



Workforce Development, Immigration and Entrepreneurship: The Keys to Global Competitiveness

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Vivek Wadhwa

Visiting Scholar, UC-Berkeley

Director of Research, Center for Entrepreneurship and Research
Commercialization and Exec in Residence, Pratt School of
Engineering, Duke University

Senior Research Associate, Harvard Law School

Columnist, BusinessWeek

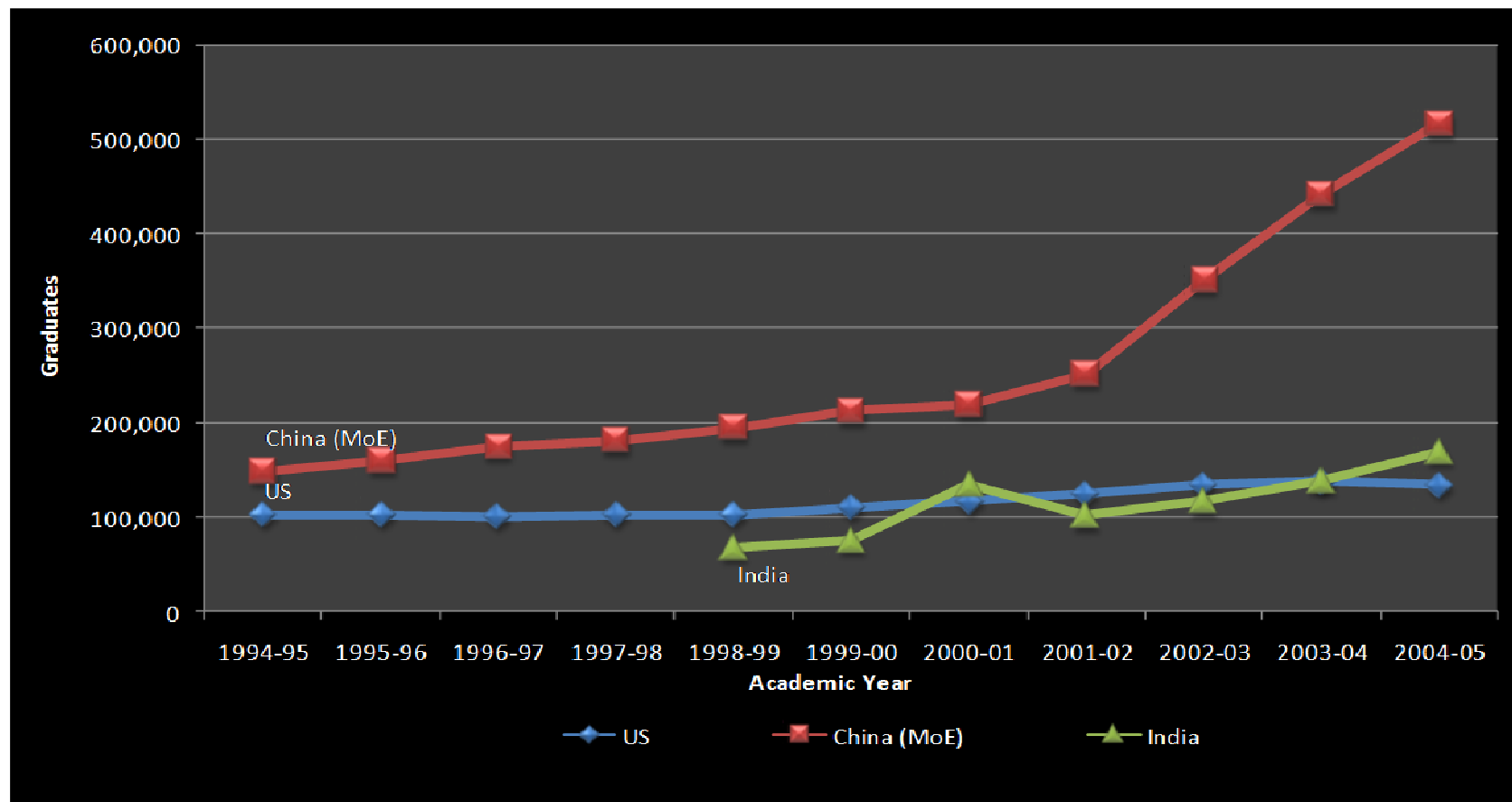
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Bachelor in engineering, CS and IT

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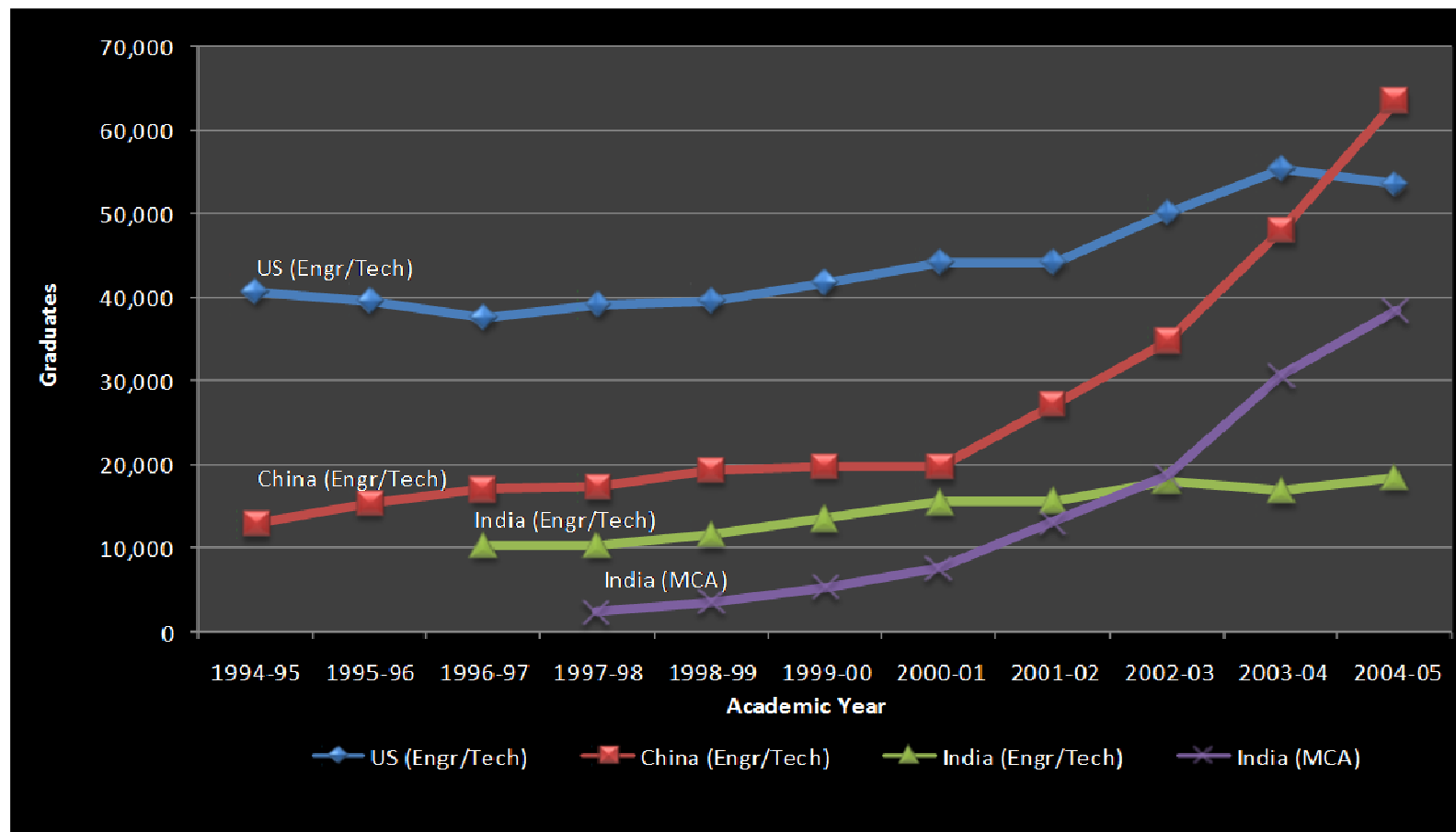


China numbers are suspect – inconsistent data collection, unrelated degrees.
India/China numbers were revised slightly based on new data



Masters in engineering, CS and IT

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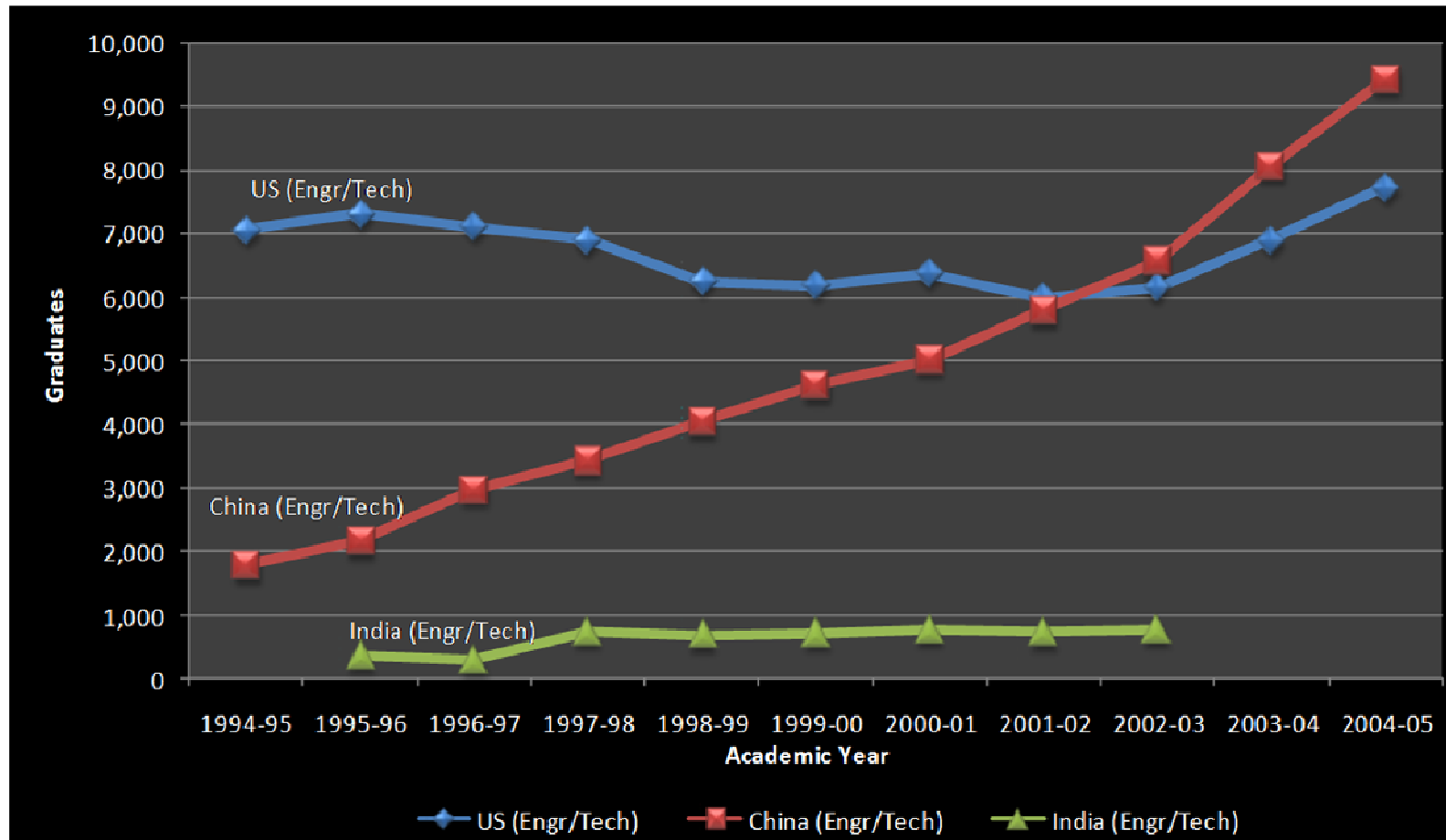


China numbers are suspect – inconsistent data collection, unrelated degrees.



PhD's in engineering, CS and IT

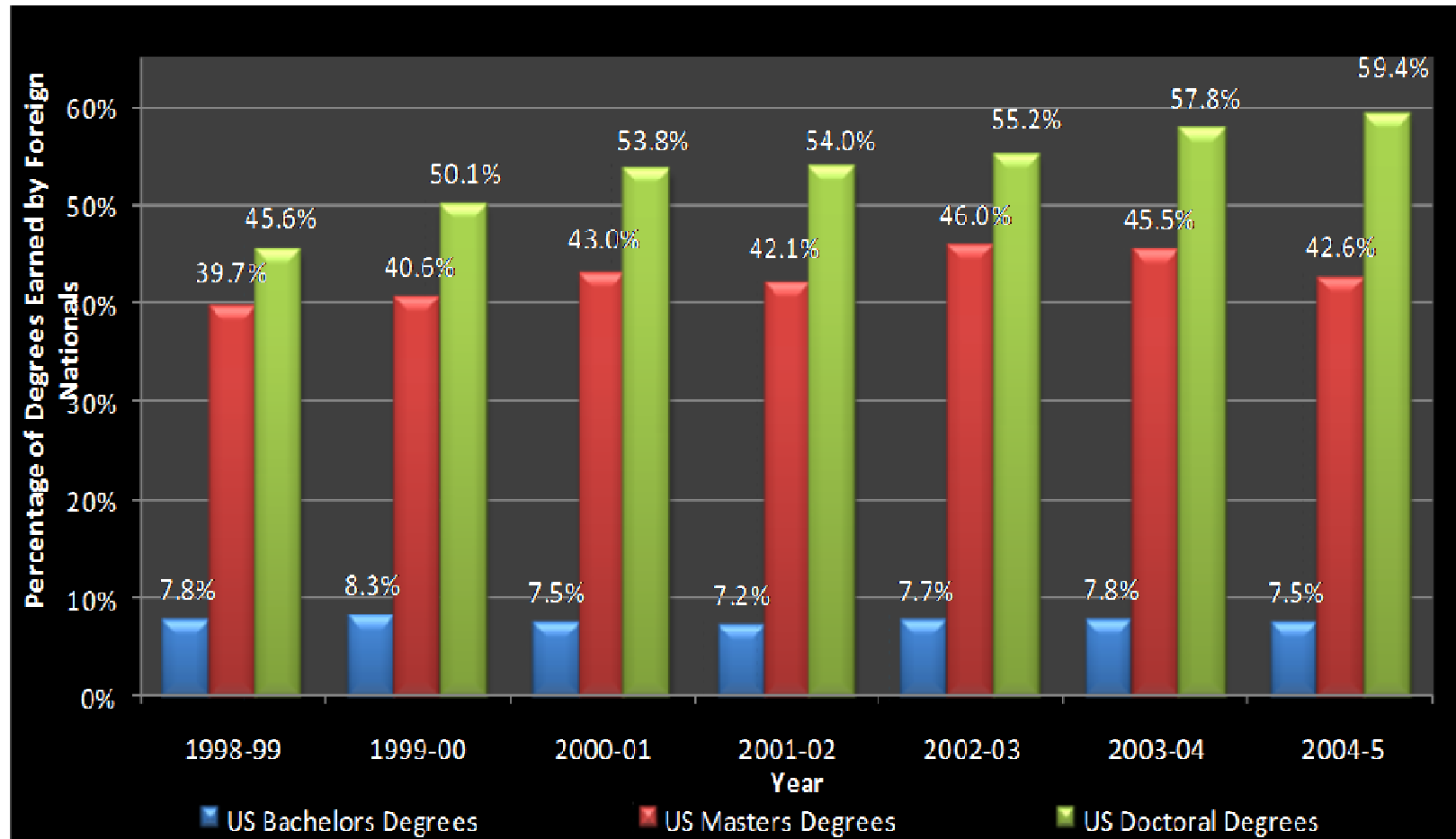
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U.S. engineering degrees earned by foreign nationals

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R&D in India – on-the-ground reality

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India is the rapidly becoming the next global center of research, design and innovation:

- Pharmaceutical
 - Drug discovery, specialty pharmaceuticals, biologics, high value, bulk manufacturing, advanced intermediate manufacturing
- Aerospace
 - In-flight entertainment, airline seat design, collision control/navigation control systems, fuel inverting controls, first-class cabin design
- Consumer Appliances/Semiconductors, etc.
 - Design of next-generation washing machines, dryers, refrigerators, digital TV, cell phones, automobiles, tractors, locomotive motors

India is racing ahead in R&D, despite its weak education system and graduation rates



R&D in China– on-the-ground reality

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China is using its manufacturing might to build R&D capability

- Massive investments in infrastructure
- Massive investments in technology parks
- Massive amounts of investment capital in key industries
- Massive subsidies for R&D
- Pressure on multi-nationals to move R&D to China
- *Dependant on returnees for management/R&D*

Yet, China is “limping forward” – MNC investment in R&D in China is largely directed at Chinese Market. China excels in imitation – not innovation

Lesson: You can’t mandate or buy innovation



India's challenge and achievement

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- 50% of engineering graduates are not employable
- Famed IIT's graduate less than 5000 engineers
- Country has weak infrastructure and weak education system

Yet:

- Tip of the iceberg: In 2007, top 5 IT companies hired 120,000 engineers. Accenture and IBM India added 14,000 each.
- India is racing ahead in becoming a global R&D hub

How? India has adopted the best practices of its Guru (the U.S.) and perfected these



Workforce development in India -1

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■ Workforce Recruitment

- Résumés don't reflect potential and degrees are not a proxy for skill and competency. Hiring is based on ability and competence
- “Bulk” hiring from universities
- Open door interviews/storefronts
- Lower-tier schools, non-metro areas, women, retirees, ex-servicemen, older workers, disadvantaged groups

■ New Employee Training

- “Army boot camp” like training for new recruits in technical as well as soft-skills
- 2-7 month training programs for “freshers”
- Infosys’ new center can train 13,500. TCS aiming for 30,000 at a time
- Complemented by extensive mentoring and on-the-job training



Workforce development in India -2

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- Ongoing Skill Development
 - 40-150 hours mandatory formal training every year for every employee
 - Supplemented by extensive mentoring/informal training
 - Extensive online training programs which employee are rewarded for completing
 - “Leaders as Teachers” – senior executives deliver training. Cadence requires every manager to spend 1-2 weeks a year. Satyam mandates 30 hrs.
 - “Communities of learning”, seminars, expert talks, online technical forums
- Managerial development – 3 years from “fresher” to manager
 - Extensive managerial development programs usually in conjunction with leading business schools.
 - Career progression planned and predictable
 - Senior Management invests significant time in coaching/mentoring
 - Promotion from within policies



Workforce development in India - 3

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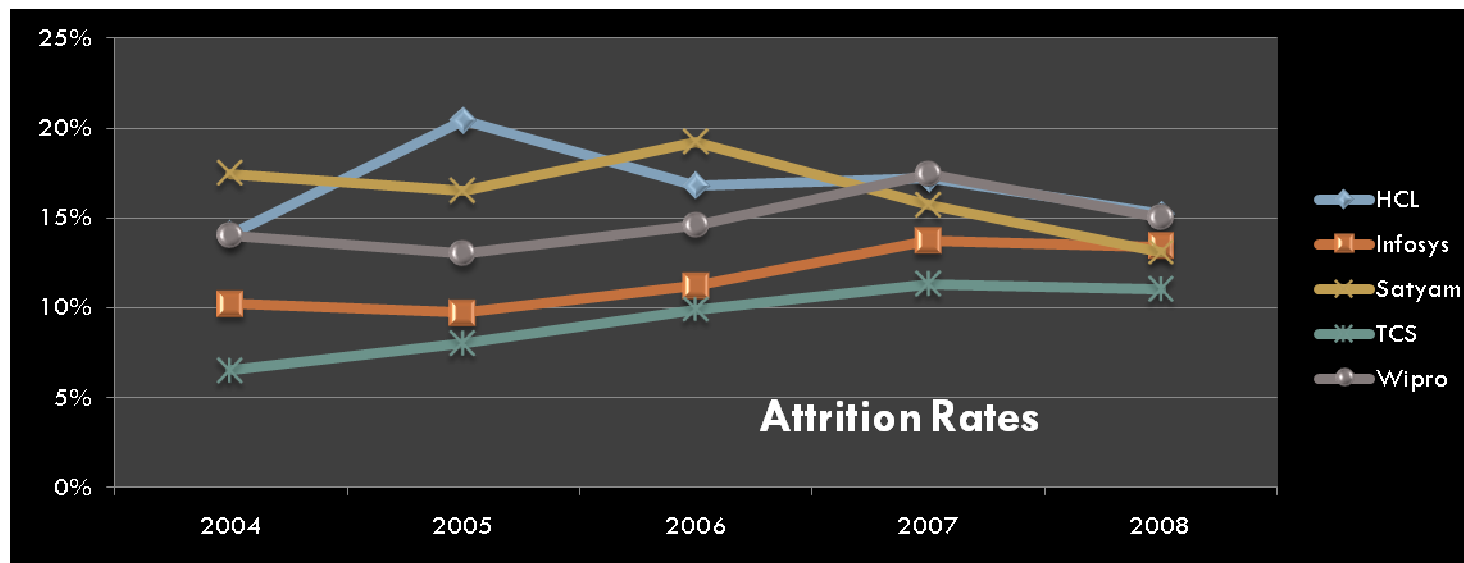
- Performance management/appraisal
 - ERP-like systems manage employee development through their careers
 - Sophisticated, frequent review processes like 360 degree feedback
 - Tied to training, salary and career progression
 - HCL has “Employee first, customers second” program to empower employees
 - Employees often appraise managers and senior leaders; results available on line
- Upgrading education
 - Training academics, funding curriculum development
 - Leading companies have helped develop customized degree programs
 - Strong university to industry linkages



Indian outsourcers growth and turnover

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Company	2004	2005	2006	2007	2008	2009P	CAGR
Accenture (India only)	9,953	16,014	23,186	36,852	41,500		43%
HCL	16,358	24,090	32,626	42,017	51,038	62,435	33%
Infosys (including subsidiaries)	25,634	36,750	52,715	72,241	91,187	102,838	37%
Satyam (excluding subsidiaries)	14,032	19,164	26,511	35,670	45,969	53,878	35%
TCS (including subsidiaries)	33,774	45,714	66,480	89,419	111,407	133,837	35%
Wipro	28,502	41,857	53,742	67,818	82,122	98,092	30%



Accenture global attrition rate 2008 – 18%, U.S. It services industry norms – 15-30%



Skilled immigration

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- Based on 5 research projects:
 1. Contribution of skilled immigrants to the tech sector
 - Called 2,054 engineering and tech companies founded from 1995-2005
 - Was the CEO or CTO a first-generation immigrant? From what country?
 2. Interviews with 144 immigrant tech founders
 3. Analysis of WIPO patents, U.S. government data
 4. Survey of 1200+ returnees to India/China
 5. Survey of 2000 foreign students in U.S.



Americas New Immigrant Entrepreneurs

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Tech and engineering companies founded from 1995-2005:

- 25.3% nationwide had an immigrant as a key founder
- 52.4% of Silicon Valley startups founded by immigrants
- 2005 revenue -- \$52 billion. Employed 450,000
- Indians founded 26% of these -- more than the next 4 groups (from U.K, China, Taiwan and Japan) combined

WIPO patents:

- 25.6% had foreign national authors in 2006. This increased from 7.6% in 1998
- 16.8% had a Chinese-name and 13.7% had an Indian-name authors in 2006. This increased from 11.2% and 9.5% in 1998



Background of immigrant entrepreneurs

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- 96% of immigrant company founders have bachelors degrees
- 74%+ have a Masters or PhD
- 75%+ have degrees in engineering, math, or science-related fields
- 52% obtained degrees in the U.S. and stayed after graduation
- Plus, anecdotal evidence indicates that immigrants who come to the U.S. are risk takers and highly entrepreneurial



Could America's loss be Canada's gain?

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Legal, educated, skilled workers currently waiting for green cards:

- 500,040 in main employment-based visa categories plus 555,044 family members
- 259,717 intl. grad students plus 38,096 in practical training (includes postdocs)

Permanent resident visas available yearly:

- 120,120 in the three main employment visa categories (EB-1, EB-2, and EB-3)
- Largest numbers in queue from India and China
- Max. number of visas per country – 8,400 (7% of pool)

Over 1 million skilled immigrants waiting for yearly quota of 120,000 visas – with 8,400 max/country

U.S. is experiencing a massive reverse brain-drain for the first time in its history



Returnees to India and China

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- Average age of Indians – 30, Chinese – 33
- Indians – 65.6% masters, 12.1% PhD's. Chinese 51% masters, 40.8% PhD's...primarily in management/STEM
- 26.9% Indians, 34% Chinese were U.S. perm. residents/ citizens
- Indian senior management positions increased from 10.2% in the U.S. to 44.1% in India and Chinese increased from 9.3% in the U.S. to 36.3% in China
- More than half plan to start businesses in home countries

Entrepreneurship Research

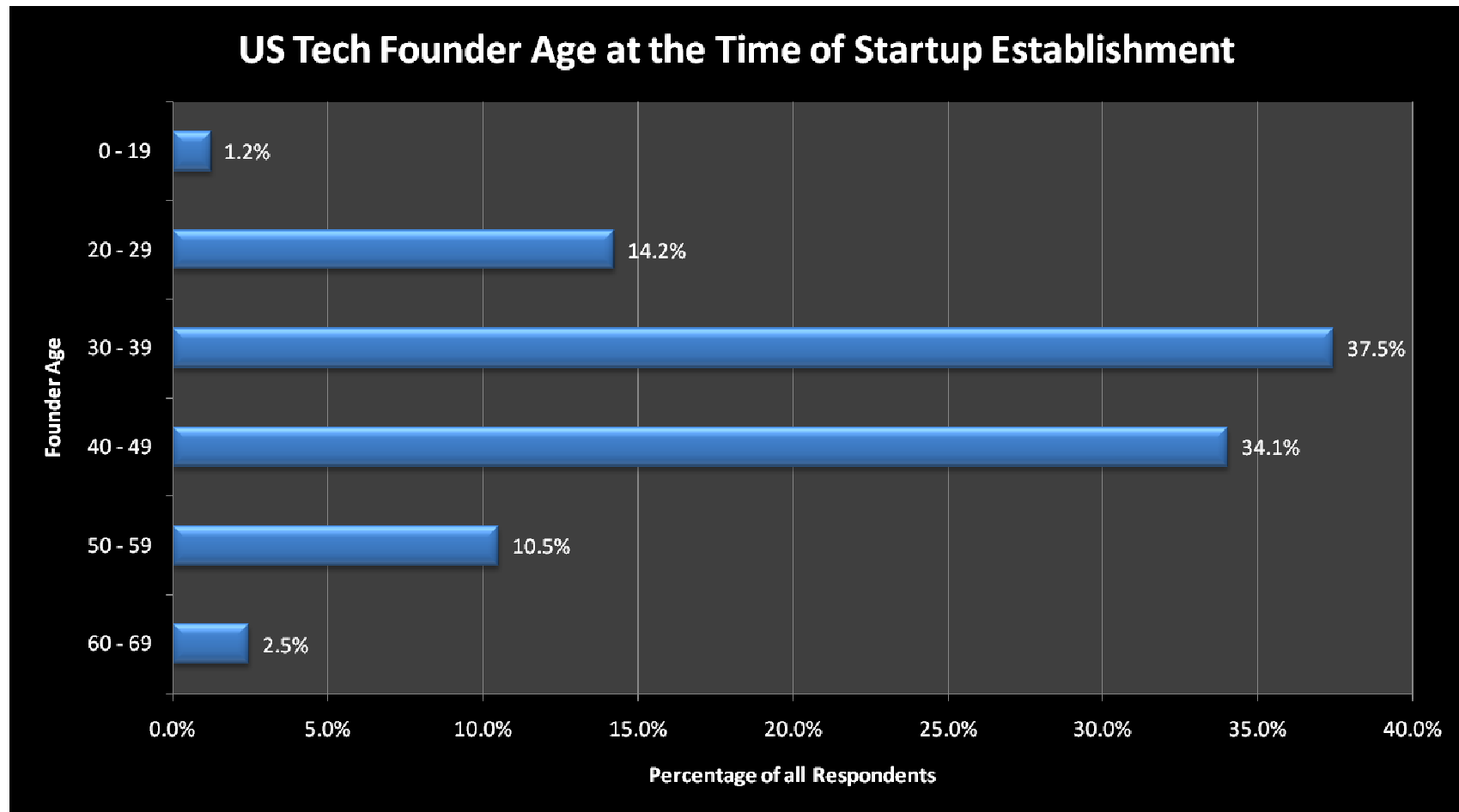
Based on 3 projects:

- Survey of 652 CEO's/CTO's of 502 tech companies
- Interviews with 144 Immigrant tech company founders
- Detailed survey of 549+ founders of companies in 12 high-growth industries

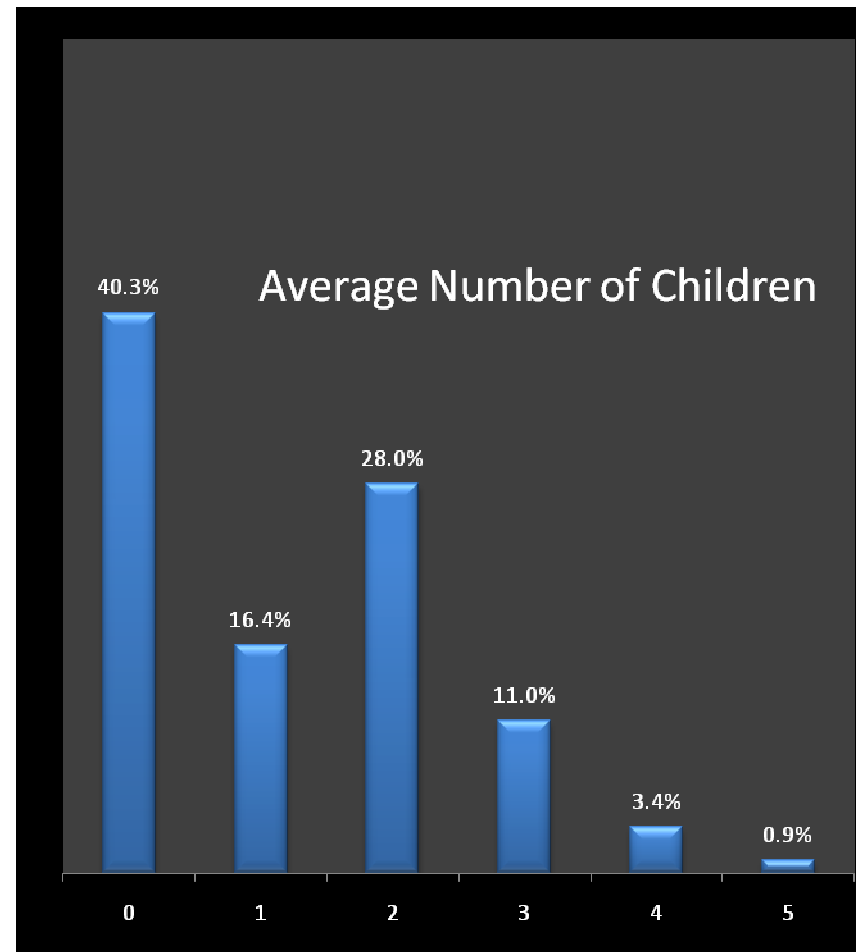
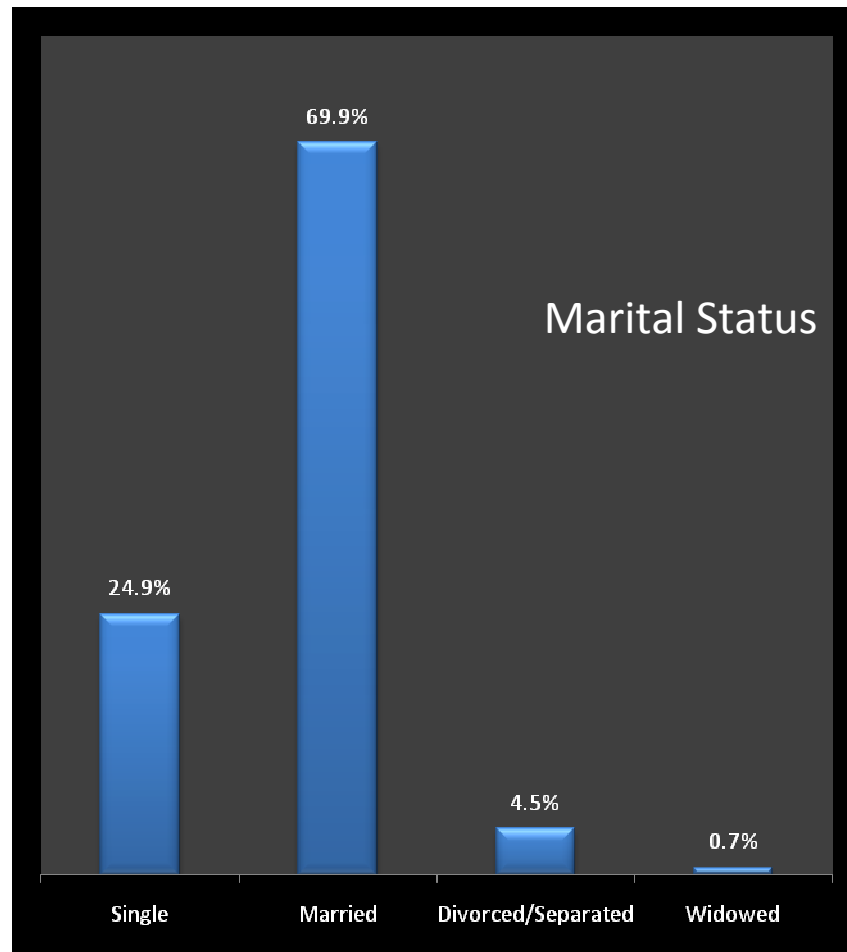
Common Myths:

- Tech entrepreneurs: unmarried, rich, college-dropouts obsessed with making money
- Ivy-league education provides huge advantage
- Venture Capital prerequisite for economic growth

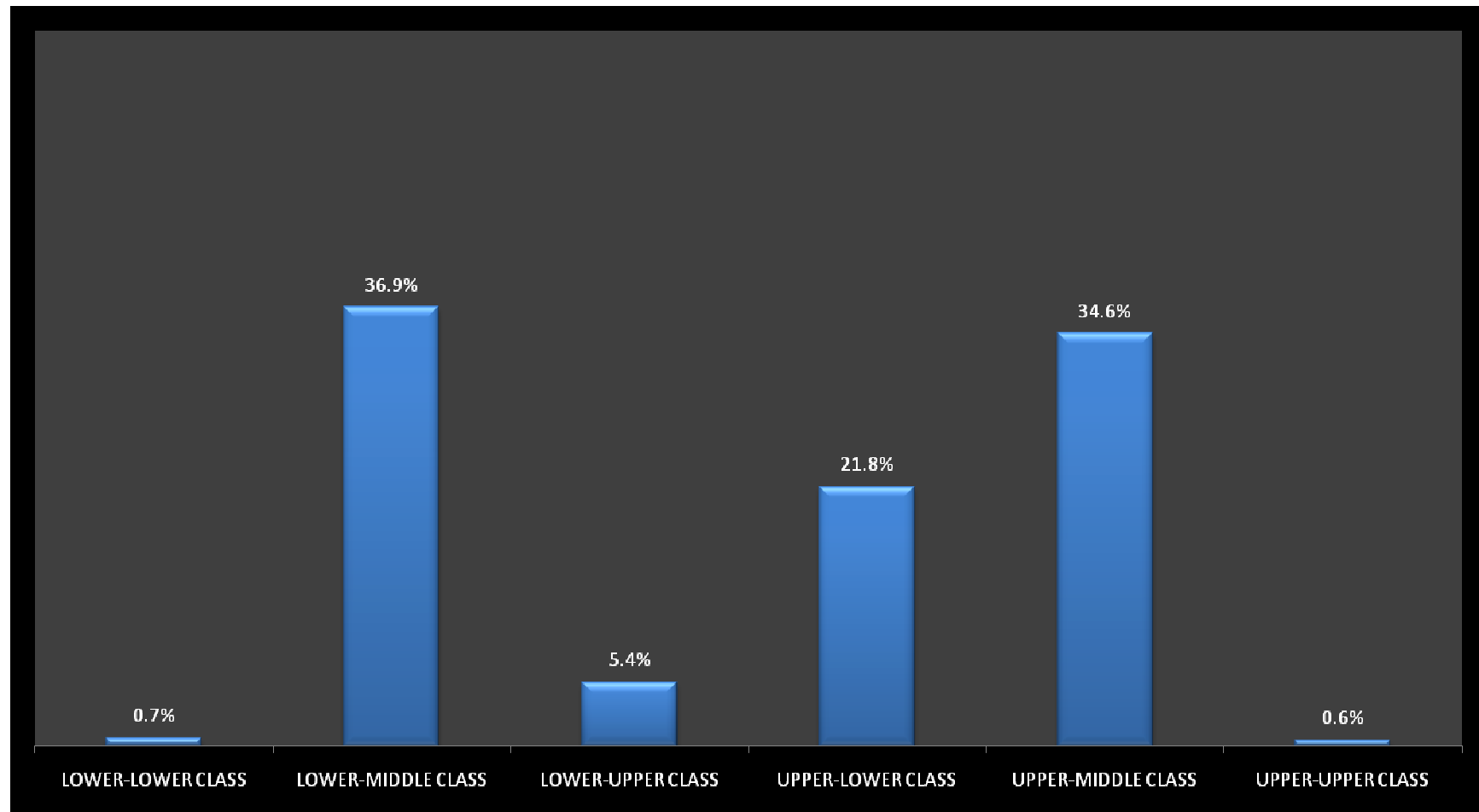
Tech entrepreneurs: Not young



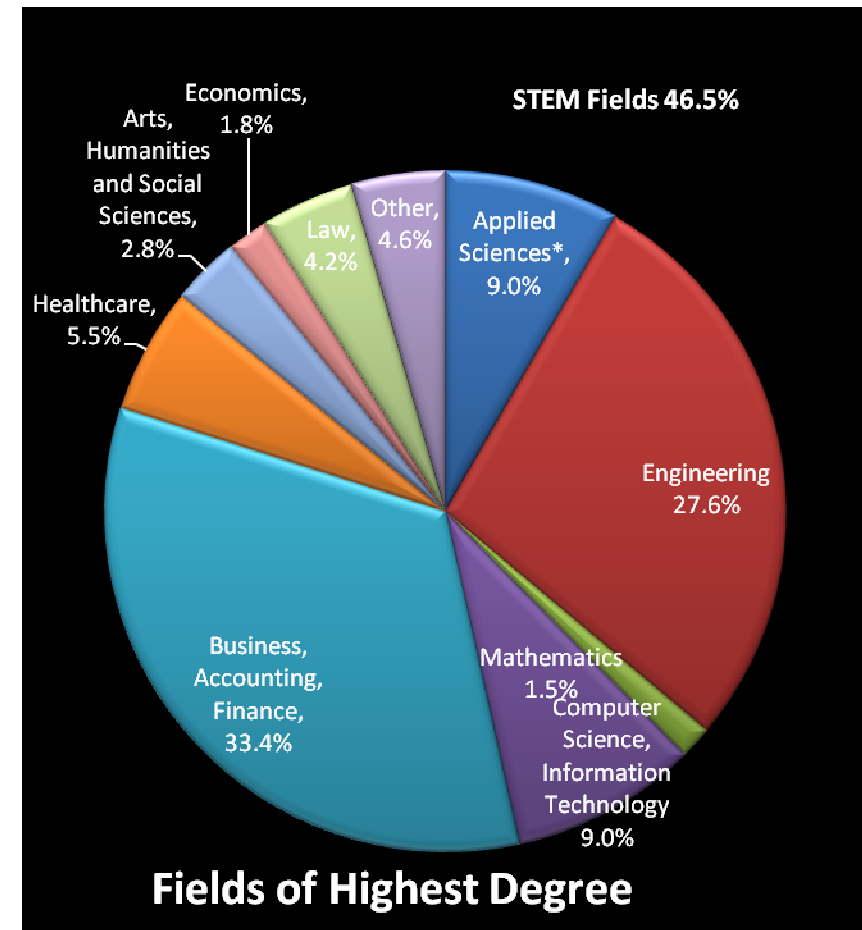
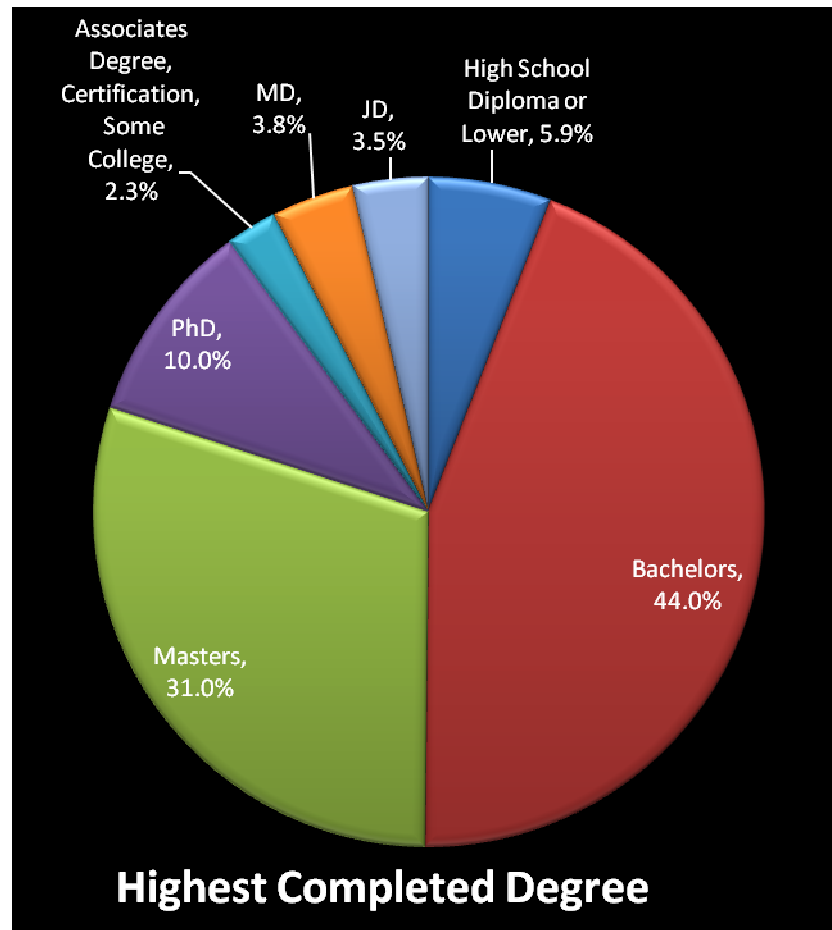
Married with children



Entrepreneurs: Not from rich families

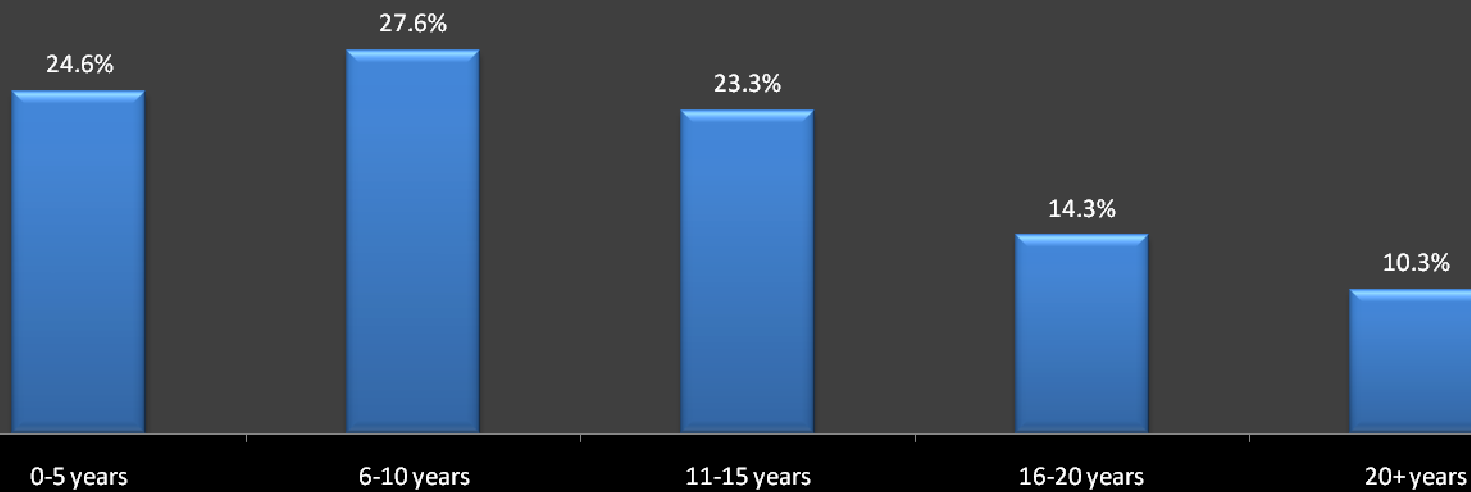


Tech entrepreneurs: Not college dropouts

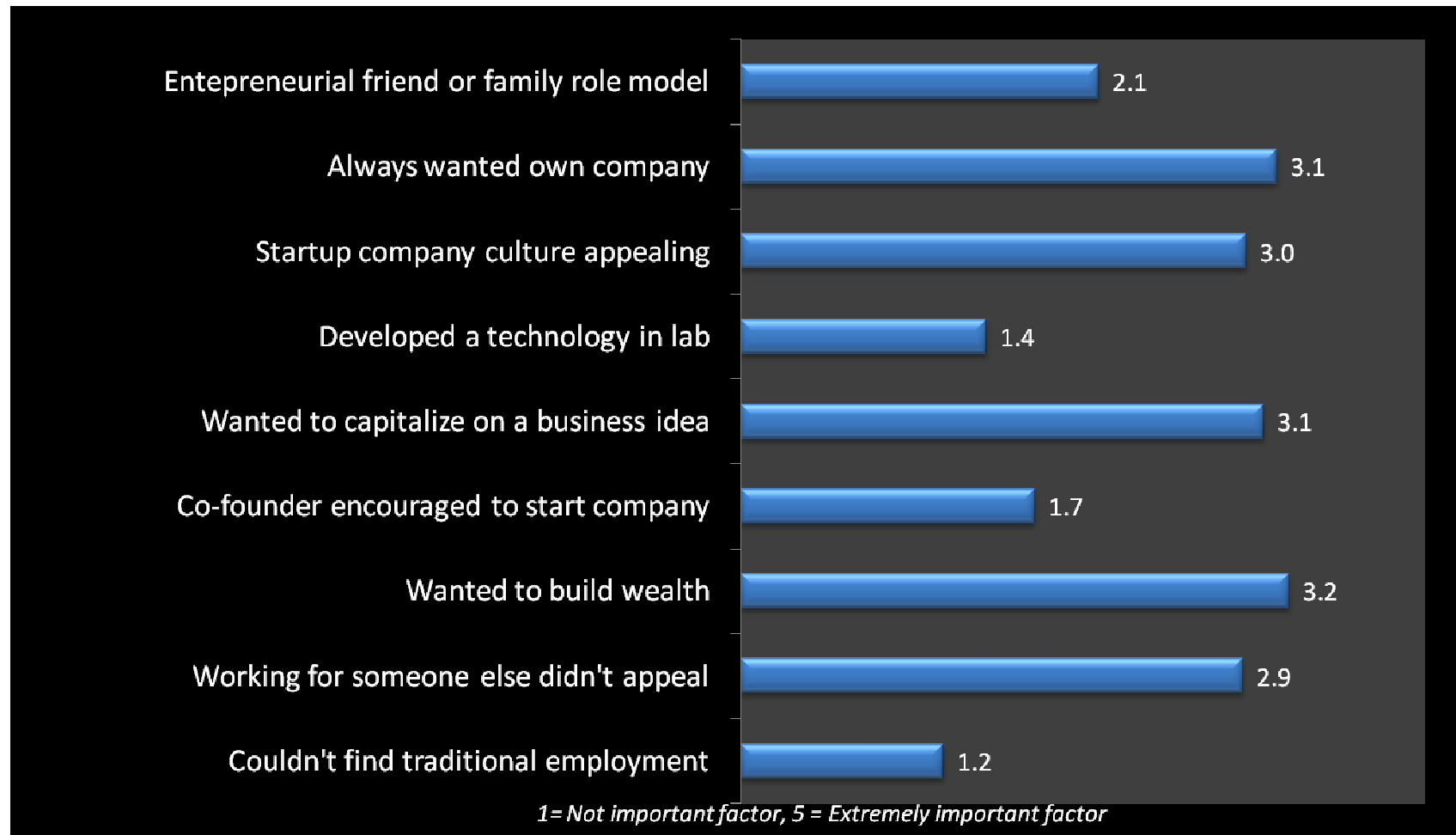


Entrepreneurs: *Highly experienced*

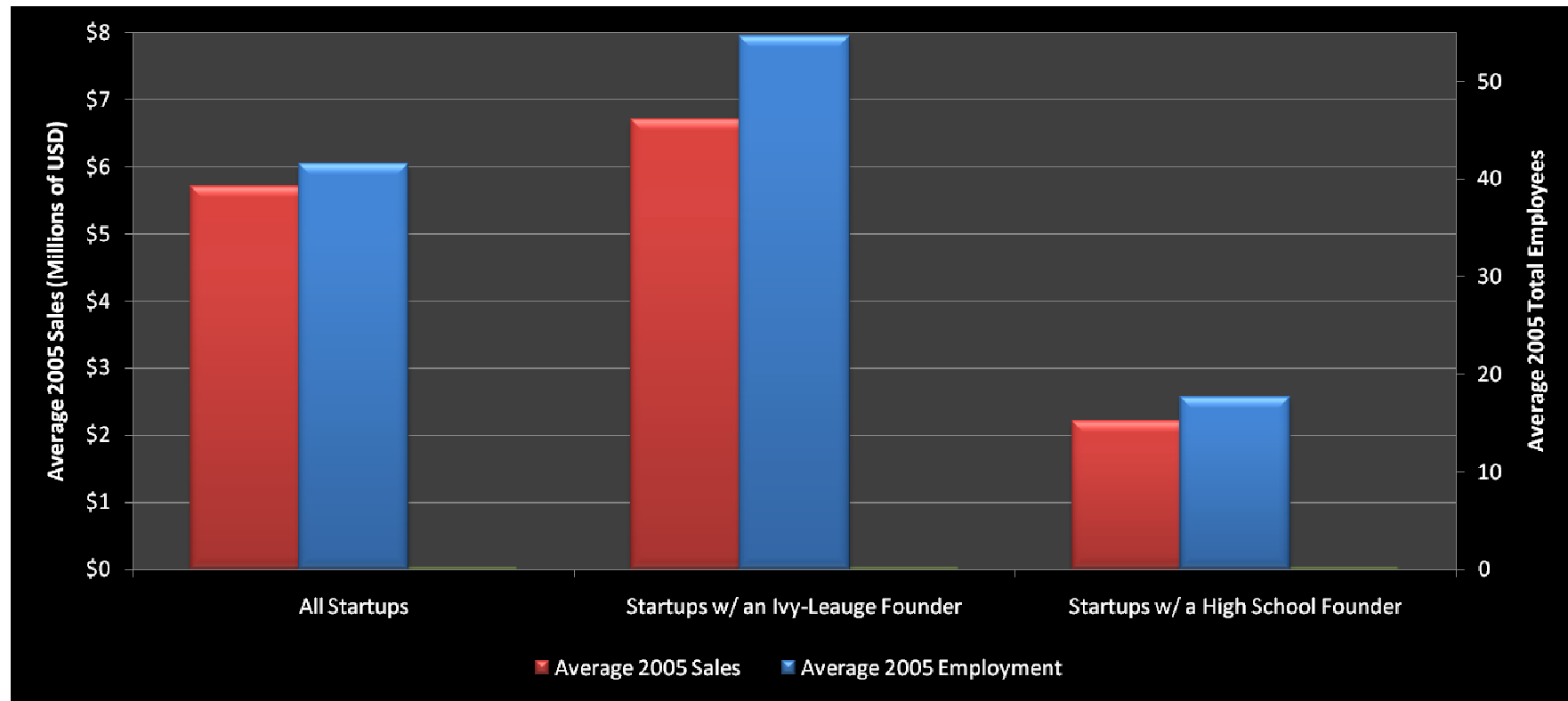
Approximately how many years did you work for another employer prior to starting your first business?



Reasons for becoming an entrepreneur

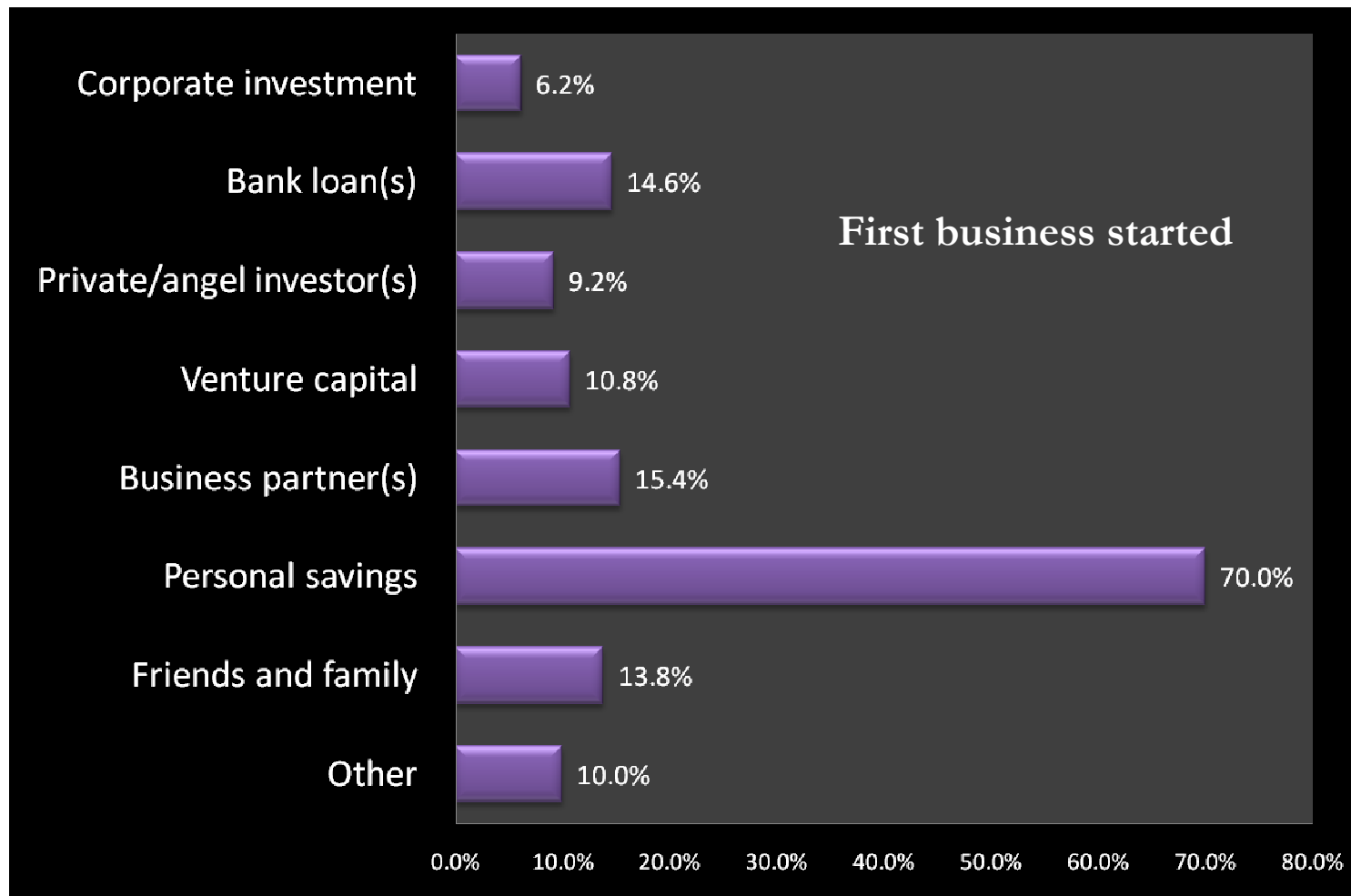


Education counts...*not necessarily ivy-league*



What makes the difference is higher education: not the degree or school.

Bootstrapping is the norm – *not* VC





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More information at:

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