ENTREPRENEURIAL BEHAVIOR AND THE DEVELOPMENT OF TRADING INSTITUTIONS: AN ANALYTICAL APPROACH

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Conceptualizations of the Entrepreneur

- Knight (1921)
- Schumpeter (1934)
- Hayek (1945)
- Kirzner (1973)
More recent work in field of entrepreneurship argues for a more precise theory.

- Shane and Venkataraman (2000)
- Phelps (2005)
- Davidsson (2002)
Towards this:
An analytical framework akin to our general equilibrium models of consumer behavior and producer behavior would aid us in building a theory of entrepreneurial behavior. This gives us a unified way to:

1. Explain many of the empirical findings about entrepreneurship.
2. Be able to lend insight into entrepreneurship not readily observed empirically.
Main Elements of Entrepreneurial Economy Two important features of entrepreneurship: (1) decision making under uncertainty (2) decision changes the status quo in some way.

- Populated by individuals with an idea for improving the status quo (a venture idea).
- These are potential entrepreneurs.
- Endowed with time to produce consumption goods or be entrepreneurial.
- Choosing to be entrepreneurial means one uses time to work on implementing his venture idea.
- Entrepreneurial effort increases one’s probability of success.
The Analytical model builds on the work of new classical economists who use consumer-producer models and focus on inframarginal as well as marginal analysis. This literature was originally pioneered by Yang and a survey of the literature can be found in Yang (2003).
Why Consumer-Producer?

- Often the entrepreneur is both a user and producer (often ideas come from being a consumer of the good or user of the technology) (Harhoff & Hippel, 2002).

- Entrepreneurs change comparative advantages and this changes trade patterns — inframarginal analysis used to study optimization within a given market structure and across various structures.

- Inframarginal analysis looks at corner solutions. Studying when individuals choose not to become entrepreneurs (corner solution) is as important as studying when they do become entrepreneurs. (This is particularly so for theory since this is something that is very difficult to observe empirically - we often study successful entrepreneurs because this is what we can observe.)
Some Definitions and Assumptions

**Definition**

*Venture Idea*: An observation from the space, \( \mathcal{U} \in \mathbb{R}_{++} \), of unknown or unimplemented ideas.

**Assumption**

Implementing a production technology from \( \mathcal{U} \) requires a venture idea, \( m_i^1 \), and entrepreneurial effort (\( l_e^i \)).
A Potential Entrepreneur is an individual, $i \in \mathcal{I}$, who has a venture idea, $m^i_1 \in \mathcal{U}$. An Entrepreneur is a potential entrepreneur who chooses positive entrepreneurial effort $l_e > 0$.

**Definition**

*Entrepreneurial Discovery*: A function, $\hat{\gamma} : [0, 1] \rightarrow (0, 1]$, describing the relationship between entrepreneurial investment, $l_e$, and the probability of entrepreneurial success, $\hat{\gamma}(l_e)$.

In the paper, we assume a linear functional form

$$\hat{\gamma}^i = \gamma^i l_e^i \quad 0 < \gamma^i \leq .$$

(1)
Current Status Quo
Goods $x$ and $y$ are produced by individuals with 1 unit of labor time according to:

$$y^i = l^i_y,$$  \hspace{1cm} (2)
$$x^i = m_0 l^i_x.$$  \hspace{1cm} (3)

If an entrepreneur is successful then $x$ can be produced according to:

$$x = m_1 l_x.$$  \hspace{1cm} (4)
Entrepreneur’s Decision Tree - No Trade

\[ l^* > 0 \quad l^*_e = 0 \]

\[ \gamma l^*_e \]

\[ U_{\text{Success}} \]

\[ U_{\text{Fail}} \]

\[ U^{\text{SQ}} \]
An entrepreneur in autarky chooses his optimal entrepreneurial effort, \( l_e^* \), in order to solve the problem

\[
\max_{l_e} \{ U^{SQ}, (\hat{\gamma} U^{Success} + (1 - \hat{\gamma}) U^{Fail}) \}
\]

subject to \( 0 \leq l_e \leq 1 \) and \( \hat{\gamma} = \gamma l_e \). Solving this problem yields the following result: Let \( E^A \subset (0, 1] \times \mathcal{U} \) be the set of pairs \((\gamma, m_1)\) such that the potential entrepreneur chooses \( l_e > 0 \).

**Proposition**

*Given the above autarky model,*

\[
E^A = \{(\gamma, m_1) \in (0, 1] \times \mathcal{U} | \frac{1}{27} \frac{(\gamma m_1 + (1-\gamma)m_0)^3}{(\gamma(m_1-m_0))^2} > \frac{m_0}{4} \}.
\]
Individuals (empirically) might express this decision as:

- Entrepreneurs use words such as “I took the plunge” or “I saw the opportunity and decided to go for it.”
- Potential entrepreneurs use phrases such as, “I once had an idea for ... but never acted on it.”

Further analyzing the entrepreneur’s optimal entrepreneurial effort helps explain some intuitive results observed about entrepreneurs. For example, if entrepreneurial effort is positive, then assuming all else equal, entrepreneurial effort will (1) decrease if the status quo technology increases (2) increase if the size of the venture idea increases and (3) increase if entrepreneurial efficiency increases.
How does entrepreneurial behavior change if there is a (competitive) market?
Model is altered such that one individual is assumed to be a potential entrepreneur and is currently specializing in \( x \) production. Other individual specializes in \( y \) production. Each now also have the usual budget constraint where we let \( p = \frac{p_x}{p_y} \) be the relative price of \( x \) in terms of \( y \).
Key Assumption
Market is competitive. ∴ entrepreneur expected price is expected marginal cost. Most studies of entrepreneurship assume some type of market power a priori and this drives entrepreneurial behavior. Here we can study how an entrepreneur creates profits in competitive markets. This may give insight into why entrepreneurship seems to be correlated with more free market systems ((Baumol, 2005)).
Results that helps explain some empirical market-entrepreneurship links

**Proposition**

*Given the two person trade model and its assumptions, an entrepreneur in autarky with no trading opportunity has a lower positive amount of entrepreneurial effort than when there is a trading opportunity.*
When there is a market opportunity, let $E^M \subset (0, 1] \times \mathcal{U}$ be the set of pairs $(\gamma, m_1)$ such that the potential entrepreneur such that chooses $l_e > 0$.

**Proposition**

*Given the model and its assumptions, $E^A \subset E^M$.***
Conclusion and Extensions  This paper applied the framework to study how entrepreneurial activity can drive and is driven by trade development. Framework can be used to explore a number of questions:

- Study different types of technology and effect on entrepreneurial behavior (Campbell, 2008b).
- Study how different intellectual property mechanisms effect entrepreneurial behavior (Campbell, 2008c).
- Use framework to build a computational model of an entrepreneurial economy and study evolutionary effects of entrepreneurship at both micro and macro levels (Campbell, 2008d).
- Framework can be made more general to include other functional forms.
- Framework can be modified with various assumptions in order to do specific case studies.
“Entrepreneurship innovation and capitalism will make it into the economics classrooms only with the arrival of ‘abstract, formal’ treatments. When those arrive, economics — and capitalism - will receive a huge boost.”

- Phelps (2005) p. 30


Review, 35(4), 519-530.


