

E-Skills – The Recent US Experience

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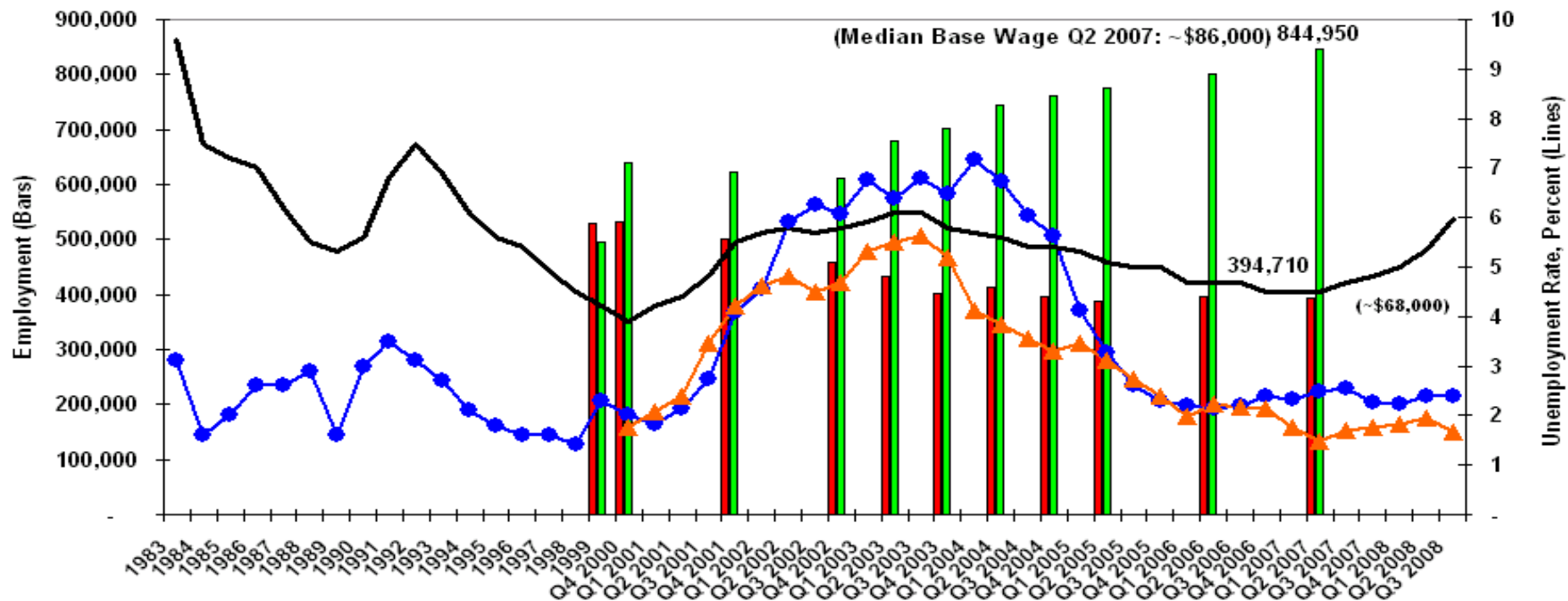
The US “E-Skills/Offshoring/IT & Software Workforce Debate Has Been Driven By Populism



What Has Happened To US IT/Software Workers?

US "IT and Software Employment and Unemployment", 1983-2008

- Employment - Computer Programmers
- Employment - Software Engineers
- Unemployment - Computer Programmers
- ▲ Unemployment - Software Engineers
- Unemployment - Total Economy



Note: Annual data 1983-1999, 4-quarter lagging moving average 2000-2008; "Software engineers" includes both applications and systems software engineers. Employment Data do not include selfemployed workers. Source: NSF; BLS CPS and OES Data

What Has Been The Role of “Offshoring/India”?

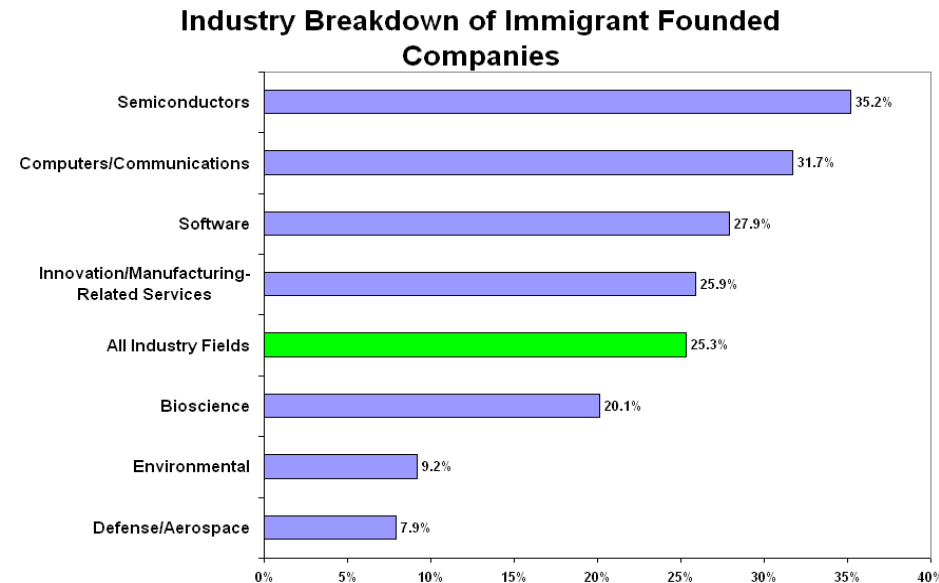
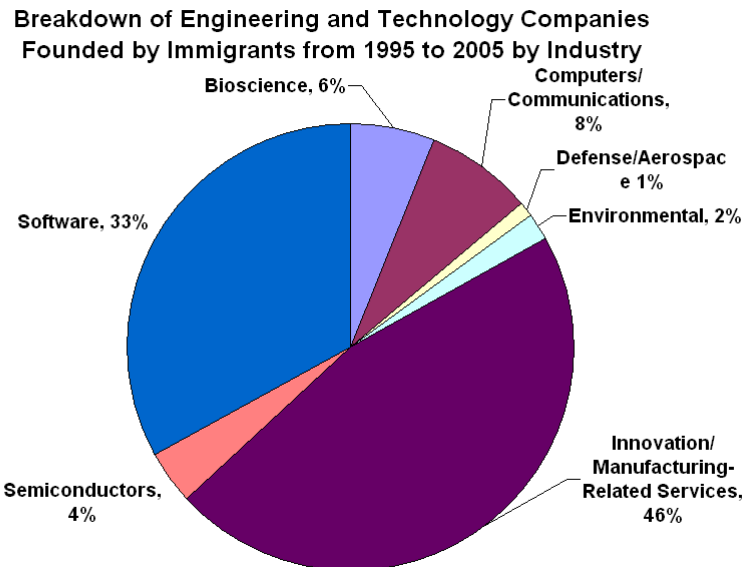
Top-25 Company Recipients of L-1 and H-1B Visas in FY 2006. By Sector and Home Country

The Top 25 L-1 Employers Of 2006					The Top 25 H-1B Employers Of 2006				
Rank	Company	Sector	Home Country	No. of Visas	Rank	Company	Sector	Home Country	No. of visas
1	Tata Consulting Systems	IT Services/Software	India	5,408	1	INFOSYS TECHNOLOGIES LIMITED	IT Services/Software	India	4,908
2	Cognizant Technology Solutions	IT Services/Software	India	1,888	2	WIPRO LIMITED	IT Services/Software	India	4,002
3	Wipro Limited	IT Services/Software	India	1,187	3	MICROSOFT CORPORATION	IT Services/Software	US	3,117
4	IBM	IT Services/Software	US	614	4	TATA CONSULTANCY SERVICES LIMITED	IT Services/Software	India	3,046
5	Hewlett-Packard	IT Hardware	US	417	5	SATYAM COMPUTER SERVICES LTD	IT Services/Software	India	2,880
6	Satyam Computer Services	IT Services/Software	India	336	6	COGNIZANT TECH SOLUTIONS U S CORP	IT Services/Software	India	2,226
7	Intel Corporation	Semiconductors	US	314	7	PATNI COMPUTER SYSTEMS INC	IT Services/Software	India	1,391
8	Caritor, Inc.	IT Services/Software	US	280	8	IBM CORPORATION	IT Services/Software	US	1,130
9	Ernst & Young	Business Services	US	249	9	ORACLE USA INC	IT Services/Software	US	1,022
10	HCL Technologies	IT Services/Software	India	244	10	LARSEN & TOUBRO INFOTECH LIMITED	IT Services/Software	India	947
11	Infosys Technologies, Inc	IT Services/Software	India	235	11	HCL AMERICA INC	IT Services/Software	India	910
12	Patni Computer Systems, Inc	IT Services/Software	India	221	12	DELOITTE & TOUCHE LLP	Accounting	US	890
13	Schlumberger	Oil Services	France	198	13	CISCO SYSTEMS INC	ICT Hardware	US	828
14	Syntel	IT Services/Software	US	197	14	INTEL CORP	Semiconductors	US	828
15	M&E Group, Inc	N/A	N/A	194	15	I-FLEX SOLUTIONS INC	IT Services/Software	India	817
16	Exxon-Mobil	Oil	US	187	16	ERNST & YOUNG LLP	Accounting	US	774
17	Kanbay, Inc.	IT Services/Software	India	178	17	TECH MAHINDRA AMERICAS INC	IT Services/Software	India	770
18	Halliburton	Oil Services	US	157	18	MOTOROLA INC	ICT Hardware	US	760
19	PriceWaterhouseCoopers	Business Services	US	152	19	MPHASIS CORPORATION	IT Services/Software	India	751
20	Oracle, Inc	IT Hardware	US	148	20	DELOITTE CONSULTING LLP	Consulting	US	665
21	Nokia	Mobile Telephony	Finland	141	21	LANCESOFT INC	IT Services/Software	US	645
22	Microsoft	IT Services/Software	US	133	22	NEW YORK CITY PUBLIC SCHOOLS	Education	US	642
23	Perot Systems	IT Services/Software	US	121	23	ACCENTURE LLP	Consulting	US	637
24	Deloitte	Business Services	US	112	24	JPMORGAN CHASE & CO	Financial Services	US	632
25	HSBC	Financial Services	UK	103	25	POLARIS SOFTWARE LAB INDIA LTD	IT Services/Software	India	611

Yellow Indicates IT Services Company. Source: Office of US Senator Chuck Grassley, as described in Kirkegaard (2007); Author

The Role of the “Immigrant Technology Entrepreneur”

- From 1995-2005, one quarter of ALL new US Engineering and Technology Firms had at least 1 foreign-born founder!
- In Silicon Valley, the share was 52.4%! (Yahoo, Google, E-bay etc.)
- In 2006 = 450,000 workers and \$52bn in sales
- Share of venture-capital backed upstarts with foreign-born founder; 1970-80: 7%; 1980-90; 20%; 1990-2005; 25%



The Real Skills Challenge is Not From Trade, But From Technology

Recent Consumer Services Interaction Trends

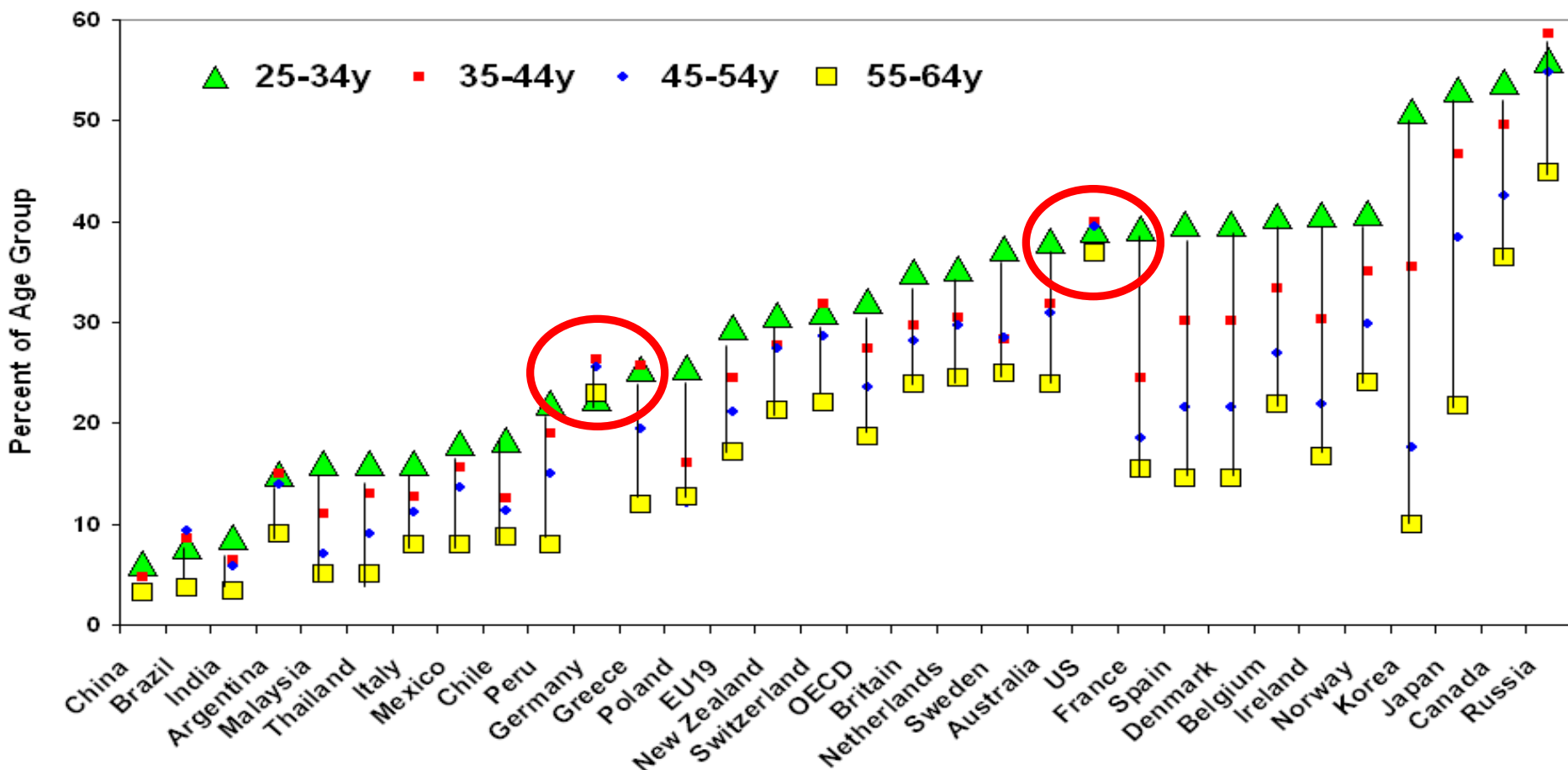
Type of Consumer Interaction	Average Cost of Consumer Services Per Interaction, 2004	Implied Cost Savings in 2004	Developments Since 2004
Call to OECD Country Agent	~\$6		
Call to India-Based Agent	~\$3	~50%	Indian Wages Up ~15% p.a.
E-Mail Based Correspondence	~\$2.50	~60%	Global internet usage continues to rise exponentially (1.4bn in feb '08)
Interactive Voice Response (IVR)	~\$1.80	~70%	IVR/Automated Speech Response Reach 50% of US/EU Companies in 2007
Automated Speech Response	~\$0.75-\$1.50	~75-80%	
Web-Based Self-Service	~\$0.60-\$0.75	~80-90%	Global internet usage continues to rise exponentially (1.4bn in feb '08)

Source: IBM, Forrester, Gartner, Avaya, Author

Tradability Will Just Be the Mid-Point Before Automation

A Broader Fact Check on America's High-Skilled Workforce; A Relative Comparison

Share of Population With Tertiary Education, By Age, 2005



Note: 2005 or latest available from 2003/04. Source: UNESCO/OECD World Education Indicators; OECD Education at a Glance (2007), China Statistical Yearbook 2005 for China; and the 61st NSS Round for India.

E-Skills Policy Formation Problems In the US vs. EU

- **Complete Absence of Stakeholder Approach:**
 - Federal government ideologically opposed to involvement;
 - US labor unions in IT services mostly populist/internet-based;
 - US IT services companies opposed to domestic union-representation
 - Requirement for annual Congressional funding for federal programs
 - Lots of good policy research/reports/proposals go to waste
- **Most Labor Market Policies Exist at the State-Level:**
 - State-level Ideological resistance to government involvement;
 - Erratic state level funding makes long-term institutions difficult to sustain

Summary and Conclusion

- **US IT and Software Workers Have Faced Very Intense Skill-Bias, But Remain At Full Employment**
- **Despite Draconian Restrictions on High-Skilled Immigration, US-Based IT Services Companies Remain Able to “Source Employees Globally”**
- **Immigrants (Usually Former Students) Play a Very Large Role in the Formation of New US Technology Upstarts**
- **The Cheapest Workforce in IT Services Will Ultimately Be Computers; Pure Cost Competition Not a LT Option**
- **The US Faces A Broad Stagnation in the (High) Skill Level of Its Workforce**
- **US politics have made “dealing with E-skills issues” difficult**