



Endogenous Capability Building and Start-up Advantage in New Markets

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Who Can Better Establish New Markets: Start-ups or Diversifying Entrants?

- Existing firms have a higher chance of survival and are bigger than new firms (e.g. Dunne et al 98, Barnett et al 03, Carroll et al. 96)
 - Diversifying entrants' existing resources and capabilities give them advantage (e.g. King & Tucci 02, Helfat 97, Helfat & Lieberman 02)
 - Core & specific (e.g. technological) capabilities needed for building new products
 - Peripheral and general capabilities (e.g. brand, market awareness and scanning of emerging opportunities, supply chains, distribution channels, sales and marketing)
 - Resources for investment into developing new products and business models
- ➔ So theoretically, diversifying entrants should be better poised to establish new markets

But Startups seem Important!

- Over 70% of gross job creation and a large share of commercialized innovations are due to start-ups and young firms (Decker et al 14, Roberts et al 15, Acemoglu et al 13)
- Currently over 300 start-ups valued over \$1B each

Biggest American “unicorns”
(Date founded)

Unicorn (noun): Any startup worth more than \$1bn

Company valuation,
\$bn*, July 2015

 U B E R (2009)	Taxi hailing	41
 airbnb (2008)	Accommodation for tourists and millennials	26
 Snapchat [§] (2011)	Ephemeral messaging app	16
 Palantir (2004)	Big data	15
 SPACE X [§] (2002)	It is rocket science	12
 Pinterest (2009)	Photo sharing	11
 Dropbox (2007)	Cloud-based file sharing	10
 wework [§] (2010)	Office space provision	10
 theranos (2003)	Diagnostics through blood sampling	9
 Square (2009)	Mobile-payments system	6

Sources: CB Insights; Mattermark; PrivCo; *The Economist* *Latest post-money †Estimate

But Startups seem Important!

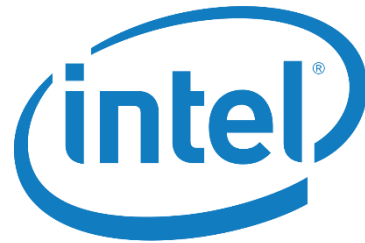
- Anecdotal start-ups play a significant role in starting new markets

myspace

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- Our review of 26 major technological new markets (from (Forbes, 2009)) over the past 35 years (1979-2009) finds start-ups first successfully commercialized a product in at least half those markets

➔ Why start-ups seem to be more successful in establishing new markets than the theory suggest?

(Related) Explanations

- Fear of cannibalization stops mature firms
 - But you can't cannibalize what will be others' lunch
 - Less relevant unless significant overlap with current market
- (Over)confidence & Luck! there are many startups
 - But potential entrants are many as well
- Inertia and cognitive frames imposed by current routines lead to suboptimal incumbent actions (e.g. Henderson 93, O'Reilly & Tushman 08, Tripsas & Gavetti 00, Kaplan 08)
 - More relevant for incumbents than diversifying entrants (Sosa 13)
 - May explain why some potential entrants miss the opportunity, but many should and do enter (e.g. King and Tucci 02, Klepper & Simon 00)

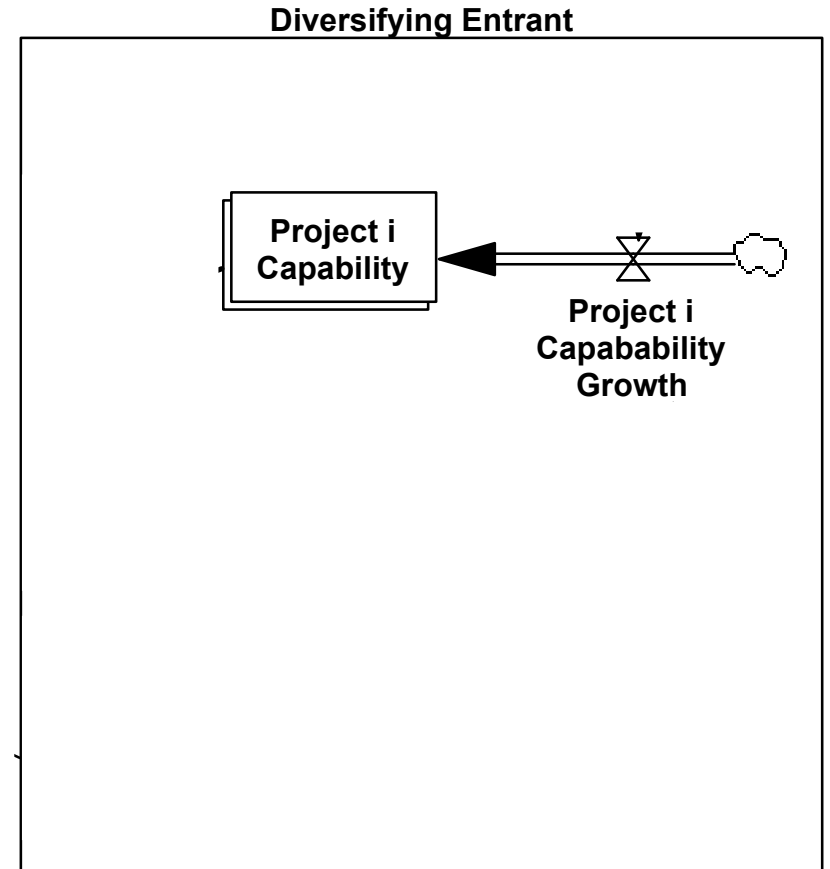
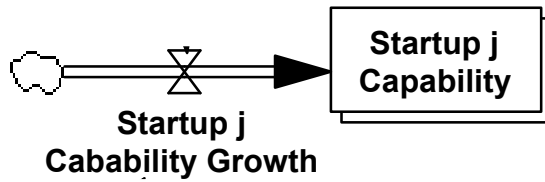
Advancing a Complementary Hypothesis

- Learning and experimentation at the heart of finding a product design that starts a new market (e.g. Nelson & Winter 82, Dossi et al 00, Helfat & Lieberman 02)
- Resource availability and motivation, thus speed of learning, are endogenous to progress as perceived by employees and those controlling resources (e.g. VCs for startups and higher managers for projects inside a diversifying entrant)

Research Question: Who can learn and build capabilities faster in the early race, with endogenous leaning, between start-ups and internal projects?

Method: A simulation model to explore the mechanisms regulating this race

Model overview

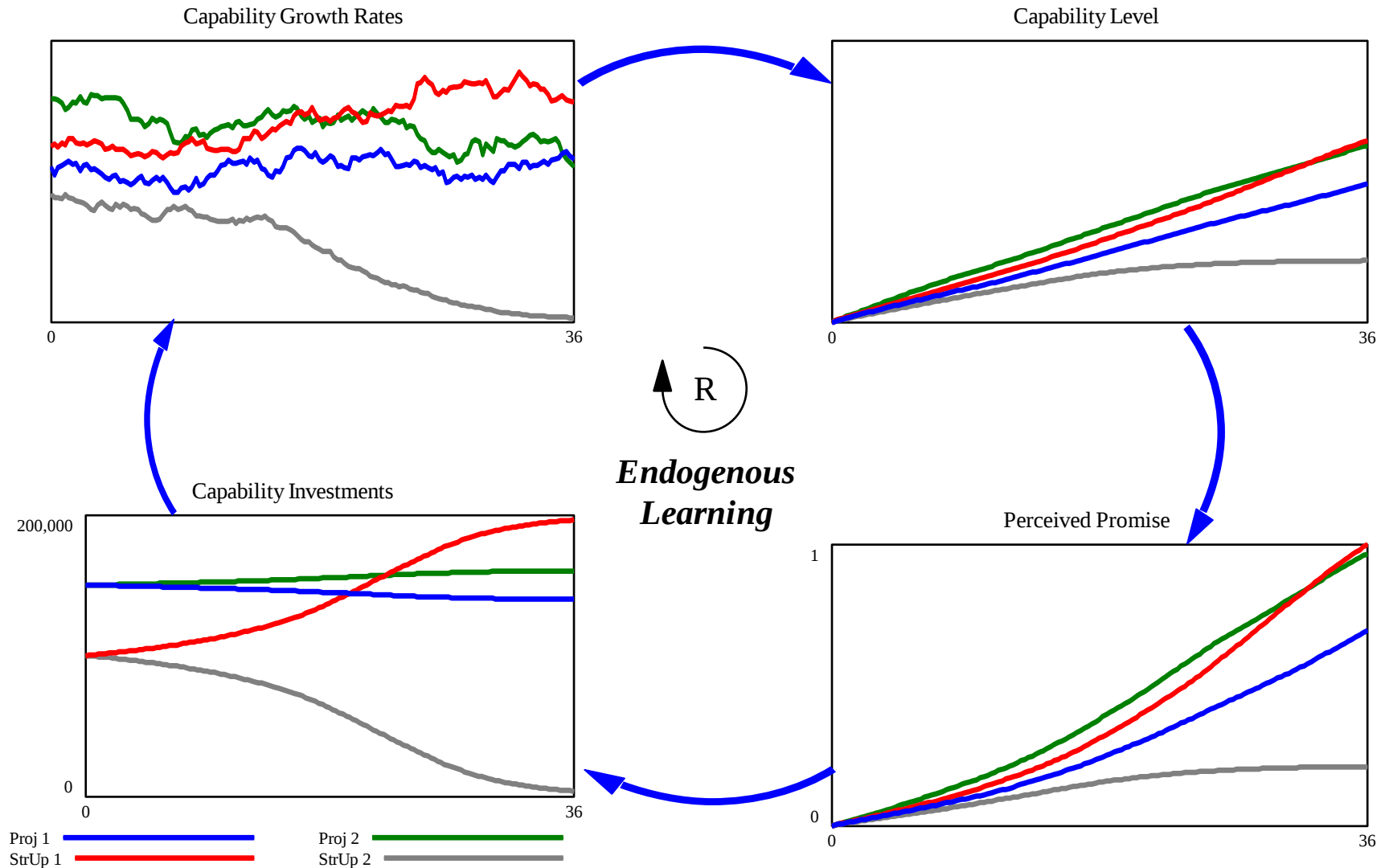


Startup vs. Existing Firm: Key Assumptions

- Existing firms may have an advantage in resources:
 - More resources to allocate to potential new ventures
 - More productive in their investments due to existence of supportive resources and capabilities
 - r : ratio of existing firm's resources allocated to new projects vs. resources going to competing start-ups
- Startup's resource endowments more closely linked to their past performance
 - The relationship among organizational units make it hard to fully decouple different internal projects
 - A logic of investing in a portfolio further leads to less aggressive decoupling among projects
 - $Resource\ Share_i = \frac{e^{\alpha \cdot g \cdot P_i}}{\sum_j e^{\alpha \cdot g \cdot P_j}}$
 - α : Degree of decoupling among internal projects of the diversifying entrant

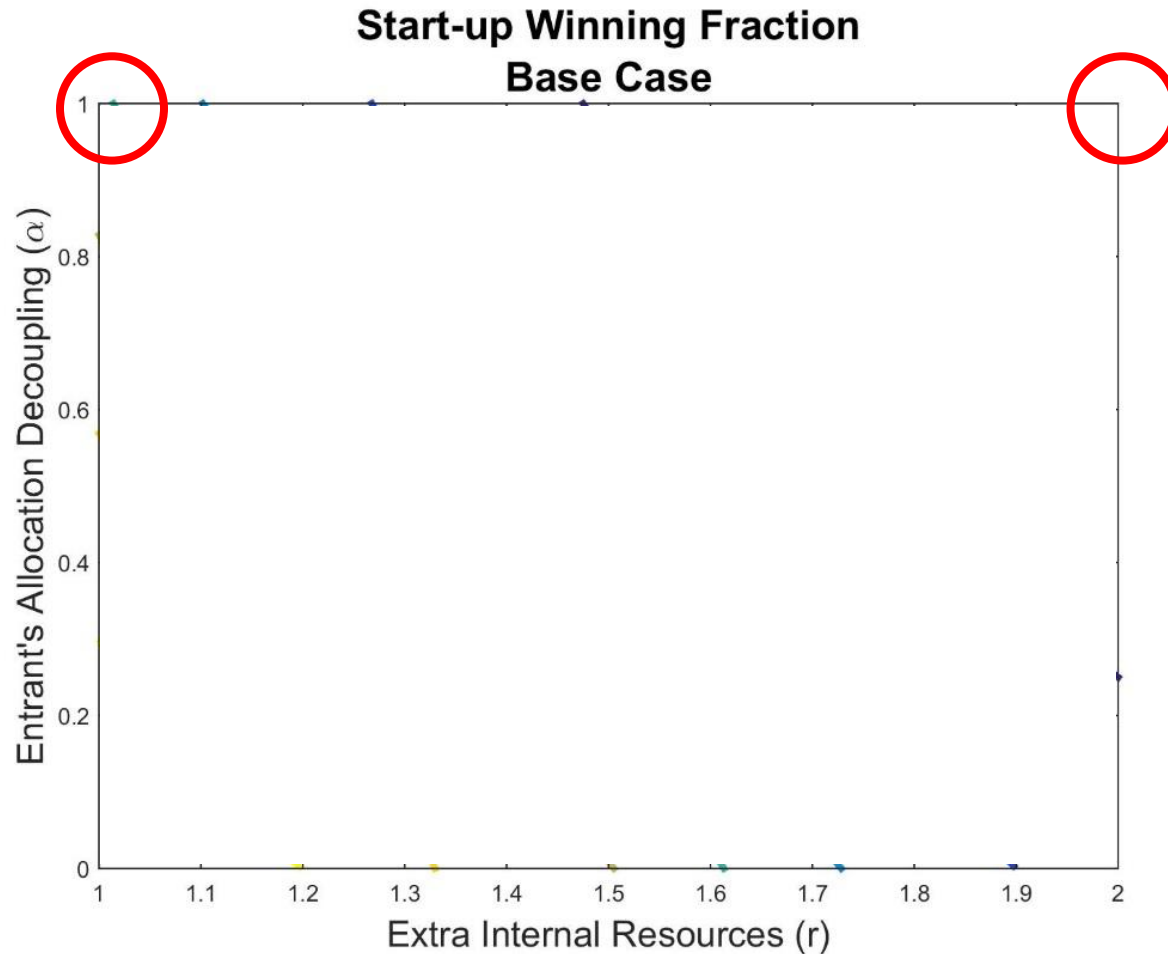
Capability Building with Endogenous Resources

Sample Simulation (2 startups & 2 projects)



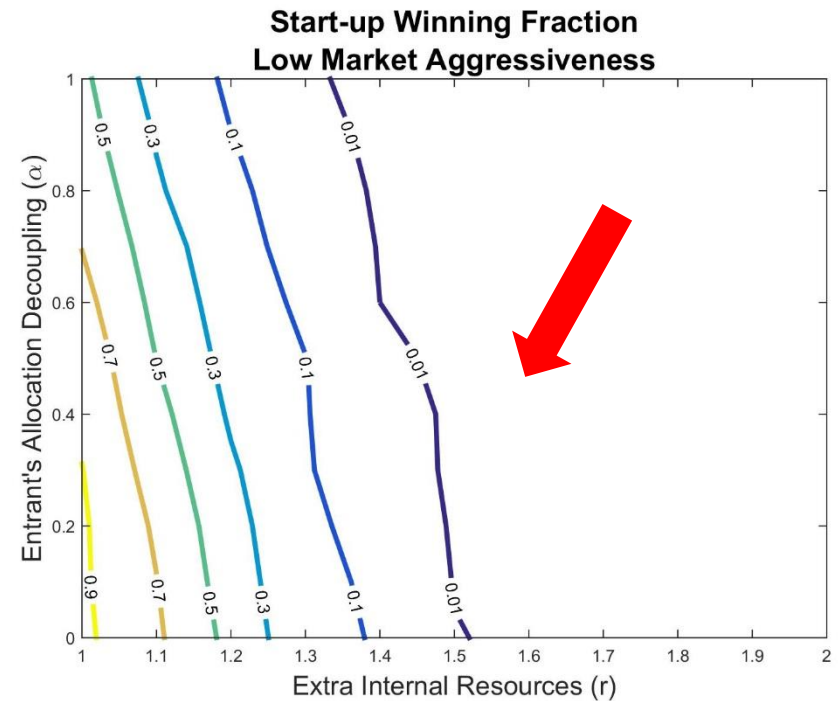
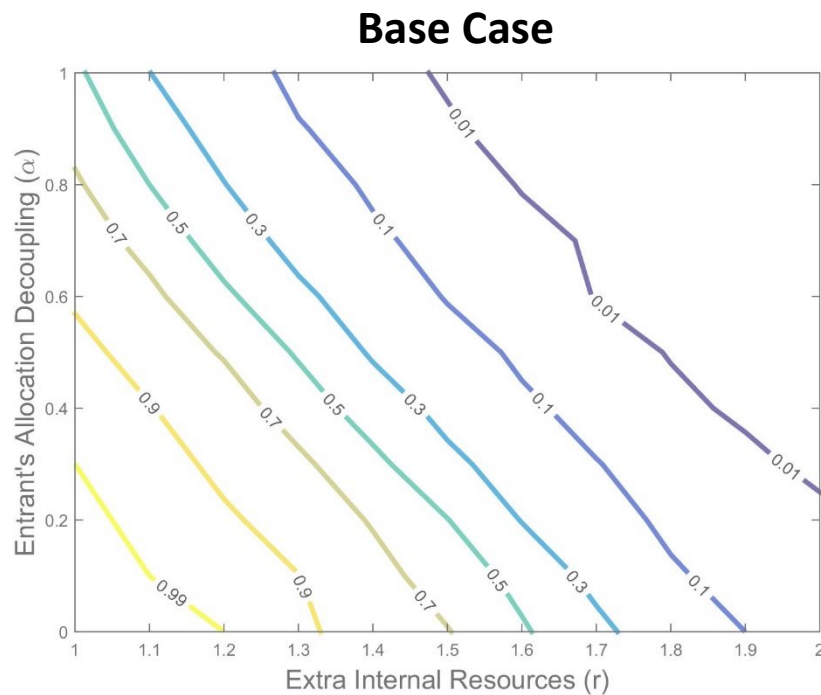
Who wins the race?

5 start-ups and 5 projects inside a diversifying entrant



Capital Market Under Pressure to be Aggressive

Reducing market's aggressiveness in allocating to the more viable start-ups (g)

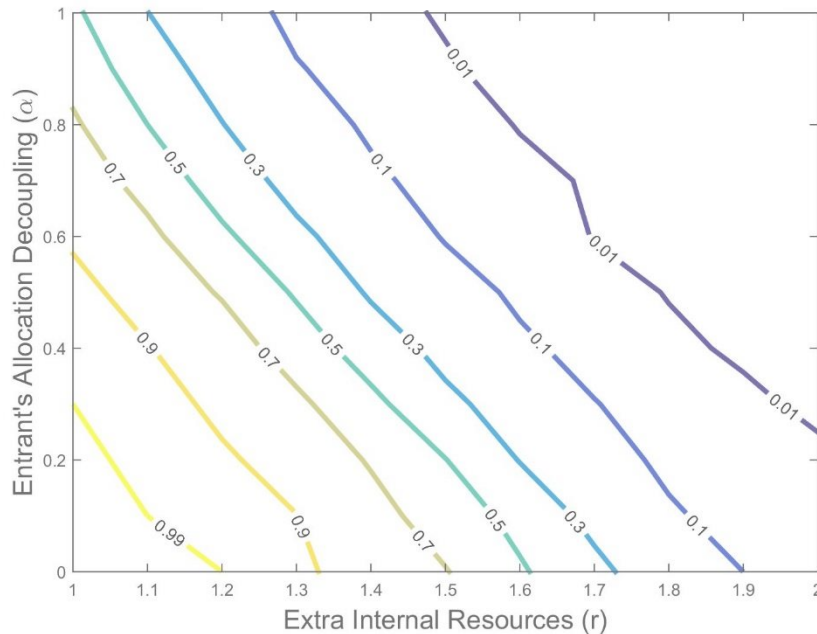


“If you focus on diversification instead of single-minded pursuit of the very few companies that can become overwhelmingly valuable, you’ll miss those rare companies in the first place” Peter Thiel, Zero to One

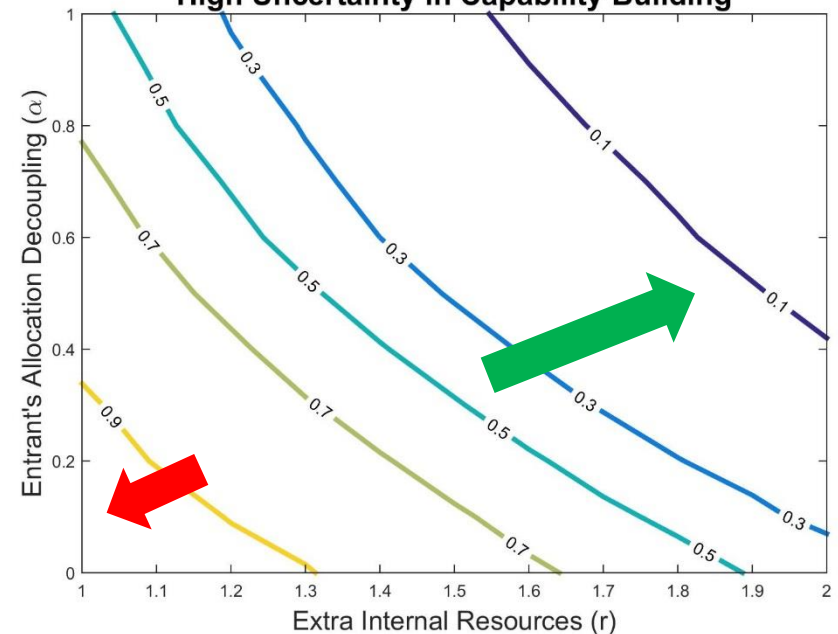
Uncertainty in Adaptation Returns

Doubling The Standard Deviation of Return on Capability Investments:

Base Case

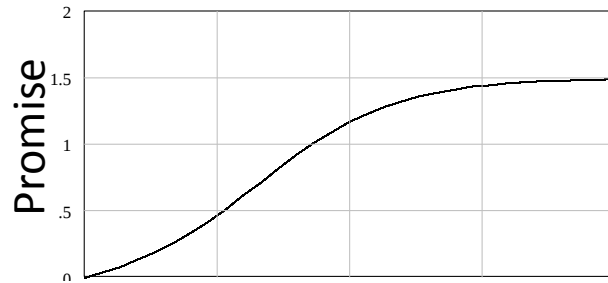


**Start-up Winning Fraction
High Uncertainty in Capability Building**

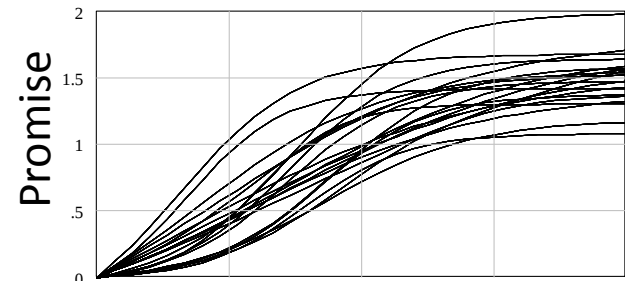


Some uncertainty in returns on adaptation is needed for the winning start-up to differentiate itself. Moreover, uncertainty increases the role of luck, making results closer to a coin toss.

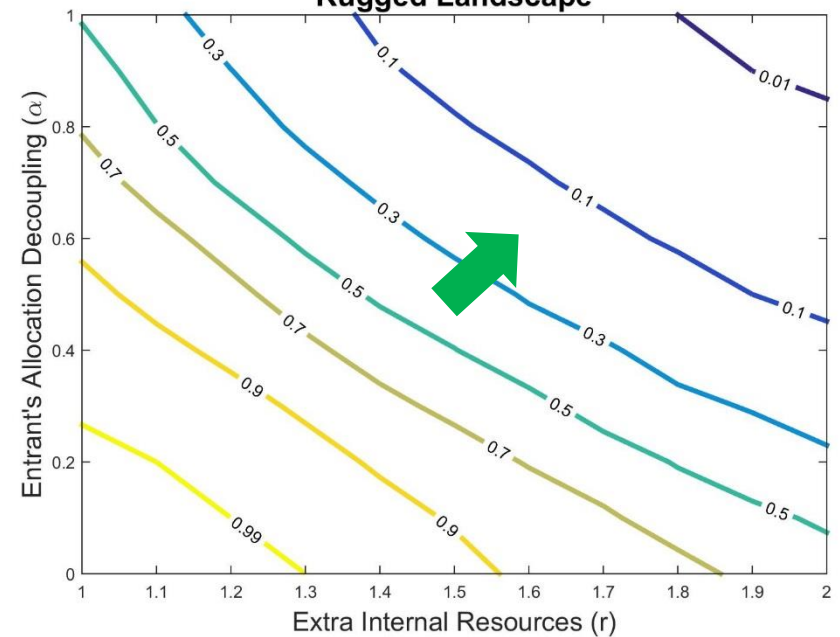
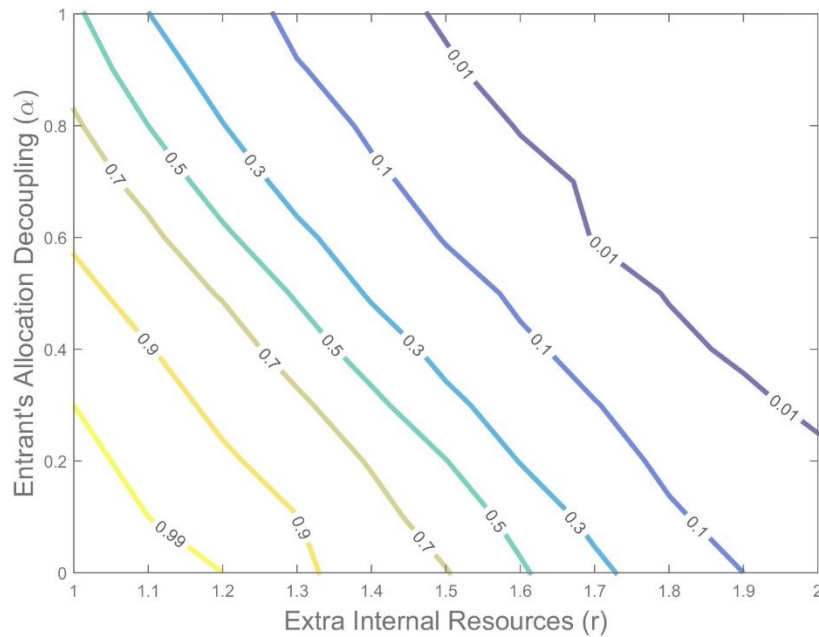
Rugged Technological Landscapes



Capability
Base Case



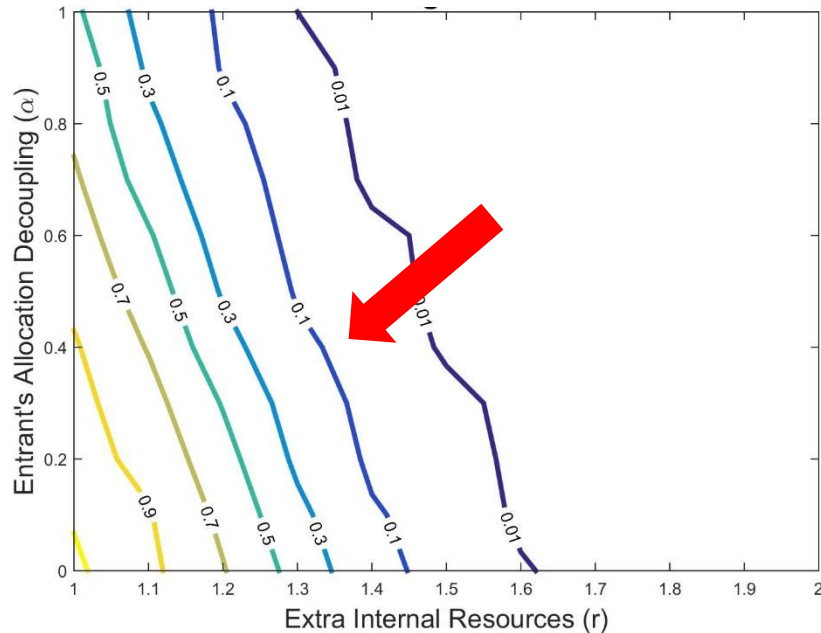
Capability
**Start-up Winning Fraction
Rugged Landscape**



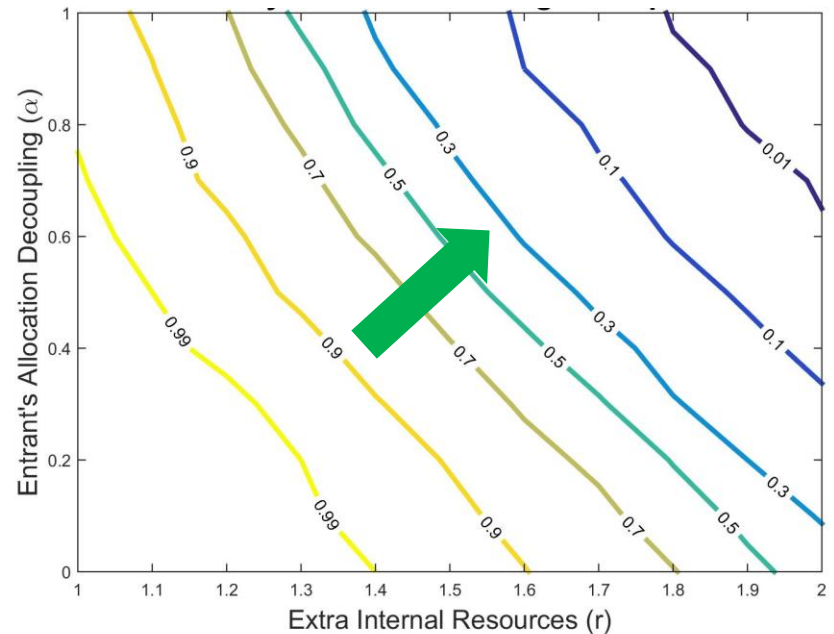
On rugged landscapes it is likely that some start-up faces stronger reinforcing loops, and thus is further advantaged

Visibility into performance of the other side

Symmetric Visibility



Only Startups Visible



- Visibility of your performance may be beneficial if it discourages investments into your competitors
- How to balance the benefits of visibility with costs of spill-overs?

Conclusions & Discussion

- Core mechanisms are most salient when developing the new market is complex, uncertain, subject to increasing returns, and contested by multiple start-ups and entrants
- The benefits of portfolios may break down when resources for learning depend on past performance
- Entrepreneurial spin-offs can be successful by combining the benefits of both (Dosi 84, Klepper & Sleeper 00, Christensen 93, Klepper 01)
- This early race is often followed by competition among existing firms to acquire the winning start-ups. Thus existing firms may invest despite the handicap in order to build the absorptive capacity for future acquisitions
- Empirical testing can benefit from internal project data where available. Also, using LBD or other data one may investigate success rate of new firms in new NAICS/SIC codes compared to existing codes

Thank you!

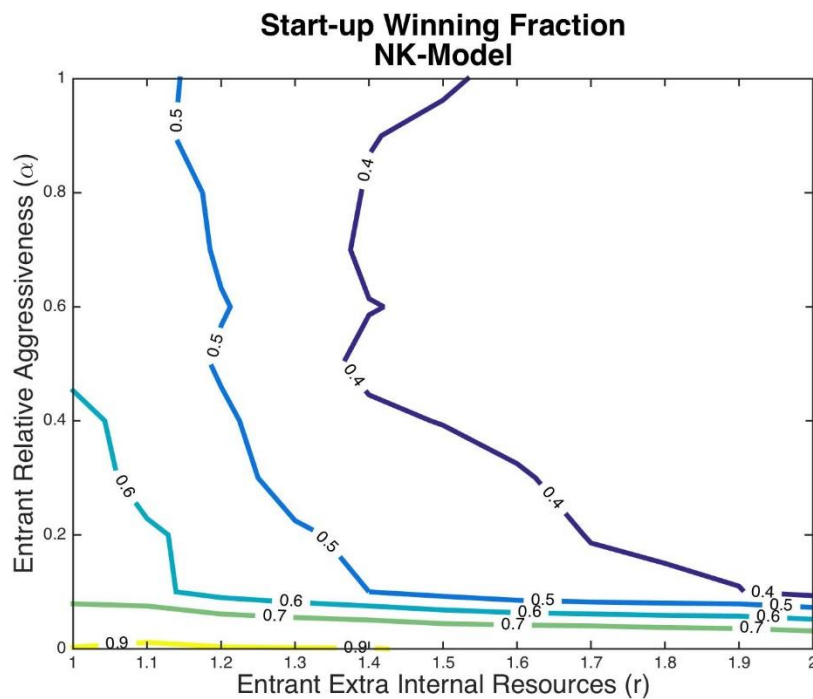
Would love to hear your suggestions:

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Alternative Formulation: NK-Landscape

- Qualitatively similar



- Reasons for choosing the alternative:
 - Continuous time and state allow for more adaptation steps and varying levels of uncertainty
 - Flexibility in defining the single/multiple basins of attraction
 - Computational efficiency allows for more extensive sensitivity analysis

Startups vs. Diversifying Entrants in New Markets

	Innovation	Startup	Diversifying Entrant
1	Internet (ISPs)	UUNET Portal Software	
2	PC	Apple	Commodore
3	Mobile phones		Motorolla
4	E-mail		AOL
5	DNA sequencing	Illumina Knome	
6	Magnetic Resonance Imaging (MRI)	Fonar	
7	Microprocessors	Intel	Texas Instruments
8	Fiber optics		GTE AT&T
9	Word Processor (WYSIWYG)		Xerox HP
10	Robotic surgery	Computer Motion	
11	Open-source software	Linux	
12	Light-emitting diodes (LED)		Monsanto
13	Liquid crystal display (LCD)		Hitachi NEC Samsung

Startups vs. Diversifying Entrants in New Markets

	Innovation	Startup	Diversifying Entrant
14	GPS systems	Benefon	Qualcomm
15	Online shopping	NetMarket Amazon Ebay	
16	Media file compression		Fraunhofer-Gesellschaft
17	Microfinance	Grameen Bank	
18	Social networking via the Internet	MySpace	
19	Digital photography		Sony
20	Genetically modified plants	Calgene	
21	Bio fuels	BlueFire Renewables	DuPont
22	Bar codes and scanners		IBM RCA
23	ATMs		IBM
24	Stents		Cook Group Johnson & Johnson
25	SRAM Flash memory	SanDisk	Toshiba
26	Anti-retroviral treatment for AIDS		Glaxo Wellcome