

Globalization of IT: Economic Gains & Policy Challenges

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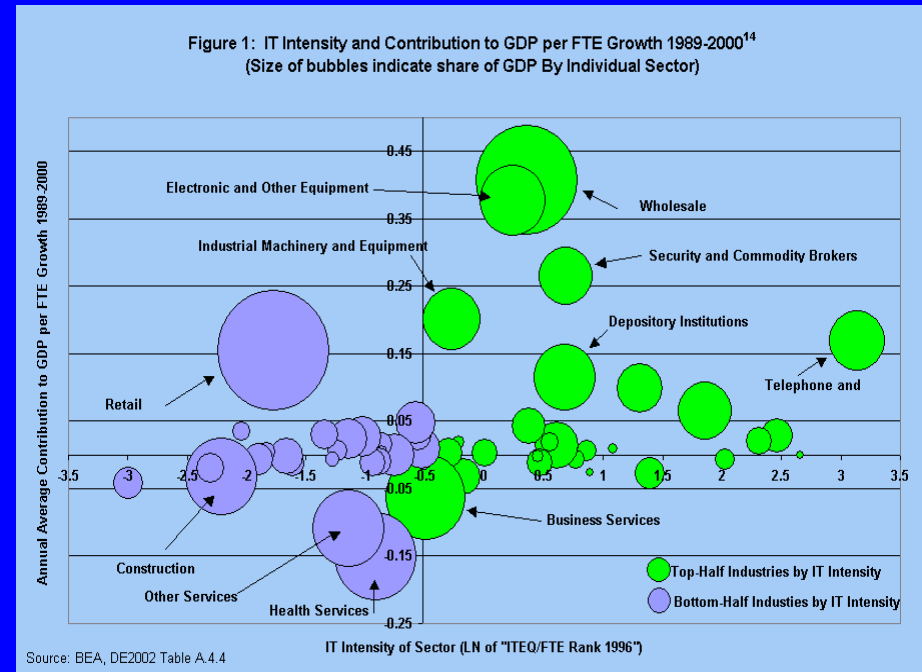
Gains from Global Sourcing of IT Hardware

a model for understanding channels of gains

Macroeconomic Gains

- Reduced IT hardware prices by 10-30 % more than if produced only in US
- Diffused IT investment through US sectors due to demand elasticity greater than 1.0
- Accounted for more than 1/2 of accelerated productivity growth
- Raised GDP growth 0.3 /yr (95-2000) & added at least \$230 billion to GDP

Sectoral Gains



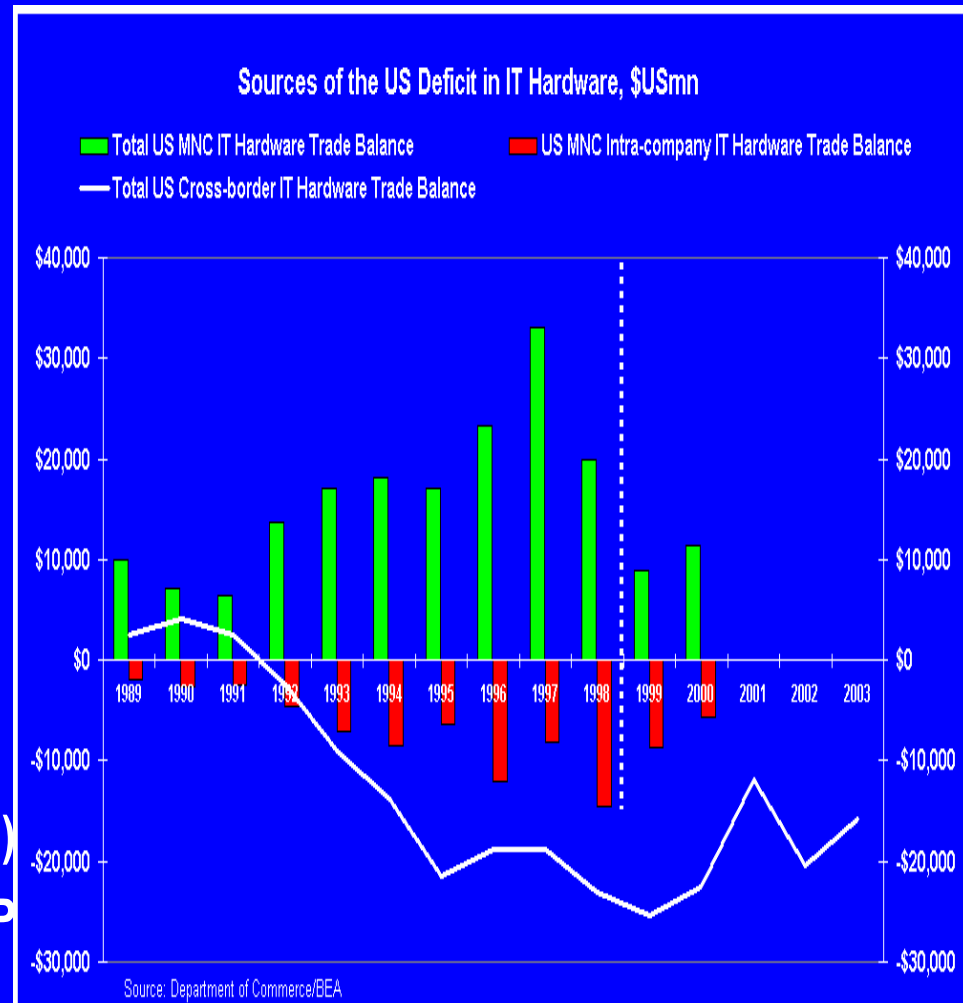
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Export Competitiveness too

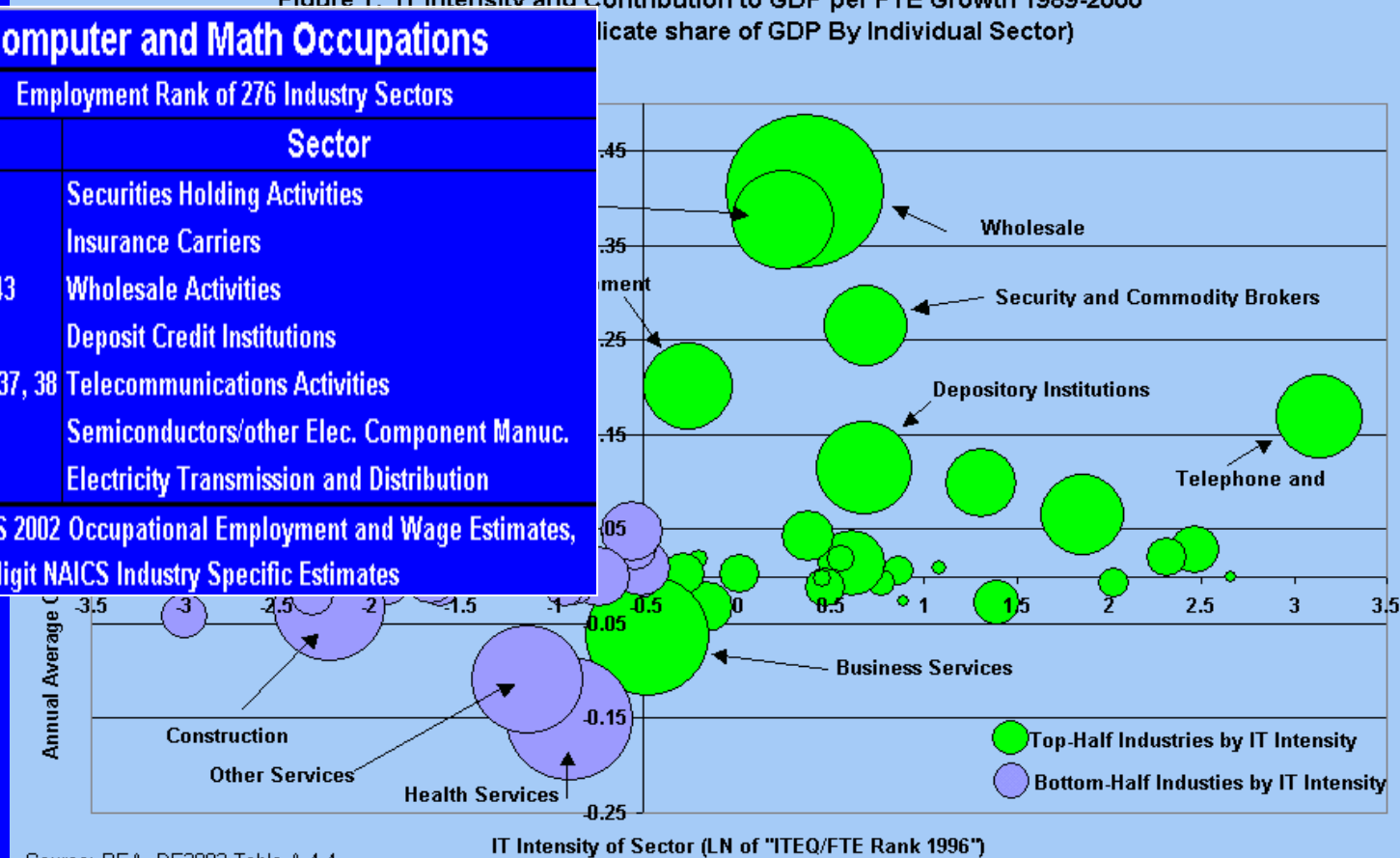


Sectors that invested a lot in IT capital also hire a lot of IT workers

Figure 1: IT Intensity and Contribution to GDP per FTE Growth 1989-2000¹⁴

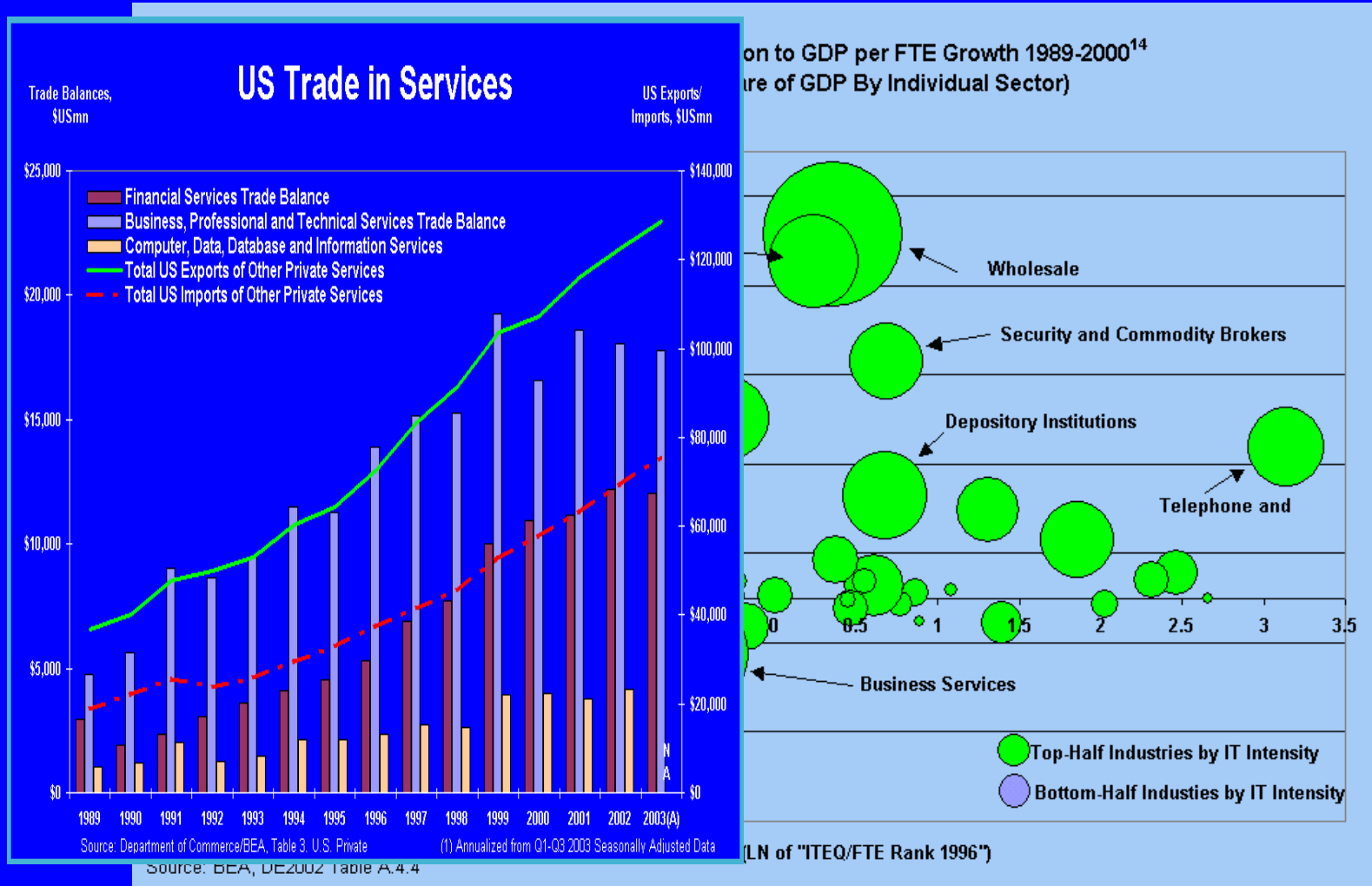
Computer and Math Occupations	
Employment Rank of 276 Industry Sectors	
Rank	Sector
#2, 29	Securities Holding Activities
#4	Insurance Carriers
#5, 32, 43	Wholesale Activities
#14	Deposit Credit Institutions
#16, 17, 34, 37, 38	Telecommunications Activities
#25	Semiconductors/other Elec. Component Manuc.
#36	Electricity Transmission and Distribution

Source: BLS 2002 Occupational Employment and Wage Estimates, National 4-digit NAICS Industry Specific Estimates





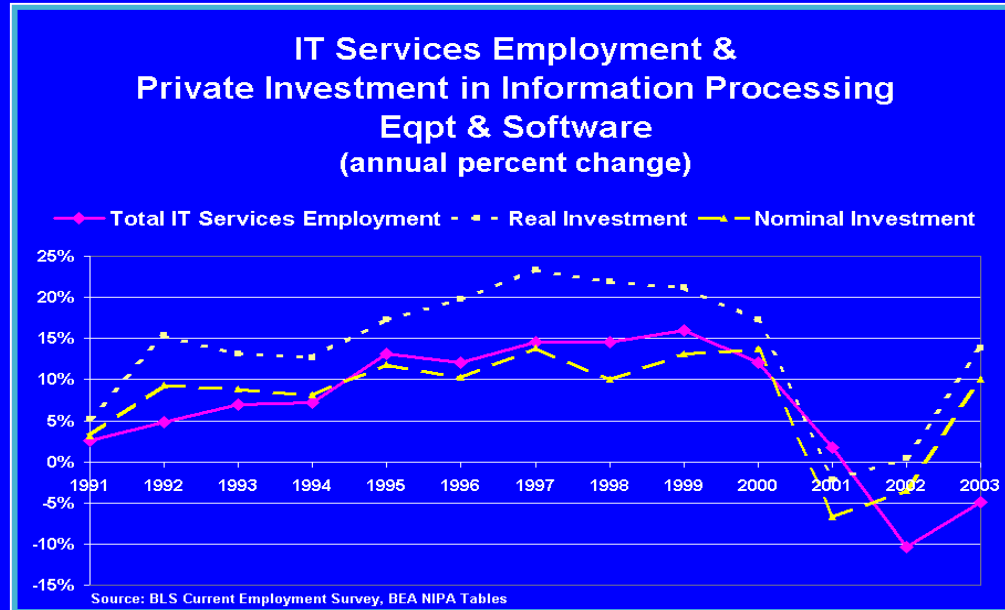
Source: BEA, DE2002 Table A.4.4

And these sectors *also* are net exporters



IT jobs: *Microcosm of cyclical & structural changes*

- **Cyclical factor of IT investment** 
 - IT jobs in IT sector move in lock-step, but, 2/3 of IT jobs are in non-IT sectors and have held up better than IT sector
- **Structural factor:** 
 - Rising skill demands from changing technology & trade



Evolution in IT Occupations and Demand for Skills 1999-2002

	Change 1999-2002	Av. Wage	2002 Emp. Level
Data Entry Keyers	-143250	\$ 23,190	377,000
Computer Operators	-25860	\$ 31,640	173,000
Computer Programmers	-71280	\$ 63,690	457,000
Computer Software Engineer	115170	\$ 74,615	612,000
Total "White-Collar IT" Occupations	-144630	NA	5,492,000

Source: BLS 2002 Occupational Employment and Wage Estimates,
National 4-digit NAICS Industry Specific Estimates

Two-Pronged Strategy for American Innovation & Growth

Domestic strategy:

- New-jobs policies for displaced workers:
 - *Wage insurance*
- Entry and up-skilling policies within a career-ladder, esp. sci/tech jobs where human capital depreciates quickly
 - *Human-capital investment tax credit*
- Movement/flexibility policies mitigate costs of adjustment
 - *Health care and pension portability ; better information on job availability;*

The Human-Capital Investment Tax Credit

Invest in people for a competitive economy

- The ITC instrument fits a 'classical' economics case
 - Private benefit captured by firms is less than national (social) benefit
 - Is the rationale for the R&D tax credit & accelerated depreciation / investment tax credit.
- H-ITC for incumbent workers to move up career ladder
 - An H-ITC mitigates the firm's disincentive to train workers for fear of losing them to a rival firm that does not train
- H-ITC for entry level workers
 - A internship credit mitigates students' concern about technical careers and recognizes that the 'first job' may no longer be US

Two-Pronged Strategy for American Innovation & Growth

External strategy:

- Foreign macro demand & exchange rate policies
 - *Collapse in exports is a key problem today*
- Get back to the trade negotiating table
 - *Open markets abroad for internationally competitive US services*
 - *Off-shoring of some services increases competitiveness of others*

Conclusion

- Gains from global sourcing of IT hardware:
 - *Global sourcing, productivity growth, job creation go hand-in-hand.*
- Future gains from deeper global engagement of IT:
 - *Global sourcing of software & services generates cheaper tailored applications, diffused to lagging sectors.*
 - *Opening service markets abroad promotes two-way trade*
- The jobs challenge:
 - *Adjustment to new careers; and different-skill jobs*
 - *IT skill needs to design, market & apply IT to lagging sectors*

Jobs Lagging For A Variety of Reasons

Assessment & remedy require cutting through boom-bust

The Current Employment Situation, Thousands

	1999	2000	2001	2002	2003	Current, March, 2004(P)
Total Nonfarm Private Employment¹	109,996	111,643	109,312	108,501	108,491	108,798
Manufacturing¹	17,277	17,175	15,702	14,899	14,324	14,310
Private Service Providing¹	85,417	87,071	86,227	86,332	86,823	87,225
Business and Financial Occupations²	na	5,180	5,389	5,320	5,568	5,622
Computer and Mathematical Occupations²	na	3,325	3,397	3,032	3,291	3,072
Architecture and Engineering Occupations²	na	3,012	2,839	2,798	2,606	2,629
Unemployment Rate (16y and above)						
Annual Average	4.2%	4.0%	4.8%	5.8%	6.0%	na
End-of Period	4.0%	3.9%	5.8%	6.0%	5.7%	5.7%

¹ Data from the BLS Current Employment Survey. Annual data from the month December, seasonally adjusted

² Data from the BLS Current Population Survey. Annual data from the month of February, seasonally unadjusted

Source: Bureau of Labor Statistics Monthly Current Population and Establishment Data

Manufacturing continued decline=>adjustment policies

White collar & high skills reviving=>skill-matching policies