

# ENTREPRENEURIAL OPTIMISM, CREDIT AVAILABILITY, AND COST OF FINANCING: EVIDENCE FROM U.S. SMALL BUSINESSES

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# RESEARCH QUESTIONS

- ⊙ Does entrepreneurial optimism affect
  - ⊙ the choice of capital structure
  - ⊙ the credit availability to small firms
  - ⊙ and their cost of financing

# LITERATURE AND MOTIVATION

- ◎ Managerial optimism
  - ◎ Theories: Heaton, 2002; Hackbarth, 2008
  - ◎ Empirical Evidence: Malmendier and Tate, 2004, 2007; Puri and Robinson, 2007, 2010; Landier and Thesmar, 2009
  - ◎ ***The Achilles heel of any behavioral corporate finance study is the empirical measure of managerial bias.***
    - ***Previous measures***
      - ◎ Unexplained expected lifetime (Puri & Robinson)
      - ◎ Not exercise options (Malmendier & Tate)
      - ◎ Entrepreneurs' demographic characteristics (Landier & Thesmar)
    - ***Toward this end, we design an innovative measure of optimism.***

# LITERATURE AND MOTIVATION

## ◎ Capital Structure

- ◎ The Pecking Order Theory: Myers and Majluf, 1984; Myers, 1984
- ◎ The Trade-Off Theory : Jensen and Meckling, 1976; Jensen, 1986; Hart and Moore, 1994
- ◎ The Market Timing Theory: Baker and Wurgler, 2002
- ◎ ***While the overwhelming majority of empirical studies involve publicly traded firms, very few focus on small private firms.***
  - ***Cumming , 2005; Cole, 2009; Landier and Thesmar, 2009***

# LITERATURE AND MOTIVATION

- ◎ Small Business Lending
  - ◎ Small firms tend to borrow significant amount of money (for example, Berger and Udell (1998) report that roughly 50% of the small firms' financing comes in a form of debt)
  - ◎ Asymmetric information and relationship lending (Petersen and Rajan, 1994; Berger and Udell, 1995; Cole, 1998; Elsas and Krahn, 1998; Harhoff and Korting, 1998; Berlin and Mester, 1998; Scott and Dunkelberg, 1999; Ferri and Messouri, 2000 ; Machauer and Weber, 2000; Degryse and van Cayseele, 2000; Berger, Saunders, Scalise, and Udell, 1998; Cole, Goldberg, and White, 2004)
  - ◎ ***Entrepreneurial optimism and lending***
    - ***Theory: De Meza and Southey, 1996; Manove and Padilla, 1999; De Meza, 2001***
    - ***There is no empirical evidence regarding how optimism impacts banks' lending decisions.***

# HYPOTHESES

- ◎ *H1: Optimistic entrepreneurs are more likely to prefer debt to equity financing. Thus, controlling for other determinants of capital structure, small firms with optimistic entrepreneurs are more likely to choose highly levered capital structure.*
- ◎ *H2: Optimistic entrepreneurs are likely to use more short-term debt.*
- ◎ *H3: Optimistic entrepreneurs are more likely to pay trade credit late, other things equal.*
- ◎ *H4: Optimistic entrepreneurs' loan applications are more likely to be rejected, other things equal.*
- ◎ *H5: Optimistic entrepreneurs are more often requested to provide collateral for the loans granted, other things equal.*
- ◎ *H6: The interest rate of loans granted to optimistic entrepreneurs is higher, other things equal.*

# SAMPLE AND DATA

- ◎ The U.S. Federal Reserve Board's 1998 and 2003 SSBF data.
  - ◎ A small business is defined as a non-financial, non-farm enterprise employing fewer than 500 full-time equivalent employees.
- ◎ Excluding firms that are inherited or acquired as a gift or publicly traded
- ◎ Excluding firms without assets information
- ◎ The primary owners of firms are responsible for daily management.
- ◎ Our final sample consists of 2960 firms from the 1998 survey and the 3360 firms are from the 2003 survey
- ◎ The sample of the most recently applied loans consists of 654 observations from the 2003 survey and 570 observations from the 1998 survey.

# MEASURE OF OPTIMISM

- ⊙ We use the difference between the realistic probability that the entrepreneur's application for loans will be denied given the firm characteristics and credit conditions and the entrepreneur's subjective assessment of this probability as our measure of optimism.
- ⊙  $\text{Optimism}_1 = E_U(d|x) - E_S(d|x)$

# MEASURE OF OPTIMISM

- ◎ Both the 1998 and 2003 Federal Reserve Board surveys ask entrepreneurs the following question:  
*“During the last three years, were there times when [FIRM] needed credit, but did not apply because it thought the application would be turned down?”*
- ◎ We use the answer to this question as our value for  $E_S(d|x)$ .
- ◎ It is equal to 1 if the entrepreneur’s answer to the above question is “yes”, and zero otherwise.

# MEASURE OF OPTIMISM

- ⊙ We then use a logit regression to predict the realistic probability that entrepreneurs' application for loans will potentially be turned down.
- ⊙ Empirically, we run a logit regression where the dependent variable is  $E_S(d|x)$  and the explanatory variables include a number of firm characteristics and measures of credit conditions.
- ⊙ The predicted probability based on this logit regression is our value of  $E_U(d|x)$ .

# MEASURE OF OPTIMISM

- ◎ By construction the difference  $E_U(d|x) - E_S(d|x)$  can take on values in the interval  $(-1, 1)$ .  $E_U(d|x) - E_S(d|x)$  increases the more optimistic the entrepreneur is.

True Response/Prediction	YES=1	NO=0
YES=1	Rational (0)	Pessimist (-1)
NO=0	Optimist (1)	Rational (0)

Measure of Optimism	2003		1998	
	Coefficient	p-value	Coefficient	p-value
Intercept	0.169	0.655	-0.868**	0.048
<i>DB Score</i>				
DB_Score=2	-0.745***	0.000	0.352	0.249
DB_Score=3	-1.066***	0.000	0.654**	0.029
DB_Score=4	-1.247***	0.000	1.134***	0.000
DB_Score=5	-1.683***	0.000	1.686***	0.000
DB_Score=6	-1.862***	0.000		
<i>Firm Characteristics</i>				
Ln(Assets)	-0.016	0.576	-0.042	0.114
Ln(Firm Age)	-0.280***	0.000	-0.191***	0.003
Profit Margin	-0.015	0.337	-0.004	0.814
Tangible Assets	0.371**	0.016	0.507***	0.000
Corporation	0.295**	0.011	0.108	0.318
Urban	0.327**	0.016	0.148	0.206
<i>Bankruptcy History</i>				
Firm Bankrupt	0.489	0.277	3.277***	0.005
Owner Bankrupt	1.715***	0.000	1.608***	0.000
Owner Personal Wealth	-0.990***	0.000	-1.605***	0.000
Industry Dummies		Yes		Yes
N		3360		2960
Pseudo R-square (%)		13.43		11.51



# THE DEMOGRAPHICS OF OPTIMISM

	2003	1998
Intercept	-0.117*** (0.000)	-0.034 (0.310)
Male (+)	0.054*** (0.000)	0.020 (0.233)
White (+)	0.113*** (0.000)	0.113*** (0.000)
Education (+)	0.025** (0.032)	0.016 (0.277)
Ln(Experience) (-)	-0.015 (0.109)	-0.028** (0.011)
N	3360	2960
Adjusted R-square (%)	1.22	1.44

# ENTREPRENEURIAL OPTIMISM AND CAPITAL STRUCTURE

## ⊙ Models

$$DebtRatio = \alpha + \beta_1 \times Optimism + \beta_2 \times InforAsymmetry + \beta_3 \times ControlVar + \varepsilon$$

$$CL/TL = \alpha + \beta_1 \times Optimism + \beta_2 \times InforAsymmetry + \beta_3 \times ControlVar + \varepsilon$$

# ENTREPRENEURIAL OPTIMISM AND CAPITAL STRUCTURE

- ◎ Findings
  - ◎ We do not find significant correlation between entrepreneurial optimism and debt ratio.
  - ◎ We find that optimism is significantly and positively correlated to the ratio of CL/TL, indicating that more optimistic entrepreneurs use more short-term debt. This is consistent with the findings in Landier and Thesmar (2009)

DV: Debt Ratio	2003		1998	
	(1)	(2)	(3)	(4)
Intercept	9.908*** (0.000)	10.170*** (0.000)	24.780*** (0.000)	26.304*** (0.000)
Optimism	-0.695 (0.214)		-1.074 (0.333)	
Optimism Fractional Rank		-0.356 (0.628)		-2.149 (0.182)
Ln (Owner Wealth)	0.875** (0.026)	0.820** (0.046)	2.947** (0.010)	2.626** (0.025)
Ln (Assets)	-0.856*** (0.000)	-0.857*** (0.000)	-2.021*** (0.000)	-2.039*** (0.000)
Ln (Firm Age+1)	-0.240 (0.354)	-0.263 (0.318)	-0.321 (0.597)	-0.397 (0.514)
Profit Margin	0.001 (0.992)	0.001 (0.981)	-0.019 (0.916)	0.022 (0.904)
Percentage of Tangible Assets	-0.262 (0.660)	-0.237 (0.692)	-1.822 (0.185)	-1.685 (0.222)
Corporation	2.283*** (0.000)	2.296*** (0.000)	1.856* (0.067)	1.869* (0.065)
Urban	0.417 (0.387)	0.436 (0.367)	0.306 (0.779)	0.354 (0.745)
Industry Dummies	Yes	Yes	Yes	Yes
N	3360	3360	2960	2960
Adjusted R-Square (%)	2.57	2.53	2.74	2.77

DV: CL/TL	2003		1998	
	(1)	(2)	(3)	(4)
Intercept	0.555*** (0.000)	0.521*** (0.000)	0.360*** (0.000)	0.314*** (0.000)
Optimism	0.062*** (0.002)		0.058*** (0.003)	
Optimism Fractional Rank		0.041 (0.130)		0.058** (0.043)
Ln (Owner Wealth)	0.042*** (0.004)	0.047*** (0.002)	0.001 (0.992)	0.008 (0.688)
Ln (Assets)	-0.012*** (0.002)	-0.012*** (0.004)	0.005 (0.330)	0.005 (0.250)
Ln (Firm Age+1)	0.054*** (0.000)	0.056*** (0.000)	0.045*** (0.000)	0.047*** (0.000)
Percentage of Tangible Assets	-0.376*** (0.000)	-0.380*** (0.000)	-0.299*** (0.000)	-0.303*** (0.000)
Profit Margin	0.001 (0.128)	0.001 (0.141)	0.002 (0.605)	0.002 (0.601)
Corporation	-0.034** (0.039)	-0.035** (0.035)	-0.033* (0.060)	-0.033* (0.060)
Urban	0.013 (0.485)	0.010 (0.565)	0.042** (0.030)	0.041** (0.036)
Industry Dummies	Yes	Yes	Yes	Yes
N	2634	2634	2296	2296
Adjusted R-Square (%)	12.73	12.50	8.07	7.88

# ENTREPRENEURIAL OPTIMISM AND CREDIT AVAILABILITY

## ⊙ Models

$$\textit{TradeCreditPaidLate} = \alpha + \beta_1 \times \textit{Optimism} + \beta_2 \times \textit{InforAsymmetry} + \beta_3 \times \textit{OtherControl} + \varepsilon$$

$$\textit{Approval} = \alpha + \beta_1 \times \textit{Optimism} + \beta_2 \times \textit{InforAsymmetry} + \beta_3 \times \textit{PrivateInfor} + \beta_4 \times \textit{OtherControl} + \varepsilon$$

## ⊙ Private information

- ⊙ Length of relationship
- ⊙ Distance
- ⊙ In person communication

# ENTREPRENEURIAL OPTIMISM AND CREDIT AVAILABILITY

- ◎ Findings
  - ◎ We find that optimistic entrepreneurs are less likely to pay their trade credit late.
    - A small firm with the most optimistic entrepreneur is roughly **15%** less likely to pay trade credit late than the least optimistic entrepreneur, holding everything else equal.
  - ◎ The loan applications of optimistic entrepreneurs are more likely to be approved.
    - The loan application by the most optimistic entrepreneur is **29-40%** more likely to be approved by banks than that by the least optimistic entrepreneur.

DV: Trade Credit Paid Late	2003		1998	
	(1)	(2)	(3)	(4)
Intercept	-0.497**	-0.106	-0.572**	-0.214
Optimism	-0.660***		-0.483***	
Optimism Fractional Rank		-0.408***		-0.383***
Ln (Owner Wealth)	-0.247***	-0.296***	-0.105	-0.145*
Ln (Assets)	0.063***	0.055***	0.027	0.017
Ln (Firm Age+1)	-0.158	-0.086**	-0.040	-0.048
Percentage of Tangible Assets	-0.207**	-0.189*	0.226**	0.249**
Profit Margin	0.010	0.008	-0.002	-0.002
Debt Ratio	0.002	0.002	-0.001	-0.001
CL/TL	-0.053	-0.082	0.117	0.084
Corporation	-0.055	-0.046	0.234***	0.231***
Urban	0.041	0.062	0.068	0.083
Industry Dummies	Yes	Yes	Yes	Yes
N	1967	1967	1662	1662
Pseudo R-Square (%)	4.42	2.56	2.96	1.86

DV: Probability of Loan Approval	2003		1998	
	(1)	(2)	(3)	(4)
Intercept	-0.569	-1.718***	0.169	-1.173
Optimism	1.247***		1.631***	
Optimism Fractional Rank		1.693***		2.436***
Ln (Owner Wealth)	0.542***	0.719***	0.302	0.540**
Ln (Assets)	0.084*	0.092**	0.132***	0.141***
Ln (Firm Age+1)	0.159*	0.213**	0.125	0.153
Percentage of Tangible Assets	-0.103	-0.131	-0.441*	-0.501**
Profit Margin	-0.169	-0.199	0.108	0.108
Debt/Assets	-0.002	-0.003	-0.005	-0.006
Current Liability/Total Debt	-0.178	-0.123	-0.782***	-0.774***
Corporation	-0.255	-0.315	0.330**	0.314**
Urban	-0.204	-0.261	-0.271	-0.282
Owner Bankrupt	0.287	0.688	-1.980***	-1.721***
Firm Bankrupt	-1.444**	-1.352*		
Ln (Distance+1)	0.059	0.047	0.062	0.056
Ln (Relationship+1)	0.026	0.011	-0.032	-0.033
In Person	-0.147	-0.167	0.037	0.010
DB Score Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	796	796	728	728
Pseudo R-Square (%)	29.02	27.76	38.41	36.10

# ENTREPRENEURIAL OPTIMISM AND COST OF FINANCING

## ◎ Models

$$\textit{Collateral} = \alpha + \beta_1 \times \textit{Optimism} + \beta_2 \times \textit{InforAsymmetry} + \beta_3 \times \textit{PrivateInfor} + \beta_4 \times \textit{Loan} + \beta_5 \times \textit{OtherControl} + \varepsilon$$

$$\textit{Spread} = \alpha + \beta_1 \times \textit{Optimism} + \beta_2 \times \textit{InforAsymmetry} + \beta_3 \times \textit{PrivateInfor} + \beta_4 \times \textit{Loan} + \beta_5 \times \textit{OtherControl} + \varepsilon$$

# ENTREPRENEURIAL OPTIMISM AND COST OF FINANCING

- ◎ Findings
  - ◎ We do not find evidence that optimistic entrepreneurs are more often required to provide collateral.
  - ◎ We do not find evidence that optimistic entrepreneurs are charged an interest premium by financial lenders.

<b>DV: Probability of Collateral</b>	2003		1998	
	(1)	(2)	(3)	(4)
Intercept	-3.052***	-2.579***	-1.501**	-1.342*
Optimism	-0.342**		-0.189	
Optimism Fractional Rank		-0.610**		-0.216
<b><i>Control Variables</i></b>				
Ln (Owner Wealth)	-0.111	-0.209*	-0.007	-0.033
Ln (Assets)	0.021	0.018	0.023	0.019
Ln (Firm Age+1)	0.138*	0.106	-0.002	-0.008
Percentage of Tangible Assets	0.067	0.110	0.107	0.119
Profit Margin	-0.103	-0.104	0.047	0.047
Debt/Assets	0.071	0.071	-0.007	-0.007
Current Liability/Total Debt	-0.154	-0.150	0.082	0.085
Corporation	-0.020	0.002	0.107	0.109
Urban	-0.232*	-0.195	-0.098	-0.095
Owner Bankrupt	0.608	0.617		
Firm Bankrupt	-0.813	-0.980		
Loan Size	0.280***	0.281***	0.156***	0.156***
Loan Length	0.044	0.045	0.155**	0.154**
Ln (Distance)	-0.012	-0.011	-0.054	-0.053
Ln (Relationship)	-0.107***	-0.104***	-0.064*	-0.064*
In Person	0.242*	0.248**	0.123	0.120
DB Score Dummies	Yes	Yes	Yes	Yes
Loan Type Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	654	654	570	570
Pseudo R-Square (%)	20.38	20.65	16.47	16.40

DV: Spread over prime-rate	2003		1998	
	(1)	(2)	(3)	(4)
Intercept	6.878***	7.385***	5.606***	6.856***
Optimism	-0.405		-1.292***	
Optimism Fractional Rank		-0.654		-2.069***
<i>Control Variables</i>				
Ln (Owner Wealth)	-0.270	-0.372*	-0.240	-0.503**
Ln (Assets)	-0.165*	-0.168*	-0.129*	-0.144**
Ln (Firm Age+1)	-0.293**	-0.329**	-0.234*	-0.300**
Percentage of Tangible Assets	0.049	0.096	-0.069	0.022
Profit Margin	-0.010	-0.012	0.249*	0.248*
Debt/Assets	0.021	0.022	-0.009	-0.009
Current Liability/Total Debt	-0.264	-0.264	0.127	0.135
Corporation	0.032	0.056	0.007	0.011
Urban	-0.167	-0.131	-0.176	-0.168
Owner Bankrupt	0.601	0.556	3.169**	2.946**
Firm Bankrupt	2.342	2.216		
Ln (Distance)	0.091	0.090	-0.049	-0.047
Ln (Relationship)	-0.014	-0.012	-0.121**	-0.119**
In Person	-0.227	-0.220	-0.093	-0.100
Loan Size	-0.085	-0.084	-0.130	-0.130
Loan Length	-0.049	-0.048	-0.015	-0.017
Fixed Interest Rate	0.851***	0.860***	-0.563**	-0.532**
Collateralized	-0.472**	-0.482**	-0.363*	-0.356*
DB Score Dummies	Yes	Yes	Yes	Yes
Loan Type Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	654	654	573	573
Pseudo R-Square (%)	10.34	10.41	14.38	15.20

# ALTERNATIVE EXPLANATION

- ⊙ Is our optimism measure simply picking up the private information on firm quality?
  - ⊙ We control for distance, length of relationship, and communication method, in our primary specifications. These variables are commonly used proxies for the lenders' private information.
  - ⊙ Alternative approach: we regress our optimism measure on the above three proxies for private information asymmetry and replicate our main findings using the residuals (the part of optimism that cannot be explained by lenders' private information) . Our main results do not change.



# CONCLUSIONS

- ⊙ Optimistic entrepreneurs prefer short term debt to long term debt, confirming Landier and Themathar (2009).
- ⊙ We show financiers do not necessarily have better knowledge than entrepreneurs about their unrealistic optimism and do not curtail lending to more optimistic entrepreneurs.
- ⊙ Thus optimism causes banks to increase interest rates on loans to small businesses on average and to be more dependent on the personal wealth of entrepreneurs, which depresses the supply of credit to small businesses, particularly people with lower personal wealth.