

# Immigration and the Tech Industry: A Labor Shortage Remedy, an Innovation Booster, or a Cost Saver?

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<http://heather.cs.ucdavis.edu/CIIPSlides.pdf>

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- Former statistics professor; continue in statistics research and consulting.



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- The foreign tech workers are not typically “the best and the brightest”
- The foreign tech workers are valued so much by employers as a source of cheap, immobile labor.

# Points to Be Addressed, cont'd.

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Overhiring of foreign tech workers is causing:

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## Points to Be Addressed, cont'd.

Overhiring of foreign tech workers is causing:

- wage suppression
- greatly curtailed careers; **H-1B is fundamentally about age**
- an **internal brain drain** in the U.S.

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- Economists and the “Ptolemy epicycle problem.”
- Which variables are missing? E.g. experience in specialized software skills.
- So I limit myself to the fields I know, computer science (CS) and electrical engineering (EE).

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# Which Foreign Tech Workers?



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- H-1B work visa: Temporary visa.
- Employer-sponsored green cards: U.S. permanent residence.
- Much overlap; I sometimes will take one as proxy for the other.

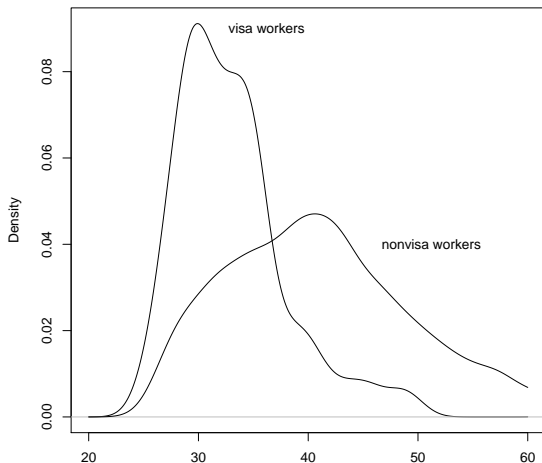
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# Some Demographics

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- : Foreign workers are young!



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# Demographics, cont'd.

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- “ICs”—Indians and Chinese.  
Computer-related H-1Bs, 2001:

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- “ICs”—Indians and Chinese.  
Computer-related H-1Bs, 2001:

sending nation	% of total
India	64.8%
China	8.2%
Philippines	2.3%



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Breakdown by major firm, % ICs among green card sponsorees:

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Breakdown by major firm, % ICs among green card sponsorees:

firm	Chinese	Indian	total IC
Qualcomm	13.0%	66.4%	79.4%
eBay	6.8%	70.3%	77.1%
Cisco	10.0%	64.1%	74.1%
Intel	10.7%	58.8%	69.5%
Motorola	12.7%	46.8%	59.5%
HP	4.9%	55.6%	59.5%
Google	26.4%	30.0%	56.4%
Microsoft	12.9%	37.6%	50.5%

## Trends in Time

IC %s among green card sponsorees:

year	China	India
2005	10.8%	31.2%
2006	9.6%	35.1%
2007	9.2%	36.7%
2008	8.0%	41.5%
2009	7.7%	43.6%

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  - salaries for new CS grads up only 3% in a year (NACE, 2011)
  - wages for experienced workers in Silicon Valley up only 3% since 2009 (Carey, 2011)
  - nationwide tech salaries up only 1% in a year (Dice, 2011)

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None of these indicates a shortage.

## Claims of a “Pipeline” Shortage

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- Texas Instruments testimony: No shortage of EE new engineering grads at Bachelor’s level (Whitaker, 2011).

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- Is this true?
- For simplicity, I focus on the PhD.

# Do Enough Americans Pursue a STEM PhD?

- U.S. PhD programs do consist largely of foreign students. Look at NSCG data (2003); what % of natives in CS/EE hold a PhD, versus what % of former foreign students (FFSs)?

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- But that doesn't mean that not enough Americans study for a doctorate.

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  - Program now in its last year, but CRA still maintains a long list of post docs. Post doc says in CRA newsletter, “situation not improved much today” (Bethel, 2011).
  - External review of CRA post doc program suggests the current poor PhD job market will be permanent (SRI, 2010).

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- Similarly, the legal prevailing wage doesn’t account for extra smartness, etc., the “special” things the employers claim Americans lack.
- In other words: **The legally-required prevailing wage is below the market wage.**

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Bottom line: The legal prevailing wage is easily 20% undervalued.

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- Green-card data analysis (see below).
- Analysis by economic theory (see below).

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- Green-card data analysis (see below).
- Analysis by economic theory (see below).
- But what about studies with contrary results? (Addressed below.)



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- I calculate  $WR = \text{wage paid} / \text{prevailing wage}$ .
- Since prevailing wage  $<$  market wage, **a value of WR near 1.00 means underpayment.**

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- So, *most foreign workers are underpaid*, relative to comparable Americans.
- Note: This data effectively excludes the Indian/Indian-American IT staffing firms, which do not sponsor workers for green cards (Hira, 2007).

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- Proof by nonmonetary compensation:
  - Foreign workers receive other compensation, e.g. green card or valued U.S. experience.
  - Thus, they often accept lower wages than do comparable Americans.



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**So the “shortage” is of young people. When they run out of young Americans, they hire young H-1Bs.**

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- H-1B allows people like Bradley to get the skills without paying for them.

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- Industry claims that only new graduates know the new stuff. Yet those new grads learned the new stuff from old guys like me!



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- Example: Our site visit during this conference, Part I.
- This puts the American job applicant at a significant disadvantage relative to a similar foreign applicant.

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department quality	% foreign-born
highest quarter	37.2%
second quarter	44.5%
third quarter	47.5%
lowest quarter	50.6%

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Again, all of the above exclude the Indian “bodyshops.”

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# Quality of PhD Institution, CS

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(Not in the paper.)

group	mean rating (1-5)
foreign	3.44
American	3.71

group	% from top 10 progs. (out of 128)
foreign	16.8%
American	26.6%

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  - Internal brain drain.

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- Microsoft has admitted that it simply doesn't have many positions for older workers (Wadhwa, 2008).

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- From the green card data, Microsoft:

job	% over \$100K
software engineers	6%
financial analysts	17%
lawyers	100%

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- Many of our brightest young people avoid STEM from the beginning, writing it off as a "dead end."
- Even large fractions of MIT—putatively our best/brightest—grads go into the financial industry, not STEM (Schramm, 2011).