The Landscape for Early-Stage Financing of Innovative Companies

Dimo Dimov

University of Connecticut, USA

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What are innovative enterprises?

- Primarily engaged in innovation
  - Tend to be new or younger
  - Can grow substantially
  - Account for over half of all innovations and almost all radical innovations
- Opportunity templates
  - Market applications for new inventions or technological discoveries
  - New applications for existing technologies
  - Replication of business practices in new geographical locations

Development of innovative enterprises

- It starts with an individual (group) and an idea
- Exploration of technical feasibility, market potential, and economic viability
- Product development
- Start-up of operations; market introduction
- Market and organizational expansion

Financing needs

- Seed stage – initial R&D, business concept refinement, feasibility analysis
- Start-up stage – prototype development, market research and outreach, formal organization.
- Early-growth – small-scale commercialization, platform for scalability
- Expansion – substantial growth in scale and market impact.

The challenges for mainstream finance

- High uncertainty
  - No track record, no collateral
  - Limited evidence for feasibility and viability
  - Possible high-rates of obsolescence
- Information asymmetry
  - The entrepreneur’s knowledge is tacit
  - Hard to distinguish high- and low-quality opportunities
- Value is entirely based on long-term growth potential

Innovation and failure

- The risk-return balance
  - Long-tail (power) distribution
  - A few cases account for the bulk of market impact
  - The majority of cases are deficient or lackluster
- Accommodating failure
  - Fail early
  - Fail cheaply
  - Learn from failure

One mega success makes a difference

American Research & Development (ARD)

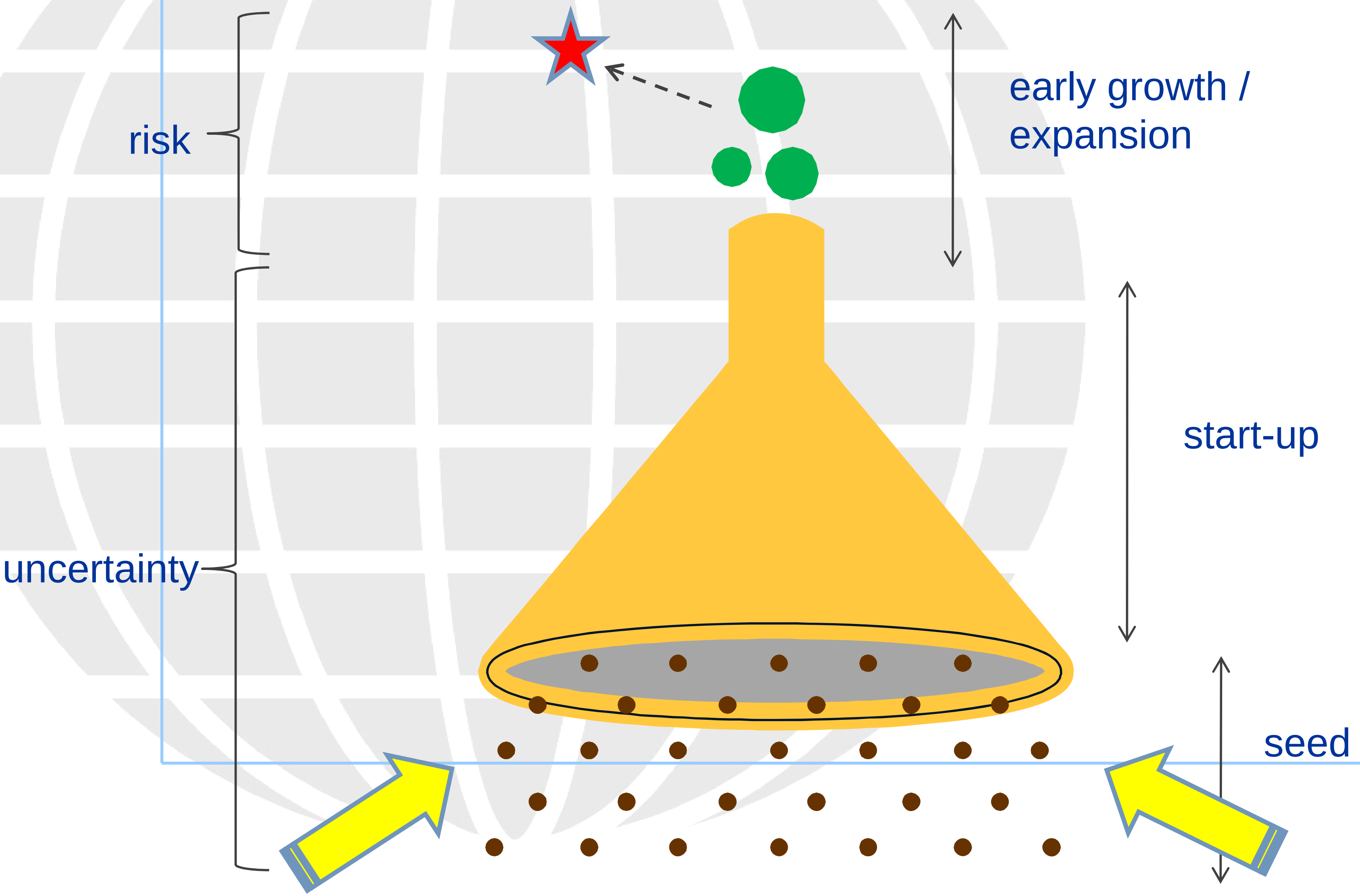
- Invested $70k in DEC in 1957
- Sold stake in 1971 for gain of $355m
- Raised the 25-year return of its entire portfolio from 7.4% to 14.7%.

Success as a multi-event line-up

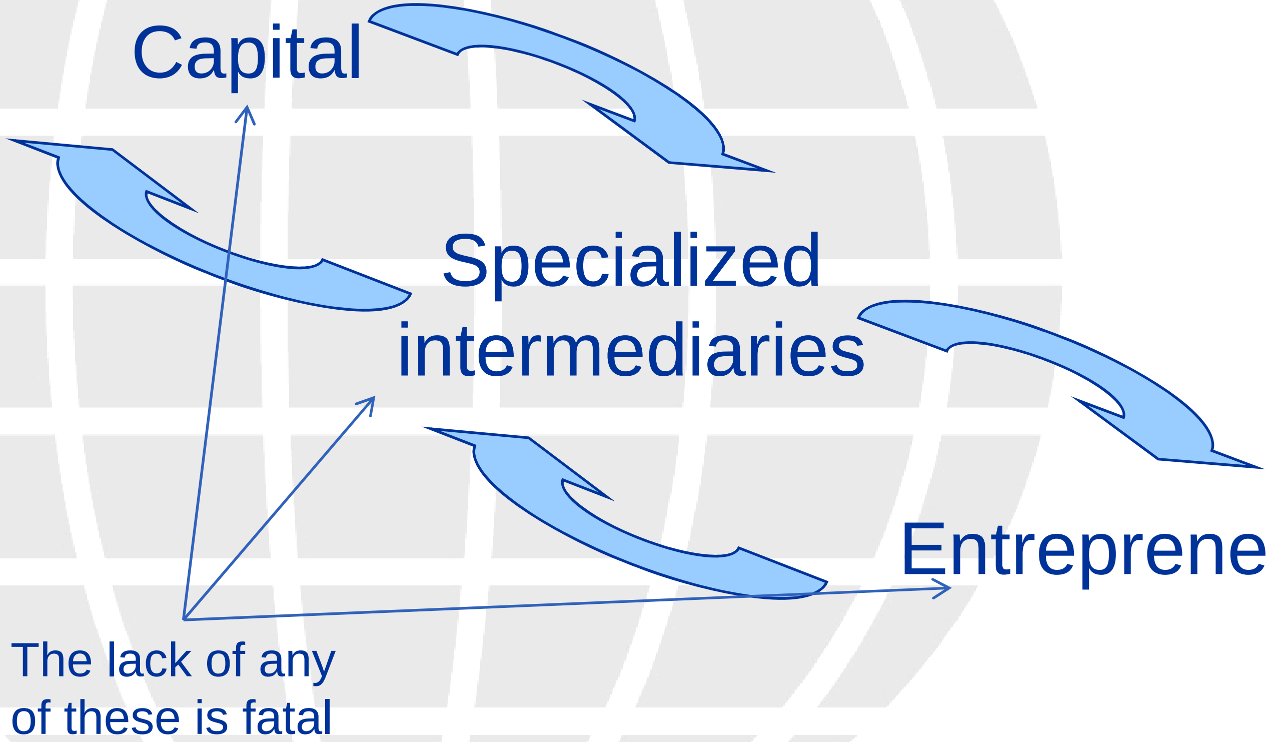
Event	Probability
Company has sufficient capital	80%
Management is capable and focused	80%
Product development goes as planned	80%
Production and sourcing go as planned	80%
Competitors behave as expected	80%
Customers want product	80%
Pricing is forecast correctly	80%
Patents are issued and enforceable	80%
Combined probability of success	17%
Dropping 3 events to 50% leads to	4%

Source: Zider (1998)

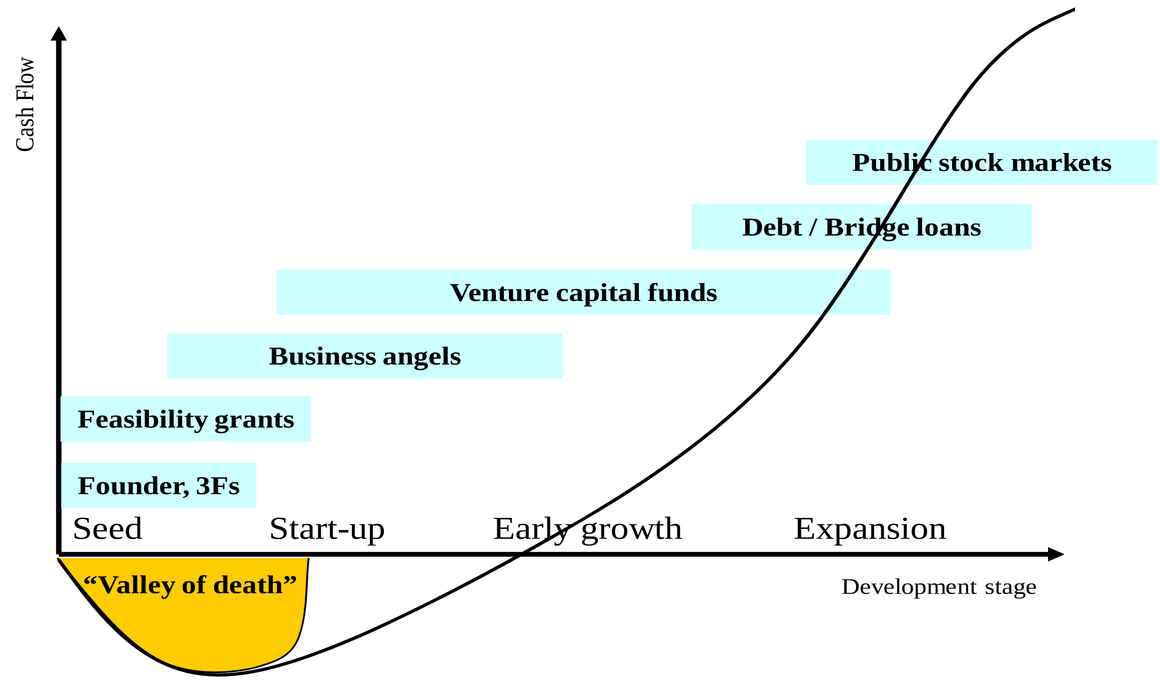
The financing landscape



The problem of simultaneity



The J-curve for innovative enterprises



The financing of Amazon.com

- Jul-94, founder personal funds ($10k) - $0.001
- Jul,Nov-94, loans from founder ($44k)
- Feb-95, founder's father ($100k) - $0.17
- Jul-95, founder's mother ($146k) - $0.17
- Dec-95, 1 angel - director ($50k) - $0.33
- Jan-96, angel syndicate (20 angels, $937k) - $0.33
- May-96, founder's brother & sister ($20k) - $0.33
- May-96, founder's father ($100k) - $0.17
- Jun-96, venture capital (Kleiner Perkins, $8M) - $2.34
- Jan,Feb-97, directors ($200k) - $6.67
- IPO (3m shares, $49.1M) [Q2,97] - $18.00 ($429.5m cap)
- Current price - $87.56 ($37.6bn capitalization)

Source: Company SEC filings

Favorable early-stage financing conditions

- No guaranteed repayment
- Ability to “seed” a large number of enterprises
- A real options approach – additional resources allocated to those that show potential

Merit-based awards (grants)

- Often provided by public agencies
- Innovation oriented
- Unconditional allocation of funds (based on meeting pre-specified criteria)
- Substantial administrative and decision burden
  - Decentralization can be optimal
  - Susceptible to political / bureaucratic influences

Example: SBIR

- Overview and operation
  - Launched in 1982 to promote innovative and high-technology firms
  - Awards funded and selected by 11 agencies
  - 4% of an agency's budget allocated to small innovative firms
- Award structure
  - Phase I, $100k for feasibility study
  - Phase II, $750k for project / prototype development
  - Beyond Phase II, award recipients are expected to privately fund their commercialization efforts
- Prominent recipients: Apple, Compaq, and Intel.

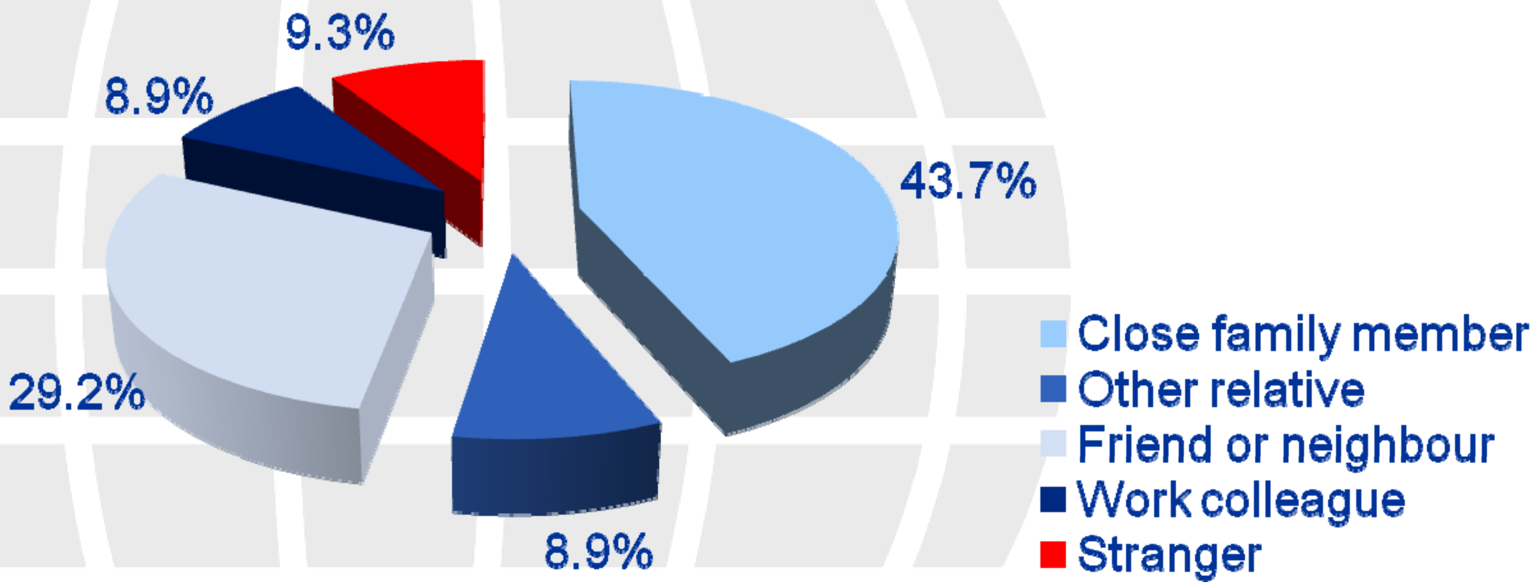
Scale and impact of SBIR

- 2007 budget of $2.315 billion
- Represents 60% of the US public SME finance programmes in the US.
- Most of the founders came from universities.
- Recipients have higher survival and growth rates
- Without the SBIR award
  - 20% of the founders would not have started their firm.
  - 40% would not have continued it.

External equity

- Match between risk profile and potential payoffs
- Investors have claims on the residual value of the enterprise (i.e. they share the upside)
- Investors also share the downside (i.e. they can lose their money entirely)
- Various mechanisms ensure that they get paid before the entrepreneurs do (e.g. convertible preferred stock)
- Examples: business angels, seed funds, incubators, venture capital funds

Family, friends, and fools

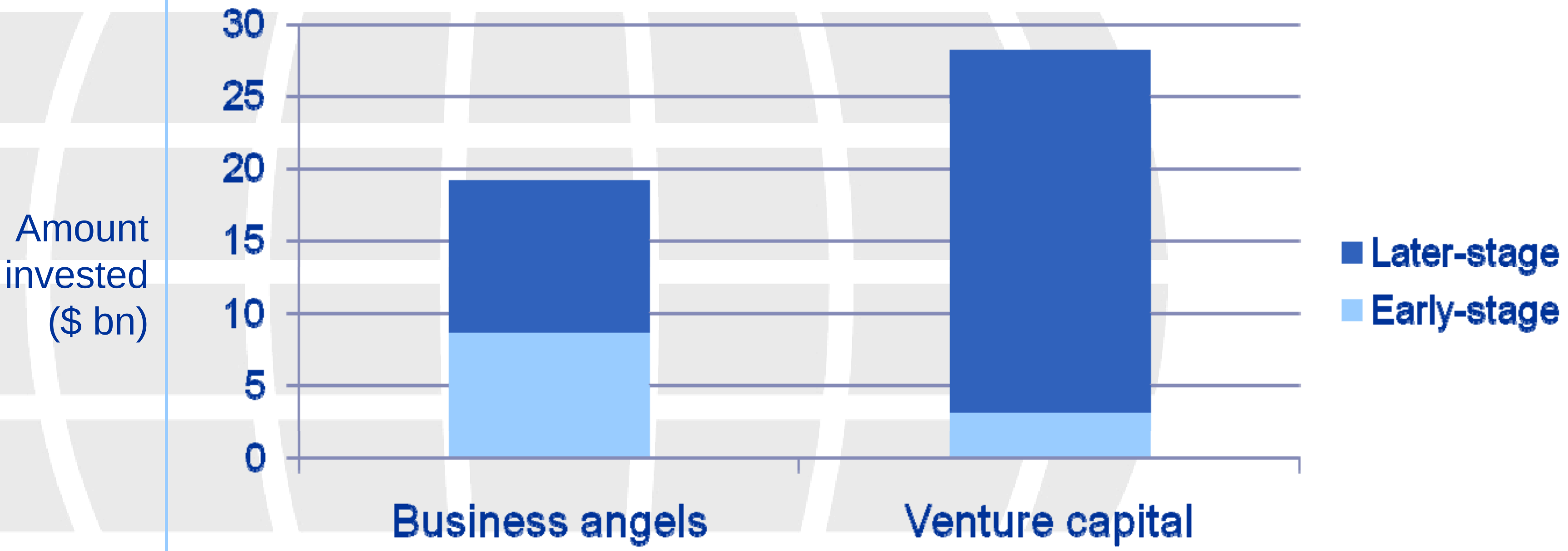


Source: GEM

Who are the business angels?

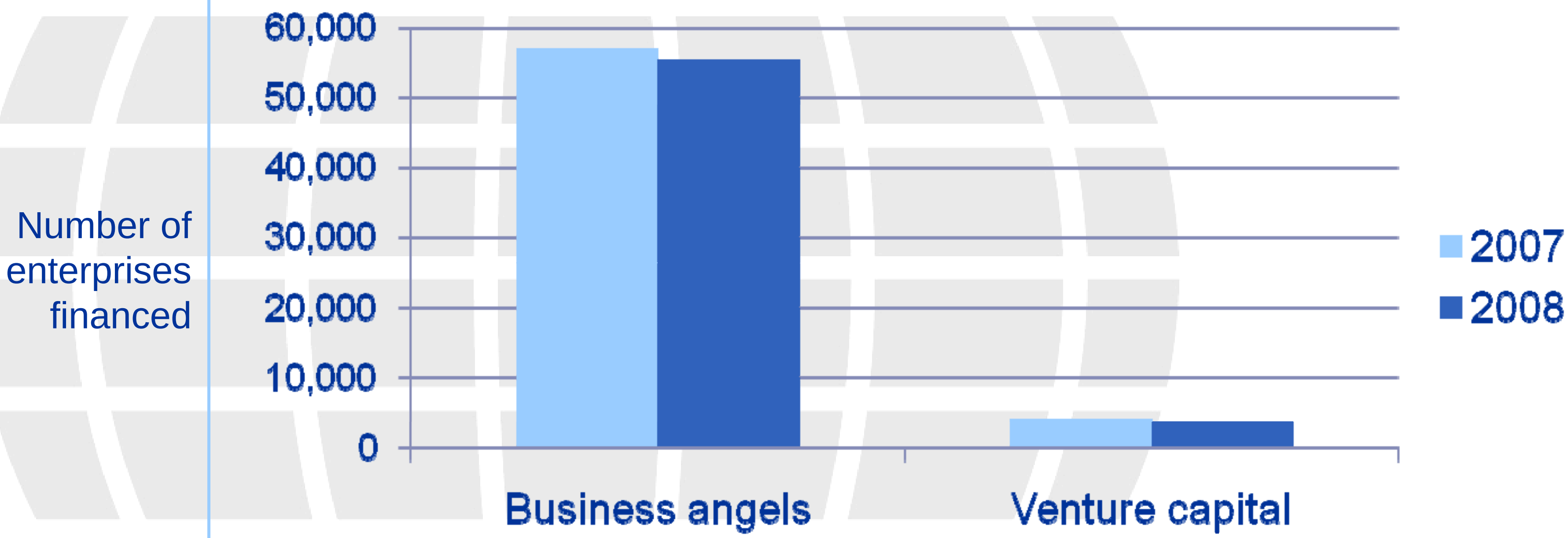
- (Wealthy) individuals, often cashed-out entrepreneurs
- Make equity investments of $25-50k (up to $1-2m for syndicated deals) in promising ventures
- Provide substantial portion of the seed and start-up capital of innovative enterprises
- Provide more than capital (expertise, support)
- Around 260k active angels in the US
- Active & passive; novice & experienced

How much do they matter? (1)



Source: Center for Venture Research, MoneyTree

How much do they matter? (2)



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Business angel networks (BAN)

- Pool the financial, knowledge, and information resources of a group of angels
- Alleviate the inefficient flow of information between (individual) angels and entrepreneurs
- Attract bigger deal flow
- Allow individual angels to diversify their portfolios and participate in more deals
- 297 in Europe; 245 in the USA

Factors affecting BA investing

- Potential for promising returns
  - Availability of growth capital
  - Lucrative exit routes
- Supply of high quality enterprises
- Tax conditions (tax relief, capital gains tax, dividend tax)
- Economic conditions (growth, interest rates, inflation)
- Stock market conditions

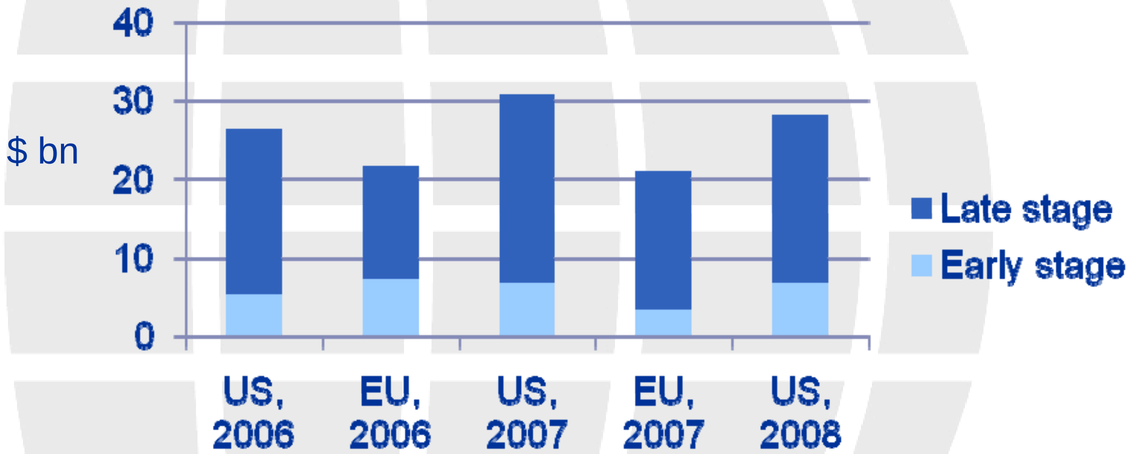
The bright side of venture capital (USA)

- Over 3,000 IPOs over the past 25 years
  - Creation of wealth
  - Creation of business angels
- Major impact of VC-backed firms (as of 2008)
  - 12.05 million jobs
  - $2.9 trillion in sales
  - 10.5% of US private sector employment
  - 20.5% of US GDP
  - High-value industries, higher wages
- Nurturing of emerging and R&D-heavy industries

Source: IHS Global Insight

The two sides of the Atlantic

- The volume disparity has decreased



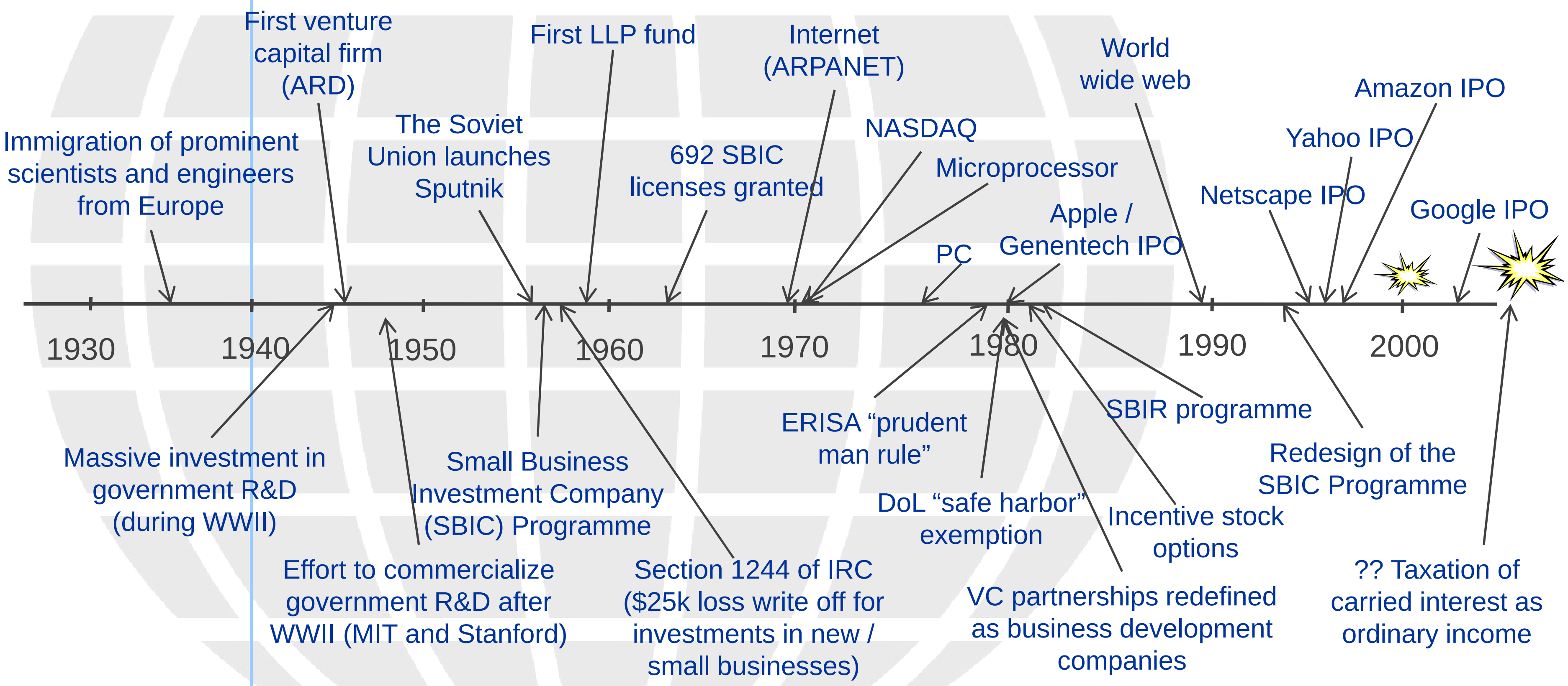
But …

- The European scene is dominated by buyouts
- European VC returns lag those in the US (the 2000s have been gloomy for all)

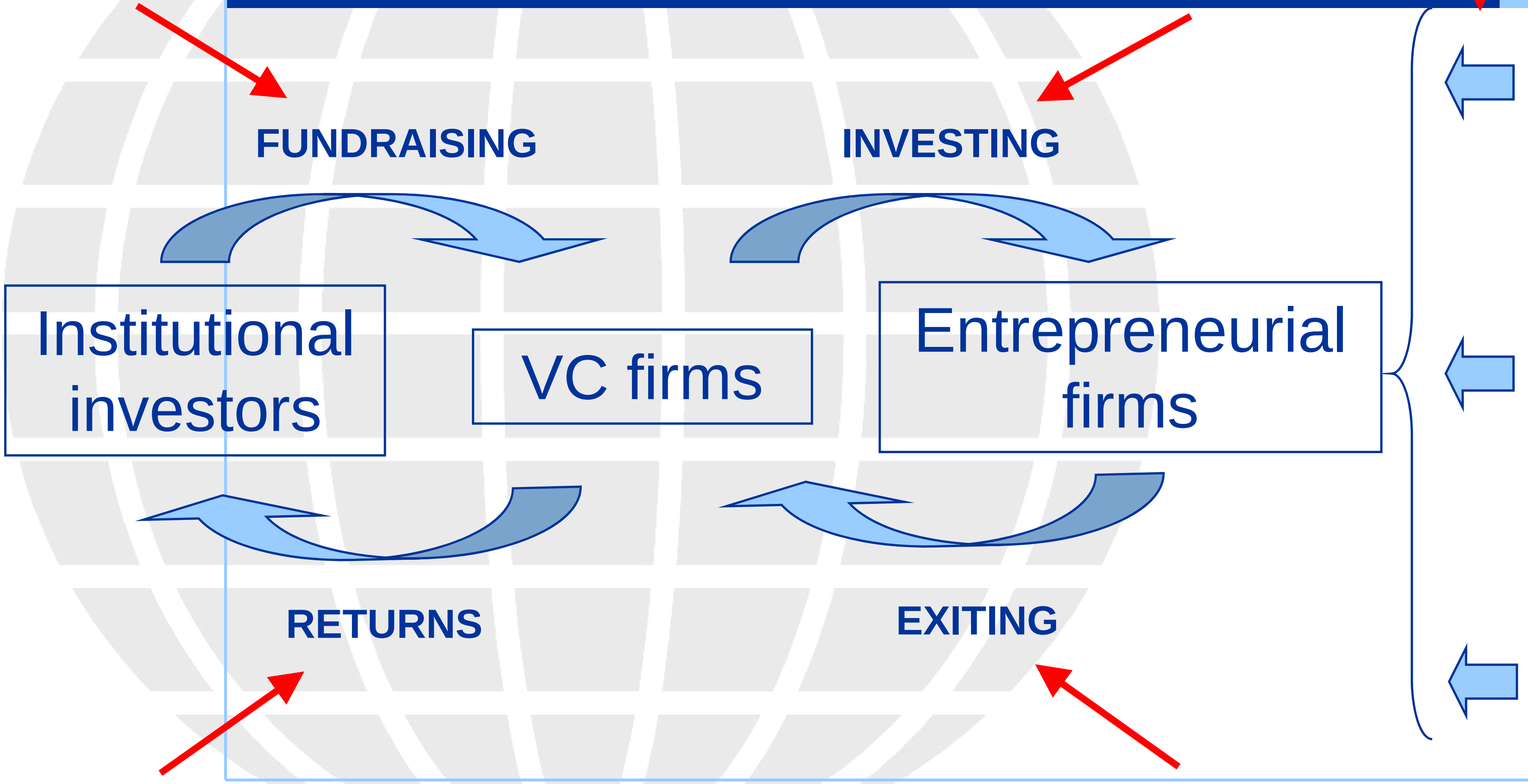
Designer's dream

To have a well functioning VC industry
(just like the US)

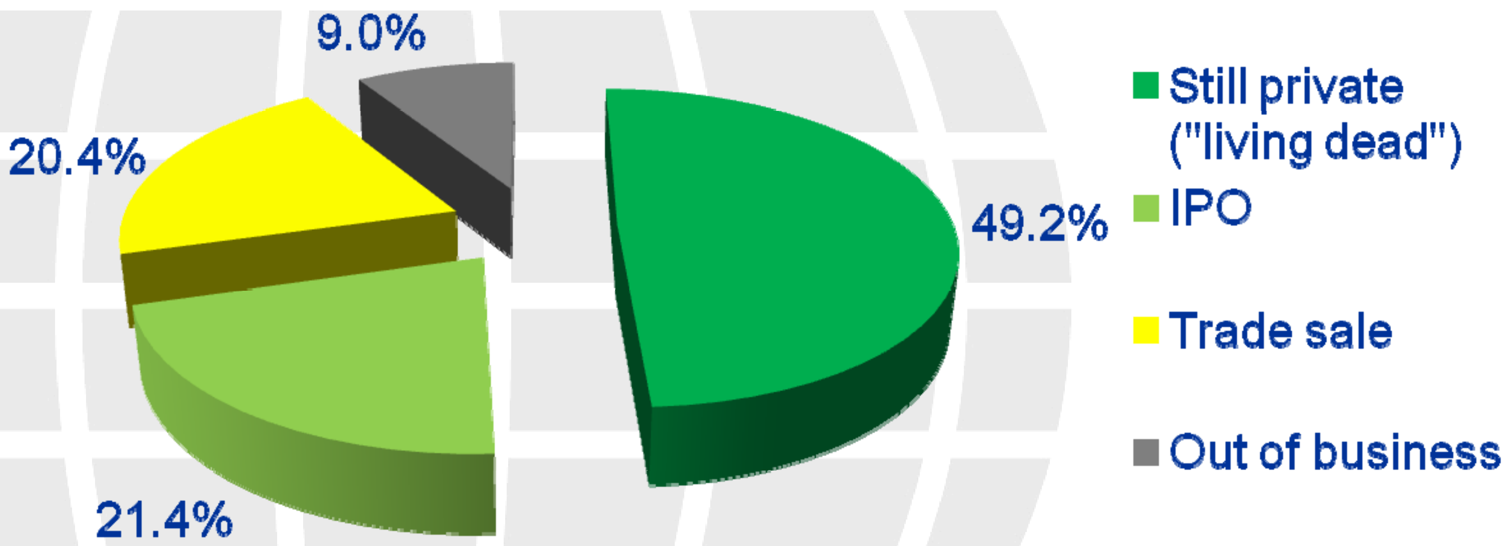
The creative hand of history



The levers of VC finance



The fate of VC investments



Source: Cochrane (2005)

The role of stock markets

- Provide liquidity to private investors
- Exert a pull effect on venture capital activity
  - Lucrative exits entice investors
  - Lucrative exits excite potential entrepreneurs
- Impose financial discipline and transparency
  - Put weight on accurate financial performance data
  - Provide pricing / valuation parameters

Implications for innovative enterprises

- Strict regulations can
  - Stifle young, less established companies
  - Discourage private investors
  - Turn away institutional investors
- Regulatory reform can be used to
  - Attune the exchange to the needs to younger, high-growth companies
  - Increase the exchange's appeal to institutional and international investors

IPO Summary (junior exchanges)

Some concluding reflections

- The finance cycle is difficult to ignite and maintain
- Different considerations and opportunity costs at each stage
- Patience and small steps
- Repeating history is difficult (disentangling skill and luck)
- Humbled by history (from within the greatest bull market)