On the Economic Performance of Nascent Entrepreneurs

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Outline of the Presentation

- Genesis of the topic
- Purpose of our paper
- Framework for analysis
- Data and key variables
- Empirical model and findings
- Punchline
- Possible next steps

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Genesis of the Topic

- Literature on Nascency
  - individual considering starting a new firm
  - decision to become a nascent entrepreneur
- Literature on Entrepreneurship
  - behavior/performance and firm size

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Purpose of Our Paper

- We compare technology-based performance among nascent and established firms
  - policy continues to focus on technology/innovation-based economic growth while also emphasizing the importance of entrepreneurship as a key driver
    - “Entrepreneurship plays an essential role in generating innovation and stimulating U.S. economic growth. New firms account for most net job growth, and small businesses employ 30% of high-tech workers.” (National Economic Council, 2011)

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Framework for Analysis

- Uncertainty in the *ex-post* value of R&D (Y_i).
- *Ex-ante* firm i knows that the value Y_i of a new R&D project with distribution $F_i(Y)$, with known mean (m_i), and with dispersion (s_i)
- Firms: nascent (i=0) or established (i=1)
- Projects by nascent firms are inherently riskier, $s_0 > s_1$
- Unconditional expected value $m_0 \gtrless m_1$
- Failure occurs when the value of the R&D project Y_i falls below a certain threshold level $\bar{Y}$

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Data and Key Variables

- 2005 NRC database of Phase II SBIR projects funded b/w 1992 - 2001
  - 6408 projects from DoD, NIH, DOE, NASA, and NSF → 1878 random projects
- Key Variables
  - Phase II project technology commercialized by 2005
  - Nascent firm founded because of the SBIR Phase II award and the number of previous Phase II awards was zero
  - Failure if Phase II project discontinued by 2005

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Data Set

National Research Council Survey of Phase II Awards

Agency	Phase II Sample Size	Respondents	Response Rate	Random Sample
DoD	3,055	920	30%	891
NIH	1,678	496	30%	495
NASA	779	181	23%	177
NSF	457	162	35%	154
DOE	439	157	36%	161
	6,408	1,916		1,878

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Empirical Model and Findings

We estimated a probit model with sample selection, in which commercialization is only observed for the projects that did not fail:

$$notfail_i = (z_i\gamma + u_{2i} > 0)$$

and

$$commer_i = (x_i\beta + u_{1i} > 0 | u_{2i} > -z_i\gamma).$$

The error terms u_{1i} and u_{2i} are assumed to be jointly normally distributed

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Project Failure

Descriptive Statistics

	Project That Did Not Fail (n=988)			Project That Failed (n=541)		
Variable	**Mean**	**Std. Dev.**	**Range**	**Mean**	**Std. Dev.**	**Range**
commer	0.64	0.48	0/1	.	.	.
nascent	0.12	0.32	0/1	0.16	0.37	0/1
breadthexp	1.23	0.45	1-3	1.19	0.44	1-3
privexp	0.70	0.46	0/1	0.71	0.46	0/1
univexp	0.37	0.48	0/1	0.34	0.47	0/1
govtexp	0.08	0.26	0/1	0.09	0.28	0/1
prevphII	6.26	21.47	0-175	8.67	26.98	0-222
prevrelphII	1.14	2.44	0-28	0.54	1.64	0-28
emp	25.76	50.74	0-375	39.58	67.63	0-450
age	17.38	11.18	5-105	20.57	10.86	5-105
$award	8.23	3.28	1.1-54.3	7.73	4.31	0.9-84.0
addlfund	0.73	0.45	0/1	0.24	0.43	0/1
$addlfund	1.61	6.96	0-106	0.38	3.57	0-65

Note: Of the 1,878 projects in the NRC database, information on all of the variables in this table was available for only 1,529 projects.

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Conditional Commercialization

- While nascent firms have a greater likelihood of project failure, those that do not fail have a greater probability of commercialization – 11 percentage points higher
- Given that a project did not fail, larger firms have a greater probability of commercialization
- Additional funding (0/1) rather than the amount of additional funding ($) to support the technology developed during the Phase II project increases the probability of commercialization

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Punchline

- We have shown that nascent technology-based firms that receive a Phase II SBIR R&D award are more likely to fail, but those that do not fail have a higher probability of commercialization

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Possible Next Steps

- Might it be in society's best interest to place an emphasis on supporting technology-based nascent entrepreneurs rather than legacy entrepreneurs?

THANK YOU

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