



The Landscape for Early-Stage Financing of Innovative Companies

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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

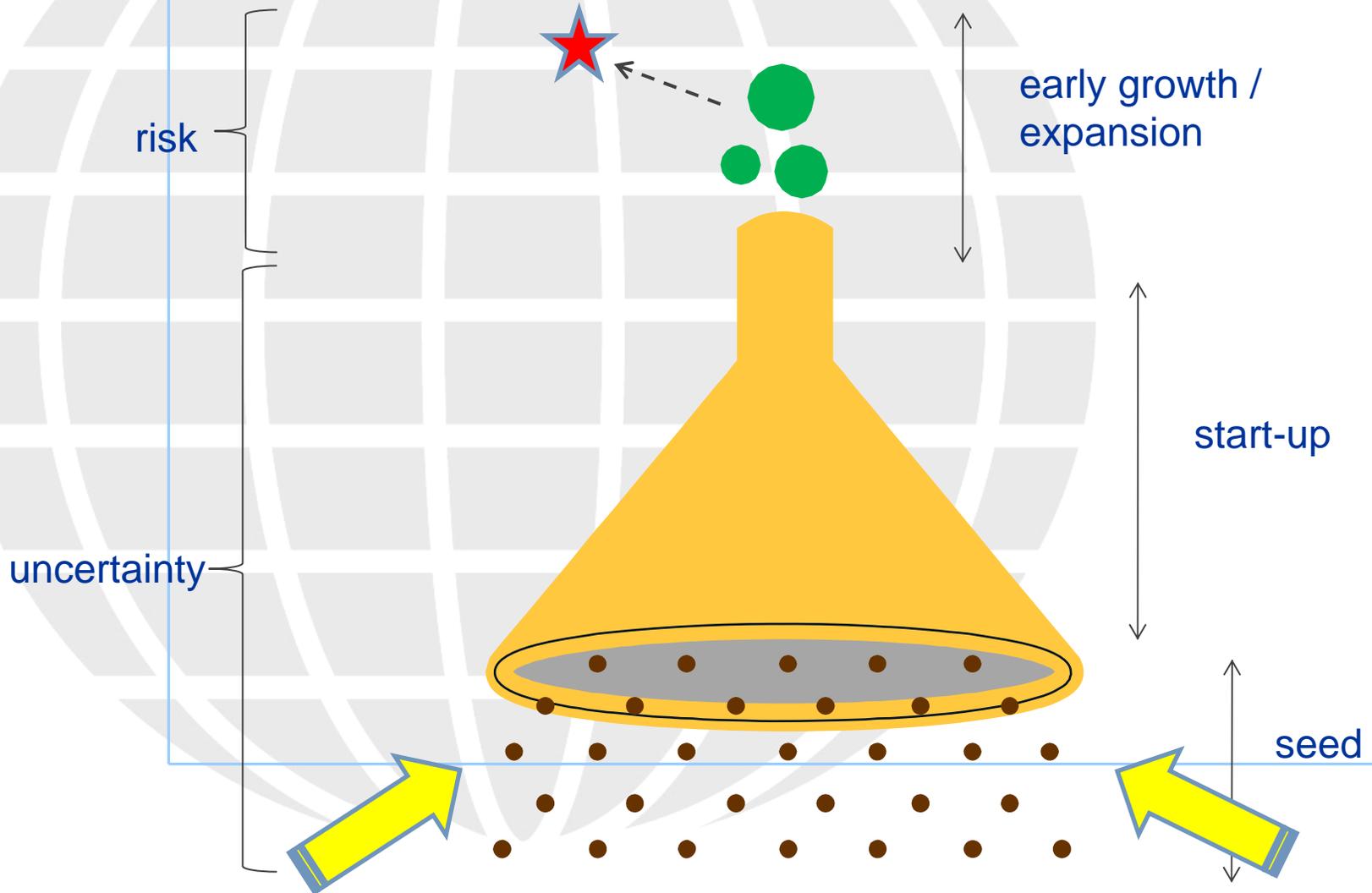
American Research & Development (ARD)

- 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%.

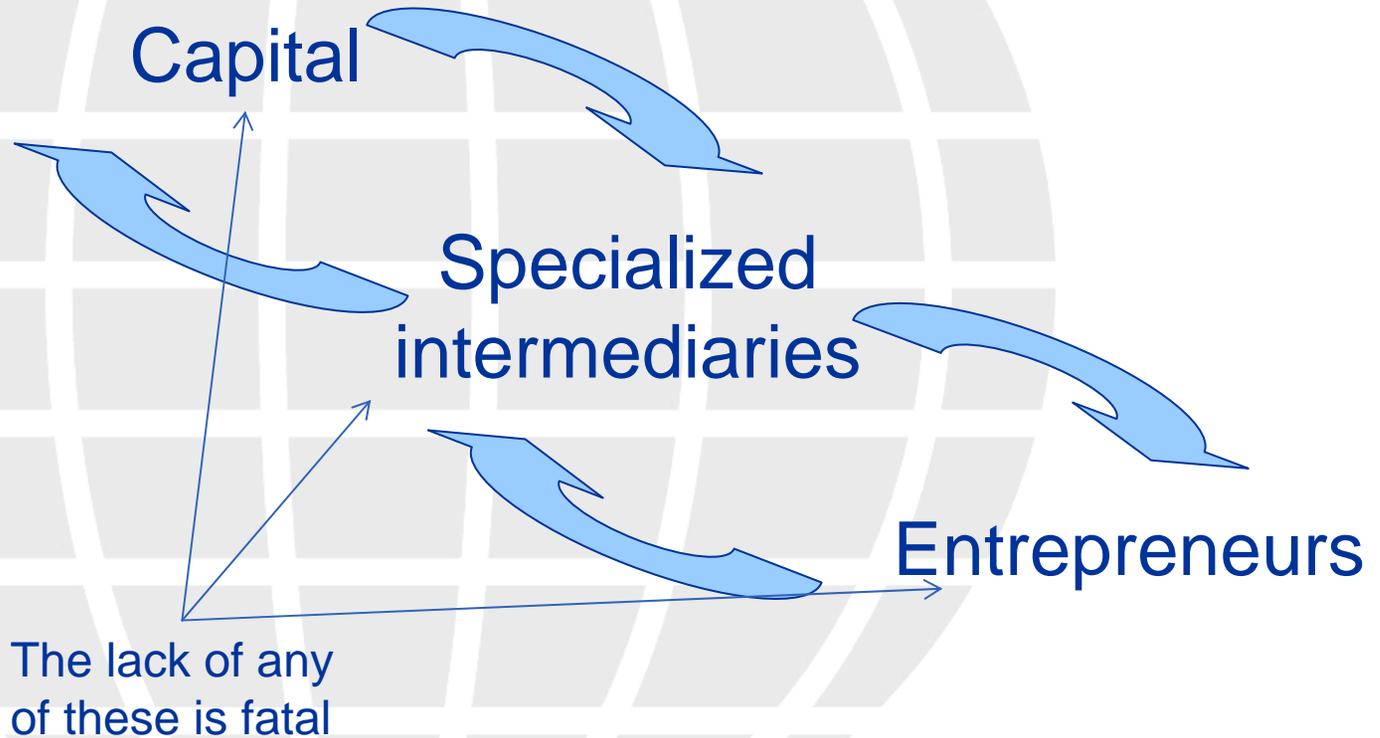
Success as a multi-event line-up

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%

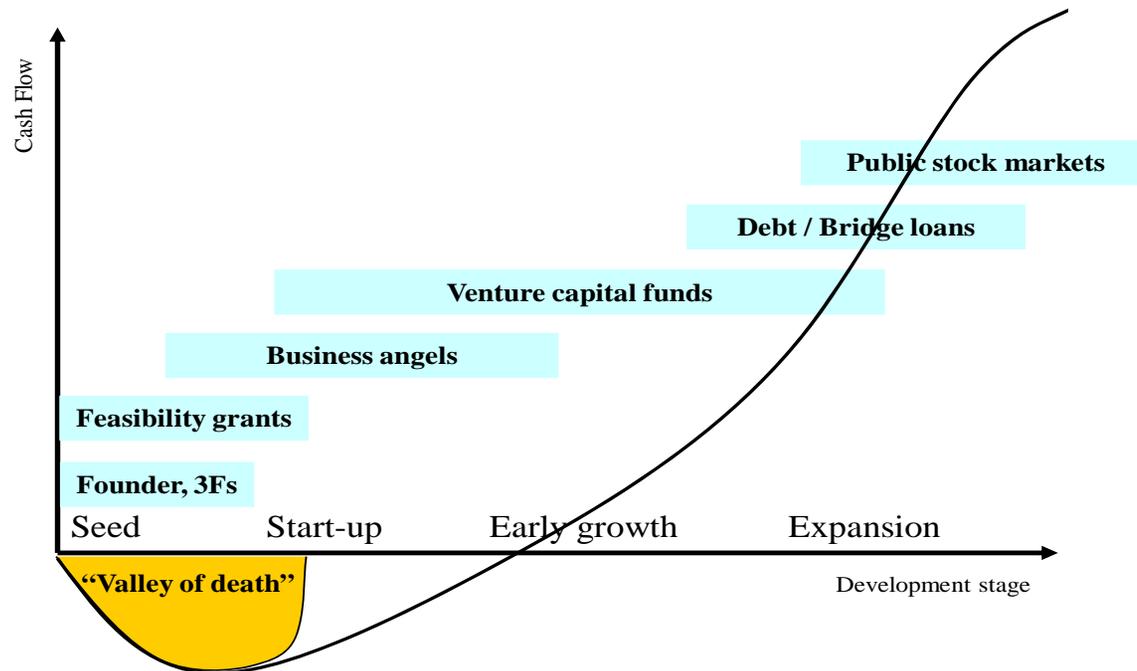
The financing landscape



The problem of simultaneity

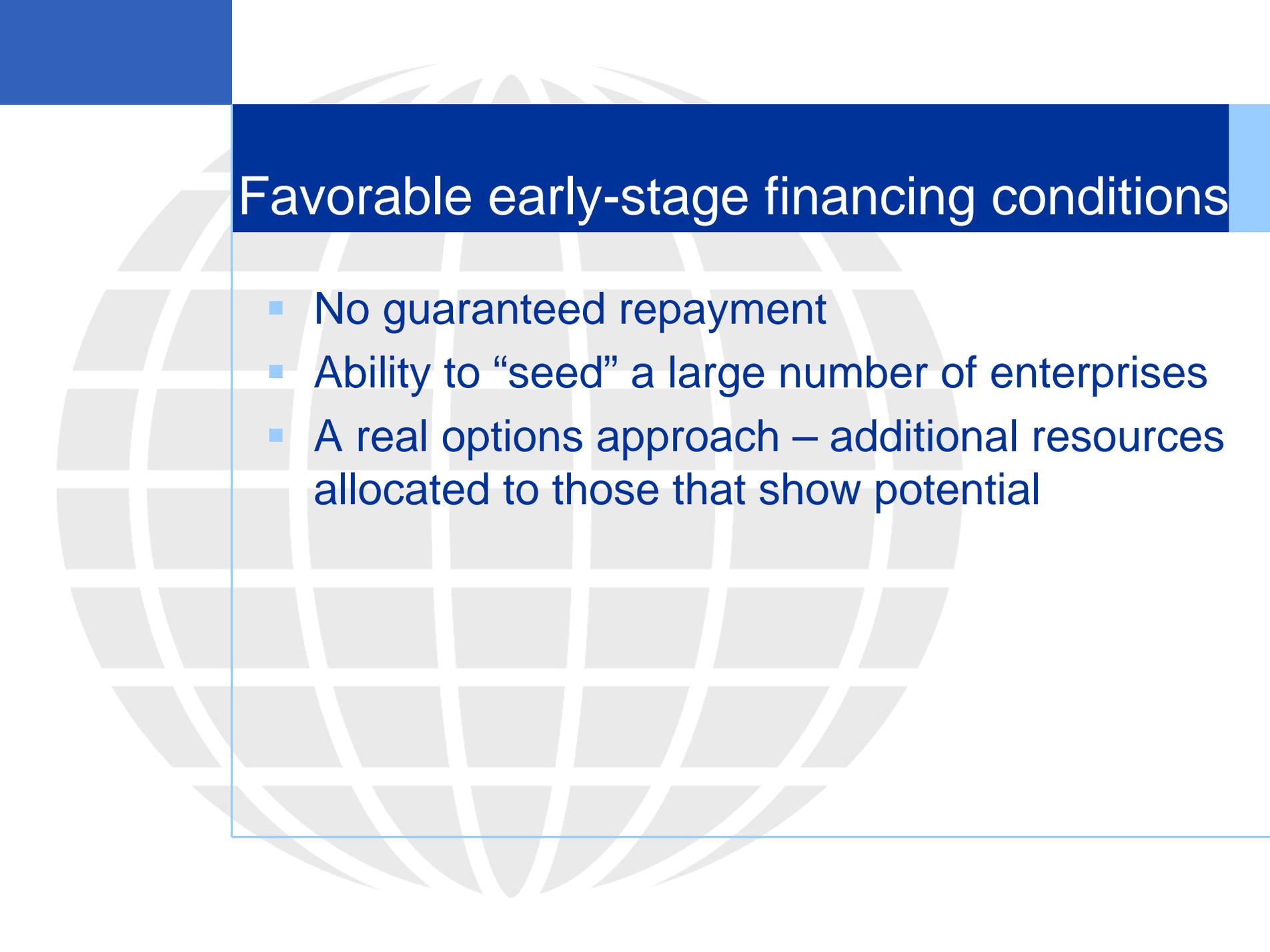


The J-curve for innovative enterprises



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)



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.

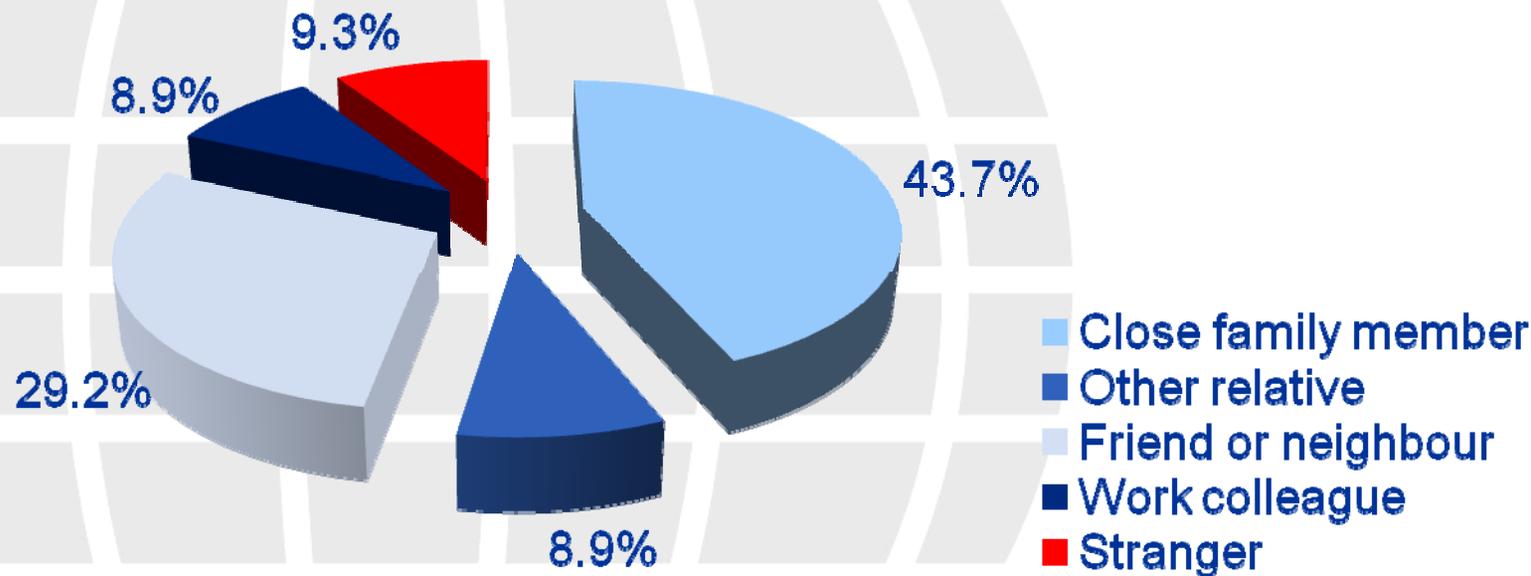
Scale and impact of SBIR

- 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

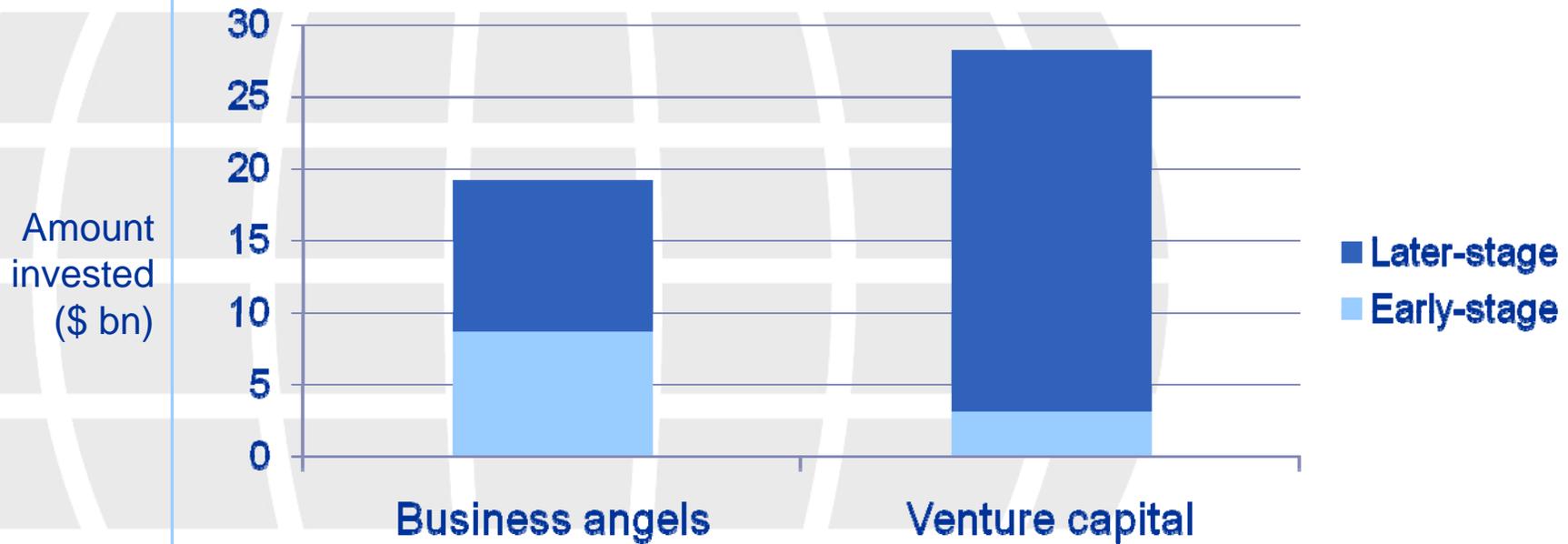
Family, friends, and fools



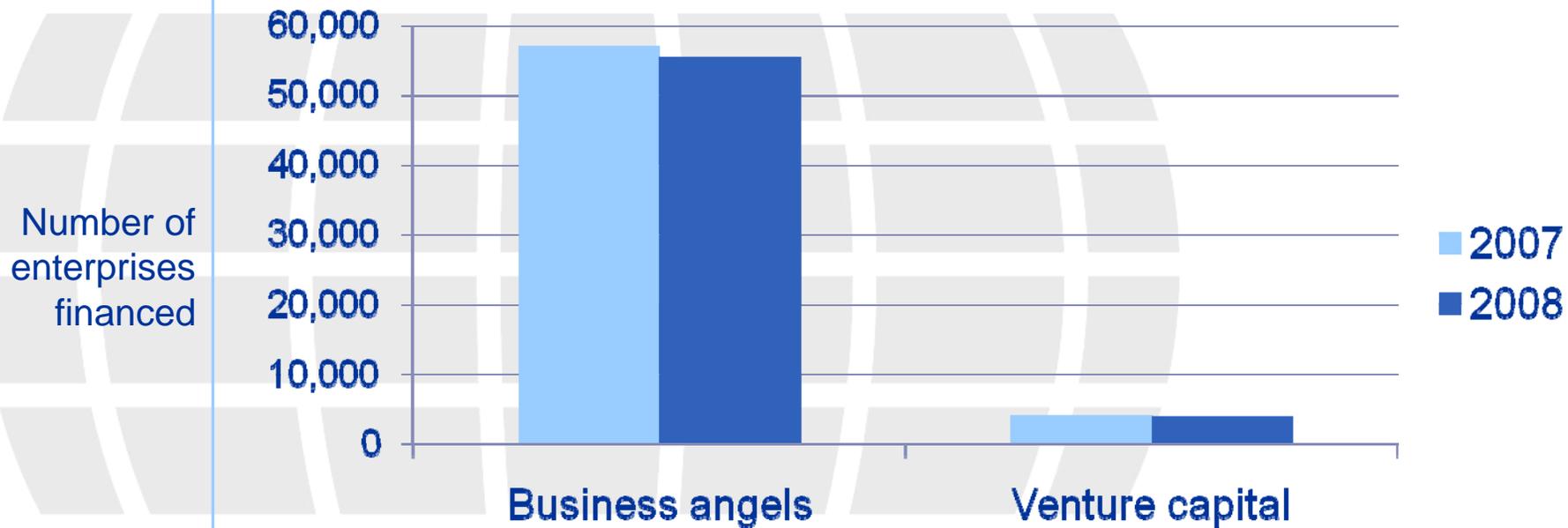
Who are the business angels?

- (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)



How much do they matter? (2)



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

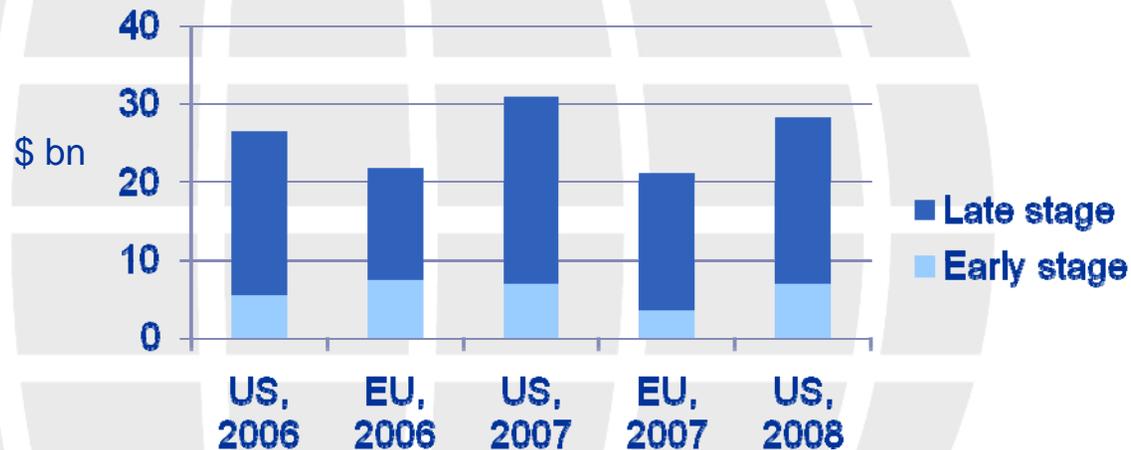
- Potential for promising returns
 - Availability of growth capital
 - Lucrative exit routes
- Supply of high quality enterprises
- Tax conditions (tax relief, capital gains tax, dividend tax)
- Economic conditions (growth, interest rates, inflation)
- Stock market conditions

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

The two sides of the Atlantic

- The volume disparity has decreased



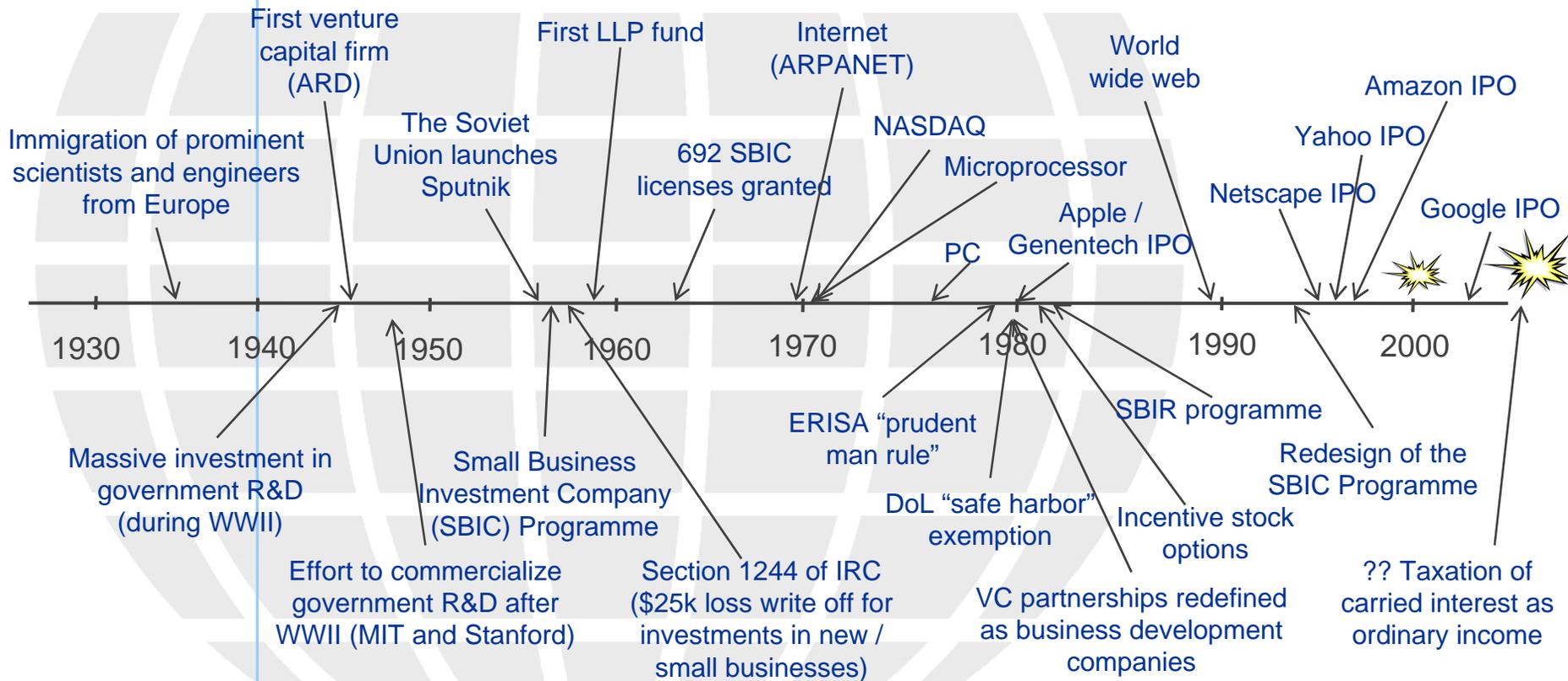
But ...

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

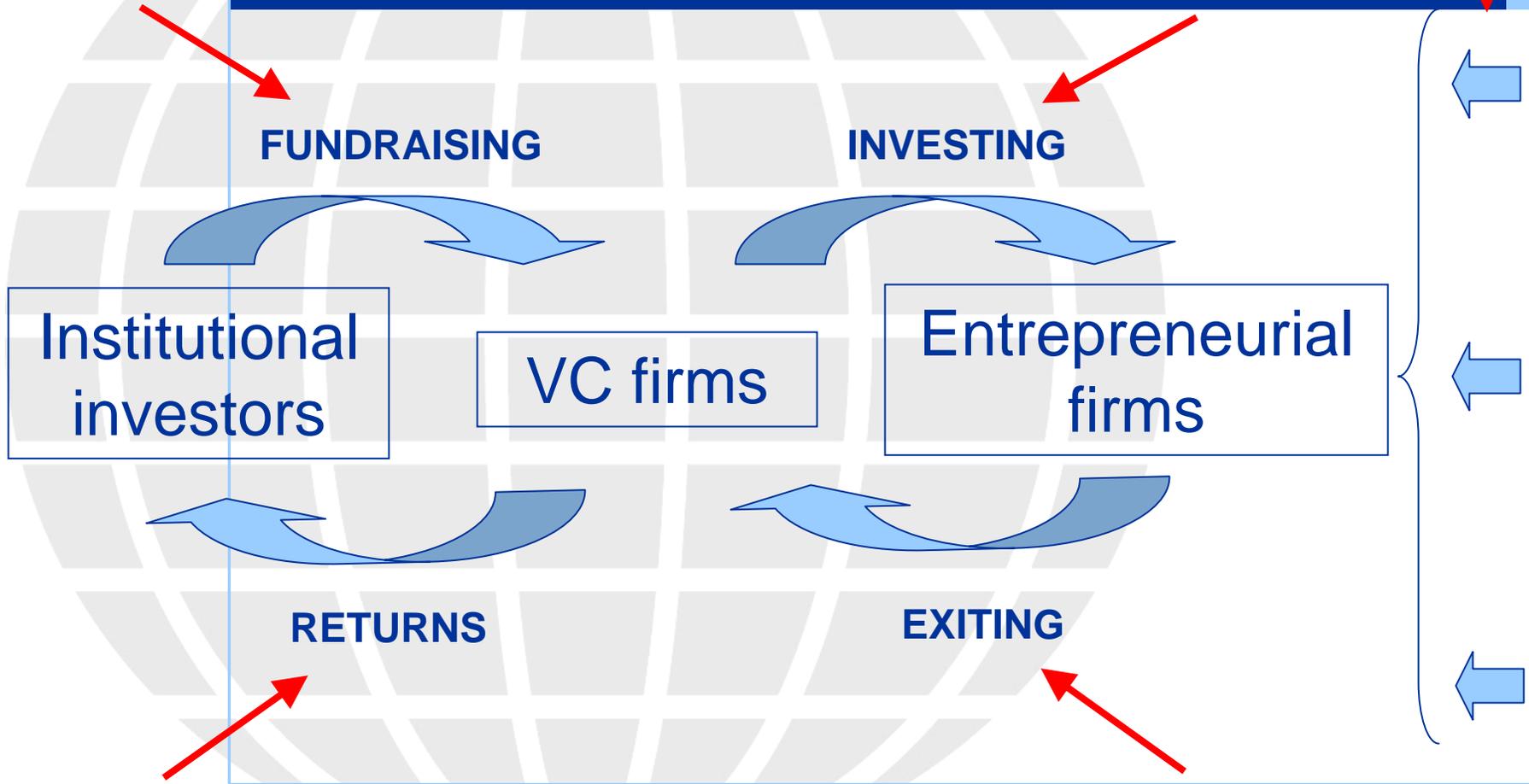
Designer's dream

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

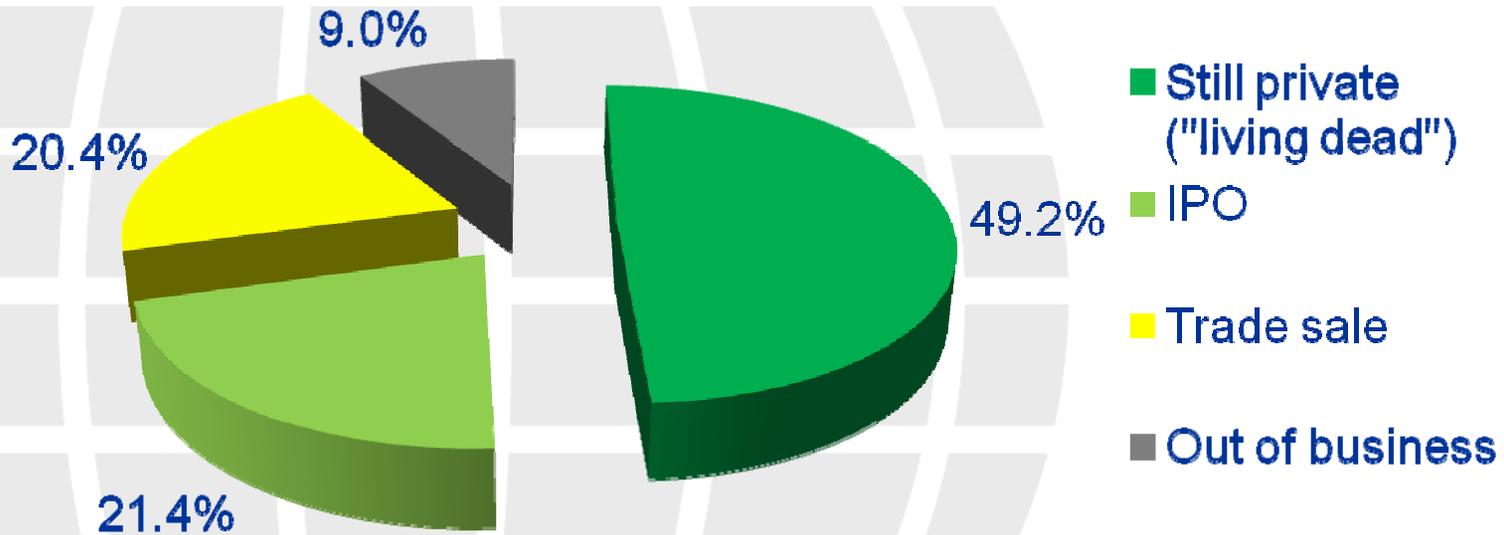
The creative hand of history



The levers of VC finance



The fate of VC investments



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)