Introduction to Entrepreneurial Finance

La Rocca, M., La Rocca, T., & Cariola, A. (2011). Capital structure decisions during a firm's life cycle.

- study examines the financing choices of small and medium-sized enterprises (SMEs), which are particularly vulnerable to information and incentive problems, using the framework of the business life cycle
- study analyzed the strategic financing choices of SMEs during the business life cycle.
- The business life cycle differs significantly between **High-growth industries** vs. **low-growth industries** & **Emerging industries** vs. **traditional industries**.
- **Key Finding**: SMEs, which are highly vulnerable to information and incentive problems, are frequently constrained by limited access to external financing.
- bank-centric systems like Italy vs. equity-focused systems like the US significantly shapes financing choices.

Financial Life Cycle: Theory and Hypotheses

H1: Pecking-Order Theory	• Firms prefer internal financing (retained earnings) first. If internal funds are insufficient, they use debt as a second choice and equity as a last resort • This hierarchy is influenced by information asymmetry and transaction costs. • More profitable firms retain earnings and reduce leverage. Less profitable firms rely more on debt, consistent with the pecking-order theory
H2: Financial Lifecycle	• Young firms, due to high information opacity, rely on equity sources (e.g., venture capital) initially. As they mature and reduce information asymmetries, they transition to debt financing to meet additional needs. → **Not Supported.** • Contrary to expectations, debt plays a critical role in the early stages for firms, especially in bank-oriented financial systems like Italy, where private equity markets are underdeveloped.
H3: Reverse Financial Lifecycle	• Young firms use debt from banks (often backed by personal guarantees) to fund growth. Over time, as firms mature and accumulate internal resources, they reduce reliance on debt and use retained earnings instead. → **Supported.** • Debt is prevalent in early stages and gradually decreases as firms grow older and use internal financing for their operations.

What role does firm opacity play in the firm's capital structure decision?

Firms opacity	→ Firm opacity refers to the lack of transparency, creating **information asymmetries** between the firm and potential financiers. → **Informational opacity** is a critical determinant of a firm's financing behavior, especially when analyzed across different stages of the business life cycle. **Impact:** • Higher financing costs due to increased perceived risk. • Preference for trust-based funding (e.g., trade credit, angel investors). • Affects the cost of capital and limits access to traditional financing sources. • **Access to Financing:** High levels of informational opacity can restrict access to external financing, particularly debt. Lenders often require transparency regarding financial health and future prospects, and opaque firms may face higher costs • **Investor Perception:** Investors may perceive opaque firms as higher risk • Risk premium increases → higher opacity → higher risk → investor expect more return

Debt Financing:	→ Borrowed money to be repaid with interest, without relinquishing ownership → Danger of bankruptcy • **Bank Loans:** Short-term (e.g., working capital) and long-term loans. • **Corporate Bonds:** Debt securities with periodic interest payments. • **Trade Credit:** Deferred payment terms with suppliers (paying later) • **Leasing:** Access assets (e.g., equipment) without upfront purchase. • **Private Debt:** Loans from private entities or individuals. **Convertible debt:** starts as a **loan** (debt) with the option for the lender/investor to convert the debt into **equity** (ownership stake) at a later stage, often when the company meets certain milestones or in the event of a funding round. Bridging as from the debt phase where capital will be provided without diluting ownership making attractive for founder and then to the equity phase where this can be converted into equity (mostly early stages with uncertainty)

The Life Cycle Approach to Entrepreneurial Finance:

Seed Stage:	• Validate the business idea (market research, prototype, business plan). • **Funding Sources:** Personal savings, bootstrapping, informal investments (friends & family).
Startup Stage:	• Build and launch products/services; establish initial customer base (product development, marketing, operational expenses). • **Funding Sources:** Angel investors, seed-stage venture capital, crowdfunding platforms.
Growth Stage:	• Scale operations and market presence (production, marketing, hiring, new market entry). • **Funding Sources:** Venture capital, strategic partnerships, bank loans.
Expansion Stage:	• Enter new markets, launch new products (scaling production, workforce expansion, international growth). • **Funding Sources:** Venture capital, private equity, debt financing.
Maturity Stage:	• Maintain operations, explore innovations, and optimize market opportunities. • **Funding Sources:** Retained earnings, dividends, debt financing.
Exit Stage:	• Realize returns through exit strategies (selling, IPO, succession). • **Funding Sources:** Investment banks for IPOs, negotiations with acquirers.

Which environmental factors play a role in the capital structure decision?

Market Conditions	Economic conditions, such as interest rates and inflation, affect the cost of borrowing and the availability of financing
Regulatory Environment:	Legal and regulatory frameworks can impact financing options
Industry Dynamics	characteristics of the industry
Cultural and Societal Norms	Risk-taking behavior
Technological Trends	Crowdfunding
Governmental Conditions	Tax shield, Tax shelter, subsidies, public fundings, grants

Block, J. H., Colombo, M. G., Cumming, D. J., & Vismara, S. (2018). New players in entrepreneurial finance and why they are there. *Small Business Economics*, *50*(2), 239-250.

- Young innovative firms are suffering from financing constraints that are limiting their growth and threatening their survival, E.g.: Lack of internal cash flows and collaterals, as well as asymmetric information and agency problems are reason for the difficulties in raising external funding.

Overview and comparison of new players in entrepreneurial finance

Accelerators (and incubators)	• Are organizations that aim to help start-ups with mentorship, advice, network access, and shared resources to grow and become successful. • Sometimes they also offer physical space and financial resources (mostly in the form of equity).
Angel networks	• Networks of business angels who invest together in early-stage high growth ventures. • Provide equity and offer management support and network access. • Group can provide higher amounts of financing.
Crowdfunding	• Umbrella terms used to describe diverse forms of fundraising, typically via Internet, whereby groups of people pool money to support a particular goal.

Four main types of Crowdfunding

Reward-based	Backers receive rewards such as customized products, services, or community perks (e.g., name plaques, event invitations).
Donation-based	Funds are raised for charitable or social causes, with contributions ranging from small to large sums.
Lending-based	Largest in total funding, including peer-to-peer lending and invoice crowdfunding → Lenders are motivated by financial returns and assess default risks.
Equity-based	Backers receive company shares, similar to venture capital. → Driven by potential high financial returns and engagement in the business, offered via open or closed platforms.

Factors explaining the emergence of new players in entrepreneurial finance

Supply-side factors:	• Technological developments (information technology and platforms) • Investment opportunities (high-growth markets and opportunities) • Low-interest-rate environment • Social changes (social acceptance of entrepreneurial finance)
Demand-side factors:	• Needs of entrepreneurs (need for flexibility, faster access to capital, and less restrictive contracts); • Changing characteristics of entrepreneurial firms (higher growth expectations and risk-taking behavior); • Value creation opportunities (growth in networks and collaboration).

Cumming, D., Deloof, M., Manigart, S., & Wright, M. (2019). New directions in entrepreneurial finance. *Journal of Banking & Finance, 100*, 252-260.

Differences between Entrepreneurial Finance & Traditional Finance:

Focus on Young, Privately-Owned Firms	• Entrepreneurial finance specifically targets younger firms, particularly those that are privately owned, as opposed to the broader corporate finance that includes established public companies.
Information Asymmetries	• significant information asymmetries between entrepreneurs and finance providers, which vary throughout the firm's lifecycle • Information asymmetries create an insufficient supply to meet demand, leading policymakers to focus on the so-called equity gap. → Traditional finance typically deals with established firms where financial history and performance data are more readily available. → In entrepreneurial settings, the lack of a track record can complicate investment decisions, leading to issues of adverse selection and moral hazard.
Variety of Financial Providers	• different funding sources as VC, PE, BA, crowdfunding, and trade credit
Tangible and intangible assets	• Entrepreneurs often lack tangible and intangible resources (e.g., human capital, networks, reputation) essential for value creation

Lifecycle Dynamics	• funding needs and sources change significantly as firms progress through their lifecycle (seed, start-up, growth, maturity), unlike traditional finance, which often assumes a more stable and predictable capital structure for mature firms → Information asymmetries, risks, and resource needs change over the lifecycle of entrepreneurial firms

Why is it so important to obtain "appropriate" financing?

Alignment with Business Needs:	• Securing the right type of financing that aligns with the firm's growth stage, operational needs, and strategic goals is essential for sustainable growth. → Facilitating growth
Cost of capital	• cost associated with different financing sources varies → Equity financing may dilute ownership, while debt requires regular repayments → Choosing the appropriate mix of financing can optimize the cost of capital.
Access to Networks and Expertise:	• Certain investors, such as venture capitalists and business angels, bring valuable expertise and networks, which can be crucial for the firm's development. Appropriate financing can enhance not just capital but also strategic support.

Different sources of external financing available to entrepreneurial firms include:

Business Angels:	• Private individuals who provide capital, often in exchange for equity. They may also offer mentorship and industry connections. Their investments are typically based on personal networks and are less formalized compared to institutional investors.
Venture Capital:	• Institutional investors who provide funding in exchange for equity, often in stages (tranches) • typically invest in firms with high growth potential and take an active role in management.
Private Equity	• Investments made in privately-held companies or buyouts of public companies, often aimed at restructuring or improving efficiency for eventual resale or public offering. (own private managed funds)
Crowdfunding	• Raising small amounts of money from a large number of people, usually via online platforms. It can take various forms, including equity crowdfunding (offering shares) and reward-based crowdfunding (offering products or perks).
Bank Debt:	• Traditional loans provided by financial institutions, which become available once firms establish a track record and can provide collateral. This source of financing tends to require detailed financial documentation and is more accessible to firms with tangible assets.
Trade Credit	• Financing provided by suppliers that allows firms to purchase goods and services on credit. This is often a primary source of funding for early-stage companies that lack access to other forms of credit.

Valuing young companies & start-ups

- Range of different valuations DCF, VC-Method, First Chicago (There is no best method)
- Terminal value and discount rate
- Key person discount rate (what potentially happens if founder leaves) Trade off between uncertainty / complexity & simplicity

Financing choices of start-ups

Cole, R.A., & Sokolyk, T. (2018). Debt financing, survival, and growth of start-up firms

- explores the impact of debt financing on the survival and growth of start-up firms, specifically distinguishing between business debt (debt taken in the firm's name) and personal debt (debt taken in the owner's name for business purposes). → examines how different debt types relate to the long-term success of these start-ups.
- **Business debt** is often provided by informed lenders (banks and suppliers) who actively monitor the firm's performance → reduce information asymmetry
- **personal debt** is typically based on the owner's creditworthiness and lacks firm-specific monitoring.
- Banks play a crucial role in screening, selecting & monitoring high quality start-ups → Evidence shows that banks are successful in monitoring & managing risk in high-information asymmetry environments
- → **Debt Usage**: About 76% of start-ups in the sample used some form of debt in their initial year, with 44% using business bank credit, 24% using trade credit, and 55% relying on personal debt. Firms using business debt generally performed better in survival and growth metrics.
- **Self selection**: refers to the idea that high-quality start-up firms are more likely to apply for and obtain debt financing, particularly business debt, due to their better performance prospects and perceived creditworthiness. → Self-selection occurs when high-quality firms proactively choose to apply for business debt, knowing that they have a better chance of being approved due to their strong financials or competitive advantage. → Conversely, lower-quality firms might avoid applying for business loans and instead resort to personal debt, which often has lower screening requirements.

Table IV
Factors explaining the use of debt at the firm's start-up.
This table reports odds ratios from a weighted bivariate probit selection model. The sample includes 3243 Kauffman Firm Survey 2004 start-up firms with non-missing data for all variables. Column 1 presents the results from the first-stage probit model, examining the determinants of the use of debt. Columns 2, 3, and 4 present the results from the second-stage regression, where the dependent variable is *Business Bank Credit*, *Business Trade Credit*, and *Personal Debt*, respectively. *t*-Statistics are in parentheses. Variable definitions are in Table I. *State-Level SME Lending* is a predicted value of the amount of state-level bank lending to small and medium enterprises, scaled by the number of small/medium firms in the state, on the amount of state-level homestead bankruptcy exemption. Industry dummies (based on two-digit NAICS codes) are included but omitted from the table for the sake of brevity. Survey weights are applied.

Variable	1	2	3	4
	First stage:	Second stage:	Second stage:	Second stage:
	Debt (any type)	Business bank credit	Business trade credit	Personal debt
Firm characteristics:				
Ln (Revenue + 1)	1.040	1.030	1.063	0.973
	(6.25)***	(5.27)***	(2.89)***	(−4.39)***
Corp	1.158	1.345	1.027	0.957
	(2.12)**	(4.70)***	(0.26)	(−0.63)
Multiown	0.955	1.102	1.104	0.848
	(−0.64)	(1.54)	(1.33)	(−2.49)**
Credit risk	0.900	0.890	0.888	1.109
	(−2.40)**	(−2.98)***	(−2.11)**	(2.45)**

H1: High-quality start-ups are more likely to secure debt financing. Start-ups with better growth prospects are likelier to seek and obtain debt.	• **Supported:** Higher-quality firms with better revenue and credit ratings are more likely to use debt. This confirms that lenders favor firms with strong initial performance indicators • **Ln(Revenue + 1):** Odds ratio = 1.040 (**statistically significant**), indicating that higher revenue increases the likelihood of obtaining debt.

	→ Self-selection explains why high-quality firms are more likely to obtain debt financing, especially business debt, as they choose options that align with their growth prospects.
H2: High-quality start-ups are more inclined to secure business debt than personal debt.	• **Supported:** High-quality firms are more likely to secure business bank credit or trade credit, as lenders prioritize firms with strong business fundamentals and prospects. • **Ln(Revenue + 1):** Odds ratio = 1.030 for business bank credit (**statistically significant**). • **Credit Risk:** Odds ratio = 0.890 for business bank credit (**statistically significant**), indicating better credit risk increases the likelihood of obtaining business debt. → Self-selection explains why high-quality firms are more likely to obtain debt financing, especially business debt, as they choose options that align with their growth prospects.
H3: Conversely, low-quality start-ups are more likely to obtain personal debt rather than business debt due to lender selection or borrower self-selection.	• **Supported:** Lower-quality firms are steered towards personal debt due to higher risks or lack of business creditworthiness. • **Ln(Revenue + 1):** Odds ratio = 0.973 (**statistically significant**), indicating lower-quality firms are more likely to use personal debt. • **Credit Risk:** Odds ratio = 1.109 (**statistically significant**), suggesting lower credit quality increases personal debt usage

Table V
Debt use and firm performance: survival analysis.
This table reports hazard ratios from the Cox proportional hazard model. The dependent variable is the probability that firm *i* will be out of business by year *t*, conditioning on firm *i* surviving up to time *t* (=2005–2007). Independent variables are from KFS 2004 and are described in Table I. *Ln (Debt Amount + 1)* is the natural algorithm of one plus the sum of amounts of business bank credit, business trade credit, and personal debt). *Ln(Revenue + 1)* is the natural logarithm of one plus the level of revenue at the firm's start-up. Where indicated, regressions include controls for *Firm Characteristics*, *Owner Characteristics*, *Other Sources of Capital*, and *Industry Classifications*, all from KFS 2004. *State-Level SME Lending* is a predicted value from the regression of the amount of state-level bank lending to small and medium enterprises, scaled by the number of small/medium firms in the state, on the amount of state-level homestead bankruptcy exemption. The full set of results is presented in Appendix Table A column (1). Survey weights are applied. *z*-Statistics are reported in parentheses.

Variable	1	2	3
Debt (any type)	0.706 (−3.301)***		
Business bank credit		0.842 (−2.413)**	0.776 (−2.78)***
Business trade credit		0.940* (−0.677)	0.980 (−0.173)
Personal debt		0.980 (−0.274)	0.992 (−0.086)

Table VI
Debt use and firm performance: revenue analysis.
This table reports Weighted Least Squares regressions of revenue, measured as the natural logarithm of one plus the level of revenue three years after the firm's start-up (KFS, 2007). Independent variables are from KFS 2004 and are described in Table I. *Inverse Mills Ratio* is estimated from the probit regression of the firm's survival to 2007. Where indicated, regressions include controls for *Firm Characteristics*, *Owner Characteristics*, *Other Sources of Capital*, and *Industry Classifications*, all from KFS 2004. *State-Level SME Lending* is a predicted value from the regression of the amount of state-level bank lending to small and medium enterprises, scaled by the number of small/medium firms in the state, on the amount of state-level homestead bankruptcy exemption. The full set of results is presented in Appendix Table A column (2). Survey weights are applied. *t*-Statistics are reported in parentheses.

Variable	1	2	3
Debt (any type)	0.266 (0.670)		
Business bank credit		0.832 (3.077)***	0.647 (2.36)***
Business trade credit		0.724 (2.152)**	0.317 (0.91)*
Personal debt		−0.934 (−3.401)***	−0.849 (−3.12)***

H4: Firms that secure debt (particularly business debt) at start-up have higher survival and growth rates compared to those without debt.	• Supported: Firms using any form of debt have higher survival rates and revenue growth, indicating the importance of early-stage debt financing for stability and growth.

	• Debt (Any Type): Hazard ratio = 0.706 (statistically significant), showing a 30% lower hazard rate of going out of business.
H5: Start-ups with business debt (especially from banks) show stronger performance outcomes than those with personal debt.	• Supported: Business debt (especially bank credit) correlates with higher survival and revenue growth. Personal debt does not provide similar benefits and may hinder revenue growth. • Business Bank Credit (Survival): Hazard ratio = 0.776 (statistically significant), indicating a 22.4% higher survival rate. • Business Bank Credit (Revenue): Coefficient = 0.647 (statistically significant), showing positive impact on revenue growth.

- For start-up founders, obtaining business debt (especially from banks or suppliers) can improve survival and growth prospects. Investors and lenders can use these findings to better assess start-up creditworthiness and financing decisions.
- Firms with higher initial revenues and perceived competitive advantages are more likely to secure business debt.
- Business debt (obtained from informed lenders like banks) is associated with better survival rates and revenue growth.
- Personal debt, often sourced from less-involved lenders, does not significantly impact survival and may relate to lower future revenues.
- The form of debt matters: business debt correlates positively with firm survival, while personal debt does not show the same beneficial effect.

Nofsinger, J.R. and Wang, W. (2011). Determinants of start-up firm external financing worldwide.

Information Asymmetries:	• Significant challenges exist between start-ups and investors. • Essential for entrepreneurs to credibly communicate their project's value. **Overcoming Information Asymmetry**: • Investors evaluate signals from entrepreneurs and ventures → Signals as Product type (new vs. existing), Production technology (new vs. existing), Entrepreneur's experience **Reducing Information Asymmetry**: • Investors evaluate business quality and entrepreneur's capabilities. • Start-up characteristics affect external financing likelihood. • Venture capitalists (VCs) are more likely to fund innovative products. • Informal financing often involves people with social connections to the entrepreneur (family, friends). • Social ties may mitigate moral hazard due to shared social obligations.
Types of Investors:	• **Institutional Investors**: Venture capital funds, banks, government agencies. • **Individual Investors**: Angels and informal investors. • Informal investors differ from angels by their relationship with the entrepreneur. **Impact of Investor Protection**: • Access to financing also depends on protection against opportunistic behaviors. • Formal laws (contract enforcement, property protection) and social connectedness are crucial. • Social relationships are especially valuable in low-legal protection environments. • Investor protection positively impacts access to external financing. **Preferences of Investor Types**: • Informal investors favor start-ups with product focus. • Institutional investors prefer existing products and experienced entrepreneurs.

	• **Stages of Capital Acquisition**: Early stages: angel investors; later stages: venture capital → IPO • **Information Asymmetry and Moral Hazard**: critical issues in capital acquisition. • Solutions include monitoring, contractual rights, capital staging, and risk-sharing. • Venture capital contracts often include: Cash flow rights, voting control, decision-making control; Time-varying contracts (e.g., staged financing) to reduce information asymmetry.

Table 7
Informal financing. Logit regressions are shown of the presence of informal financing on informational characteristics (product type, production technology, and entrepreneur experience), log of investor protection score, and interaction terms. New product = 1 if the product is new to all or some consumers, 0 otherwise; new technology = 1 if the production technology was not available 1 year ago, zero otherwise; prior start-up experience = 1 if entrepreneur has prior start-up experience, 0 otherwise. Investor protection score is equal to the sum of the protection of private property, quality of contract enforcement, and transformed freedom from corruption[a]. The higher the score, the better investors are protected. Growth firm = 1 if the projected employment in 5 years is larger than or equal to 20, 0 otherwise. (Standard error is provided in the parentheses.)

	1	2	3	4	5
New product	2.76**			3.21***	2.58**
	(1.11)			(1.16)	(1.26)
New technology		−1.24		−2.10	−1.04
		(−1.60)		(−1.65)	(−1.82)
Prior start-up experience			2.42	2.25	3.12
			(2.04)	(2.07)	(2.52)
Investor protection	1.70***	1.33***	2.19***	2.41***	2.97***
	(0.24)	(0.20)	(0.69)	(0.71)	(0.88)
New product × investor protection	−0.91**			−1.08***	−0.85*
	(−0.39)			(−0.40)	(−0.44)
New technology × investor protection		0.47		0.75	0.38
		(0.56)		(0.58)	(0.64)
Prior start-up experience × investor protection			−0.90	−0.84	−1.15

Table 8
Institutional financing. Logit regressions are shown of the presence of institutional financing on informational characteristics (product type, production technology, and entrepreneur experience), log of investor protection score, and interaction terms. New product = 1 if the product is new to all or some consumers, 0 otherwise; New technology = 1 if the production technology was not available 1 year ago, zero otherwise; prior start-up experience = 1 if entrepreneur has prior start-up experience, 0 otherwise. Investor protection score is equal to the sum of the protection of private property, quality of contract enforcement, and transformed freedom from corruption. The higher the score, the better investors are protected. Growth firm = 1 if the projected employment in 5 years is larger than or equal to 20, 0 otherwise. (Standard error is provided in the parentheses.)

	1	2	3	4	5
New product	−1.96*			−1.97*	−1.91
	(−1.13)			(−1.16)	(1.24)
New technology		0.12		0.59	−0.12
		(1.55)		(1.60)	(−1.77)
Prior start-up experience			4.76*	4.63*	6.01**
			(2.45)	(2.45)	(3.01)
Investor protection	0.40*	0.74***	2.27***	1.88**	2.30**
	(0.24)	(0.20)	(0.81)	(0.83)	(1.03)
New product * investor protection	0.79**			0.77*	0.75*
	(0.39)			(0.40)	(0.43)
New technology * investor protection		0.08		−0.11	0.11
		(0.53)		(−0.55)	(0.61)
Prior start-up experience * investor protection			−1.61*	−1.56*	−2.03**
			(−0.84)	(−0.84)	(−1.02)
Size	−0.03	−0.04	−0.04	−0.035	−0.03
	(−0.03)	(−0.03)	(−0.03)	(−0.03)	(−0.03)
Financial development/GDP					

Investor Responses to Signals:

H1: A **new product** signals innovation, leading to better access to external financing or signals risk and uncertainty, leading to worse access to external financing.	• Informal financing: **Supported for positive signal**. Informal investors view new products as innovative, leading to higher likelihood of financing (Table 7). • Institutional financing: **Supported for negative signal**. Institutional investors see new products as risky, reducing the likelihood of financing (Table 8).
H2: The use of **new production technology** can signal either efficiency (positive signal) or uncertainty (negative signal), affecting access to external financing.	• Informal financing: **Not supported**. New technology has no significant impact on informal financing (Table 7). • Institutional financing: **Not supported**. New technology is also insignificant for institutional financing (Table 8).
H3: Prior **entrepreneurial experience** signals managerial skills (positive signal, better access to financing) or potential	• Informal financing: **Not significant**. Social ties of informal investors mitigate the need for entrepreneurial experience (Table 7)

for self-serving behavior (negative signal, worse access to financing).	→ Social relationship theory = informal investors rely on private information obtained through social ties (e.g., friends, family), making prior entrepreneurial experience less important. • Institutional financing: **Supported for positive signal**. Prior experience strongly increases the likelihood of institutional financing (Table 8).
H4: Investor protection moderates the effect of signals on access to financing.	New product: • Informal financing: Investor protection less important; informal investors rely on social ties to reduce risks (Table 7). • Institutional financing: Investor protection more important; institutions prefer strong legal systems for risky ventures (Table 8). Entrepreneurial experience: • Institutional financing: Investor protection less important when entrepreneurs are experienced, reducing moral hazard concerns (Table 8).
H5: Firms with high growth potential are more likely to attract external financing.	• Informal financing: Supported. Informal investors favor firms with strong growth prospects (Table 7). • Institutional financing: Not significant. Growth potential does not significantly affect institutional financing decisions (Table 8).

Differences in Financing Approaches:
→ **Expertise**: Institutions have resources to overcome information asymmetry.
→ **Accountability**: Institutional investors answer to stakeholders with varied interests.
→ **Reliance on Formal Protection**: Institutions depend on legal protections; informal investors rely on social connections.

	External financing ratio			
	1	2	3	4
Informational characteristics				
New product	−0.0011 (0.0118)			−0.0043 (0.0116)
New technology		0.0336** 0.016		0.0259* (0.0158)
Prior starting-up experience			0.0486** (0.0197)	0.0444** (0.019)
Control variables				
Size				0.0250*** (0.0028)
Financial development/GDP				0.0018 (0.0063)
Intercept	0.6257*** (0.0083)	0.6197*** (0.0064)	0.5797*** (0.0186)	0.3229*** (0.032)
Number of observations	1869	1869	1831	1831
Noncensored value	1238	1238	1209	1209
Log likelihood	182.1	184.3	181.8	230

* 10% Significant.
** 5% Significant.
*** 1% Significant.

- Examines how certain firm-level characteristics (new product, new technology, entrepreneurial experience) affect the external financing ratio (percentage of total investment sourced externally).
- New Product: Coefficient = -0.0043, not significant. Indicates that introducing a new product does not significantly influence the external financing ratio.
- New Technology: Coefficient = 0.0259*, significant at the 10% level. Firms using new technology receive slightly higher external financing, indicating a positive but modest impact.
- Entrepreneurial Experience: significant Coefficient = 0.0444 → Entrepreneurs with prior experience are more likely to secure external financing.
- Size of Firm: Significant Coefficient = 0.0250 → Larger startups secure higher external financing, reflecting the importance of scale.

→ Entrepreneurial experience and firm size are strong predictors of external financing.

→ New product introduction does not attract more financing, potentially due to perceived risks or uncertainty.

Investor Protection

Table 6
Sorting by Investor Protection. The external financing ratio is calculated as the total investment minus the self-investment divided by the total investment. External financing diversity = sum of the number of external financing channels including: (1) work colleague, (2) employer, (3) friends and neighbors, (4) banks and other financial institutions, and (5) government program. Countries are sorted into quartiles of property rights, contract enforcement, and freedom from corruption. Equal-weighted averages are reported for each quartile. The *F*-statistic tests whether the four mean financing variables are equal, while the *t*-statistic tests whether the two extreme group means are equal.

	Property right protection					
	1 (Worst)	2	3	4 (Best)	Joint equality *F-stat*	'Worst' vs. 'Best' *t-stat*
External financing ratio	0.385	0.397	0.429	0.441	2.98**	−2.67***
External financing diversity	0.963	1.314	1.358	1.367	24.84***	−7.54***
	Contract enforcement					
	1 (Worst)	2	3	4 (Best)	Joint equality *F-stat*	'Worst' vs. 'Best' *t-stat*
External financing ratio	0.386	0.42	0.424	0.434	1.72	−1.78*
External financing diversity	0.96	1.34	1.372	1.354	26.02***	−5.68***
	Freedom from corruption					
	1 (Worst)	2	3	4 (Best)	Joint equality *F-stat*	'Worst' vs. 'Best' *t-stat*
External financing ratio	0.384	0.4	0.44	0.444	3.18**	−2.17**
External financing diversity	0.947	1.32	1.35	1.431	28.05***	−6.91***

- Assesses how varying levels of investor protection (property rights, contract enforcement, and corruption) impact the external financing ratio and diversity.

→ External Financing Ratio: Measures the share of external financing in total investment.
→ External Financing Diversity: Reflects the number of different sources of external financing accessed by firms.

Findings Across Quartiles (Best vs. Worst Investor Protection):

External Financing Ratio:	External Financing Diversity:
• Best protection quartile: 44.1%. • Worst protection quartile: 38.5%. • Higher investor protection increases the proportion of external financing (significant at the 1% level for property rights and freedom from corruption).	• Best protection quartile: 1.367 (average number of financing sources). • Worst protection quartile: 0.963. • Startups in countries with stronger investor protection have access to a more diverse range of financing sources.

- **Influence of Investor Protection**: Stronger investor protections increase willingness to provide capital.
- **Protection Proxies**: Private property protection, contract enforcement quality, freedom from corruption.

Country Grouping:

- Countries sorted by investor protection levels.
- Higher protection is associated with greater financing access and diversity.
- Better investor protection positively affects early-stage financing.
  → Countries with strong property rights protection and effective contract enforcement generally show higher external financing ratios and greater diversity in financing sources.

→ Startups in environments with strong investor protection (in terms of property rights, contract enforcement, and low corruption) benefit from higher external financing ratios and a more diverse range of funding sources.
→ This supports the importance of institutional and legal frameworks in determining access to capital for startups.

Problem with Incomplete Contracts: Incomplete contracts refer to agreements that cannot account for every possible future scenario, leading to potential conflicts between entrepreneurs and investors: Moral Hazard: Entrepreneurs may have incentives to act in ways that benefit them at investors' expense, especially when unforeseen circumstances arise.

Incomplete contracts leave investors vulnerable to such actions, as all contingencies cannot be pre-defined

Vaznyte, E., & Andries, P. (2019). Entrepreneurial orientation and start-ups' external financing. *Journal of business venturing, 34*(3), 439-458.

- study builds on pecking order theory (POT) by investigating how a start-up's entrepreneurial orientation (EO), its strategic attitude towards innovation, risk-taking (willingness to commit resources to uncertain ventures) and market proactivity (strategic positioning to seize market opportunities ahead of competitors → influences financial decision-making.

Pecking Order Preference:

- Start-ups with low EO are more likely to follow the traditional financing hierarchy of Pecking order theory, preferring external debt over equity (cost of debt is lower than cost of equity)
- high EO start-ups deviate from this order and often prioritize equity financing.

→ Impact of EO and Contextual Factors: EO, alongside a start-up's development stage and industry-level risk, influences the financing strategy more in the early stages than later in a firm's life cycle.

Dimensions of Entrepreneurial Orientation (EO)

1. **Risk-taking**: The tendency to engage in ventures with moderate risk.
2. **Innovativeness**: The pursuit of new ideas and innovative solutions.
3. **Proactiveness**: An anticipatory, opportunity-seeking approach.
4. **Autonomy**: Independent action in decision-making.
5. **Competitive Aggressiveness**: A strong stance against competitors to outpace competitors with 'first-mover' advantages (=a firm's ability to be better off than its competitors as a result of being first to market in a new product category.)

Table 2
Tobit model for a share of debt and equity financing.

	Share of debt financing			Share of equity financing		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
EO		1.923	−81.970		13.909***	103.761
		(1.445)	(50.430)		(3.198)	(117.594)
Industry-level risk		−0.474**	−1.390**		1.319***	2.441
		(0.214)	(0.574)		(0.409)	(1.516)
EO*Ind.-level risk			0.296*			−0.314
			(0.178)			(0.411)

H1: EO is **negatively associated** with the use of external debt financing.	**Not supported** • results did not support this hypothesis as the effect of EO on debt financing was positive but not significant.
H2: EO is **positively associated** with the use of external equity financing.	**Supported** • Start-ups with higher EO are more inclined to secure equity financing, highlighting their preference for funding that aligns with innovative and risk-taking strategies.
H3: The relationship between EO and debt financing is **more negative in less risky industries** compared to riskier ones.	**Supported** • suggests that in higher-risk industries, the relationship between EO and debt financing becomes more positive, indicating that debt providers may see high-EO firms as better suited for riskier environments
H4: The relationship between EO and equity financing is **more positive in riskier industries** compared to less risky ones.	**Not Supported** • The results did not support the hypothesis, indicating that industry risk does not significantly affect the relationship between EO and equity financing.

Development Stage - Break-even Point:

- **Early-Stage Start-ups**: High EO start-ups pre-break-even face high information asymmetries, making debt costlier and equity more beneficial.
- **Post-Break-even**: As these firms gain stability, information asymmetries decrease, and their funding costs lower for both debt and equity.

Table 4
Tobit model for a share debt and equity financing before and after break-even point.

	Share of debt financing				Share of equity financing			
	Before breakeven		After breakeven		Before breakeven		After breakeven	
	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
EO	2.025	−143.677*	0.165	61.143	15.914***	225.737	2.721	73.916
	(2.299)	(75.307)	(1.699)	(59.037)	(3.891)	(145.201)	(3.968)	(123.839)
Ind.-level risk	−0.034	−1.731*	−0.987***	−0.371	1.252***	3.948**	0.549	1.338
	(0.314)	(0.924)	(0.255)	(0.652)	(0.474)	(1.895)	(0.543)	(1.608)
EO*Ind.-level risk		0.511*		−0.216		−0.730		−0.251
		(0.265)		(0.209)		(0.506)		(0.437)

H5: The relationship between EO and debt financing is **more negative before the break-even point** compared to after.	**Not supported** → Break-even status did not show a significant moderating effect on EO's impact on debt financing
H6: The relationship between EO and equity financing is **more positive before the break-even point** compared to after.	**Supported** → The relationship between EO and equity financing is significantly more positive before the break-even point compared to after it
H7: The effect of industry-level risk on EO's relationship with debt financing is **stronger before break-even** compared to after.	**Supported** → Industry-level risk significantly strengthens the negative relationship between EO and debt financing before the break-even point. This implies that in high-risk industries, startups with high EO are assessed more positively by debt providers before they become profitable
H8: The effect of industry-level risk on EO's relationship with equity financing is **stronger before break-even** compared to after.	**Not supported** → The moderating effect of industry-level risk on the EO-equity financing relationship was not significant. This indicates that while industry-level risk may impact the relationship between EO and debt financing, it does not have a comparable moderating effect on equity financing

Crowdfunding P2P lending

Walthoff-Borm, X., Schwienbacher, A., & Vanacker, T. (2018). Equity crowdfunding: First resort or last resort?

Influence of entrepreneurial orientation on entrepreneur's choice to use crowdfunding

- some start-ups prefer external equity over external debt financing
- Start-ups with high EO are more likely to attract equity financing because investors view their strategic dynamism as a sign of high growth potential.
- High EO firms often welcome external input and resources, making them more inclined to partner with equity investors.

- Why do firms search for ECF? → Equity crowdfunding, for instance, is associated with less stringent contractual terms → possibility that the emergence of equity crowdfunding reverts or distorts the traditional pecking order

Impact on financing:	Start-ups with a high EO are more likely to attract equity financing as investors see their high strategic dynamism as a sign of high growth potential → Companies with a high EO often welcome external input and resources, making them more willing to work with investors.
Attractiveness to investors:	Investors tend to favor companies with a high EO, especially in sectors where innovation and proactivity are critical to success, as these characteristics indicate adaptability and resilience in uncertain markets.
Risk Taking:	Crowdfunding is inherently uncertain, as the outcome depends on public acceptance and engagement. Entrepreneurs with a high risk attitude and entrepreneurial orientation are more willing to accept this uncertainty and use crowdfunding as a way to test the market

→ **Limitations of the pecking order theory for start-ups:** The pecking order theory is only applicable to start-ups to a limited extent due to the influence of entrepreneurial orientation. Start-ups with a high degree of innovation, proactivity and risk-taking are more likely to deviate from traditional financing preferences and opt for flexible, equity-based or alternative financing methods that better fit their strategic goals and growth aspirations.

Control & Liquidity Aspect

Control Aspect:	• entrepreneurs retain direct control over their projects while allowing the public to buy equity (or in the case of reward-based no equity at all) • enables founders to maintain majority decision-making power while raising funds
Liquidity Aspect:	• the possibility for investors to buy and sell their shares in the company • provides liquidity for investors, allowing them to invest relatively small amounts with potential returns → Unlike traditional private investments, some equity crowdfunding platforms offer options for investors to sell shares on secondary markets, enhancing liquidity • but usually illiquid asset

"Wisdom-of-crowd paradigm" = the average of the crowd's assessments is more accurate than the judgment of an experienced expert

Is ECF a last resort?

Dependent variable	Sample 1				Sample 2	
	Searched for equity crowdfunding				Searched for equity crowdfunding	
	Model 1 Marginal effect	Model 2 Marginal effect	Model 3 Marginal effect	Model 4 Marginal effect	Model 5 Marginal effect	Model 6 Marginal effect
Independent variables						
Internal funds		−0.209***	−0.200***	−0.201***		−0.041***
		(0.044)	(0.044)	(0.045)		(0.010)
Excessive debt levels (negative equity)		0.356***				0.186***
		(0.098)				(0.065)
Excessive debt levels (> 95%)			0.171**			
			(0.088)			
Excessive debt levels (> 90%)				0.158*		
				(0.087)		
Tangible fixed assets ratio		0.187	0.214	0.209		0.059
		(0.161)	(0.152)	(0.152)		(0.103)
Intangible fixed assets ratio		0.743***	0.821***	0.806***		0.598***
		(0.18)	(0.178)	(0.176)		(0.143)

H1: Entrepreneurial firms with more internally generated funds are less	→ Model 2: Increasing internal funds by one standard deviation reduces the probability of ECF search by approximately 21%.

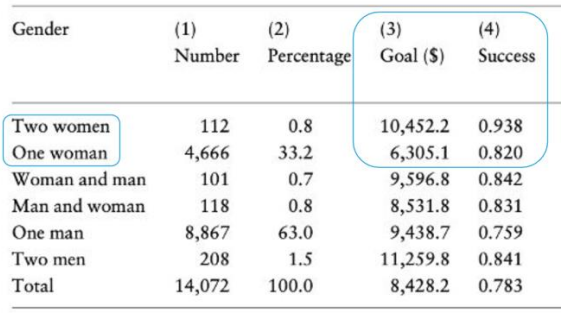
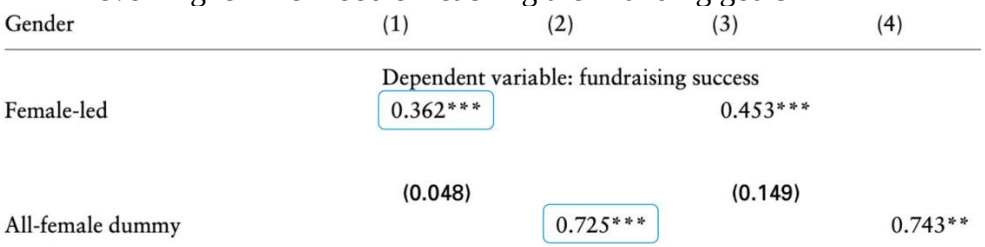
likely to seek equity crowdfunding	→ Model 6: Increasing internal funds by one standard deviation reduces the probability of ECF by approx. 4%. → Company is already leveraged and therefore less likely to be interested in seeking ECF
H2: Entrepreneurial firms with lower debt capacity (i.e., with excessive debt levels) are more likely to seek equity crowdfunding.	→ Model 2: Firms with negative equity ratios are approx. 35.6% more likely to search for ECF → Model 6: Firms with further negative equity ratios are 18.6% more likely to search for ECF --> Companies in Sample 2 are already heavily dependent on external debt capital and may have fixed financing structures and agreements with lenders. -> These companies may therefore be more cautious about raising additional equity, even with rising debt levels --> As they have already decided on a financing strategy, there is less incentive to switch to ECF immediately
H3: Entrepreneurial firms with **(a) less tangible fixed assets and** **(b) more intangible fixed assets are more likely to seek equity crowdfunding.**	→ (a): No significant influence of tangible assets on the likelihood of searching for ECF **→ (b): Significant influence** → Model 2: Increasing intangible assets by one standard deviation increases the probability of ECF search by 74.3% → Model 6: Increasing intangible assets by one standard deviation increases the probability of ECF search by 59.8% If companies haven't any tangible assets and only rely on intangible asset they could be unable to offer collateral, their only option is often to use ECF as this does not require collateral → probability is lower in model 6 as they already have debt which requires some collateral

Gafni, H., Marom, D., Robb, A., & Sade, O. (2021). Gender dynamics in crowdfunding (Kickstarter): Evidence on entrepreneurs, backers, and taste-based discrimination.

Literature Review about the Gender Disparities in Funding

- **Underrepresented Investors**: Women make up <15% of angel investors and 9% in VC in the U.S
- **Lower Success Rates**: Female founders face a 19% success rate in angel funding, showing gender-based barriers
- **Goal Setting & Risk**: Women set funding goals at 77.5% of male founders' goals and take fewer risks
- **Homophily Effect**: Preference for similar individuals limits women's access to key networks
- **Crowdfunding Inclusivity**: Lower barriers make crowdfunding more accessible for women
- **Gender Bias in Pitches**: Studies show investors prefer male-led pitches, even with identical content

H1: The level of participation of female entrepreneurs on the platform is different from the level of participation of male entrepreneurs.	**supported** women project leaders in the Kickstarter sample was 34.7% and increased slightly to 36.4% of funded projects → shows that female-led projects are not only present but also slightly more successful in funding, indicating that female entrepreneurs are actively contributing on the platform despite the general gender gap

<table>
<tr><td>H2: Female entrepreneurs participate in different project categories at a different rate than male entrepreneurs.</td><td>Supported - strong gender segmentation in project categories
Women were predominantly represented in categories like Dance (77%) and Fashion, but significantly underrepresented in others such as Comics, Design, Games, and Technology, where male project leaders accounted for 76-92% of projects</td></tr>
<tr><td>H3: Female entrepreneurs set lower funding goals than male entrepreneurs.</td><td>Supported
 
<table>
<tr><th>Gender</th><th>(1)
Number</th><th>(2)
Percentage</th><th>(3)
Goal ($)</th><th>(4)
Success</th></tr>
<tr><td>Two women</td><td>112</td><td>0.8</td><td>10,452.2</td><td>0.938</td></tr>
<tr><td>One woman</td><td>4,666</td><td>33.2</td><td>6,305.1</td><td>0.820</td></tr>
<tr><td>Woman and man</td><td>101</td><td>0.7</td><td>9,596.8</td><td>0.842</td></tr>
<tr><td>Man and woman</td><td>118</td><td>0.8</td><td>8,531.8</td><td>0.831</td></tr>
<tr><td>One man</td><td>8,867</td><td>63.0</td><td>9,438.7</td><td>0.759</td></tr>
<tr><td>Two men</td><td>208</td><td>1.5</td><td>11,259.8</td><td>0.841</td></tr>
<tr><td>Total</td><td>14,072</td><td>100.0</td><td>8,428.2</td><td>0.783</td></tr>
</table></td></tr>
<tr><td>H4: Female entrepreneurs will, ceteris paribus, achieve lower success rates than male entrepreneurs.</td><td>Not supported
Female entrepreneurs enjoying a higher success rates (<u>was proven in a logistic regression model</u>
Baseline is man led projects (=0 in the dummy variable scenario) therefore the female led is higher compared to women
coefficient for “Female-led” is 0.362 (significant), indicating a positive association between female-led projects and higher success rates, even after controlling for funding goals and other variables
all-female dummy (teams entirely consisting of women) shows a significant coefficient of 0.725, reinforcing that projects led by all-women teams have an even higher likelihood of reaching their funding goals 
<table>
<tr><th>Gender</th><th>(1)</th><th>(2)</th><th>(3)</th><th>(4)</th></tr>
<tr><td></td><td colspan="4">Dependent variable: fundraising success</td></tr>
<tr><td>Female-led</td><td>0.362***</td><td></td><td>0.453***</td><td></td></tr>
<tr><td></td><td>(0.048)</td><td></td><td>(0.149)</td><td></td></tr>
<tr><td>All-female dummy</td><td></td><td>0.725***</td><td></td><td>0.743**</td></tr>
</table></td></tr>
<tr><td>H5: The level of participation of female backers on the platform will be different from the level of participation of male backers.</td><td>Used GLM to examine the participation patterns of female and male backers on Kickstarter → hypothesis aimed to test whether female participation as backers was significantly different from that of male backers
Generalized Linear Model (GLM): to analyze the likelihood of female versus male participation as backers (GLM allowed for flexibility in the distribution of the outcome variable, which in this case was whether a backer was female or male → particularly useful when the dependent variable follows a non-normal distribution, as is common in participation studies <u>where outcomes may be binary (e.g., female vs. male participation)</u>
general information is that 44.8% of backers on Kickstarter are women, while 55.2% are men → so we look for the proportion
the male proportion rises to 73.9% for serial backers (Backers which contributed to more than 5 projects)
→ Female backers' participation is higher than male backers on Kickstarter
→ evidenced by the All-female dummy coefficient of 0.041 (significant), which suggests that projects with only female backers participate at a higher rate than those involving male backers</td></tr>
</table>

	(1) (2) (3) (4) Dependent variable: Proportion of female backers GLM Tobit GLM Tobit All-female dummy (only females) 0.041** 0.041** (0.016) (0.016) All-male dummy (only males) −0.061*** −0.062*** (0.016) (0.016) Female-led 0.100*** 0.101*** (0.003) (0.003)
H6: Women will tend to fund female entrepreneurs, while men will tend to fund male entrepreneurs.	• **Tobit Model** was applied to handle the **proportion of female backers** supporting projects • Model is suitable for datasets with censored data, where the dependent variable (share of female backers) may be constrained at zero or one, making it ideal for analyzing proportions or rates → 40% of female backers' contributions go to female-led projects, whereas male backers contribute only 23% of their support to female-led initiatives → projects led by female entrepreneurs have a positive coefficient (0.101) for female backers, indicating that female-led projects attract a significantly higher share of female backers than male-led projects do → male-led projects show a negative coefficient (−0.062) when predicting female backer contributions, meaning female backers are less likely to support projects led by male (1) (2) (3) (4) Dependent variable: Proportion of female backers GLM Tobit GLM Tobit All-female dummy 0.041** 0.041** (0.016) (0.016) All-male dummy −0.061*** −0.062*** (0.016) (0.016) Female-led 0.100*** 0.101*** (0.003) (0.003)

Difference between TBD & SD

Taste-Based Discrimination (TBD):	• occurs when backers choose projects based on a personal preference for supporting entrepreneurs of their own gender, not because of rational project characteristics → If a male backer avoids female-led projects because of a bias, this is considered TBD • TBD: Hiring only employees from a specific ethnic group
Statistical Discrimination (SD):	• based on perceived characteristics of a group rather than personal preference → a backer might avoid certain categories if they believe projects in those categories are less likely to succeed, regardless of the project leader's gender • SD: Age discrimination in insurance

H7: The preference for contributing to a female-led project is correlated with taste-based discrimination.	• Gender Inequality (GI) metric has a negative and marginally statistically significant coefficient for male backers funding female-led projects → Specifically, the GI coefficient for males is -0.172 (at 10%) and is in the other model -0.102 (at 10%) → Indicates that as the GI score increases (reflecting more traditional views on gender roles), male backers are less likely to fund female-led projects

	→ For **female backers, the GI metric is not statistically significant in either model**, suggesting that TBD does not strongly impact female backers' funding choices toward female-led projects. This finding highlights that while male backers exhibit a bias influenced by TBD, female backers do not show a significant gender bias related to their views on gender roles • **Backer's Gender Dummy:** The dummy variable for Backer is a Woman has a positive coefficient of 0.863 in the logit model (significant at the 10% level), indicating that **female backers are generally more supportive of female-led projects**, though this **effect is likely due to social preferences rather than TBD specifically**

	Contribution to a female-led project	Female	Male	Contribution to a female-led project	Female	Male
	LOGIT			*PROBIT*		
Gender inequality	−0.103*	−0.022	−0.172*	−0.064*	−0.012	−0.102*
	(0.058)	(0.091)	(0.095)	(0.035)	(0.057)	(0.056)
Backer is a woman	0.863*			0.527*		
	(0.490)			(0.291)		

Case 1 Sizable: Crowdfunding

Tax Shield:	• refers to the reduction in taxable income achieved through deductible expenses, such as interest payments or depreciation • For instance, using debt financing can lower a company's taxable income and, subsequently, its tax burden.
Tax Shelter:	• A tax shelter is a strategy or investment vehicle that provides tax advantages, often by deferring, reducing, or exempting taxes • Examples include investments in start-ups or small businesses under favorable tax incentive schemes like the "Tax Shelter" program in Belgium. • **Increases Attractiveness to Investors:** Tax Shelter made Sizable more appealing to a broader range of investors by reducing their perceived risk and providing tangible financial benefits • **Stronger Investor Confidence and Trust:** Leveraging the Tax Shelter fostered investor confidence by signaling Sizable's financial and strategic planning competence. It demonstrated that the company was structured to comply with supportive government programs, reinforcing its credibility and sustainability. • **Enhanced Access to Growth Capital:** The Tax Shelter facilitated Sizable's ability to raise critical capital for scaling operations. By aligning with this incentive program, the company could not only attract individual investors but also potentially position itself for institutional co-investments, strengthening its financial foundation for long-term growth.

Female Entrepreneurship Lecture

Benefits of female entrepreneurs	• labor market attachment • risk averse • source of income / financial independence solve inflexibility of work schedule circumvent the glass ceiling • tapping unaddressed market needs spillover to the next generation

	• if your mom is an entrepreneur then you will have a higher chance to be an entrepreneur mom that are self employed, then sons are more egalitarian
Why is female entrepreneurship different?	• more different for a women to get funding • mostly active in retail sector, service industry • different motivations (push theory - you don't have any other good options, pull theory- pulled in) smaller in size (for females) • less likely to grow (due to small kids) • retail sector / service sector low barriers to entry • high competition • low margin • survival rates are similar • stable & resilient firm • more conservative business approach higher tolerance for modest profit
Challenges for female entrepreneurs	• Access to finance access tonetworks access to information training • reconciling business and family
Financing challenges even more severe	• Capital access is barrier to growth • more trouble to raise financing compared to men smaller start up amount, more personal funds less likely to obtain loans worse conditions • women make use of expensive pension savings • → Crowdfunding a possible solution for female entrepreneurs (Obama did it)

Financing choices:

- Institutional investors (angel investor, VC)
- Informal (less organized; Friends &family)
- Entrepreneurial orientation: Depending on how EO you are, the riskiness of business, this impacts the funding

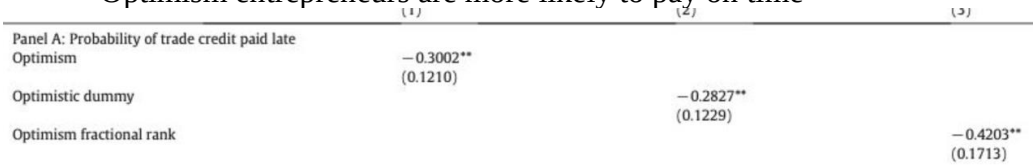
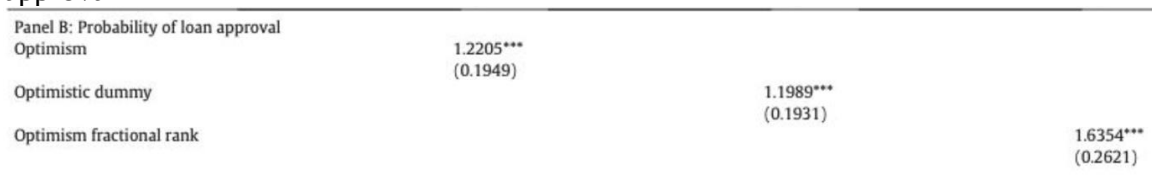
Relationship Lending

Dai, N., Ivanov, V., & Cole, R. A. (2017). Entrepreneurial optimism, credit availability, and cost of financing: Evidence from US small businesses. Journal of Corporate Finance, 44, 289-307.

- → article aims to explore how entrepreneurial optimism influences credit availability and financing costs for small businesses. Optimism is viewed in the literature from two distinct perspectives:
- **→ means that entrepreneurs are more aware of opportunities and tend to underestimate risks.**
- Negative View: Optimism is considered a cognitive bias where entrepreneurs underestimate risks or overestimate opportunities, potentially leading to excessive risk-taking, poor performance, and imprudent financial decisions.

- Positive View: Optimism fosters positive expectations about the future, higher productivity, and better decision-making.
- Despite the importance of credit for small businesses, little empirical research has systematically examined the **impact of entrepreneurial optimism on access to credit or financing costs.**
- The authors introduce an innovative measure of optimism based on the discrepancy between:
- → The actual likelihood of a loan denial (predicted using objective data).
- → The entrepreneur's subjective perception of this likelihood.
- The central research questions are:
- → Do optimistic entrepreneurs have better or worse access to credit?
- → Are their financing costs higher or lower?

Credit Access

H1A: Optimistic entrepreneurs have worse access to credit: they are more likely to pay trade credit late and less likely to have their loan applications approved, other things equal.	• Negative significant coefficient, H1A is **not supported** • By increasing the level of optimism, the likelihood of paying trade credit late decreases • Optimism entrepreneurs are more likely to pay on time  Panel A: Probability of trade credit paid late Optimism −0.3002** (0.1210) Optimistic dummy −0.2827** (0.1229) Optimism fractional rank −0.4203** (0.1713) → Firms with more tangible assets, cash or structured as corporations are more likely to pay in time (negative association) → Firms with high delinquency count or frequent credit applications are more likely to pay late (positive association) → Experienced owners and those with prior bankruptcy records are more likely to pay in time (negative association)
H1B: Optimistic entrepreneurs have better access to credit: they are less likely to pay trade credit late and less likely to be denied loan applications, other things equal.	• Positive significant coefficient, H1B is **supported** • By increasing the level of optimism, the likelihood of loan approval increases • Optimism entrepreneurs are more likely to have a loan approval → Optimism reduces the likelihood of paying late & increasing the likelihood of loan approval  Panel B: Probability of loan approval Optimism 1.2205*** (0.1949) Optimistic dummy 1.1989*** (0.1931) Optimism fractional rank 1.6354*** (0.2621) → Smaller firms, those with higher short-term liabilities or poor growth are more likely to face loan rejections. → Longer relationships with lenders and geographic proximity improve loan approval odds (positive association)

Financing Costs

H2A: Optimistic entrepreneurs have higher cost of borrowing, other things equal.	• Negative significant coefficient, **not supported** • By increasing the level of optimism, the likelihood requiring collateral decreases • Optimism is seen as a positive signal of credit worthiness

	Panel A: Collateral or guarantee (1) (2) (3) Optimism −0.8423*** (0.2882) Optimistic dummy −0.7901*** (0.2879) Optimism fractional rank −0.9245** (0.3706) → Firms with higher cash reserves are also less likely to be asked for collateral. → Corporations and frequent credit applicants are more likely to face collateral/guarantee requirements → Larger loans and longer loan durations increase the probability of requiring collateral or guarantees.
H2B: Optimistic entrepreneurs have lower cost of borrowing, other things equal.	• Negative significant coefficient, **supported** • By increasing the level of optimism, the likelihood having high borrowing costs decreases • Optimism entrepreneurs are more likely to face lower interest rates → Optimistic entrepreneurs are less likely to face collateral requirements → Optimistic entrepreneurs are charged with lower interest rates Panel B: Interest rate and spread over prime-rate (1) (2) (3) (4) (5) (6) Optimism −1.0929* (0.6067) −1.1993** (0.5900) Optimistic dummy −1.0807* (0.5904) −1.1801** (0.5753) Optimism fractional rank −0.9650 (0.7311) −1.1826* (0.7091) → Larger firms, white entrepreneurs, and those with more business experience generally receive more favorable interest rates. → Collateral or guarantees, when provided, lead to lower interest rates, reinforcing the idea that they reduce perceived risk for lenders.

Deloof, M., La Rocca, M., & Vanacker, T. (2019). Local Banking Development and the Use of Debt Financing by New Firms

Does the density and type of banks in a region help or hinder financing for new firms?

Table 4. Different Bank Types and Debt Financing 2007–2013.

	(1)	(2)	(3)	(4)
Sample:	All	All	Debt >0	All
Dependent variable:	Debt/TA	Debt >0	Debt/TA	ST Debt/TA
Overall branch density	0.135**	0.484***	0.026	0.094**
	(0.055)	(0.165)	(0.075)	(0.040)
BCC density	−0.030	−0.369**	0.113*	−0.013
	(0.064)	(0.157)	(0.066)	(0.038)
Banche Popolari density	−0.079	−0.051	−0.124	−0.017
	(0.096)	(0.309)	(0.163)	(0.066)
Foreign bank density	−0.708**	−0.528	−1.294***	−0.374*
	(0.281)	(0.866)	(0.391)	(0.191)
R^2	0.115	0.122	0.121	0.058
Observations	274,271	274,271	86,948	274,271

H1: Higher overall bank branch density increases debt usage by new firms.	Supported • The overall branch density in a province has a significant positive effect on debt financing for new firms • In Columns 1 & 2, bank branch density is positively correlated with both the debt ratio (Debt/TA) and the probability of having debt (Debt > 0). This suggests that new firms in provinces with higher bank branch density are more likely to take on debt and the amount of debt is higher • effect of Banche Popolari on debt financing is not significantly different from national banks

	Table 3. Overall Branch Density and Debt Financing 2007–2013. (1) (2) (3) (4) (5) (6) (7) (8) (9) Sample: All All Debt >0 All All ST Debt >0 All All LT Debt >0 Dependent variable: Debt/TA Debt >0 Debt/TA ST Debt/TA ST Debt >0 ST Debt/TA LT Debt/TA LT Debt >0 LT Debt/TA Overall branch density 0.145*** 0.204*** 0.177*** 0.103*** 0.210*** 0.140*** 0.040*** 0.083** 0.094** (0.031) (0.056) (0.050) (0.022) (0.053) (0.043) (0.014) (0.035) (0.040)
H2: The impact of bank branch density is more pronounced for local banks compared to national banks.	partially confirmed • BCC banks reduce the likelihood of new firms accessing debt but offer more debt once firms secure loans • **BP Density:** column (1), the coefficient is -0.079 (p = 0.096), which is not statistically significant. In column (2), the coefficient is -0.051 (p = 0.309), and in column (3), the coefficient is 0.163 (p = 0.066), which again is not significant at the standard 5% level. • **BCC Density:** In column (1), the coefficient for BCC density is -0.030. column (2), which examines the likelihood that firms in a province use debt, the coefficient for BCC density is -0.369 • column (3), which examines the debt ratio of firms with debt, the coefficient for BCC density is 0.113
H3: Foreign banks might have a less pronounced or even negative effect on debt financing for new firms compared to domestic banks.	**Supported** • In column (2), the coefficient for foreign bank density is -0.528. indicating that higher foreign bank density significantly reduces the likelihood that new firms will use debt. • In column (3), the coefficient is -1.294 confirmed: Foreign bank density significantly reduces the likelihood of new firms accessing debt and lowers the debt ratio

Does the density and type of banks in a region help or hinder financing for new firms?

Bank Density:	• Higher bank branch density increases access to debt financing for new firms. • Reduces informational asymmetries and facilitates relationship lending. • Promotes competition, improving credit availability.
Bank Type	• **Local Banks**: → Better support for new firms through relationship lending, relying on soft information (connections, trust, local knowledge) → Loans are more suitable for new firms & more tailored but fewer in number compared to national banks • **National Banks**: → emphasize efficiency & scale; Efficient loan processing but rely on hard information (financial statements, record), which can disadvantage new firms as they will probably not meet this requirement • **Foreign Banks**: → Often reduce access to debt financing for new firms. →Focus on established firms and can "cream skim" low-risk borrowers from local banks.

Rijssegem, L., Paeleman, I., Hünermund, E., & Andries, P. (2024). Founder's financial knowledge and the new firm's ability to obtain debt financing.

→ role of founder's financial knowledge in improving debt financing outcomes

Founder's financial knowledge	• Helps select the right financing sources • Easier evaluation of financing conditions Improves negotiation with lenders Reduces informational opacity

	• Managing internationalization and innovation risks
Soft information role	• Signals competence and reduces uncertainty • Aids lender decisions, complementing hard-data • Builds trust through preparation and credibility • Enables qualitative assessment of the founder

Table 3. Heckman model: regression results of knowledge depth of debt financing, internationalization and innovation on new firm's ability to obtain debt financing

	First stage	Second stage		
	External debt sought (1)	Debt fin. ability (2)	Debt fin. ability (3)	Debt fin. ability (4)
Control variables				
Work experience	0.064**	0.018	0.012	0.011
	(0.029)	(0.021)	(0.021)	(0.021)
Entr. exp.	0.230***	0.005	0.001	0.001
	(0.088)	(0.037)	(0.037)	(0.037)
Education	−0.097***	0.023	0.021	0.020
	(0.034)	(0.017)	(0.017)	(0.017)
Founding team	−0.125	0.017	0.010	0.006
	(0.123)	(0.049)	(0.049)	(0.048)
Firm age	−0.040	−0.323**	−0.325**	−0.324**
	(0.212)	(0.127)	(0.127)	(0.126)
Firm size	0.250***	0.049*	0.042	0.038
	(0.081)	(0.026)	(0.026)	(0.025)
Sales	0.050***	0.022***	0.021***	0.020***
	(0.016)	(0.006)	(0.006)	(0.006)
Tangibility	0.573***	0.125**	0.106**	0.107**
	(0.124)	(0.054)	(0.054)	(0.053)
Personal debt	0.000	−0.002	−0.002	−0.003
	(0.012)	(0.004)	(0.004)	(0.004)
Equity	0.059	−0.014*	−0.014*	−0.013*
	(0.038)	(0.008)	(0.007)	(0.007)
Legal form	0.492***	0.045	0.040	0.046
	(0.105)	(0.047)	(0.046)	(0.046)
Medium/high tech	−0.073	−0.036	−0.033	−0.038
	(0.079)	(0.037)	(0.036)	(0.036)
Wave dummies	Included	Included	Included	Included
Independent variables				
Knowledge depth	0.195***		0.039***	0.026*
	(0.036)		(0.013)	(0.015)
Knowledge depth * Internationalization				0.001**
				(0.001)
Knowledge depth * Innovation				0.007
				(0.039)
Internationalization	−0.001	−0.003**	−0.003**	−0.004***
	(0.002)	(0.001)	(0.001)	(0.001)
Innovation	−0.068	−0.171***	−0.168***	−0.173**
	(0.102)	(0.061)	(0.060)	(0.069)

H1: The deeper a founder's knowledge of debt financing, the higher the new firm's ability to obtain debt financing	**Supported** Financial knowledge positively impacts ability to obtain debt financing (Coefficients of 0,195; 0,039; 0,026)
H2a: The positive impact of a founder's financial knowledge on debt financing is stronger for firms with higher internationalization.	**Supported** Stronger effect with internationalization (Coefficient of 0,001) → Founders' financial knowledge becomes increasingly crucial as a firm's internationalization intensifies
H2b: The positive impact of a founder's financial knowledge on debt financing is stronger for firms with higher innovation.	**Not supported** No significant association with innovation → suggests that beyond a certain level of innovation, additional financial knowledge may not significantly improve debt financing outcomes.

Founder's Financial Knowledge

Table 4. Average marginal effect (AME) of knowledge depth of debt financing at different representative values of internationalization and innovation (in %)

Internationalization	AME	SE	p-Value
0	0.028	0.014	0.052
20	0.052	0.014	0.000
40	0.076	0.021	0.000
60	0.100	0.030	0.001
80	0.124	0.041	0.002
100	0.149	0.051	0.004
Innovation	**AME**	**SE**	**p-Value**
0	0.036	0.014	0.009
20	0.038	0.013	0.004
40	0.039	0.016	0.016
60	0.041	0.022	0.063
80	0.042	0.028	0.139
100	0.043	0.035	0.221

Angel Finance

Carpentier, C., and Suret, J. (2015). Angel group members' decision process and rejection criteria: A longitudinal analysis.

- Examines Angel Group Members' (AGMs) decision-making from submission to funding
- Identifies key rejection criteria at each decision stage
- Examines the role of entrepreneurs' experience in influencing funding success
- Compares AGMs' professional approach to independent Business Angels (BAs)

Business Angels (BA)	Individual investors who provide capital to early-stage companies, often at the seed or very early stages, focusing on a wide range of industries. They value personal relationships with entrepreneurs and prioritize the entrepreneur's qualities, such as trustworthiness and commitment.
Angel Group Members (AGM)	Structured networks of business angels who collectively invest in entrepreneurial ventures, primarily at later development stages. AGMs use a formalized decision- making process and pool resources to evaluate and fund projects, often relying on gatekeepers.

Types of Risks

Agency Risk	Arises from information asymmetry between entrepreneurs and investors, leading to concerns that entrepreneurs may prioritize their own interests over those of outside equity providers
Market Risk	Relates to external factors such as market size, growth potential, competition, and customer adoption that affect the venture's success
Execution Risk	Involves challenges in implementing the product, strategy, or technology, including production, distribution, and scalability

Types of Experience

Industry Experience	Familiarity with the specific industry of the startup → Helps understand market dynamics, customer needs, and competitive landscape
Management Experience	Previous leadership or management roles → Demonstrates the ability to build and lead teams, allocate resources, and make strategic decisions

Start-Up Experience	Prior involvement in founding or running a startup → Indicates the ability to handle the unique challenges of starting and scaling a business

H1: AGMs reject proposals significantly more often for market and execution risk-related reasons than for agency risk-related reasons.	Supported • Market (30%) and product/model (39%) risks account for ~70% of rejections after pre-screening • Execution risks (e.g., product feasibility, scalability) dominate in later steps during due diligence • Agency risk (e.g., trust, motivation) causes only ~6% of rejections
H2: The rejection reasons do not differ significantly across the steps of the decision process for proposals that pass the pre-screen.	Supported • Rejection reasons remain consistent across steps after the pre-screen Reasons: • Gatekeepers and AGMs align on preferences and criteria • Ambiguous proposals are discussed with an ad-hoc committee • Hard-to-decide proposals are often presented to AGMs despite gatekeeper concerns
H3: The ultimate step reached by proposals in the decision process depends significantly on entrepreneurs' experience.	Supported • Entrepreneurial experience significantly impacts progression through the decision process • Extensive industry experience consistently increases the likelihood of progressing through steps • No start-up experience negatively impacts progression significantly in steps 4 and 5 **Table 5** Probit model of the probability of completing a step according to the top management team's industry and start-up experience. The probit procedure models the probabilities of completing a step (DPSi = 1), with DPS being a dummy variable that equals 1 if the firm completes step i and 0 otherwise (i = 2 to 5). The models are estimated using a sample of 188 in-scope files. No (extensive) industry experience is a dummy that takes the value of 1 if the top management team's industry experience is nil (extensive, more than ten years). No (extensive) start-up experience is a dummy that takes the value of 1 if the top management team's experience in start-up is nil (extensive, more than one previous start-up).

	Step 2		Step 3		Steps 4–5		Step 6	
	Parameter estimates	Marginal effects	Parameter estimates	Marginal effects	Parameter estimates	Marginal effects	Parameter estimates	Marginal effects
Intercept	−0.4483	−0.1654	−0.5551	−0.1888	−1.2940	−0.2355	−1.9486	−0.2275
p value	0.0288		0.0078		<0.0001		<0.0001	
No industry experience	0.2547	0.0940	0.0400	0.0136	−3.7442	−0.6814	−3.1634	−0.3694
p value	0.4077		0.9055		0.9875		0.9915	
Extensive industry experience	0.6841	0.2524	0.7106	0.2417	0.8087	0.1472	1.0707	0.1250
p value	0.0007		0.0006		0.0024		0.0039	
No startup experience	−0.1357	−0.0501	−0.3222	−0.1096	−0.6559	−0.1194	−0.6936	−0.0810
p value	0.5493		0.1647		0.0347		0.0942	
Extensive start-up experience	0.2582	0.0953	0.2059	0.0700	0.2015	0.0367	0.3911	0.0457
p value	0.3468		0.4536		0.5091		0.2662	
N	188		188		188		188	
Chi square	15.4794		21.1707		27.3910		23.4343	
Prob > Chi square	0.0038		0.0003		<0.0001		0.0001	

Harrison, R. T., Bock, A. J., & Gregson, G. (2020). Stairway to heaven? Rethinking angel investment policy and practice.

Styized facts

Availability of Angel Capital	**Conventional Wisdom:** • Angel investment is as or more important than venture capital (VC) for early-stage funding. • Angel capital is widely distributed, reflecting broad availability. • Angels are predominantly current or cashed-out entrepreneurs.	**Correction:** • The availability of angel capital depends on geographic, legal, regulatory, economic, and cultural factors. • → Investment is concentrated in entrepreneurial hotspots, not universally available. • Network and cluster effects influence where angel investments occur.

Local Nature of Angel Investment	**Conventional Wisdom:** • Angel investments occur primarily close to home due to the need for social networks, personalized due diligence, and post-investment involvement.	**Correction:** • A **significant minority (20–35%)** of angels invest long-distance. • International angel investing is growing due to globalization and policy support.
Bridging Capital	**Conventional Wisdom:** • Angels provide bridging capital in the entrepreneurial funding escalator, connecting startups to later-stage VC and private equity.	**Correction:** • Angels often act as **"cradle-to-grave" investors**, supporting companies through multiple funding rounds to exit. • Angel and VC funding are increasingly seen as **substitutes**, not complementary stages. • Entrepreneurs may prefer VC over angel funding when both are available.
Productive Investment	**Conventional Wisdom:** • Angel investment is economically justified, generating productive returns over a longer horizon compared to VC.	**Correction:** • **50–65%** of angel investments fail to return the initial capital. • High-performing "black swan" investments are rare and unpredictable. • Angel portfolios require large-scale diversification to consistently achieve positive returns
Inefficient Market	**Conventional Wisdom:** • The angel investment market is inefficient due to **information asymmetries** and **signaling deficiencies**, justifying public policy interventions.	**Correction:** • Market inefficiencies are not always tied to a lack of capital but to **poor matching** between investors and ventures. • Government interventions sometimes exacerbate inefficiencies, such as supporting **artificial demand** or low-quality investments.
Government Support necessary	**Conventional Wisdom:** • Government intervention (e.g., tax incentives, co-investment schemes) is essential for market growth.	**Correction:** • Tax incentives often attract **inexperienced investors** or support marginal businesses with low profitability. • The benefits of tax incentives and other interventions are not universally proven, and unintended consequences like inflated valuations may occur.

Government Intervention

Governments often use tax incentives to encourage angel investments (take the risk and support innovation)

Front-end incentive:	• Reduce of initial investment costs • Increase the attractiveness of investments, but: • Often lead to funding lower-quality ventures • Result in inefficient investments in projects with low chances of success
Back-end incentive:	• Tax deferrals or benefits on exits at the end of the investment period • Reward successful investments and promote sustainability • Provide stronger motivation for investors to prioritize high-quality ventures, as • benefits are linked to performance

Diversification: Broad portfolios reduce risks and increase the likelihood of "black swan" successes

Harrison, R. T., Botelho, T., & Mason, C. M. (2016). Patient capital in entrepreneurial finance: a reassessment of the role of business angel investors

- Analysis of the meaning and main characteristics of patient capital
- Review of the prior research about business angel as patient investors
- Entrepreneurial finance perspective to examine the investment attitudes and behaviours of business angels → Business Angels: Patient or not?

Attitudes, engagement, and exit practices of Investors – How patient are they?

Attitude to Exit: Equivocally patient	• Different time horizons, from short(3-5) to long (6+)term investments • Focused on doing good investments, not specifically on the exit. • Third, the exit is not a significant factor in their decision-making process
Engagement and influence: Patient	• 'Hands on' investors: likely to contribute with skills, experience and network • Motivated by non-financial considerations: human and social capital stock • Post-investment approach to manage risks
Exit Practice and returns: Not Patient	• Exit practices in 3-6 years • If patient, by default and not intent because of significantly underperforming investments

Three Dimensions of Patient Capital

Investment Time Horizon:	Patient capital is characterized by a **long-term commitment**, contrasting with short-term investment goals.
Investor Engagement:	A longer time horizon enables investors to engage deeply with investee companies, focusing on **strategic and operational development** rather than immediate returns
Exit Strategy Flexibility:	Patient investors are less likely to exit immediately if management decisions deviate from their preferences, allowing for **collaborative problem-solving**

Differences Venture Capitals and Business Angels

Venture Capitals	**Risk Assessment:** Market risk (external conditions) **Investment decision making:** venture characteristics **Contracting behavior**: formal (contract based engagement) • Stringent contractual provisions about under-performing entrepreneur to manage agency risk. Market risk is less controllable through ex-post contracting. • Screening and due diligence to identify high performing ventures • Contract-based engagement and influence to preserve and pursue the investors' interests
Business Angels	**Risk Assessment:** Agency Risk (relationship risk and poor decision making) **Investment decision making:** Entrepreneur characteristics **Contracting behavior:** simple & informal, post investment relationship • Lack of data, resources but strong prior industry experience to manage market risks. Agency risks more difficult to be controlled • Betting on the 'jockey'(entrepreneur) rather than the 'horse'(business) • Simple and informal contracts, that makes it harder for them to enforce sanctions. Leverage on active engagement

Patience and time horizons, how investors understood patience?

Only **43%** of the respondents mentioned 'patience' in their interview responses

- **Need for patience**. Intrinsic nature of patience in investing in early stage businesses (size, time, experience)
- **Importance of value creation.** Building value rather than focusing on exit. (value-adding and active contribution)
- **Attitudes to the exit**. Contrasting views. (limits to patience; investment decision-making process; opportunity dependence, resilience)

→ Angels either do not articulate any awareness of the patient capital concept at all, or are patient investors less by choice than by default through force of circumstances.

Verbal Protocol Analysis

- analyze the exit-centered behavior of 30 business angels in Scotland and Northern Ireland using VPA.

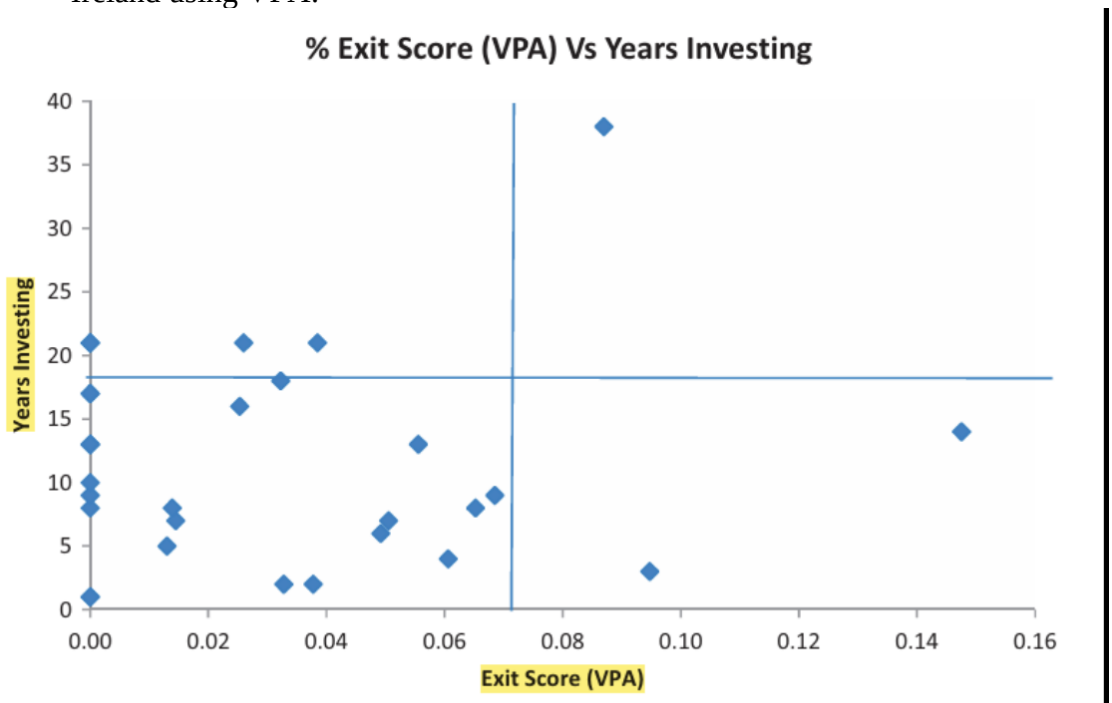


Figure 2. Exit score versus years investing.

Table 3 Profile of the investment behavior in each of the four quadrants

	Quadrant 1	Quadrant 2	Quadrant 3	Quadrant 4
N	23	4	1	2
N investment	14	35	6	7
% of each quadrant	77%	13%	3%	7%
Exit	2	5	2	0
% of exit in the portfolio	17%	14%	33%	0%
Losses	2	13	2	3
% of losses in the portfolio	15%	36%	33%	43%
Still	9	18	2	4
% of investments still in the portfolio	68%	51%	33%	57%

Q1	lowest proportion of losses (15%) and highest proportion of investments still in their portfolios (68%) → Patient because are not investing since too much time to become impatient
Q2	Highest number of investments (35) and second highest percentage of losses (36%)

	→ Patient by intention
Q3	Highest proportion of exited investments (33%) and the lowest proportion of investments in their portfolio (33%) → Desire to achieve exit-centered approach (outcome rather than capital)
Q4	Highest proportion of losses (43%) and have not achieved any exits. → Need to achieve liquidity exit centered approach (these investors have not had any exits)

The analysis categorizes the business angels into three distinct groups based on their attitudes toward exits:

Majority: Not Particularly Exit-Centered	• Most business angels were not focused on achieving exits and had achieved **few or no exits** in their investment histories. • Their investment approach was not driven by the need to realize liquidity quickly.
Exit-Centered Due to Liquidity Needs	• A small subset of angels had adopted an **exit-centered approach out of necessity**, primarily because they had **not yet achieved any exits**. • These angels were motivated by a need to generate liquidity from their investments.
Exit-Centered by Desire	• Another small group of angels expressed a **proactive desire to achieve exits**, aiming to maximize returns and align with planned investment strategies. • Their approach was strategic and deliberately focused on exit opportunities.

Key Takeawasy

- Business angels are not equivocally patient
- The majority of business angels are patient investors in terms of investment intentions, engagement and exit behaviour
- Their patience is largely by default rather than intent
- Policymakers should address gaps in entrepreneurs' awareness of angel group practices

Venture Capital

Dutta, S., & Folta, T. B. (2016). A comparison of the effect of angels and venture capitalists on innovation and value creation

How do angel investors and venture capitalists differ in their ability to influence innovation, commercialization, and entrepreneurial success?

Value added Services/Roles

Venture Capitalists	Angel Investors
• **Signaling and Networks**: VCs provide high-profile endorsements, increasing visibility and trust, helping ventures attract key resources, partnerships, and talent. Their strong industry networks enable better strategic alliances.	• **Signaling & Networks:** AIso offer early-stage credibility, especially valuable in uncertain technology development phases. Angel group networks assist with human capital recruitment

• **Governance & Mentorship**: VCs adopt formal governance mechanisms, including board memberships and contracts, to closely monitor ventures, enforce discipline, and guide commercialization strategies. This can sometimes create conflict but ensures alignment with financial goals. • **Financial Structure & Incentives:** VCs are structured intermediaries bound by fund timeframes (e.g., 10 years), requiring timely exits. This time pressure drives innovation intensity and speeds up commercialization, although tolerance for failure is limited	and partner connections, though less extensive than VCs. • **Governance & Mentorship:** Use a relational governance approach, favoring flexibility and entrepreneur-friendly contracts with weaker control rights. Angel groups often provide mentorship but with fewer stringent oversight mechanisms. • **Financial Structure & Incentives:** Invest personal funds, offering greater flexibility and longer investment horizons. They are more tolerant of early-stage failures, which may encourage exploratory innovation over commercialization speed.

Baseline Analysis

Table 2
Baseline analysis: OLS regression.

Dependent variable	Natural log of patent count	Natural log of forward 4-year citation	Natural log of citation per patent
	(1)	(2)	(3)
VC-backed	0.018 (0.039)	0.174** (0.083)	0.180** (0.082)
Log venture age	0.063* (0.037)	0.061 (0.084)	0.074 (0.090)
Log cumulative patent	0.468*** (0.026)	0.583*** (0.077)	0.397*** (0.077)
Log cumulative dollar inflow	−0.003 (0.017)	−0.034 (0.039)	−0.043 (0.041)
Year fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Observations (N)	2641	2641	2641
R^2	0.55	0.52	0.49

- The coefficient estimate of VC-backed dummy variable is positive but not significant, suggesting that there is no evidence that VC-backing affects the number of patents compared to angel-group-backing. However, patent citation results (columns 2 and 3) show that the VC-backed dummy variable is positive and significant.
- This suggests that VC-backed ventures receive 17.4% more citations and 18% more citations per patent compared to those generated by angel- group-backed ventures. Which signals higher- quality patents.
- Therefore, it indicates that VCs help ventures focus on impactful, market-relevant innovations rather than simply increasing patent output.

Difference-in-Difference Analysis

- → appropriate methodology when the outcomes of two groups (in our case, VC and angel-group-backed ventures) are observed for two time periods (in our case, before and after investment) in a longitudinal data set.
- One group is exposed to the treatment (VC investment) in the second period but not in the first period, and the second group is not exposed to the treatment during either period.
- This method enables us to control for biases due to permanent differences between those groups (selection effect), as well as biases from comparisons over time, and

measure the differences in the innovation (treatment effect) between VCs and angel-group-backed ventures.

Table 3. Difference-in-differences approach.

Dependent variable	Natural log of patent count	Natural log of forward 4-year citation	Natural log of citation per patent
	(1)	(2)	(3)
Before (2) years	0.047 (0.065)	0.172 (0.153)	0.130 (0.151)
Before (1) years	0.032 (0.053)	0.104 (0.109)	0.091 (0.109)
After (1) years	0.011 (0.039)	0.194*** (0.075)	0.196*** (0.072)
After (2) years	0.061 (0.042)	0.310*** (0.082)	0.276*** (0.076)
After (3) years	−0.066* (0.036)	0.126* (0.074)	0.120* (0.071)
After (4) years	−0.018 (0.040)	0.162** (0.082)	0.167** (0.078)
After (5) years	−0.068* (0.039)	0.144* (0.079)	0.130** (0.065)
Log venture age	0.131*** (0.033)	0.104 (0.067)	0.090 (0.073)
Log cumulative dollar inflow	0.093*** (0.022)	0.073 (0.047)	0.032 (0.047)
Year fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Observations (*N*)	2641	2641	2641
R^2	0.04	0.09	0.11

- In the third and fifth years post-VC investment, VC-backed ventures file fewer patents compared to angel-group-backed ventures, as indicated by the negative and significant coefficients in Column 1. However, analyses of the citation- based measures show a significant jump for VC-backed ventures compared to angel-group-backed ventures,
- particularly in the first and second years post-investment, as seen in the positive and significant coefficients in Column 3 which remain positive and significant also in subsequent years.
- The results indicate that the VCs focus on producing impactful innovations compared to angel groups. VCs in fact have a lower influence on innovation rate compared to angel groups in some years subsequent to investment.

Switching Analysis

Table 4A
Switching regression: Stages 1 and 2.

Dependent variable	First stage	Second stage					
	VC year dummy	Log patent count		Log forward 4-year citation		Log citation per patent	
		VC-backed	Angel-group-backed	VC-backed	Angel-group-backed	VC-backed	Angel-group-backed
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log venture age	−0.961***	−0.748***	−0.162**	−1.566***	−0.325***	−1.153***	−0.267*
	(0.080)	(0.165)	(0.082)	(0.409)	(0.118)	(0.390)	(0.155)
Log cumulative patent	0.218**	0.511***	0.489***	0.739***	0.286***	0.513***	0.184
	(0.089)	(0.039)	(0.049)	(0.122)	(0.091)	(0.127)	(0.132)
Pension fund	0.010**						
	(0.003)						
Log cumulative dollar inflow		−0.065***	−0.117	−0.147***	−0.122	−0.124***	−0.141
		(0.013)	(0.088)	(0.041)	(0.115)	(0.037)	(0.126)
Inverse Mills ratio		0.909***	−0.121	1.809***	0.288	1.369***	0.253
		(0.213)	(0.383)	(0.518)	(0.505)	(0.497)	(0.606)
S&P 500 returns	−0.172	−0.248***	−0.102	−0.437***	−0.200	−0.380***	−0.215*
	(0.271)	(0.058)	(0.094)	(0.166)	(0.146)	(0.133)	(0.126)
Bubble period	0.691***	0.478***	0.055	1.032***	0.026	0.553**	−0.053
	(0.192)	(0.126)	(0.106)	(0.288)	(0.228)	(0.265)	(0.310)
2000s time dummy	0.425**	0.206**	0.032	0.442**	0.020	−0.034	−0.200
	(0.185)	(0.086)	(0.117)	(0.217)	(0.241)	(0.187)	(0.334)
Location effects	Yes						
Industry effects	Yes						
Firm fixed effects		Yes	Yes	Yes	Yes	Yes	Yes
Observations (N)	1200	2040	601	2040	601	2040	601
χ^2/R^2	187.85***	0.39	0.34	0.26	0.14	0.22	0.13

- Column 1 shows the first-stage probit estimation, which identifies the factors that influence whether a venture gets VC funding. For example, younger ventures with a history of patents are more likely to receive VC investment.
- The second-stage results (Columns 2–7) compare innovation outcomes for VC-backed and angel-backed ventures. The inverse Mills ratio, which controls for selection bias, is positive and significant for VC-backed ventures. This means that VCs also rely on unobservable factors, like a venture's untapped potential, to select their investments. For angel-backed ventures, the inverse Mills ratio is not significant.
- These results suggest that VCs do more than just select promising ventures—they actively improve innovation outcomes, particularly the quality and impact of patents. This highlights the treatment effect of VCs, where their involvement boosts innovation beyond what can be explained by selection alone.

Hazard/Survival Analysis

→ a statistical method for analyzing data in which the aim is to investigate the time until a certain event (IPO, Acquisition, any exit)

Table 5. Parametric hazard analysis.

Dependent variable	Log of time to exit		
	(1)	(2)	(3)
Hazard type	*Success* (dummy = 1 for IPO or acquisition)	*Acquisition* (dummy = 1 for acquisition)	*IPO* (dummy = 1 for IPO)
VC-backed	−0.483*** (0.140)	−0.450*** (0.146)	−0.704* (0.401)
Log venture age	−0.128* (0.077)	−0.114 (0.082)	−0.187 (0.215)
Log cumulative patent count (time varying)	0.036 (0.049)	0.054 (0.051)	−0.029 (0.114)
Log cumulative dollar inflow (time varying)	0.082** (0.040)	0.106** (0.044)	−0.051 (0.111)
Log number of IPOs (time varying)	−0.769*** (0.112)	−0.726*** (0.117)	−1.231*** (0.267)
Log number of acquisitions (time varying)	0.032 (0.265)	0.005 (0.279)	0.718 (0.673)
Location effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Funding year controls	Yes	Yes	Yes
Log likelihood	−271.43	−271.52	−36.58
Observations (*N*)	350	350	350
Number of exit events	193	173	20

- The coefficient for VC-backed ventures is negative and significant across all exit types (Columns 1, 2, and 3), showing that VC-backed ventures exit faster overall and through both acquisitions and IPOs compared to angel- backed ventures.
- This highlights VCs' focus on achieving timely exits, driven by their structured investment timelines and return requirements. Faster exits are a hallmark of VC-backed ventures, regardless of the exit type.

Venture Capital vs. Angel Innvestor

Innovation rates	→ Both investor types are equally effective at increasing the quantity of innovation which was visible on the number of patents filled.
Innovation Quality	→ VC's outperform Angels: VC-backed ventures achieve significantly higher patent citations, reflectingmtheir superior ability to enhance innovation impact.
Commercialization	→ VC's leads Angels: VC-backed ventures achieve faster exits (IPOs or acquisitions), driven by their structured and exit-focused investment model.
Selection vs. Treatment	**Treatment Effects:** VCs dominate, as they actively improve innovation quality (higher citations) and commercialization outcomes (faster exits) through governance and strategic support. Selection effects are also present but less pronounced. **Selection Effects:** AIs dominate, as angels often choose promising ventures to mentor, but their treatment effects are less focused on improving innovation impact or commercialization outcomes compared to VCs.

Lavanchy, M., Reichert, P., & Joshi, A. (2022). Blood in the water: An abductive approach to startup valuation on ABC's Shark Tank

Likelihood to receive an offer

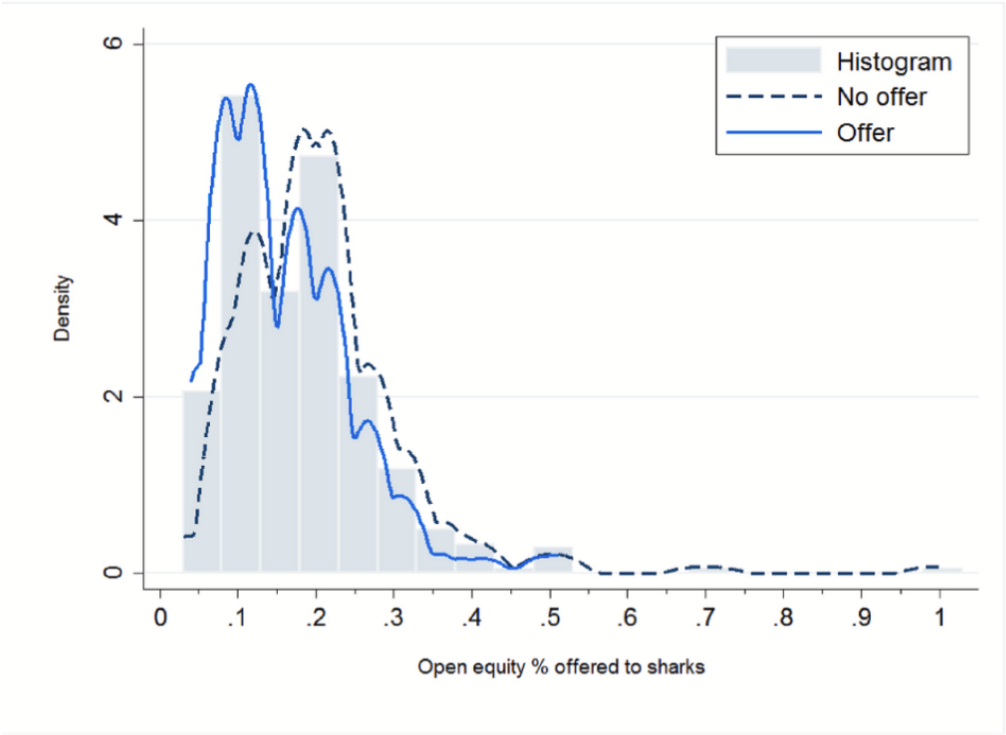


Fig. 1. Likelihood to receive an offer and initial equity percentage.

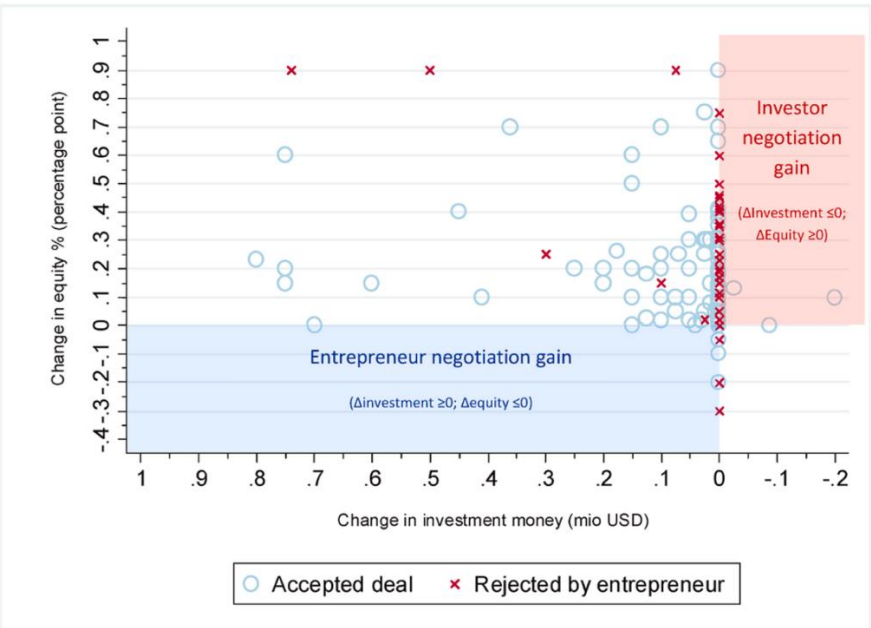
- A higher proportion of entrepreneurs who initially proposed a lower first equity share received an offer (peak at around 10%) ➜ Potential signals: confidence, experience
- On the contrary, entrepreneurs who offered a higher initial equity share tend to not receive an offer (peak at around 20%) ➜ Potential signals: desperation, business is worth less

Table 2
Results from regression analysis.

	DV: Likelihood to receive an offer			DV: Best-offer-to-initial-offer ratio	
	(1)	(2)	(3)	(4)	(5)
	Probit (AME)	Probit (AME)	Probit (AME)	Selection	Selection (w/out outliers)
Initial equity share	−1.120***	−1.126***	−1.585***	0.720	1.050*
	(0.243)	(0.264)	(0.409)	(0.678)	(0.543)
Open investment (M)	−0.040	−0.212***	−0.114	−0.219	−0.128
	(0.058)	(0.074)	(0.123)	(0.213)	(0.188)
Bidding dynamics					
– Joint offer				0.063	0.107
				(0.081)	(0.074)
– Competing offers				0.199***	0.209***
				(0.058)	(0.055)
Controls					
Patent filed		0.233***	0.150	0.245	0.119
		(0.064)	(0.096)	(0.161)	(0.118)
Patent obtained		0.226***	0.225***	0.109	0.047
		(0.061)	(0.083)	(0.150)	(0.120)
Full-time		0.144**	0.087	0.038	−0.056
		(0.059)	(0.088)	(0.120)	(0.095)
Female entrepreneur		0.005	0.023	−0.027	−0.053
		(0.059)	(0.075)	(0.072)	(0.062)
Mixed team entrepreneur		−0.112	−0.101	−0.166	−0.091
		(0.074)	(0.098)	(0.108)	(0.082)
Team size		0.086**	0.109**	0.006	−0.023
		(0.039)	(0.054)	(0.081)	(0.058)
Education: High school		0.080	0.028	0.049	−0.015
		(0.198)	(0.185)	(0.208)	(0.162)
Education: Undergraduate		0.214***	0.165*	0.192	0.108
		(0.071)	(0.099)	(0.155)	(0.123)
Education: Graduate		0.150**	0.135	0.069	0.011
		(0.074)	(0.083)	(0.120)	(0.095)
Education: PhD/Doctoral		.	.	1.401*	0.360
		.	.	(0.792)	(0.286)

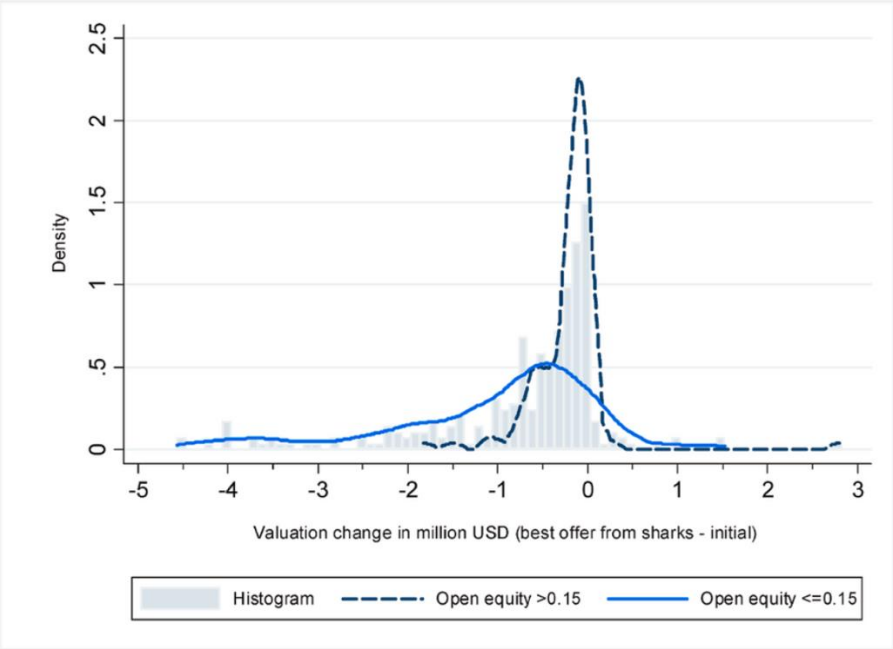
(1)DV: Likelihood to receive an offer	(2)DV: Best-offer-to-initial-offer ratio
• Entrepreneurs offering higher equity percentages are significantly less likely to receive offers • Larger investment amounts also decrease the likelihood of receiving an offer • Patents, team size, and education have significant positive effects	• Lower initial equity shares result in better quality deal terms • Competing offers also have a significant positive effect on better quality deal terms

Changes in Investment Money



- Investors frequently realise a negotiation gain, reflecting the dominance of investor negotiation power
- Most accepted deals also reside in that quadrant driving home the point of
- investor negotiation power
- Moderate number of cases where entrepreneurs accepted higher investments at the cost of more equity
- Success for entrepreneur negotiation gain is more rare
- There are cases where entrepreneurs reject poor deal teams (investors demand more equity)

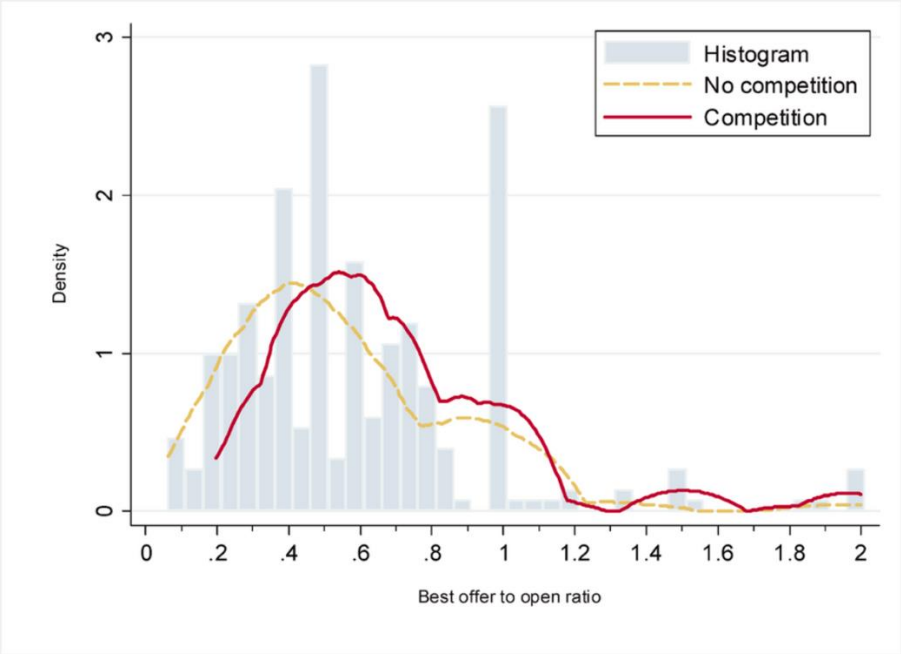
Changes in pre-money Valuation



Notes: Venture values higher or lower than $5 million excluded for readability.

Open equity <=15%	**Open equity >15%**
• Curve is wider and more spread out, indicating greater variability in valuation outcomes • Entrepreneurs in this group experience some positive valuation changes but also significant negative changes	• Curve has a sharp peak at slightly negative valuation changes, suggesting less variability • Entrepreneurs in this group overwhelmingly experience valuation decreases

Impact on Competition



Competition	No Competition
• Curve peaks at a higher ratio (0.8-1). The average ratio is 0.823. • Competition shifts distribution to the right, increasing the likelihood of offers closer to the initial ask from the entrepreneur	• Curve peaks sharply (around 0.5-0.6). The average ratio is 0.575. • No competition curve displays that offers tend to be lower than the initial valuation ask

What is the impact of negotiation dynamics towards the valuation outcomes of startups on Shark Tank?

- Lower initial equity offers increase the likelihood of receiving an offer and have a positive effect on better deal terms.
- Entrepreneurs who effectively convey strong signals can mitigate information asymmetry to achieve a better valuation.
- Investors typically hold greater leverage in negotiations, securing more control & potential return in their favour.
- Competition among investors can improve valuation outcomes, bringing them closer to their initial asks.

Nahata, R. (2019). Success is good but failure is not so bad either: Serial entrepreneurs and venture capital contracting

Does being a serial entrepreneur have an impact in the capital-raising process, specifically in the terms negotiated and agreed upon with investors?

Prior entrepreneurial experience (and particularly successful one) is likely to significantly mitigate adverse selection risk and lower the search costs for VCs. This is shown in:

- Dilution of equity
- Control Retention
- Survival as CEO

- Higher valuation

H1: Serial entrepreneurs suffer less dilution of equity in their startups by negotiating less share ownership for VCs than first-time entrepreneurs.	**Supported**, they suffer less dilution of equity & receive funding earlier • Serial entrepreneurs (both successful and unsuccessful) suffer less dilution of equity in their startups by negotiating less share ownership for VCs that first-time entrepreneurs

Determinants of total VC share ownership at IPO

	Total VC share ownership							
	OLS: All entrepreneurs				OLS: Excluding previously successful entrepreneurs			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Serial entrepreneur	−5.902***	−5.807***	−6.085***	−4.974***	−4.791**	−4.988**	−4.492*	−4.654*
	[0.00]	[0.00]	[0.00]	[0.00]	[0.04]	[0.04]	[0.07]	[0.07]
Early stage investment by VC	1.694	1.691	1.648	0.457	1.085	0.966	0.852	−0.050
	[0.20]	[0.20]	[0.22]	[0.76]	[0.46]	[0.52]	[0.57]	[0.97]
ln startup's total funding rounds	4.656***	4.649***	4.482***	5.063***	5.508***	5.374***	4.406***	5.210***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
ln VC syndicate size	5.952***	5.959***	5.577***	5.237***	6.346***	6.461***	5.703***	5.406***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Lead VC reputation	−40.455	−40.595	−43.696	−124.780*	−15.896	−15.928	−9.233	−104.227*
	[0.40]	[0.40]	[0.36]	[0.08]	[0.69]	[0.69]	[0.81]	[0.09]
Founder-CEO	−4.420***	−4.425***	−4.340***	−2.959***	−5.026***	−5.073***	−5.105***	−3.643***
	[0.00]	[0.00]	[0.00]	[0.01]	[0.00]	[0.00]	[0.00]	[0.01]
CEO Age	0.144**	0.143**	0.132*	0.208***	0.173**	0.170**	0.156*	0.228***
	[0.04]	[0.04]	[0.06]	[0.00]	[0.04]	[0.04]	[0.07]	[0.01]
Portfolio entrepreneur		−0.648	−1.058	1.560		2.382	2.485	−4.593
		[0.84]	[0.75]	[0.67]		[0.74]	[0.72]	[0.55]
ln geographical distance	0.268	0.268	0.275	0.224	0.284	0.291	0.282	0.245
	[0.11]	[0.11]	[0.11]	[0.22]	[0.15]	[0.14]	[0.16]	[0.25]
ln startup age at first VC funding	−3.558***	−3.549***	−3.403***	−3.322***	−3.250***	−3.323***	−3.175***	−3.412***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Industry market-to-book ratio	−3.387	−3.383	−3.946*	−5.685**	−8.428***	−8.609***	−9.385***	−9.004***
	[0.14]	[0.14]	[0.08]	[0.03]	[0.00]	[0.00]	[0.00]	[0.00]
ln Total VC investment			0.664	1.131			1.225	1.135
			[0.36]	[0.15]			[0.13]	[0.20]
ln Lead VC fund size				0.880*				0.554
				[0.10]				[0.42]
Intercept	30.360***	30.259***	24.765**	9.892	19.409	20.062	10.367	5.466
	[0.01]	[0.01]	[0.05]	[0.49]	[0.18]	[0.16]	[0.48]	[0.77]
Lead VC type indicator (Bank, Corporate, Government)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Law Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1262	1262	1244	942	988	988	973	732
Adjusted R^2	21.82%	21.75%	21.93%	25.02%	23.74%	23.66%	23.16%	26.78%

H2: Serial entrepreneurs retain greater board control over their startups than first-time entrepreneurs.	**Supported** • Serial entrepreneurs (both successful and unsuccessful) retain greater board control over their startups than first- time entrepreneurs

Determinants of insider board representation at IPO

	Insider board representation							
	OLS: All entrepreneurs				OLS: Excluding previously successful entrepreneurs			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Serial entrepreneur	0.053***	0.054***	0.043***	0.039***	0.064***	0.079***	0.071***	0.069***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Early stage investment by VC	−0.003	−0.003	0.000	0.009	−0.006	−0.006	−0.004	0.006
	[0.75]	[0.75]	[0.98]	[0.37]	[0.57]	[0.57]	[0.66]	[0.59]
ln startup's total funding rounds	−0.019**	−0.019**	−0.011	−0.007	−0.018**	−0.019**	−0.011	−0.009
	[0.02]	[0.02]	[0.21]	[0.42]	[0.05]	[0.04]	[0.26]	[0.40]
ln VC syndicate size	−0.047***	−0.047***	−0.037***	−0.038***	−0.051***	−0.051***	−0.041***	−0.046**
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Lead VC reputation	−0.049	−0.050	−0.121	0.099	0.107	0.101	0.077	0.584
	[0.90]	[0.90]	[0.76]	[0.85]	[0.81]	[0.82]	[0.86]	[0.37]
Founder-CEO	−0.007	−0.007	−0.014*	−0.020**	0.002	0.002	−0.006	−0.012
	[0.42]	[0.42]	[0.07]	[0.02]	[0.82]	[0.82]	[0.51]	[0.23]
CEO Age	−0.001	−0.001	0.000	0.000	−0.001*	−0.001	−0.001	0.000
	[0.22]	[0.22]	[0.44]	[0.56]	[0.09]	[0.13]	[0.28]	[0.94]
Portfolio entrepreneur		−0.005	−0.006	0.018		−0.123***	−0.120***	−0.100**
		[0.82]	[0.77]	[0.45]		[0.00]	[0.00]	[0.01]
ln geographical distance	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.001
	[0.96]	[0.96]	[0.64]	[0.34]	[0.78]	[0.78]	[0.94]	[0.40]
ln startup age at first VC funding	0.005	0.005	−0.002	0.003	0.002	0.003	−0.002	0.004
	[0.38]	[0.38]	[0.75]	[0.55]	[0.70]	[0.63]	[0.69]	[0.48]
Industry market-to-book ratio	0.006	0.006	0.000	−0.001	0.010	0.011	−0.002	−0.002
	[0.69]	[0.69]	[0.99]	[0.93]	[0.56]	[0.54]	[0.89]	[0.92]
Total VC share ownership			−0.002***	−0.002***			−0.002***	−0.002**
			[0.00]	[0.00]			[0.00]	[0.00]
ln Lead VC fund size				0.007***				0.009***
				[0.01]				[0.00]
Intercept	0.401***	0.399***	0.453***	0.338***	0.555***	0.545**	0.576***	0.463***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Lead VC type indicator (Bank, Corporate, Government)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Law Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1262	1262	1262	955	988	988	988	743
Adjusted R^2	11.79%	11.71%	17.72%	17.02%	14.08%	14.51%	18.82%	19.47%

H3: Serial entrepreneurs are more likely to survive as CEOs than first-time entrepreneurs

Supported

- Serial entrepreneurs (both successful and unsuccessful) are more likely to survive as CEO than first-timers

Determinants of founder CEO duality at IPO

	Founder CEO duality					
	Logit: All entrepreneurs			Logit: Excluding previously successful entrepreneu		
	(1)	(2)	(3)	(4)	(5)	(6)
Serial entrepreneur	1.114***	1.156***	1.259***	0.763***	0.626**	0.774**
	[0.00]	[0.00]	[0.00]	[0.01]	[0.04]	[0.05]
Early stage investment by VC	0.046	0.045	−0.028	0.083	0.085	−0.024
	[0.77]	[0.78]	[0.88]	[0.68]	[0.67]	[0.91]
ln startup's total funding rounds	−0.140	−0.142	−0.057	−0.265	−0.249	−0.197
	[0.37]	[0.36]	[0.74]	[0.14]	[0.17]	[0.36]
ln VC syndicate size	−0.113	−0.110	−0.113	−0.032	−0.036	−0.023
	[0.38]	[0.39]	[0.47]	[0.83]	[0.81]	[0.90]
Lead VC reputation	−14.982**	−15.048**	−19.566*	−12.155	−12.086	−19.065
	[0.02]	[0.02]	[0.06]	[0.14]	[0.14]	[0.22]
CEO Age	−0.043***	−0.044***	−0.052***	−0.049***	−0.049***	−0.055**
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Portfolio entrepreneur		−0.272	−0.154		−0.128	0.492
		[0.43]	[0.72]		[0.86]	[0.68]
ln geographical distance	0.013	0.013	−0.009	0.015	0.015	0.002
	[0.52]	[0.52]	[0.70]	[0.49]	[0.50]	[0.93]
ln startup age at first VC funding	0.025	0.029	−0.022	0.082	0.085	−0.007
	[0.77]	[0.74]	[0.83]	[0.39]	[0.38]	[0.95]
Industry market-to-book ratio	0.306	0.308	0.101	0.176	0.184	−0.150
	[0.29]	[0.29]	[0.78]	[0.61]	[0.60]	[0.72]
Total VC share ownership	−0.012***	−0.012***	−0.010***	−0.015***	−0.015***	−0.013**
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
ln Lead VC fund size			0.130**			0.147**
			[0.03]			[0.04]
Intercept	1.279	1.229	1.313	1.871	1.921	2.055
	[0.38]	[0.40]	[0.49]	[0.31]	[0.29]	[0.36]
Lead VC type indicator (Bank, Corporate, Government)	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Law Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1262	1262	955	988	988	743
−2 Log Likelihood	1512.61	1511.98	1109.27	1177.67	1179.77	867.20

H4: Serial entrepreneurs are able to negotiate higher valuations for their startups than first-time entrepreneurs.

Partial supported, ONLY SUCCESSFUL entrepreneurs are able to negotiate higher valuations

- Serial entrepreneurs (both successful and unsuccessful) are more likely to negotiate higher valuations for their startup than first-timers

Determinants of equity purchase price paid by the VC syndicate

	OLS All entrepreneurs					
	Average share purchase price/ IPO offer price	Average share purchase price/ IPO offer price	Average share purchase price/ IPO offer price	*ln* Price paid per % of equity ownership (inflation-adjusted)	*ln* Price paid per % of equity ownership (inflation-adjusted)	*ln* Price paid per % of equity ownership (inflation-adjusted)
	(1)	(2)	(3)	(4)	(5)	(6)
Serial entrepreneur	0.062**	0.044*	0.018	0.167***	0.180***	0.151**
	[0.02]	[0.08]	[0.52]	[0.00]	[0.00]	[0.02]
Early stage investment by VC	−0.014	−0.013	−0.012	−0.107**	−0.108**	−0.051
	[0.57]	[0.59]	[0.67]	[0.05]	[0.05]	[0.40]
ln startup's total funding rounds	0.134***	0.135***	0.144***	0.487***	0.487***	0.477***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
ln VC syndicate size	0.034*	0.033*	0.037*	0.399***	0.400***	0.443***
	[0.08]	[0.10]	[0.07]	[0.00]	[0.00]	[0.00]
Lead VC reputation	0.292	0.310	1.014	5.863***	5.850***	3.903
	[0.72]	[0.70]	[0.37]	[0.00]	[0.00]	[0.14]
Founder-CEO	−0.007	−0.007	−0.027	0.073*	0.072*	0.015
	[0.72]	[0.74]	[0.24]	[0.10]	[0.10]	[0.75]
CEO Age	0.001	0.002	0.000	0.003	0.003	−0.002
	[0.33]	[0.28]	[0.91]	[0.31]	[0.32]	[0.56]
Portfolio entrepreneur		0.120	0.095		−0.089	−0.227
		[0.11]	[0.28]		[0.51]	[0.13]
ln geographical distance	0.004	0.004	0.004	0.016**	0.016**	0.014*
	[0.20]	[0.20]	[0.23]	[0.02]	[0.02]	[0.06]
ln startup age at first VC funding	0.028**	0.027**	0.034***	−0.018	−0.017	0.012
	[0.03]	[0.04]	[0.01]	[0.58]	[0.61]	[0.75]
Industry market-to-book ratio	0.086*	0.086*	0.136***	0.234***	0.233***	0.213**
	[0.07]	[0.07]	[0.01]	[0.01]	[0.01]	[0.03]
ln Lead VC fund size			0.017**			0.093***
			[0.04]			[0.00]
Intercept	−0.071	−0.056	−0.168	10.547***	10.536***	10.471***
	[0.71]	[0.77]	[0.42]	[0.00]	[0.00]	[0.00]
Lead VC type indicator (Bank, Corporate, Government)	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Law Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1236	1236	936	1236	1236	936
Adjusted R^2	17.65%	17.91%	20.75%	36.27%	36.24%	42.11%

Does being a serial entrepreneur have an impact in the capital-raising process, specifically in the terms negotiated and agreed upon with investors?

- Yes, serial entrepreneurs (both successful and unsuccessful) are able to negotiate better non-monetary contract terms than novice entrepreneurs. However, only previously successful serial entrepreneurs obtain higher valuations.

Lecture

- Pricing difficult in saas
- SaaS P&L → ARR and MRR, with investor relations only ARR
- Fundraising: raise capital when do you not need it..yet
- Balance act between existing & future investors: You need to make sure to make both the existing and the future investor happy with the term sheet

After commitment with investors: documents after adjustment signed, lawyer needs to agree, money transfer

Cash Flow Management

- Manage open receivables (variable in your control)
- Don't take agreements for granted until money transfer
- Educating team on reasonable budget
- Which Expenditures could be cutted/postponed if things do not go according to plan
- Transparency with team

Book recos:
→ doughnut economics (Raworth)
Taleb The black swan
The future is degrowth (schmelzer, vetter)