Small Business and Entrepreneurship during an Economic Recovery

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FEDERAL RESERVE BANK of ATLANTA

BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

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The Importance of Access to Capital for Business Innovation

Moderator: Traci Mach, Board of Governors of the Federal Reserve System

Who Seeks and Who Receives? Implications of Demand for and Access to Financial Capital by Young Firms

Sheryl Winston-Smith, Temple University, Fox School of Business

Bank Capital Ratios and the Structure of Nonfinancial Industries

Seung Jung Lee, Board of Governors of the Federal Reserve System

Discussant: Clinton B. Gwin, President, Pathway Lending

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Who Seeks and Who Receives: Access to Capital in a Changing Economic Environment

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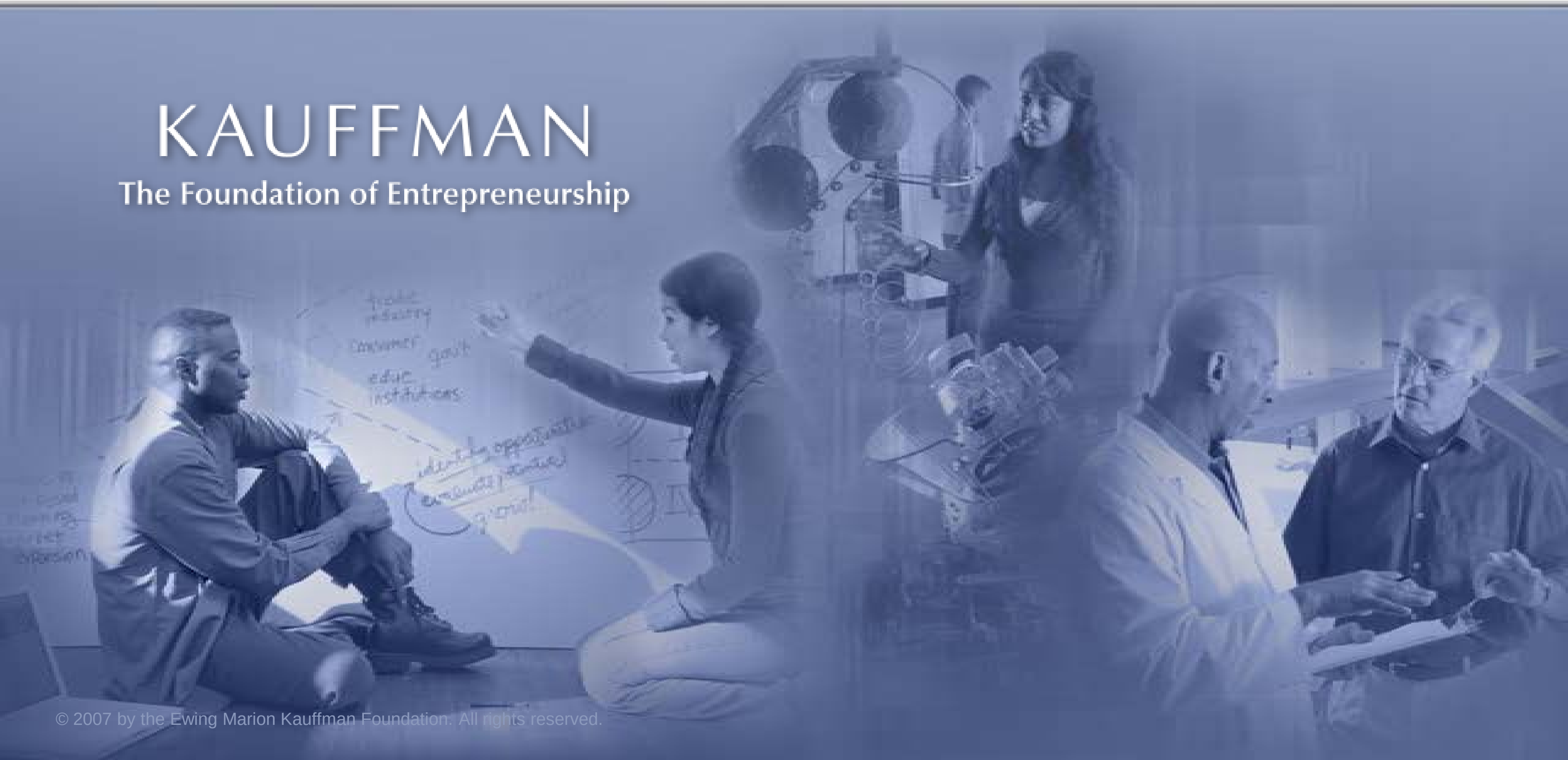
Small Business and Entrepreneurship during an Economic Recovery, November 10th, 2011

"Every individual that we can inspire, that we can guide, that we can help to start a new company, is vital to the future of our economic welfare."
— Ewing Kauffman



Motivation: Access to Financing

- Young firms and financial resources
  - Mix equity and debt sources (Cole, 2008; Cosh, Cumming, & Hughes, 2009; Eckhardt, Shane, & Delmar, 2006; Gompers & Lerner, 2006)
    - Most do not receive VC financing (Shane,2008), (Berger and Udell,1998), (Cole 2008)
    - Banks provide critical growth capital
      - Most important source of debt (Robb and Robinson, 2010)
      - Banks provide 40% of financing at startup (2004)
      - Increasingly important: 70% by 2009
  - High-tech firms
    - Entrepreneurs face strong incentives to acquire non-dilutive financing (Winton & Yeramilli, 2008; Ueda, 2004)
- Adverse financial shock magnifies information asymmetry

Research questions

- What is the impact of the financial crisis on:
- Access to capital
  - Decision to apply for a bank loan?
  - Likelihood of receiving a bank loan?

- Role of subjective measures/behavior in financing decision?
  - What are the implications for innovation and economic growth?

Banks and new firm financing

- Ease financial constraints for new firms
  - Deregulation and new entrepreneurial activity (Black and Strahan, 2002)
  - Substantial role in new firm formation (Ayyagari, Demirguc-Kunt and Maksimovic (2010); Beck, Demirgüç-Kunt and Maksimovic (2008); Kerr and Nanda (2009)
  - External sources of financing
    - Information asymmetry and importance of tangible assets (Berger and Udell, 1998)
    - Significance of outside debt in new firms' capital structure (Robb and Robinson, 2010)

High-Tech Firms

- Banks and high-tech firms
  - Bank loans increase as information asymmetry decreases (Winston Smith, 2010)
  - Increases innovation (Benfratello et al. 2010)
  - Bank loans and exit by acquisition
  - Less risky continuation strategy (Winton and Yerramilli, 2008)

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Prior empirical studies

- Selected based on financial choices...
  - Firms which have received venture capital financing

    (Amit, Glosten, & Muller, 1990; Bottazzi, Da Rin, & Hellmann, 2008; Fitza, Matusik, & Mosakowski, 2009; Gaba & Meyer, 2008; Gompers & Lerner, 2003; Gulati & Higgins, 2003; Kogut, Urso, & Walker, 2007; Lee, Peng, & Barney, 2007; Lerner, 1994)
  - Firms relying largely on external debt

    (Landier & Thesmar, 2009), others
  - Pre-IPO behaviour

    (Chemmanur,He, and Nandy (2009), others
- Or limited sample...
  - High-tech only (which focus on VC, for most part) *or*
  - Exclude high-tech entirely (which focus on banks/debt, for most part)

Empirical Setting

- Data: Kauffman Firm Survey (KFS)
  - Ongoing, longitudinal study of new businesses in US
  - Stratified random sample of new businesses started in 2004
  - Eligibility for inclusion→ NOT HAVE PRIOR TO 2004: EIN/schedule C income/legal form/state UI or FICA taxes prior to 2004
- Baseline Survey (2004) conducted in 2005
  - Annual follow-ups: Calendar years 2005-2009
  - N = 4,928 firms at baseline
- Access through NORC data enclave (confidential data)
  - Microdata
  - Industry detail
  - Continuous variables, rather than categorical

Sample Characteristics

Sample Characteristics 2007, 2008, 2009	All			High-Tech			Non-High Tech		
Panel A: Outcomes	2007	2008	2009	2007	2008	2009	2007	2008	2009
Applied for New Loan	12.0%	12.5%	12.1%	15.7%	15.1%	15.8%	11.8%	12.4%	11.8%
Always Approved for Loan	70.7%	66.4%	60.9%	51.6%	58.4%	60.5%	72.3%	67.1%	60.9%
Revenue (millions)	0.48	0.55	0.57	0.46	0.65	0.70	0.48	0.54	0.56
Profit (millions)	0.02	0.05	0.02	-0.26	-0.04	0.01	0.04	0.05	0.02
Panel B: Behavioral Characteristics									
Did not apply out of Fear	15.6%	18.5%	21.0%	13.6%	17.9%	18.2%	15.7%	18.6%	21.2%
High Credit Score	52.8%	53.0%	53.0%	61.8%	62.2%	62.2%	52.3%	52.4%	52.4%

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Sample Characteristics

Firm Characteristics	All	High Tech	Non High Tech
Comparative Advantage	61.6%	70.6%	61.1%
Product	51.0%	50.9%	51.0%
Home base	49.3%	53.4%	49.1%
High Tech	5.6%	100.0%	0.0%
Rural	16.5%	9.7%	16.8%
Owner Characteristics			
Black	8.7%	9.5%	8.7%
Female	30.6%	15.3%	31.6%
Hours Worked by Owner	42.5	42.7	42.4
Owner Age	44.9	44.7	44.9
College Degree or Higher	48.6%	72.2%	47.2%
Previous Industry Experience	43.8%	60.1%	42.8%
Previous Startup	42.4%	47.3%	42.1%

Sample Characteristics									
2007, 2008, 2009									
	All			High-Tech			Non-High Tech		
	2007	2008	2009	2007	2008	2009	2007	2008	2009
Multiple Owners	52.3%	57.9%	60.7%	52.6%	57.9%	59.8%	52.3%	57.9%	60.7%
Incorporated	21.4%	18.7%	16.9%	28.7%	27.6%	25.8%	21.0%	18.2%	16.4%
PPE/Asset Ratio	34.5%	35.1%	34.9%	27.2%	25.3%	23.9%	34.9%	35.8%	35.7%
RD Emp/Emp Ratio	11.1%	9.1%	8.2%	13.4%	14.3%	14.2%	11.0%	8.8%	7.9%
Trade Credit	54.1%	57.3%	57.4%	48.8%	52.4%	49.5%	54.4%	57.6%	57.9%
Log(Emp)	0.841	0.824	0.797	0.938	1.052	0.947	0.834	0.809	0.787
Log(Assets)	0.115	0.105	0.099	0.109	0.108	0.117	0.115	0.104	0.098
Insider Financing/Total Financing Ratio	6.4%	5.8%	6.5%	4.8%	3.2%	7.1%	6.5%	5.9%	6.4%
Has Business Credit Card	14.8%	15.0%	13.2%	11.4%	12.7%	14.2%	14.9%	15.1%	13.1%
Has Business Credit Line	6.2%	7.0%	6.0%	8.6%	9.0%	8.4%	6.1%	6.9%	5.9%
Has Intellectual Property	14.6%	11.6%	10.7%	23.9%	22.6%	22.8%	14.1%	10.9%	10.0%
Obs	4122			540			3582		

Source: Kauffman Firm Survey Microdata

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Startup Capital and Subsequent New Financial Injections (2004-2009)						
	2004	2005	2006	2007	2008	2009
Owner Equity	$ 32,612	$ 16,728	$ 12,858	$ 10,304	$ 10,218	$ 8,676
Insider Equity	$ 1,929	$ 1,539	$ 846	$ 577	$ 551	$ 833
Outsider Equity	$ 18,232	$ 20,097	$ 16,308	$ 11,522	$ 5,477	$ 10,371
Owner Debt	$ 4,884	$ 4,595	$ 4,058	$ 4,173	$ 4,675	$ 3,034
Insider Debt	$ 6,704	$ 5,847	$ 5,346	$ 4,815	$ 3,386	$ 10,118
Outsider Debt	$ 51,474	$ 47,430	$ 54,405	$ 73,480	$ 47,435	$ 75,605
Total Financial	$ 115,835	$ 96,235	$ 93,821	$ 104,870	$ 71,741	$ 108,636
Owner Equity	28.2%	17.4%	13.7%	9.8%	14.2%	8.0%
Insider Equity	1.7%	1.6%	0.9%	0.5%	0.8%	0.8%
Outsider Equity	15.7%	20.9%	17.4%	11.0%	7.6%	9.5%
Owner Debt	4.2%	4.8%	4.3%	4.0%	6.5%	2.8%
Insider Debt	5.8%	6.1%	5.7%	4.6%	4.7%	9.3%
Outsider Debt	44.4%	49.3%	58.0%	70.1%	66.1%	69.6%
Total Financial	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Source: KFS microdata						

Model and empirical analysis

- Observable financial and performance measures
  - Extent of credit constraint, revenue in previous year
- Behavioral characteristics
  - risk, fear of denial

$$(1)\ \textit{loan demand} = \beta_0 + \beta_1 \textit{growth} + \beta_2 \textit{constrained} + \beta_3 \textit{behavioral} + \beta_4 \textit{firm} + \beta_5 \textit{entrepreneur} + \varepsilon$$

$$(2)\ \textit{loan approval} = \delta_0 + \delta_1 \textit{growth} + \delta_2 \textit{asymmetry} + \delta_3 \textit{firm} + \delta_4 \textit{entrepreneur} + \mu$$

First Stage, Loan application

VARIABLES	High Tech Firms Only	All Firms	All Firms
First Stage Results			
Fear of denial	0.705***	0.636***	0.633***
	(0.155)	(0.0580)	(0.0580)
Bank Loans/Total Financial Capital	0.708*	0.399***	0.394***
	(0.412)	(0.0760)	(0.0757)

Dependent variable: Loan(s) always approved

VARIABLES	High Tech Firms Only	All Firms	All Firms
Second Stage Results			
High Tech Industry		-0.0778	-0.236**
		(0.0718)	(0.108)
Previous Startup Experience	0.0807	-0.0914**	-0.101**
	(0.131)	(0.0407)	(0.0402)
High Credit Score	0.209*	-0.0169	-0.0512
	(0.114)	(0.0410)	(0.0434)
High-Tech X High Credit Score			0.450***
			(0.109)
Intellectual Property	-0.143	-0.105**	-0.0910*
	(0.137)	(0.0471)	(0.0501)
High Tech X Intellectual Prop.			-0.235**
			(0.106)

Dependent variable: Loan(s) always approved

VARIABLES	High Tech Firms Only	All Firms	All Firms
Second Stage Results Continued			
R&D Employment	0.0248	-0.127***	-0.126***
	(0.220)	(0.0469)	(0.0465)
Have Trade Credit	-0.183*	0.0277	0.0245
	(0.100)	(0.0428)	(0.0420)
Log of Employment	-0.00783	-0.0110	-0.0110
	(0.0609)	(0.0250)	(0.0246)
Log of Assets	-0.270	0.00466	0.00624
	(0.202)	(0.0374)	(0.0381)
Insider financing/Total Financial Capital	-0.746**	-0.310***	-0.304***
	(0.324)	(0.101)	(0.100)
Has business credit card	-0.171*	-0.0981**	-0.0940**
	(0.0973)	(0.0413)	(0.0412)
Has business credit line	-0.173*	0.106***	0.110***
	(0.0943)	(0.0394)	(0.0391)
2008 Year Dummy	0.0320	-0.0751	-0.0803*
	(0.0917)	(0.0472)	(0.0472)
2009 Year Dummy	0.00760	-0.121**	-0.122**
	(0.158)	(0.0480)	(0.0480)

Conclusions

- KFS provides a window into the impact of the financial crisis on access to bank loans by young firms
  - Pre-crisis vs. post-crisis
- Kauffman Firm Survey
  - Crisis hits in critical window of new/young firm lifecycle
  - Understanding the impact of financial shock at key point

Conclusions and Policy Implications

- Credit markets tightened in 2008 and 2009
- Relationship between information transparency and entrepreneurs’ ability to secure adequate financial capital
  - Very important for high tech firms, which are typically more information-opaque
  - Tangible assets do not seem to matter as much as credit score
  - Implications for innovation and economic growth

- Comments/Questions?
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Thank you!

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