The Effect of Credit Availability on Small Business Success

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INTRODUCTION

- There are approximately 29.6 million small businesses in the United States, which comprise 99.7% of all employer firms in the country
  - (www.score.org)
- When attempting to start or run a small business it is necessary to have a large amount of capital in order to finance such an undertaking.
- In my research, I hope to find whether there is any correlation between the sources of this capital in relation to the success of the small business.
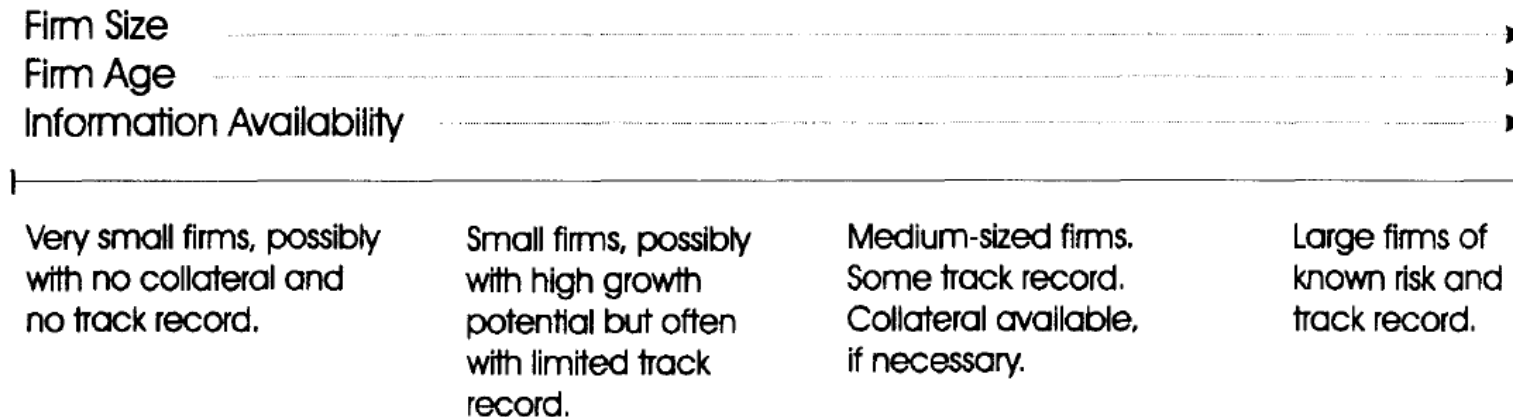
LITERATURE REVIEW

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- Haynes, George W. Brown, James R. (2009). How Strong is the Link Between Internal Finance and Small Firm Growth? Evidence from the Survey of Small Business Finances.

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- Firms viewed through a financial growth cycle in which different capital structures are optimal at different points in the cycle.
- Capital structure varies with age and firm size

Firm Continuum and Sources of Finance

Firm Size ──────────────────────────────▶
Firm Age ──────────────────────────────▶
Information Availability ──────────────────▶

| Very small firms, possibly with no collateral and no track record. | Small firms, possibly with high growth potential but often with limited track record. | Medium-sized firms. Some track record. Collateral available, if necessary. | Large firms of known risk and track record. |

George W. Haynes, James R. Brown, An Examination of Financial Patterns Using the Survey of Small Business Finances

$$CB = \alpha_0 + \alpha_1 \text{(year\_1993)} + \alpha_2 \text{(year\_1998)} + \alpha_3 \text{(firm characteristics)} + \alpha_4 \text{(owner characteristics)} + \alpha_5 \text{(loan types)} + \varepsilon_i$$

where

CB = share of loans held by a commercial bank;

year_1993 = dummy variable for 1993 (reference year is 2003);

year_1998 = dummy variable for 1998 (reference year is 2003);

firm characteristics = bankruptcy filings by the owner, natural log of number of employees (size), natural log of age, industrial classification, rural/urban location, legal organization;

owner characteristics = natural log of age, natural log of experience, gender and race of the majority owner; and,

loan types = dummy variables are included for line of credit, mortgage, vehicle, equipment, capital leases and other traditional loans. The dummy variable indicates that the firm holds a loan with a positive balance.

$$FC = \alpha_0 + \alpha_1 \text{(year\_1993)} + \alpha_2 \text{(year\_1998)} + \alpha_3 \text{(firm characteristics)} + \alpha_4 \text{(owner characteristics)} + \alpha_5 \text{(loan types)} + \varepsilon_i$$

where
FC = share of loans held by a finance company; and

other variables are the same as above.

Data

- **2003 Survey of Small Business Finances (SSBF)**
- Collects information on small businesses (fewer than 500 employees) in the United States.
- 21,200 Observations
- Owner characteristics
- Firm size
- Use of financial services
- The income and balance sheets of the firm

- http://www.federalreserve.gov/Pubs/oss/oss3/nssbftoc.htm

Conceptual Framework/Model

- Linear Regression
- $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$

- Y = Measure of Small Business Success
  - (i.e. Log Sales)
- X_0 = Intercept
- X_1 = Credit Variables
- X_2 = Owner Characteristics
- X_3 = Firm Characteristics
- ε = Error Term

CREDIT VARIABLES

- Checking
- Savings
- Owner's Personal Credit Cards
- Business Credit Cards
- Any Lines of Credit
- Mortgage
- Motor Vehicle Loans
- Equipment Loans
- Capital Leases
- Other Loans
- Trade Credit

- Primary Institution
  - Commercial Bank
  - Savings Bank
  - Savings and Loan
  - Credit Union
  - Finance Company
  - Insurance Company
  - Brokerage Company

Owner Characteristics

o Female
o Log Age
o Log Experience
o Manage
o Education
  - Less than high school degree
  - High school graduate or equivalent (GED)
  - Some college but no degree granted
  - Associate degree occupational/academic program
  - Trade school/vocational program
  - College degree (BA, BS, AB, etc.)
  - Post graduate degree (MBA,MS,MA,Phd,JD,MD,DDS,etc.)
o Hispanic
o White
o Black
o Asian

Firm Characteristics

- Log Firm Age
- Log Total Employees
- Credit Risk
  - Dun and Bradstreet Rank Credit Score - 1 most risky; 6 least risky
  - 1: 0-10
  - 2: 11-25
  - 3: 26-50
  - 4: 51-75
  - 5: 76-90
  - 6: 91-100
- Bankruptcy
- Metropolitan Location
  - Urban
  - Rural

Variable	N	Mean	Std Dev	Minimum	Maximum
A0_DB_CREDRK	21055	3.8610781	1.4475841	1	6
Checking	21200	0.9639151	0.1865058	0	1
Savings	21200	0.2775943	0.4478227	0	1
OwnerCC	21200	0.4359906	0.4958976	0	1
BusinessCC	21200	0.5364623	0.4986805	0	1
Anycreditline	21200	0.4504717	0.4975526	0	1
Mortgage	21200	0.1643868	0.3706349	0	1
MVL	21200	0.2860849	0.4519402	0	1
Equiploan	21200	0.1514151	0.3584615	0	1
Caplease	21200	0.1301887	0.3365188	0	1
Otherloan	21200	0.1214623	0.3266714	0	1
Tradecredit	21200	0.6891509	0.4628521	0	1
Combank	21200	0.8978774	0.3028167	0	1
SavBank	21200	0.0549528	0.2278935	0	1
SNL	21200	0.0167453	0.1283186	0	1
Creditunion	21200	0.004717	0.0685197	0	1
Financeco	21200	0.0023585	0.0485081	0	1
Insuranceco	21200	0.000707547	0.026591	0	1
Brokerageco	21200	0.000707547	0.026591	0	1
Female	21200	0.217217	0.4123612	0	1
LogAge	20780	3.9510808	0.2206322	2.944439	4.5217886
LogExper	20720	2.888459	0.7183715	0	4.2626799
LessHS	21200	0.0181604	0.1335343	0	1
HSGrad	21200	0.1890094	0.3915253	0	1
SomeColAA	21200	0.0612264	0.2397508	0	1
Vocational	21200	0.0262736	0.1599515	0	1
ColGrad	21200	0.3240094	0.4680146	0	1
PostGrad	21200	0.2045755	0.4034006	0	1
Manage	21200	0.8574057	0.3496669	0	1
Hispanic	21200	0.0365094	0.1875584	0	1
White	21200	0.9046226	0.2937424	0	1
Black	21200	0.0289623	0.1677044	0	1
Asian	21200	0.0395283	0.1948528	0	1
Firmage	21200	2.467794	0.9078053	0	4.634729
Familyown	21200	0.834717	0.3714445	0	1
Urban	21200	0.1775943	0.3821799	0	1
logTotalemp	21185	2.1620639	1.6307695	0	6.1862086
Bankruptcy	21200	0.0084906	0.0917544	0	1
logsales	20885	13.1701847	2.3659145	3.988984	19.1667111
logcosts	21060	12.886189	2.4924783	1.6094379	19.2041069

The REG Procedure
Model: MODEL1
Dependent Variable: logsales

Number of Observations Read	21200
Number of Observations Used	20265
Number of Observations with Missing Values	935

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	35	84606	2417.32091	1872.27	<.0001
Error	20229	26118	1.29112		
Corrected Total	20264	110724			

Root MSE	1.13627	R-Square	0.7641
Dependent Mean	13.12440	Adj R-Sq	0.7637
Coeff Var	8.65772		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	10.22182	0.18532	55.16	<.0001
Checking	1	0.74714	0.07143	10.46	<.0001
Savings	1	0.12950	0.01851	7.00	<.0001
OwnerCC	1	-0.08500	0.01692	-5.02	<.0001
BusinessCC	1	0.19979	0.01768	11.30	<.0001
Anycreditline	1	0.46682	0.01820	25.65	<.0001
Mortgage	1	-0.01480	0.02222	-0.67	0.5054
MVL	1	0.12800	0.01860	6.88	<.0001
Equiploan	1	0.04447	0.02370	1.88	0.0606
Caplease	1	0.15308	0.02476	6.18	<.0001
Otherloan	1	0.15329	0.02535	6.05	<.0001
Tradecredit	1	0.39162	0.01928	20.32	<.0001
Combank	1	0.74305	0.09097	8.17	<.0001
SavBank	1	0.76467	0.09580	7.98	<.0001
SNL	1	0.89205	0.10780	8.28	<.0001
Creditunion	1	1.06014	0.14884	7.12	<.0001
Financeco	1	1.29749	0.19390	6.69	<.0001
Insuranceco	1	-0.39342	0.30800	-1.28	0.2015
Brokerageco	1	1.06726	0.30876	3.46	0.0005
Female	1	-0.43529	0.02027	-21.48	<.0001
LogAge	1	-0.51437	0.04821	-10.67	<.0001
LogExper	1	0.17133	0.01664	10.30	<.0001
Manage	1	-0.15591	0.02576	-6.05	<.0001
LessHS	1	-0.17076	0.06018	-2.84	0.0046
HSGrad	1	-0.08380	0.02170	-3.86	0.0001
SomeColAA	1	-0.24735	0.03413	-7.25	<.0001
Vocational	1	-0.24472	0.05033	-4.86	<.0001
PostGrad	1	0.00390	0.02132	0.18	0.8549
Black	1	-0.64217	0.04845	-13.25	<.0001
Hispanic	1	-0.10931	0.04288	-2.55	0.0108
Asian	1	0.30088	0.04140	7.27	<.0001
Firmage	1	0.11459	0.01207	9.50	<.0001
A0_DB_CREDRK	1	0.06428	0.00587	10.94	<.0001
Urban	1	-0.14762	0.02115	-6.98	<.0001
logTotalemp	1	0.97347	0.00647	150.42	<.0001
Bankruptcy	1	0.33316	0.08717	3.82	0.0001

FUTURE WORK FOR PAPER

- Remove Variables to measure how much each variable of credit effects the R^2
- Decomposition
  - Break Down by Industry
    - Account for Seasonal Effects
  - Separate by Firm Size
    - Account for Business Growth Cycle

QUESTIONS/COMMENTS?