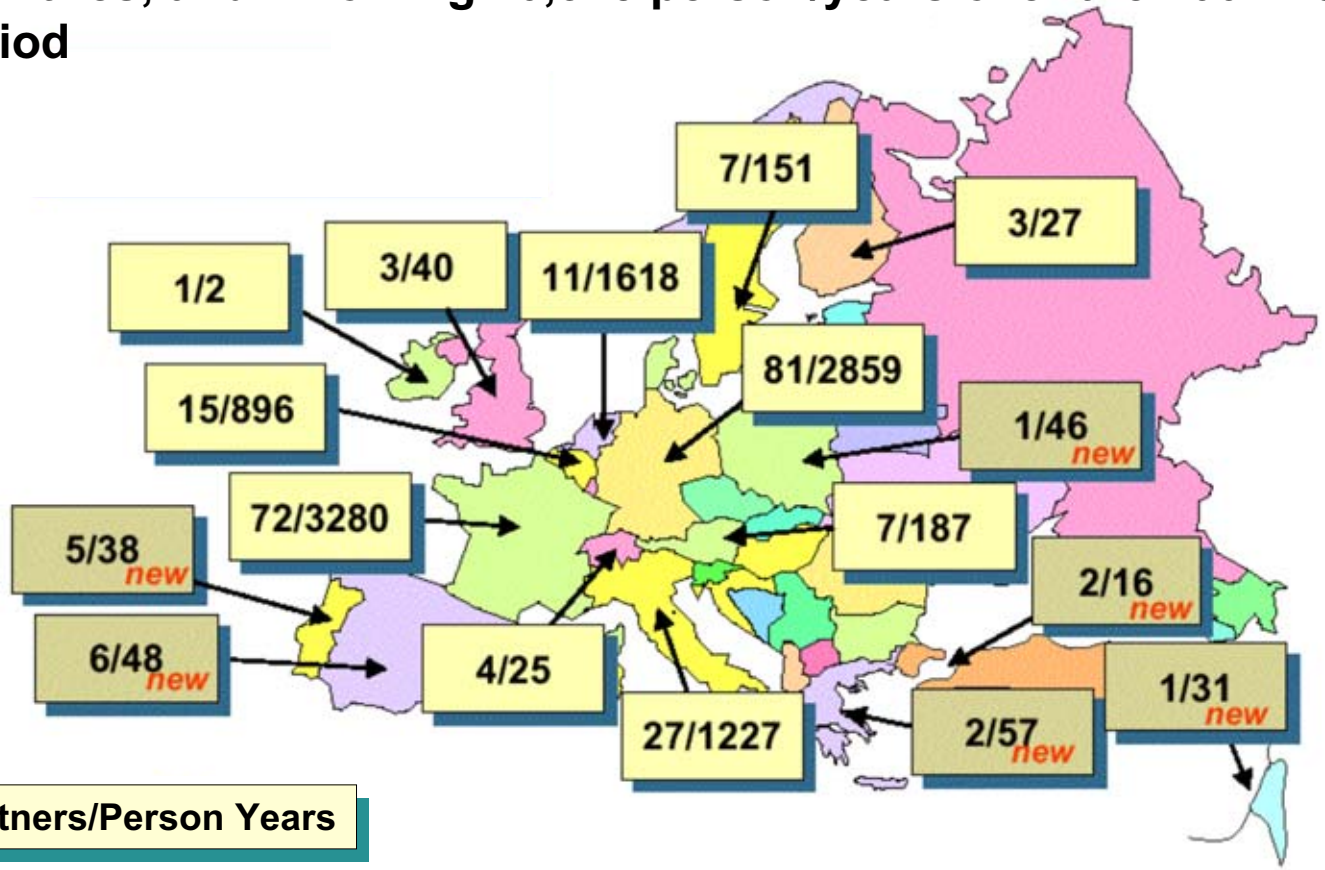
Korea's support for the semiconductor industry includes substantial capital investments.

- The Korean government has a history of supporting the semiconductor industry stretching back to the government sponsored KIET jump-starting the industry in the 1980s.

- The Korean government have provided capital to Hynix through its government controlled banks because it considers semiconductors to be a backbone industry that cannot be allowed to fail from market principles. The capital flows have included debt forgiveness, extensions of maturities, and debt-for-equity swaps.

Europe's national cooperative research efforts are impressive.

- MEDEA+ has 38 projects with 218 partners in 17 participating countries, and involving 10,548 person/years over the 2001-2004 period



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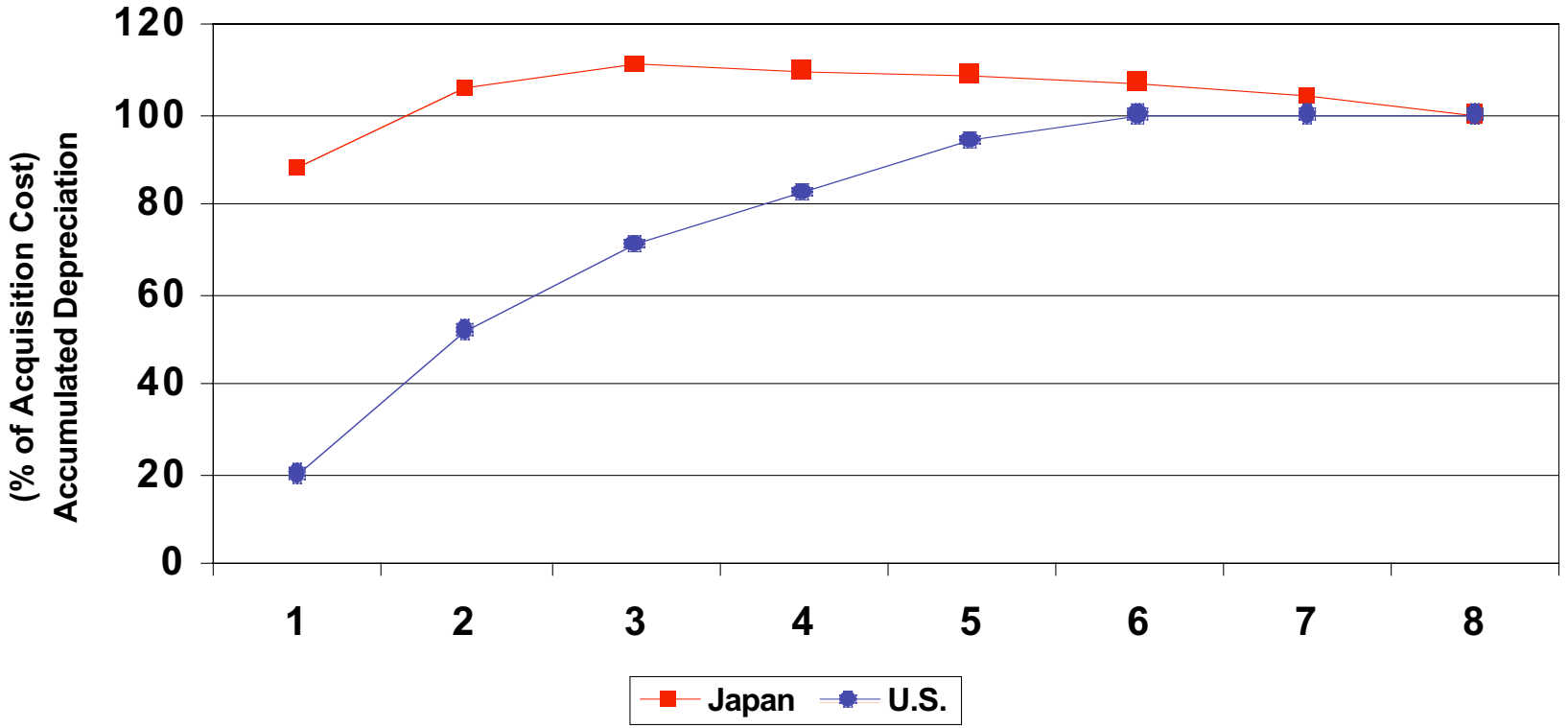
Japan has also promoted semiconductor production, allowing up to 88% depreciation of equipment in the first year.



Comparative Tax Depreciation Allowances for Semiconductor Production Equipment in the U.S. and Japan

Source: Technecon Analytic Research, Inc.

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IV. The U.S. Government must respond to keep technology leadership in the U.S.

- Vigorously enforce trade rules by pressing China to eliminate its discriminatory VAT rebates on domestic production and protect IP.
- Increase support for university R&D by doubling the NSF budget and fully funding the focus center research program.
- Adopt pro-investment tax policies by passing the Homeland Investment Act, making the R&D credit permanent, and allow for rapid depreciation of high tech equipment.
- Support state and local government economic development efforts.

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Tax, Trade, and Technology Policy are Synonymous

- Bad Tax policy drives manufacturing offshore
  - Increases our trade deficit.
  - Technology follows manufacturing.

- Foreign trade barriers
  - Moves investments overseas, lowers tax revenues in US
  - Technology follows manufacturing.

- Inadequate Federal investments in university R&D
  - Lowers future economic growth and future tax revenues
  - Undermines technology as differentiator, so labor costs to dominate

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