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# Startups as Sources of New Technologies...and Patents

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# Flying Below the Radar?

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- Less systematic research on patenting activities of startups vs. larger counterparts
- Why?
  - Harder to identify
  - Pesky name changes
  - Many exit quickly—before receiving patents
- Yet, widespread belief startups fuel economic engine (new technologies)...and supply “markets for patents”

# Goals of Presentation

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- Provide summary statistics on US patenting activities of startups in 2 IT sectors:
  - Semiconductor Devices
  - Software
- Examine trends in recent decades (1987-2005)
- For perspective, place alongside comparable statistics in 1 Life Science sector:
  - Medical Devices

# Sample & Data

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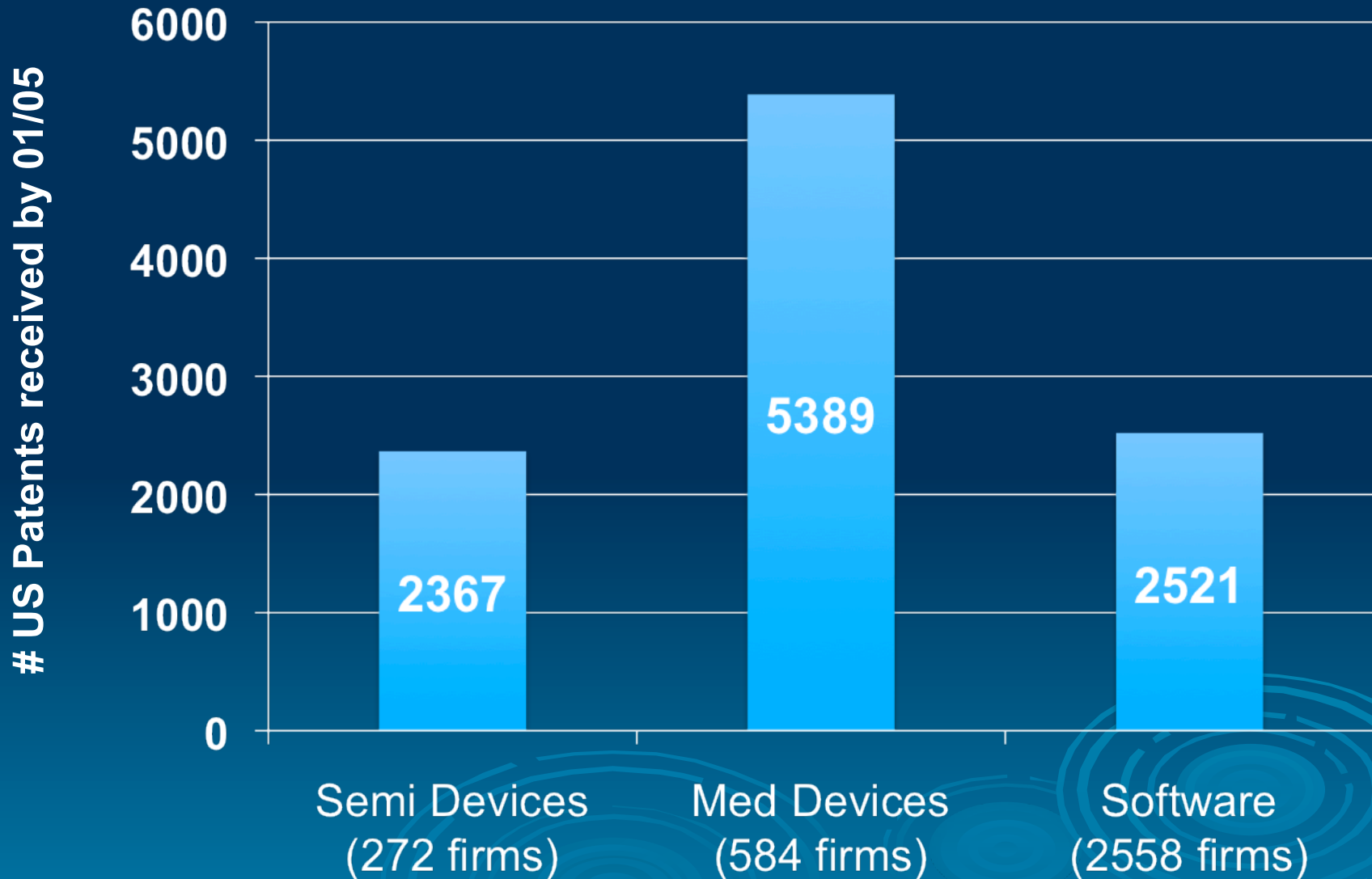
US startups founded 1987-99 that receive at least 1 round of venture capital

- Software
- Semiconductor devices
- Medical devices

Primary data sources:

- DowJones' VentureOne database
  - includes founding years and name changes
- Delphion.com
  - searches of US patents awarded by 01/2005

# Sample Size and US Patents Awarded



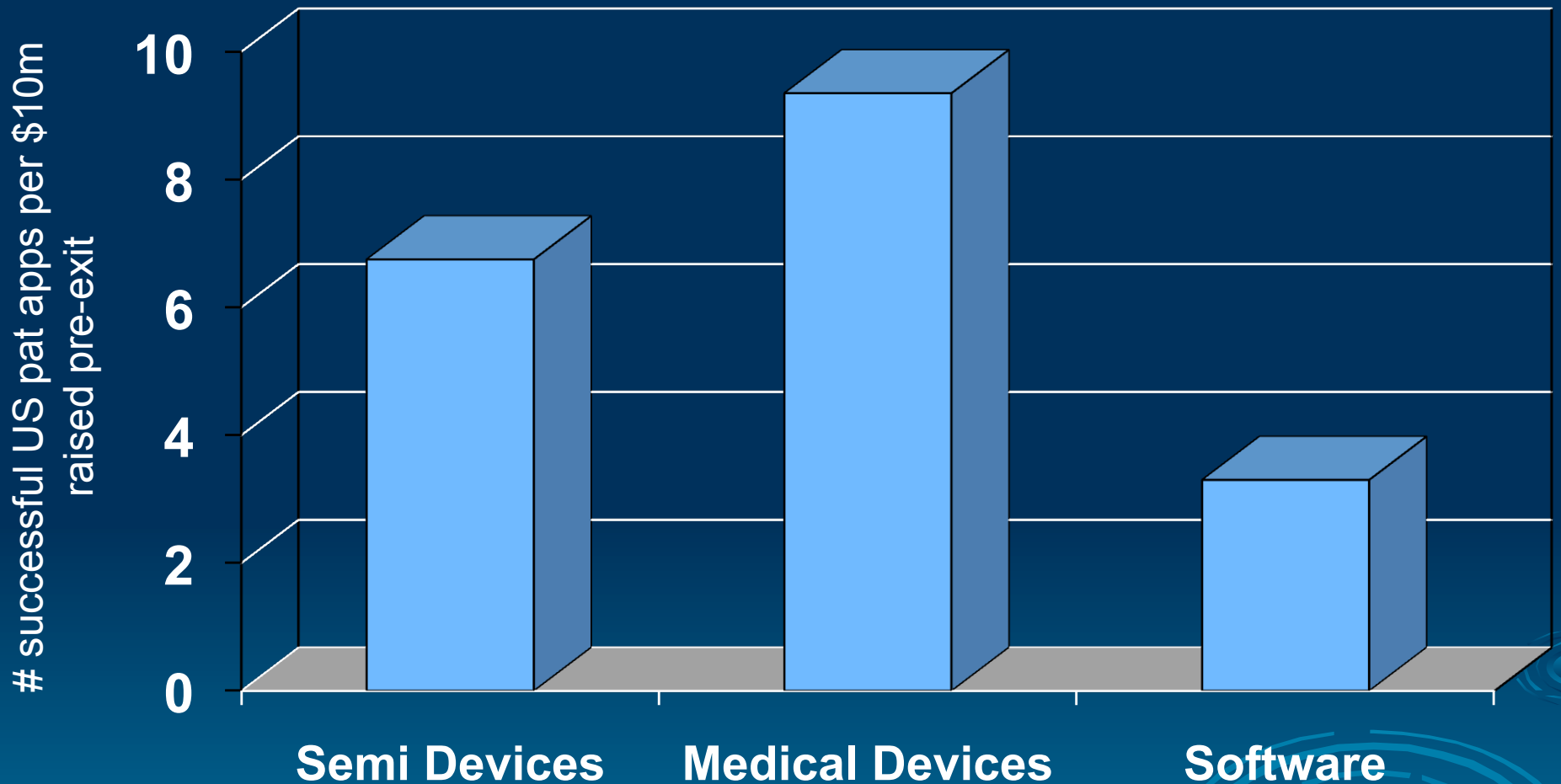
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*How intensively does the average startup in each sector file patents?*

*Proxy: % of financial resources devoted to the task pre-exit*



# Average Propensity to Patent\*



\* Averaged across sectors for 1987-2005 period, based on cumulative amount of funds raised pre-exit in constant 2000-year dollars

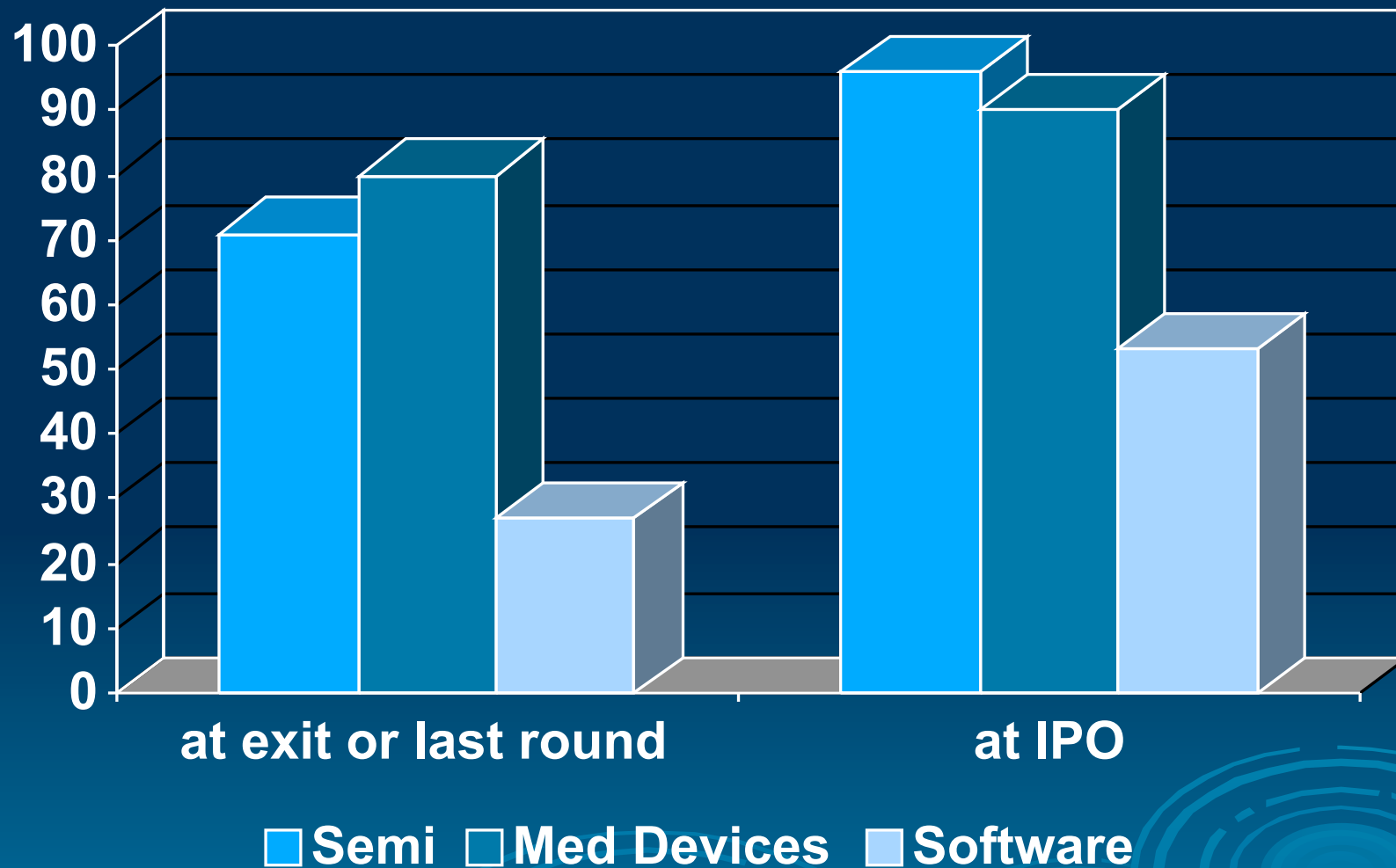
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*What % of startups successfully file  
or receive US patents?*





# % with US patents pending or granted



Note: % is based on firms with at least 1 application pending that results in an issued U.S. patent; foreign filings and U.S. applications that are abandoned or rejected are not included.

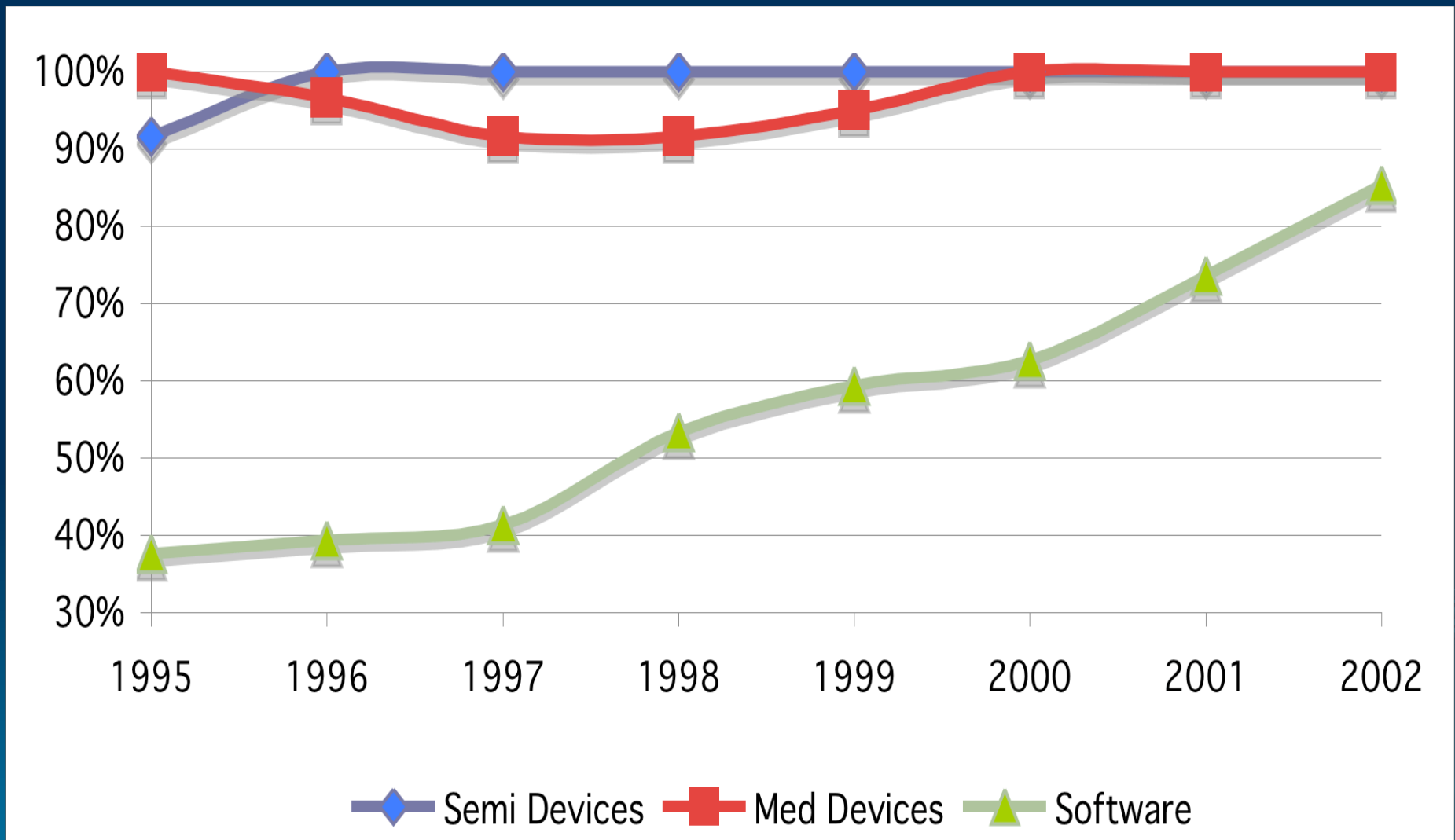
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# *Trends for IPO Sub-sample*



# % with U.S. patents pending at IPO

(IPO subset only; 3-yr moving average)

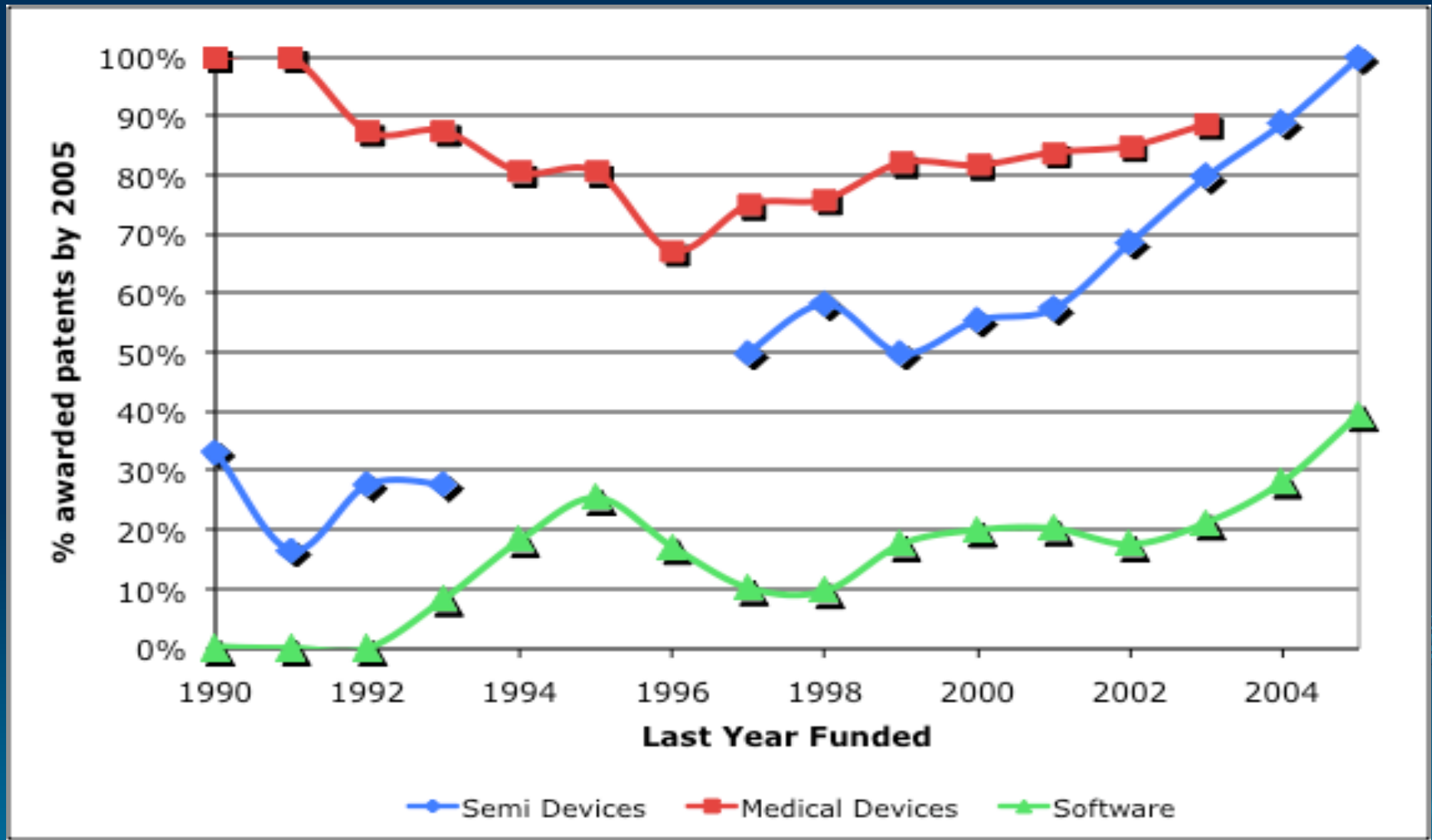


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# *Trends for “Failed” Sub-sample*



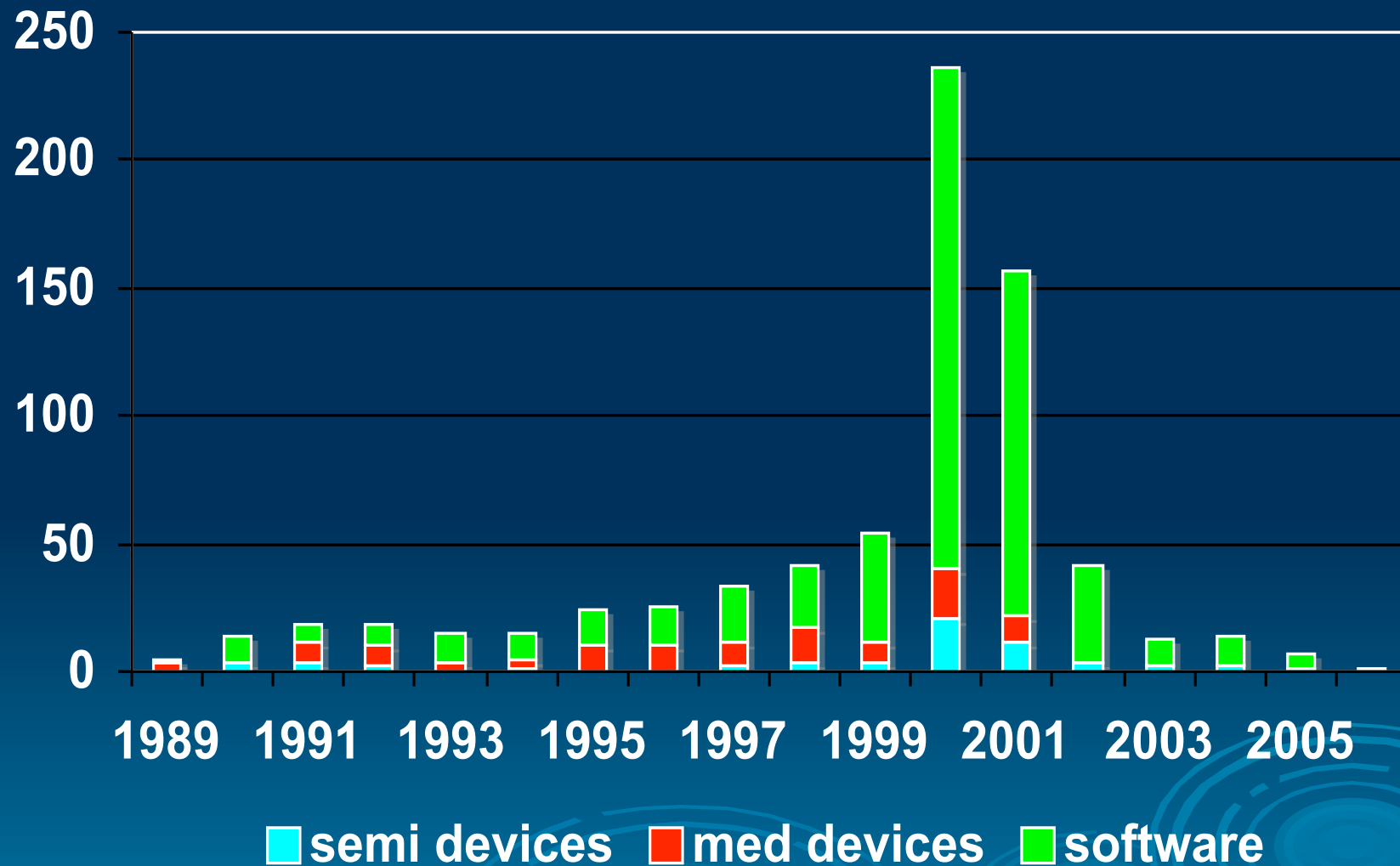
# % failed startups with patents pending (by last year of known funding, 3-yr moving average)



Note: Gaps in trend-lines appear when few or no startups last funded in a given year fail by 2006.

# # startups listed as 'defunct' by 2006

(by year of last known financing event)



# Summary

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- Among VC-backed startups, a large share of resources is devoted toward patenting activities
  - particularly in two device sectors (semi + med)
  - less so in software over 1987-2005 period
- For “successful” startups that go public:
  - highly unusual NOT to file patents pre-IPO in two device sectors
  - increasingly common to file patents pre-IPO in software
- For “failed” startups that are disbanded:
  - Within IT (semi and software), steep climb post-2000 in % with patents – increasing the supply of patents on the “market”?

# Unresolved Questions

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1. How important are failed startups in markets for patents?
  - What % of patents originating from failed startups are reassigned or sold to third parties?
  - Did the post-2000 “shakeout” in technology sectors temporarily boost the supply of high-quality patents for sale in these markets?
2. How important are patent “sales” as a means for recouping \$\$ otherwise lost on entrepreneurial-firm investments?
  - If sold at fire-sale prices, do markets for patents truly stimulate the financing of entrepreneurial-firm innovation?
3. What are the incentives of patent “buyers”? Technology development and commercialization? Enforcement? Other?
4. How have recent legal rulings altered the types/quantity of patents being bought and sold on these markets, if at all?



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*Thank you*

