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

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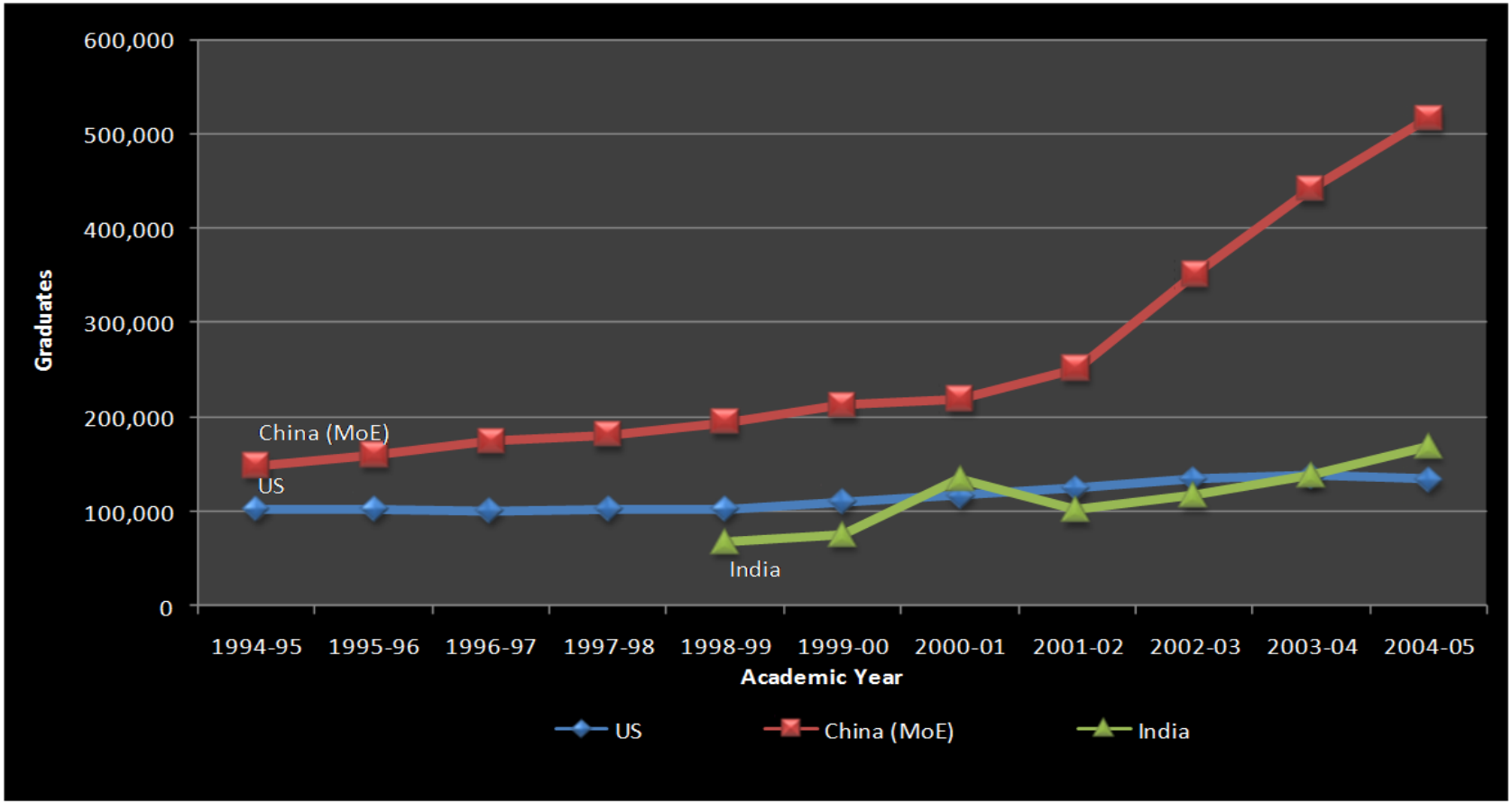
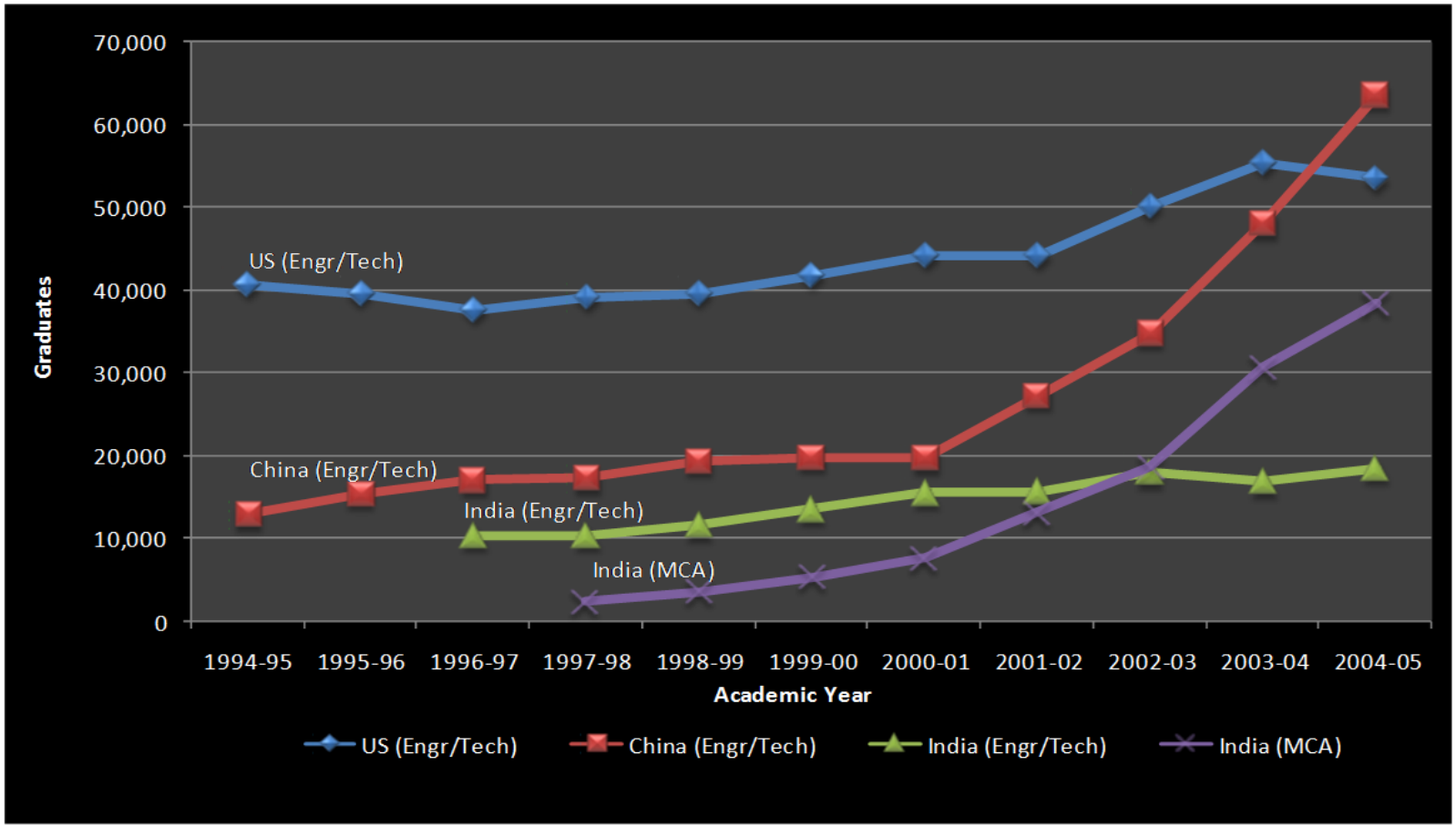
Bachelor in engineering, CS and IT



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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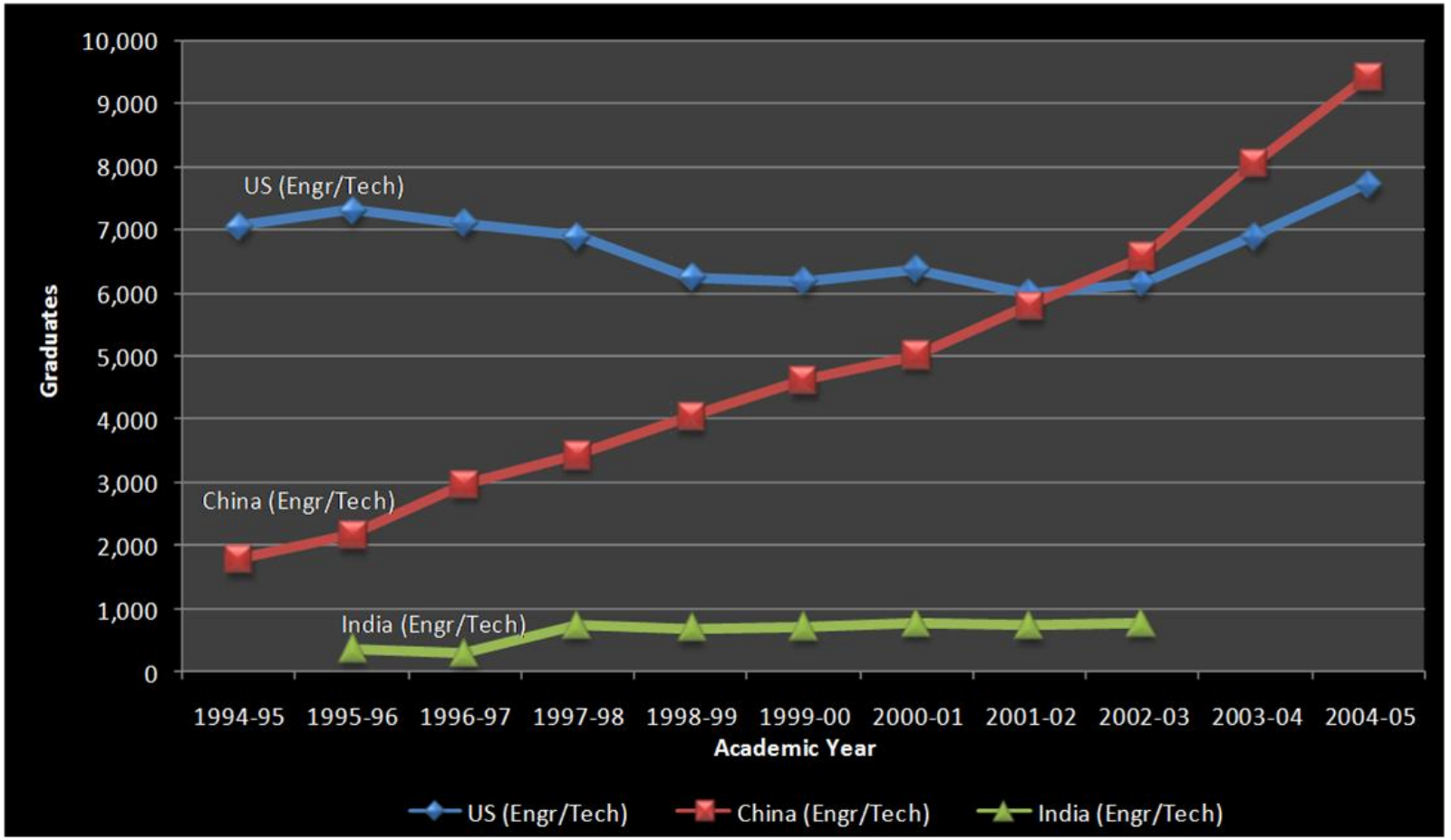
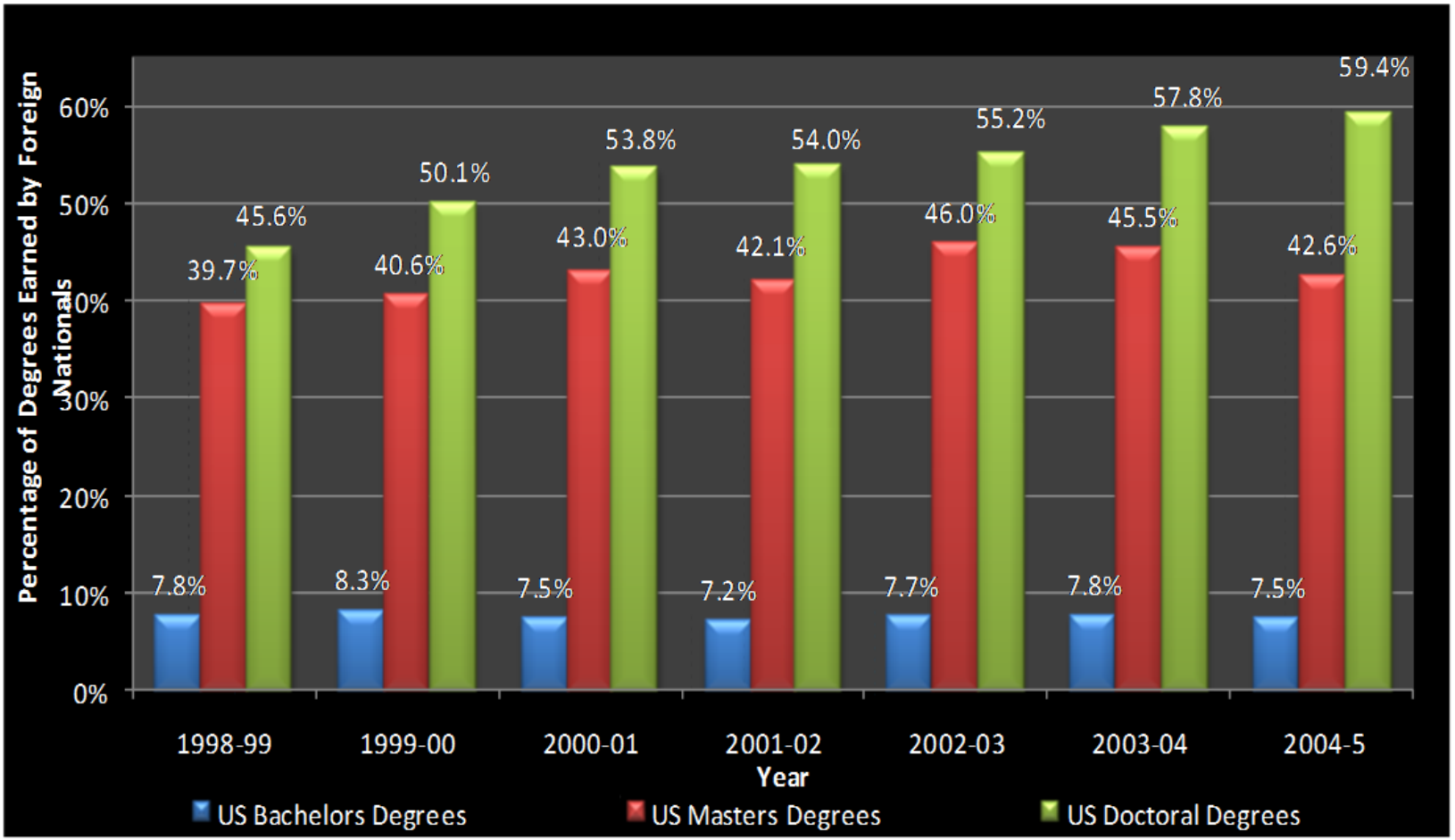
PhD's in engineering, CS and IT



U.S. engineering degrees earned by foreign nationals



R&D in India – on-the-ground reality

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

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

- 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

- 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

- 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

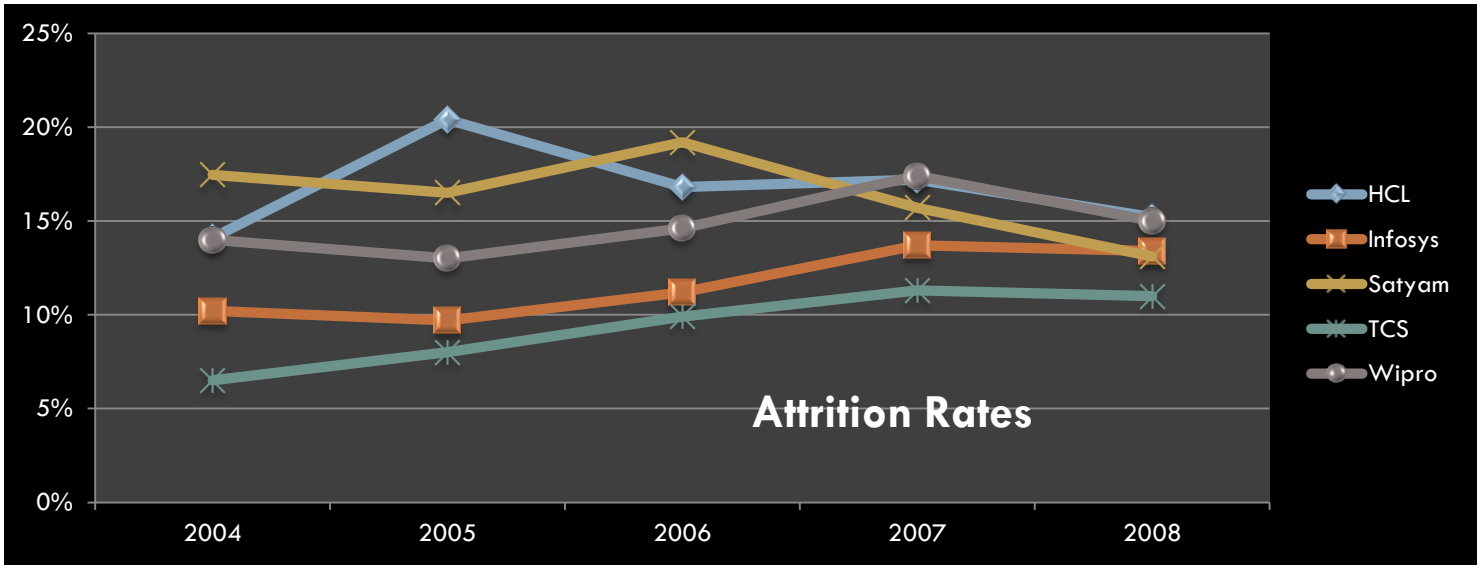
- Managerial development – 3 years from “fresher” to manager
  - Extensive managerial development programs usually in conjunction with leading business schools.
  - Career progression planned and predictable
  - Senior Management invests significant time in coaching/mentoring
  - Promotion from within policies

Workforce development in India - 3

- 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

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

- 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

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 and Indian-name authors in 2006. This increased from11.2% and 9.5% in 1998

Background of immigrant entrepreneurs

- 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?

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

- 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

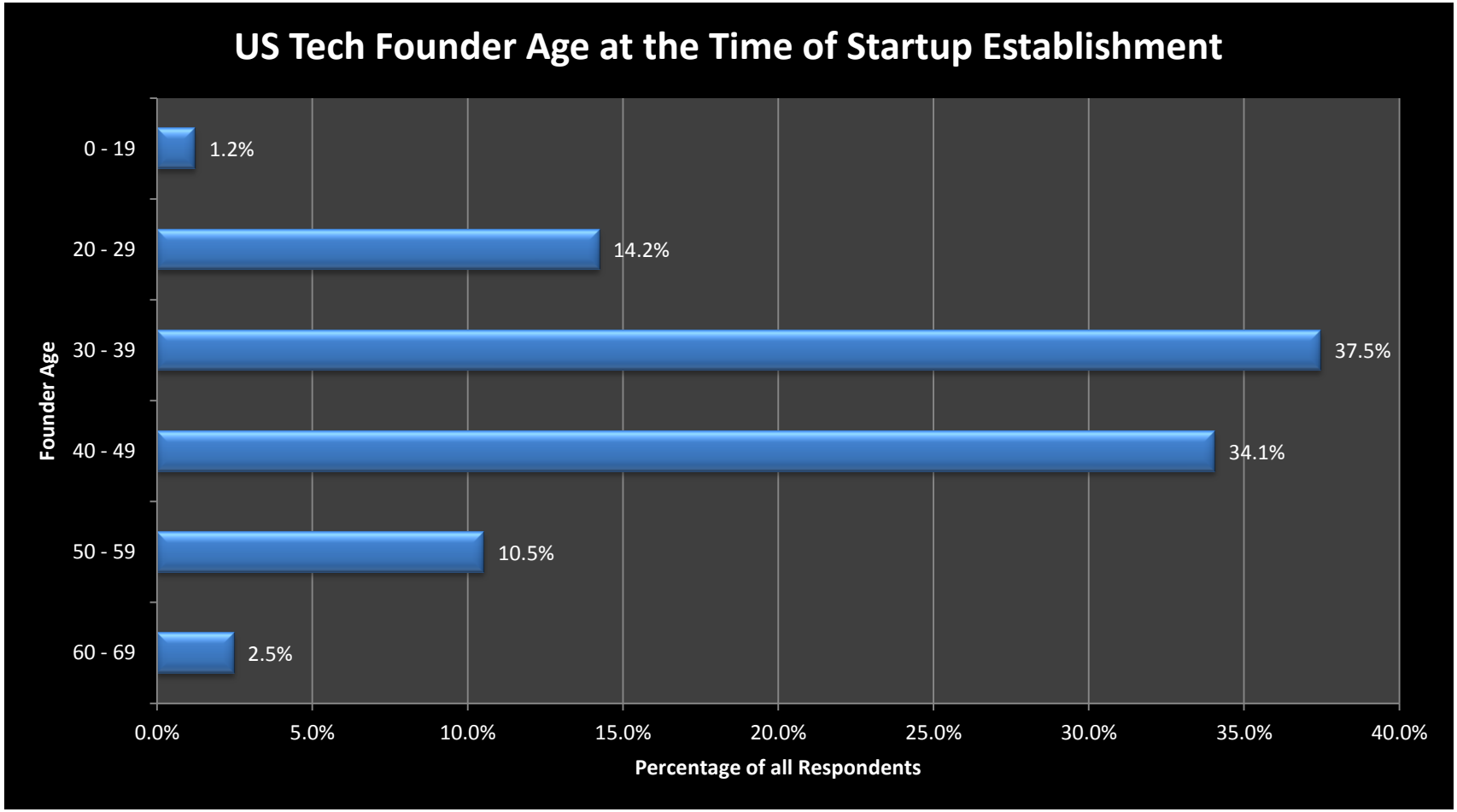
Based on 3 projects:

- 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

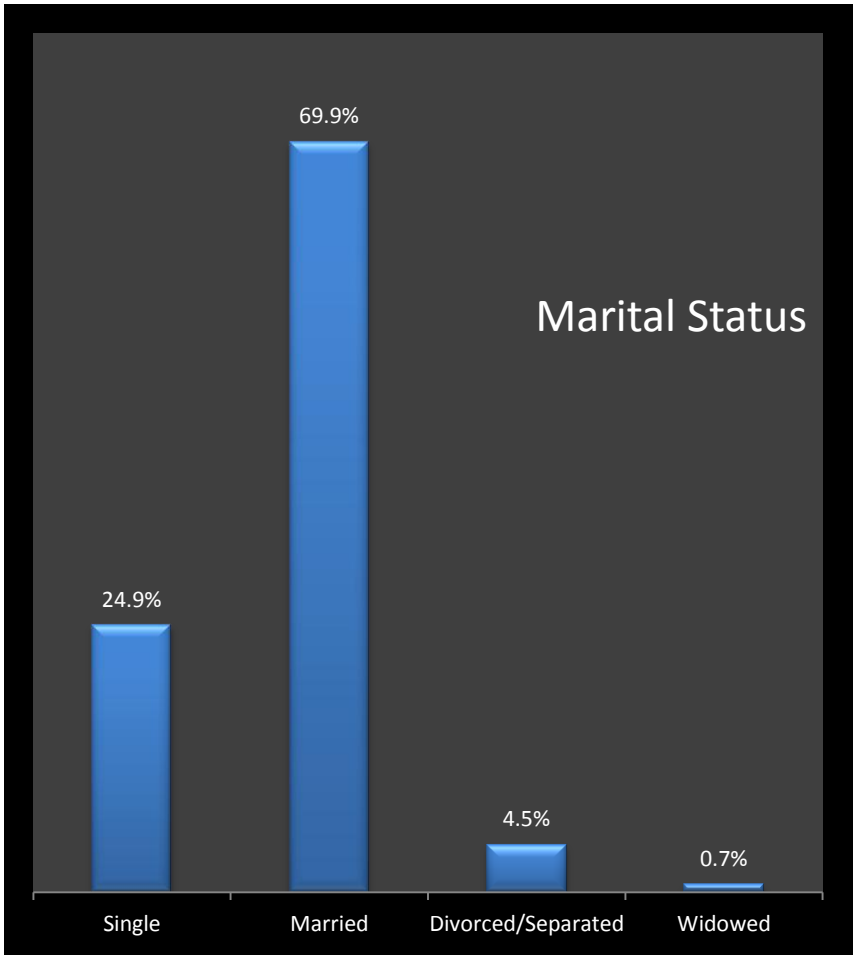
Common Myths:

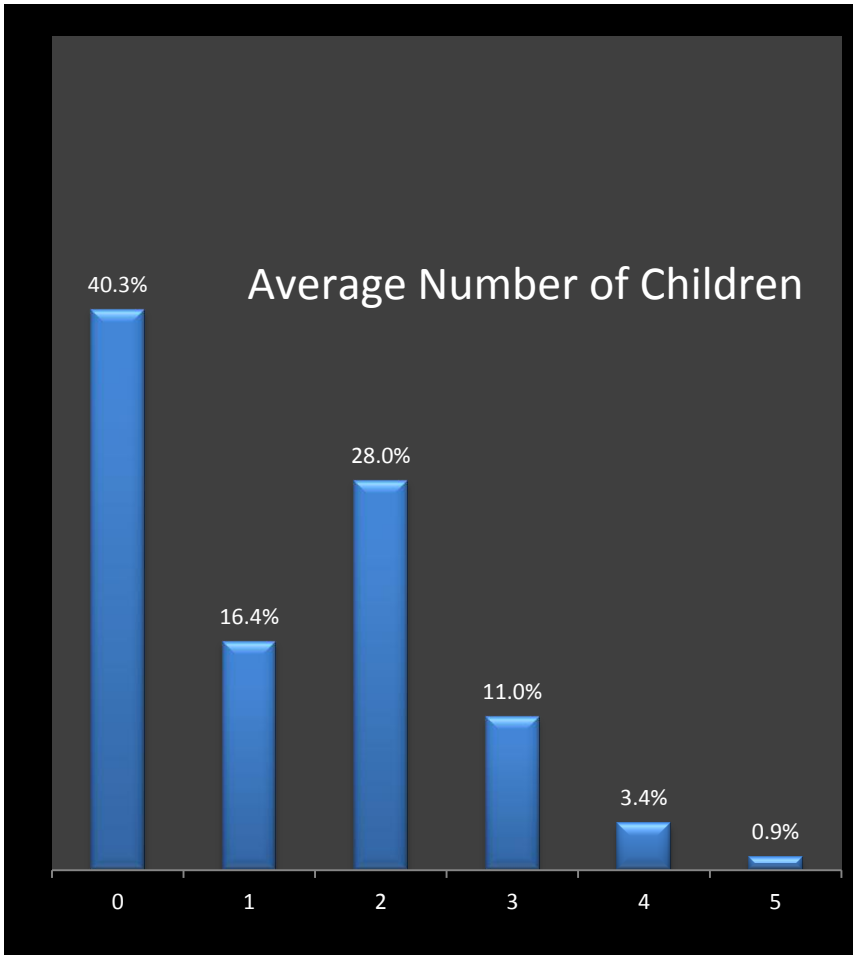
- Tech entrepreneurs: unmarried, rich, college-dropouts obsessed with making money
- Ivy-league education provides huge advantage
- Venture Capital prerequisite for economic growth

Tech entrepreneurs: *Not young*

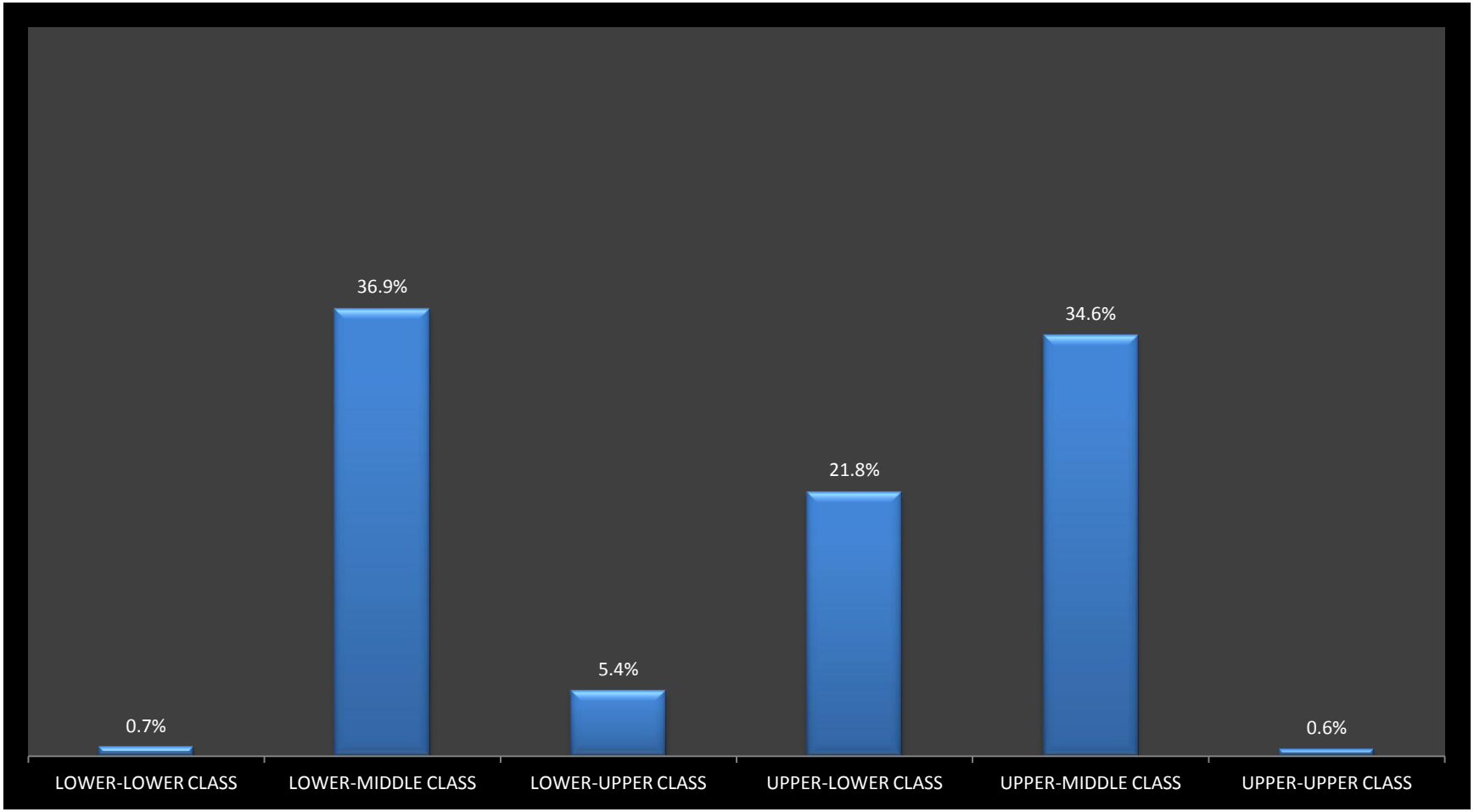


Married with children

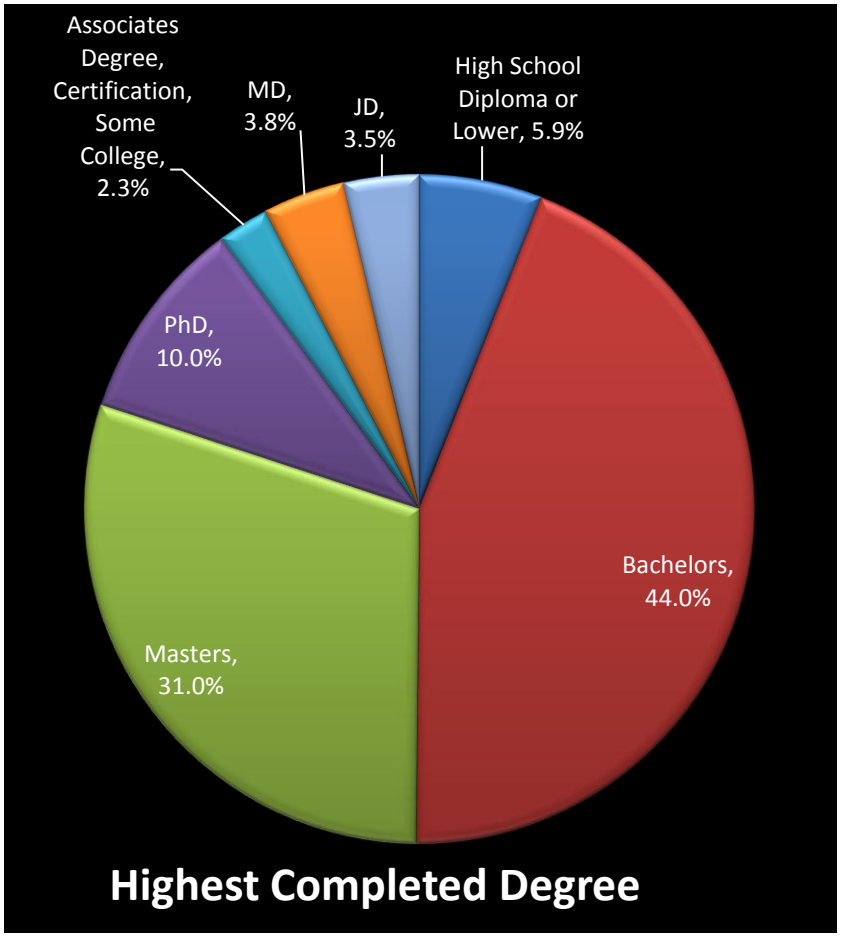


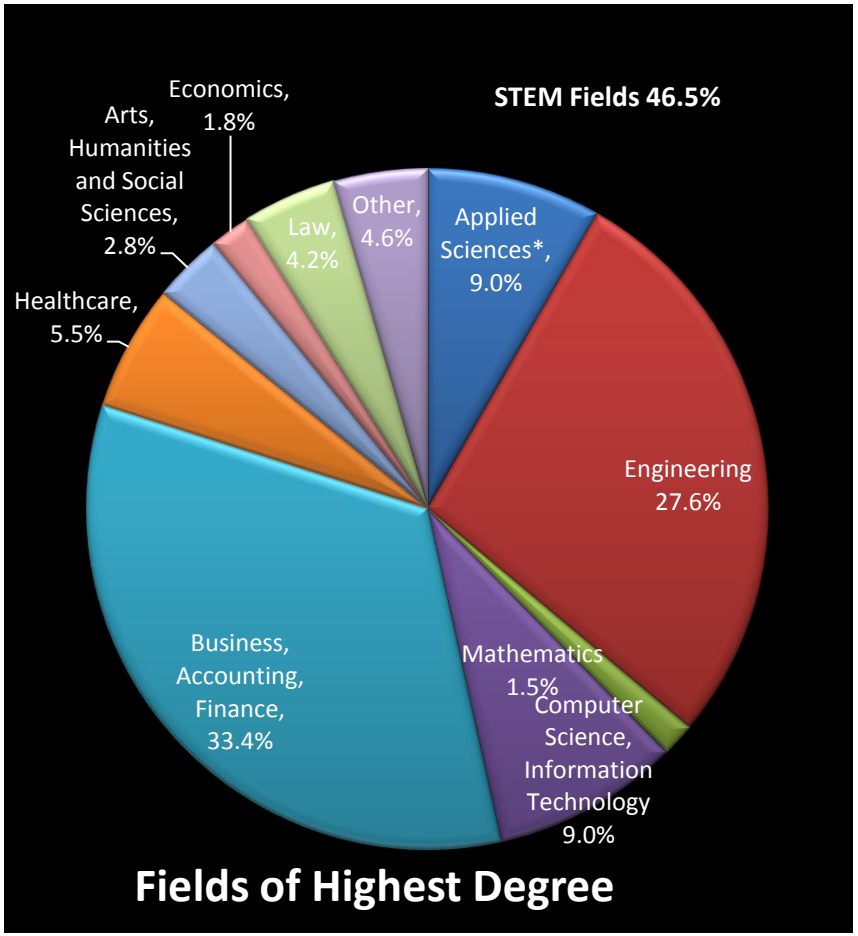


Entrepreneurs: *Not from rich families*

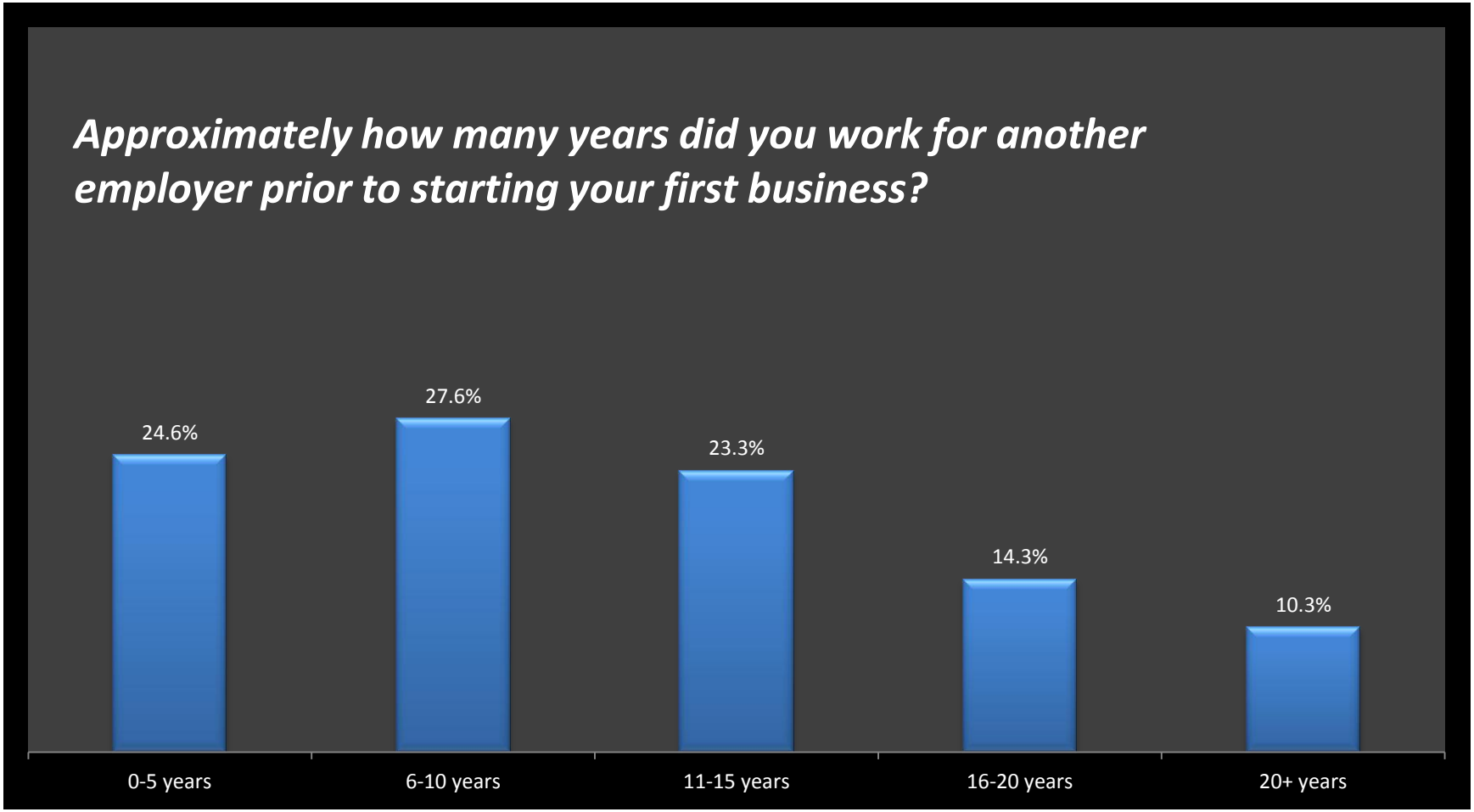


Tech entrepreneurs: *Not* college dropouts

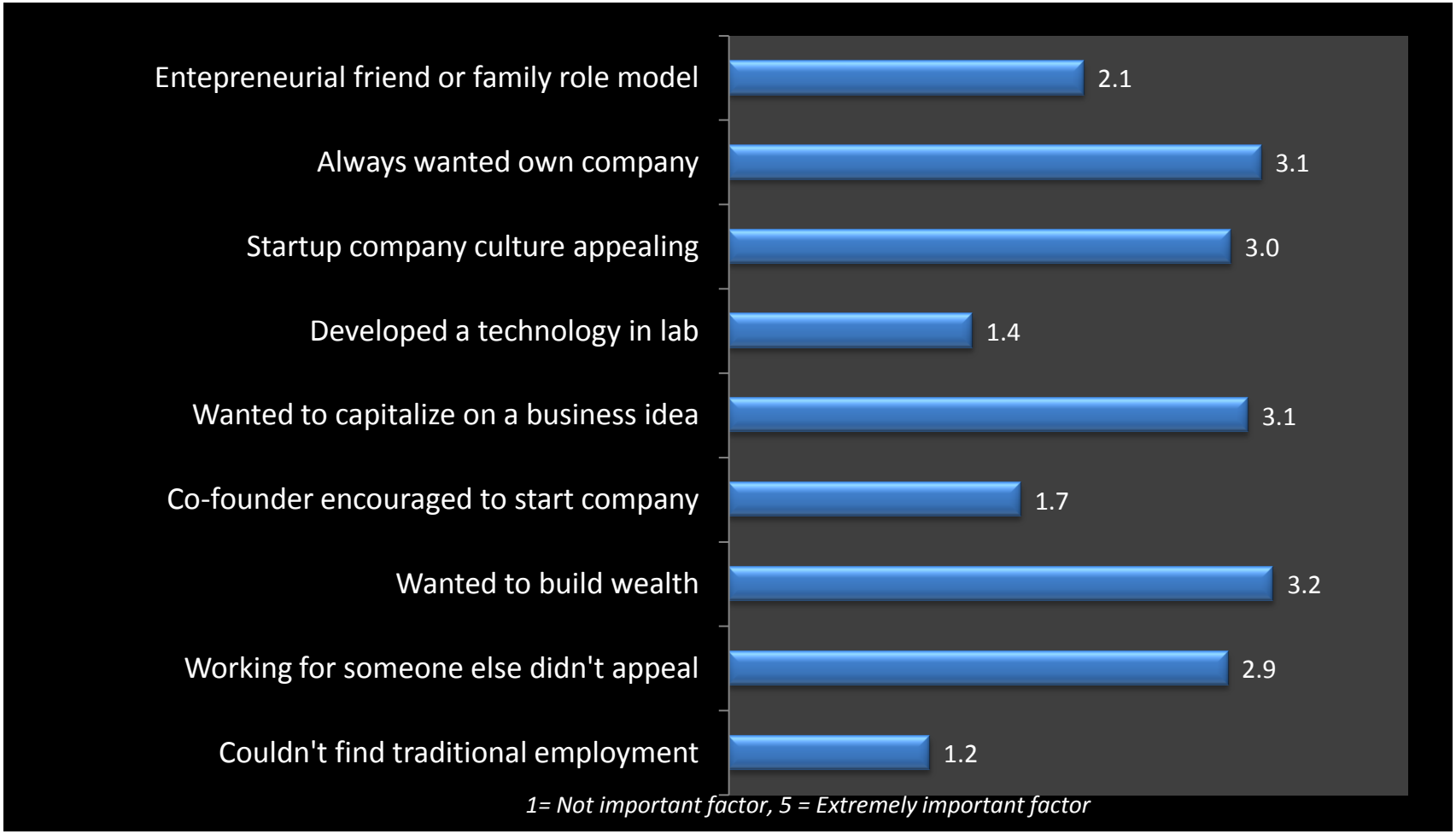




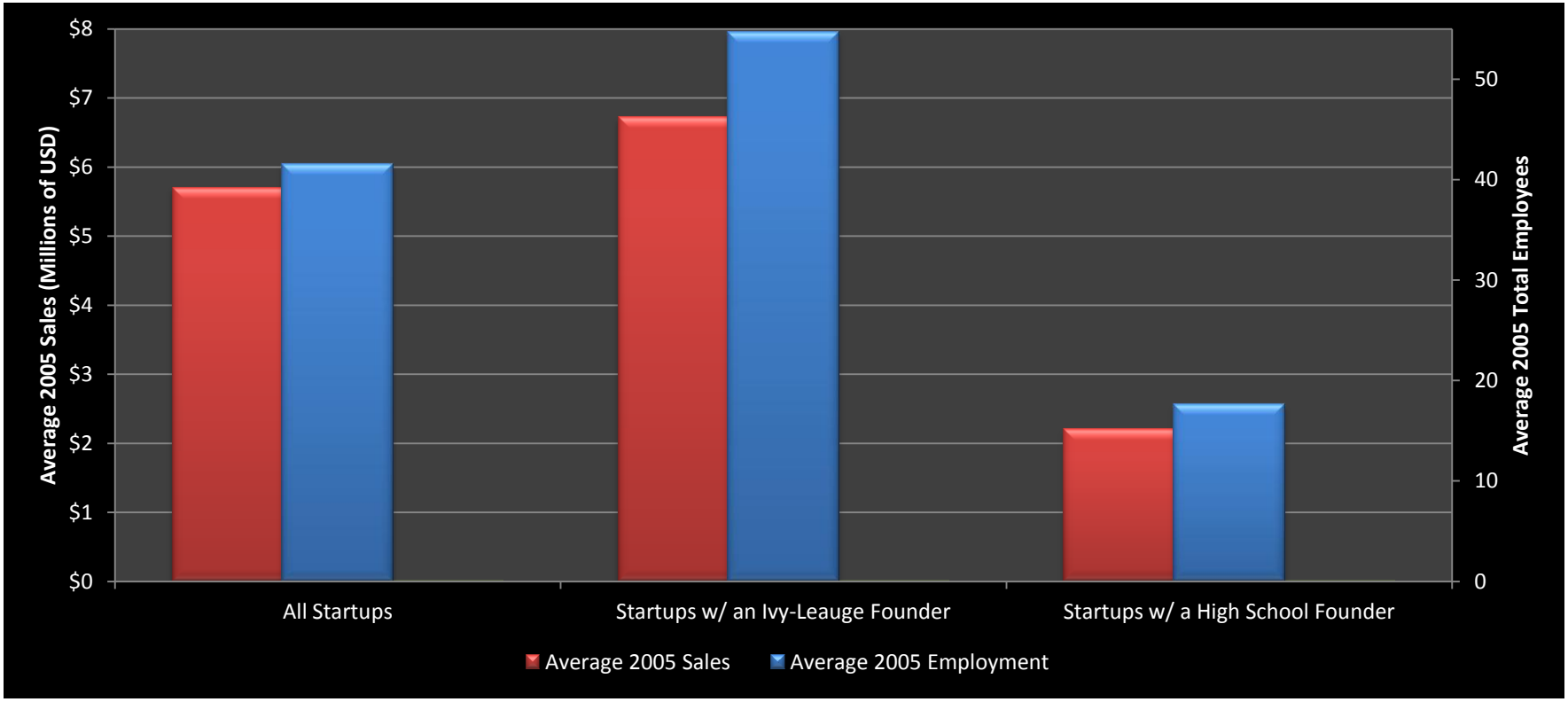
Entrepreneurs: *Highly experienced*



Reasons for becoming an entrepreneur

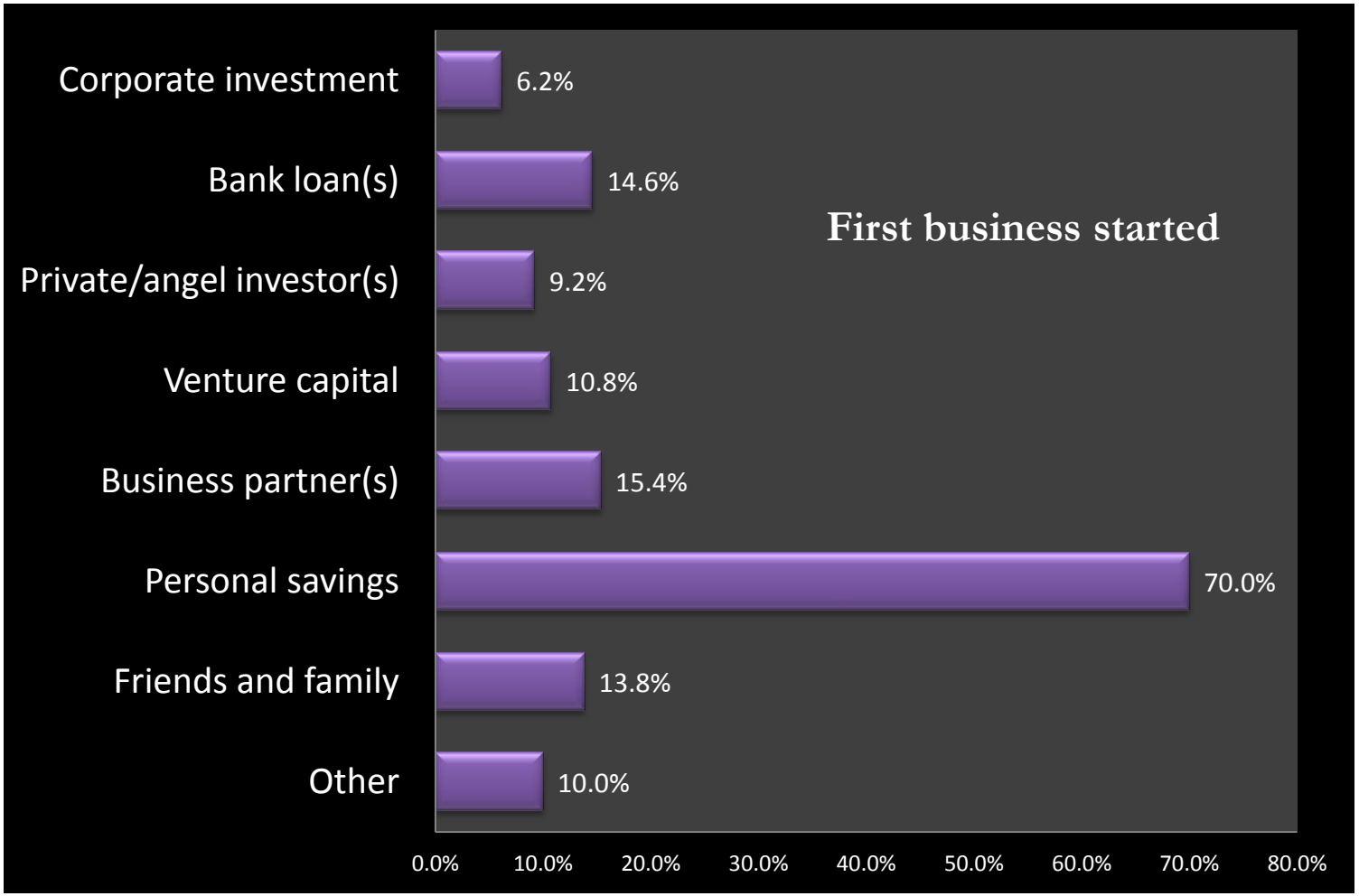


Education counts…*not necessarily ivy-league*



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

Bootstrapping is the norm – *not VC*



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