

Corporate Finance

Lecture 6: Entrepreneurship and Innovation

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Announcements

- Paper Summary will be due next Sunday (**Nov. 3rd**).

Quick Review of Last Lecture

- As the **second largest economy** in the world, China has
 - ▶ many globally influential corporations
 - ▶ rapidly evolving capital markets
 - ▶ unique regulatory framework
 - ▶ novel datasets
- **Typical Chinese characteristics** include
 - ▶ dominance of unsophisticated retail investors
 - ▶ dominance of SOEs
 - ▶ significant role of the government
 - ▶ continuing pro-ESG trends
- Chinese financial markets are affected by **foreign countries** in many aspects, e.g.,
 - ▶ Directors with foreign experience improve firms' performance
 - ▶ FDI facilitates the transmission of global liquidity shocks
 - ▶ Local and foreign investors react differently to analyst recommendations

Outline for This Lecture

1. Financing of Entrepreneurship
2. Entrepreneurs' Entry Decision
3. Gender and Race in Entrepreneurship
4. Public Policies and Entrepreneurship
5. Measures of Innovation
6. Drivers of Corporate Innovation

Part I: Entrepreneurship

Entrepreneurial Finance

- A subfield of corporate finance, with some crossovers with labor, financial intermediation, and asset pricing.
- Why do we care about entrepreneurship?
 - ▶ 99.9% of firms are private, yet we've been focusing on 0.1% public firms.
 - ▶ Aggregate job growth & innovation are driven disproportionately by young firms.
 - ▶ Imprinting & path dependence: entry conditions matter.
 - ▶ Huge frictions in this market: economically interesting & room for policies

Financing of Startups

- Young, innovative companies are unlike most other businesses.
 - ▶ Their investment needs are front-loaded.
 - ▶ Their cash flows are typically far in the future and uncertain.
 - ▶ Success usually comes from a new product or service that has not yet been rolled out or created.
- These special circumstances it difficult for these companies to access capital through traditional means, such as traditional bank and receivables financing or public equity markets.
- Consequently, entrepreneurs normally rely on initial investment of the founders' own money and then turn to a startup financing ecosystem including
 - ▶ venture capital
 - ▶ private equity
 - ▶ angel investors
 - ▶ crowdfunding

Startup Outcome Frequencies

		IPO	M&A	Failure
Gompers et al. (2020)	Survey	15%	53%	32%
	Venture Source	13%	43%	44%
Puri and Zarutskie (2012)		16%	34%	40%
Ewens and Marx (2018)		6%	41%	28%
Wang et al. (2022)		3%	16%	81%

This table presents some evidence on the frequency of startup outcomes.

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 - ▶ In addition to institutional VCs, other types include corporate VCs, captive VC funds run by family offices, and other VC-like intermediaries.

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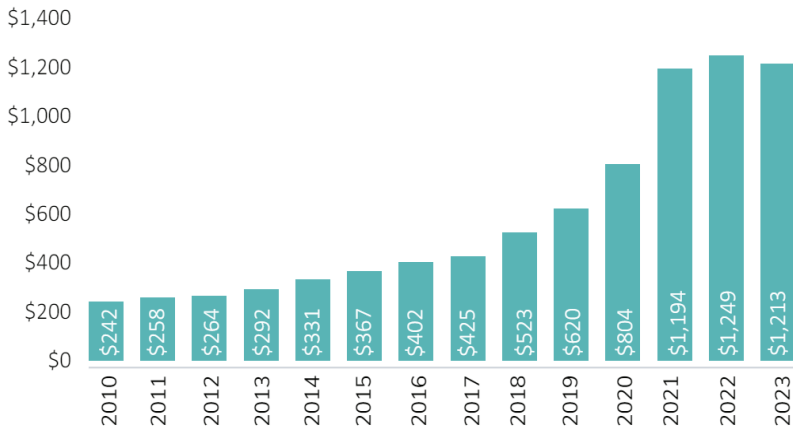
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- The venture capitalists who manage these funds provide not only financing to companies, but also nonfinancial support such as mentorship, strategic guidance, and network access.
- While most VC-funded companies fail, some become runaway successes.
 - ▶ The five largest US companies by market capitalization as of May 2024 (Microsoft, Apple, Nvidia, Alphabet (Google), and Amazon) received most of their early external financing from VCs.
 - ▶ Among public companies founded within the last 50 years, VC-backed companies account for half in number, three quarters by value, and more than 92% of R&D spending and patent value.

Venture Capital

US Venture Capital AUM by Year



Source: NVCA 2024 Yearbook; Data provided by PitchBook

Private Equity

- Private equity refers to **investments made in privately-held companies** that are not publicly traded.
- Private equity firms, also known as investors or financial sponsors, **provide capital** to startups **in exchange for a stake** in the company. The ultimate goal is to sell those shares at a profit.
- Unlike venture capital, which typically focuses on early-stage companies with high growth potential, private equity investments can be made at **any stage** of a company's lifecycle.
- Compared to venture capital, private equity investments often involve a **larger amounts** of capital.
- Private equity firms typically raise funds from **institutional investors**, such as pension funds, endowments, and wealthy individuals, to create a pool of capital that they can use to invest in various companies.
- Private equity firms often have a team of industry experts who can provide **strategic guidance and operational support** to the companies they invest in.

Angel Investors

- Angel: a wealthy individual who invests in companies in relatively early stages of development.
- Angel groups: groups of individual angels who invest together, individually or through a pooled vehicle, enabling them to share deal flow with each other.
- Angel/seed rounds: early-stage of financing where there are no PE or VC firms involved in the company to date.

Value (\$B) and Number of Angel Financing in US

	2015	2016	2017	2018	2019	2020	2021	2022
Angel/Seed	\$2,955.78	\$2,584.62	\$3,564.62	\$5,676.74	\$6,433.17	\$7,460.92	\$13,804.46	\$15,968.94

	2015	2016	2017	2018	2019	2020	2021	2022
Angel/Seed	1131	973	1083	1200	1437	1626	2547	2394

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Crowdfunding

- Crowdfunding is the use of **small amounts of capital** from **a large number of individuals** to finance a new business venture.
- There are **restrictions** as to who is allowed to fund a new business and how much they are allowed to contribute.
- Crowdfunding makes use of the easy accessibility of vast networks of people through **social media** and **crowdfunding websites** to bring investors and entrepreneurs together, with the potential to increase entrepreneurship by expanding the pool of investors beyond the traditional circle of owners, relatives, and venture capitalists.
- Crowdfunding sites generate revenue from **a percentage of the funds raised**.
- **Kickstarter**, **Indiegogo**, and **GoFundMe** are among the most popular crowdfunding platforms.

Bring a creative project to life.

ON KICKSTARTER:

258,301
projects funded\$7,993,700,342
towards creative work94,956,485
pledges

Featured project



Recommended for you



Bloomchasers:...

Evan Katz

⌚ 3 days left • 2446%...



BODY FREEDOM...

BODY FREEDOM FOR...

⌚ 3 days left • 71%...



Drivers of Entrepreneurs' Entry Decisions

- Liquidity constraints
 - ▶ Recent studies exploit shocks to households' liquidity through their [access to credit markets](#). Yet, more access to credit has been found to have [positive](#) effects, [negative](#) effects, or [no effect](#) at all (Dobbie et al. 2020, JF; Bos et al., 2018, RFS; Herkenhoff et al., 2021, JFE).

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- Labor market distress

- ▶ Hacamo and Kleiner (2022, JF): graduating college during a period of [high unemployment](#) increases entry to entrepreneurship. Consistent with labor shocks disproportionately impacting high earners, these “forced” entrepreneurs are [more successful](#).
- ▶ Fang, Li, Wu, and Zhang (2023): entrepreneurs induced by the SOE layoffs in China have better performances.

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- Unemployment benefits
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- ▶ Barrios, Hochberg, and Yi (2022, JFE): the introduction of the on-demand, platform-enabled gig opportunities (i.e., Uber and Lyft) creates **fallback opportunities** for would-be entrepreneurs that reduce risk and encourage new business formation.

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- Psychological bias

- ▶ Huang, Lin, Liu, and Manso (2021): Using entrepreneurs affiliated with Taobao Marketplace, they show that people who observe the emergence of successful stores **in their neighborhood** are more likely to become online entrepreneurs.

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- Women face more severe financing constraints.
 - ▶ Ewens and Townsend (2020, JFE): early stage investors are biased against women in the sense that male investors express less interest in female entrepreneurs.
 - ▶ Hebert (2023): female entrepreneurs are less likely to use financing with external equity or VC.
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- Other potential explanations include risk aversion (Jianakoplos and Bernasek, 1998), work experience (Boden Jr and Nucci, 2000), professional networks (Howell and Nanda, 2019), and peer effects (Markussen and Røed, 2017).

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- Cavalluzzo, Cavalluzzo, and Wolken (2002): lenders' discrimination decreases with the competition among local banks.
- Howell, Kuchler, Snitkof, and Stroebe, and Wong (2024, JF): black-owned firms obtained PPP loans primarily from automated Fintech lenders.

Public Policies in Entrepreneurship

- Two features of entrepreneurship motivate **government interventions**:
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 - ▶ Extensive frictions (info asymmetry, uncertainty, financial constraint)

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 - ▶ Strong positive externality
 - ▶ Extensive frictions (info asymmetry, uncertainty, financial constraint)
- **Typical tools** for government interventions:
 - ▶ tax incentives (Howell, Mezzanotti, Wang, and Xu, 2023)
 - ▶ grants (Howell, 2017)
 - ▶ government-sponsored venture capital (Brander, Du, and Hellmann, 2015)
 - ▶ loan guarantee (Lelarge, Sraer, and Thesmar, 2010)
 - ▶ labor policies (Jeffers, 2024)
 - ▶ immigration policies (Azoulay, Jones, Kim, and Miranda, 2022)

Part II: Innovation

Innovation as a Major Driver of Economic Growth

- Technological innovation is vital for a country's economic growth (Schumpeter, 1911; Solow, 1957; Romer, 1986) and a firm's long-term competitive advantage (Porter, 1992).
- According to a report issued by the OECD (2015), technological innovation accounts for approximately 50% of a country's total GDP growth.
 - ▶ Innovation here includes technological progress embodied in physical capital, investment in knowledge-based capital, increased multi-factor productivity growth, and creative destruction.
 - ▶ The influences varying depends on the country's level of economic development and the phase of its economic cycle.
- 85% of a nation's economic growth is attributable to technological innovation (Rosenberg, 2004).

Indicators of Innovation

- **R&D** spending
 - ▶ Firm accounts (e.g. Compustat)
 - ▶ Administrative surveys (e.g. BERD)
 - ▶ Tax records (e.g. from R&D credits)

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- **Patents** by firms and by individuals

- ▶ USPTO, European Patent Office
- ▶ Rich information on patent document (patent text, citations, patent categories, inventor team, etc. to measure quality and type of innovation)
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- **Innovation Surveys**

- ▶ EU Community Innovation survey, SPRU, Von Hippel's user based innovation

Issues with Innovation Indicators

- R&D expenses are **missing** in the financial reports of many public firms.
- It is hard to obtain the amount of R&D spending of **private firms**.
- Not all **patents** are innovations and not all innovations are patented.
- Biases due to the **truncation** of patent data and the **changing composition of inventors** in a region or sector (Lerner and Seru, RFS 2021)
- Econometric concerns:
 - ▶ lots of **zeros** (Mullahy and Norton, 2022)
 - ▶ **nonlinear outcomes**, e.g. counts (Cohn, Liu, and Wardlaw, JFE 2022)

Drivers of Corporate Innovation

- Firm-level determinants
 - ▶ Entrepreneurship (venture capital)
 - ▶ Public listing
 - ▶ Human capital
 - ▶ CEOs and other insiders
 - ▶ External investors
- Market-level determinants
 - ▶ General Market Conditions
- County-level determinants
 - ▶ Regulations
 - ▶ Financial market development
 - ▶ Demographic/social traits

Entrepreneurship and Corporate Innovation

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- Venture capitalists employ various tools to monitor and govern, such as the use of staged financing (Neher, 1999), securities that have state contingent cash flow and control rights (Cornelli and Yosha, 2003), and the active role on VC investors on boards of these firms (Hellmann and Puri, 2002).

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- There are myriad forms of entrepreneurship, ranging from self-employment to small and medium size enterprises to technology- and innovation-driven startups. Economic growth is primarily driven by innovation-driven entrepreneurship (Botelho, Fehder, and Hochberg, 2021).

Venture Capital and Innovation

- Corporate innovation takes place at **every stage** of a firm's life cycle.
- When a **young entrepreneurial firm** launches its business ventures, it has a strong incentive to invest in new technologies and revolutionary products.
 - ▶ Overcome the hurdles set by the incumbents in its industry
 - ▶ Establish itself as an independent, viable company with competitive advantage
- Due to the difficulty of raising capital from banks or public equity investors, a large number of entrepreneurial firms resort to **venture capitalists**.
 - ▶ Both a financing and advisory role during the process of corporate innovation

Venture Capital and Innovation

- Kortum and Lerner (2000) is among first to document a **positive** relation between VC and patenting.
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- Tian and Wang (2014, JF) provide empirical support for the theoretical argument that the **tolerance for the failure** is a necessity of innovation (Holmstrom, 1989; Manso, 2011).
 - ▶ Measure VCs' failure tolerance based on its past investment pattern towards underperforming entrepreneurial firms in their portfolios
 - ▶ IPO firms backed by more failure-tolerant VC investors are more innovative.
 - ▶ More pronounced for firms that face higher failure risk

Public Listing and Innovation

- Going public could lead to the “managerial myopia” problem.
 - ▶ Lerner, Sorensen, and Stromberg (2011, JF): going private seems to motivate firms to focus innovative portfolios in their core business areas.
 - ▶ Bernstein (2015, JF): the quality of internal innovation declines post-IPO. Meanwhile, public firms obtain patents from the acquisition of other companies.
 - ▶ Gao, Hsu, and Li (2018): shorter investment horizon in public firms lead them to do more exploitative innovation which rely more on existing knowledge.

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- Public listing may also affect corporate innovation through **reliance on external financing**.
 - ▶ Acharya and Xu (2017, JFE): innovative firms with greater external financing needs benefit from public equity markets, while those with smaller needs could be hampered due to the intensified short-termism.

Human Capital and Innovation

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- **Immigrants** possess unique human capital that benefits a nation's innovation.
 - ▶ Hiring high-skilled foreign labor (i.e., workers on H-1B visas) promotes innovation (Khanna and Lee 2018; Dimmock, Huang, and Weisbenner, 2022 MS).
 - ▶ Brown, Earle, Kim, and Lee (2020): compared to US-born entrepreneurs, immigrant-owned firms engage more in innovative activities for 15 of 16 different innovation measures.
 - ▶ See Kerr (2013) for a review.

CEOs and Innovation

- CEOs' personal traits
 - ▶ **Overconfident CEOs** underestimate the failure rate and invest more in innovation (Galasso and Simcoe, 2011 MS; Hirshleifer, Low, and Teoh, 2012 JFE).
 - ▶ CEO **sensation seeking** (e.g., hobby of flying airplanes) reflects risk tolerance and a desire to try new experiences in the initiation and process of innovation (Sunder, Sunder, and Zhang, 2017 JFE).

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- CEOs' compensation schemes
 - ▶ Compared to fixed wages or standard pay-for-performance compensation contracts, **those involving tolerance for early failures and reward for long-term successes** promote more exploratory innovation and generate better performance (Ederer and Manso. 2013 MS).

Other Insiders and Innovation

- Jia, Tian, and Zhang (2020): tournament incentives induced by **pay gaps between the CEO and other executives**, especially by long-term pay gaps, are beneficial to a firm's innovation performance.
- Balsmeier, Fleming, and Manso (2017, JFE): firms with higher **board independence** generate more and better-cited patents.
- Chang, Fu. Low, and Zhang (2015, JFE): **employee stock options** increase employees' risk-taking incentives and thus boost corporate innovation.

External Investors and Innovation

- Institutional investors

- ▶ Aghion, Reenen, and Zingales (2013, AER) document a **positive** association between institutional ownership and innovation outcomes and provide evidence consistent with a career concern channel (increased monitoring of institutions can insulate managers from reputation damages in case of failures).

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- Foreign institutional investors

- ▶ Luong, Moshirian, Nguyen, Tian, and Zhang (2017) show that foreign institutional ownership **improve** firms' innovative efforts and outcomes through active monitoring, more tolerance for failure, and the facilitation of knowledge spillovers from high-innovation economies.

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- ▶ Aghion, Reenen, and Zingales (2013, AER) document a **positive** association between institutional ownership and innovation outcomes and provide evidence consistent with a career concern channel (increased monitoring of institutions can insulate managers from reputation damages in case of failures).

- Foreign institutional investors

- ▶ Luong, Moshirian, Nguyen, Tian, and Zhang (2017) show that foreign institutional ownership **improve** firms' innovative efforts and outcomes through active monitoring, more tolerance for failure, and the facilitation of knowledge spillovers from high-innovation economies.

- Hedge funds

- ▶ Brav, Jiang, Ma, and Tian (2018, JFE) document **positive** effects of hedge fund activism on innovation efficiency due to reallocation of innovative resources, redeployment of human capital, and change to board-level expertise.

General Market Conditions and Innovation

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- Market-wide patenting-related **litigation risk** leads innovators to shield themselves by shifting their place of conducting innovation from industry (i.e. public and private firms) to universities (Cohen, Gurun, and Kominers, 2016).

Regulations and Innovation

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- Breuer, Leuz, and Vanhaverbeke (2022) suggest that **reporting regulations** impose proprietary costs on innovative firms, esp. smaller ones, thereby discouraging their innovation activity. However, reporting regulations provide positive information spillovers to other firms, esp. larger ones, thereby concentrating innovation spending among a few large firms.

Financial Market Development and Innovation

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- More transparent **information environments** tend to boost corporate innovation by relaxing financial constraints and improving managerial learning from stock prices (Brown and Martinsson, 2019 MS).

Demographic/Social Traits and Innovation

- A **younger labor force** produces more innovation (Derrien, Kecskes, and Nguyen, 2023 RFS; Anelli, Basso, Ippedico, and Peri, 2023).
- An individual's **STEM background** affects his or her likelihood/style of doing innovation in the future (Bianchi and Giorcelli, 2020).
- Greater **labor scarcity** in an economy encourages the development of labor saving technologies (Acemoglu, 2010 JPE).
- Greater **religiosity** is associated with less favorable opinions about innovation and lower innovation outputs (Bénabou et al., 2013, 2015).
- Firms headquartered in countries with higher **gambling propensity** tend to undertake riskier projects, spend more on innovation, and generate greater innovative output (Chen, Podolski, Rhee, and Veeraraghavan, 2014; Adhikari and Agrawal, 2016).

WORKSHOP ON ENTREPRENEURIAL FINANCE AND INNOVATION

A bi-weekly, virtual workshop featuring research in entrepreneurial finance and innovation. The workshop is open to submissions at contact@workshop-efi.com.

The WEFI organizers are [Michael Ewens](#), [Camille Hebert](#), [Song Ma](#) and [Melanie Wallskog](#). Our two advisors are Yael Hochberg and David Robinson.

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- David Thesmar (MIT)
- David Robinson (Duke)
- Ufuk Akcigit (Chicago)
- Shai Bernstein (Harvard)
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- Xuan Tian (Tsinghua)
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