

Slack, Location, Diversification, or R&D Intensity? How the Most (and Least) Innovative Firms Deploy Resources.

Jamil Kreugel, Matthew Farrell, & Chris H. Willis

Problem Statement & Purpose

Many important factors which lead to firm innovation have been identified by management scholars, including research and development (R&D) spending, firm diversification, organizational slack, and location in a Marshallian externality. Having largely been studied in isolation of one another, theoretical and practical gaps remain. For example, resources allocated towards diversification could equally be spent pursuing R&D directly or could remain unutilized as slack resources. We ask: *How do the most innovative firms combine these factors?* Using the causally asymmetrical capability of fsQCA, we also ask: *How do the least innovative firms combine these factors?*

Methods

Our study contained 135 firms active in the semiconductor industry (both public and private) in 2013. 2013 was chosen such that patent citations could be studied 6 years hence following prior research (2019 is the last available year in the WRDS patent database).

Calibration

Percentile thresholds were used (Ragin, 2008).

Causal Conditions

R&D Intensity (i.e., the R&D spending to sales ratio); degree of diversification, organizational slack, and agglomeration

Outcome Condition

Citations of patents and the negation thereof; a widely-used metric in the innovation literature for innovation quality.

Necessity Analysis

Surprisingly, no condition passed the .9 threshold typically utilized to consider a condition necessary.

Results of fsQCA Analysis

Outcome	Patent Citations			
	Attribute	P1	P2	P3
R&D Intensity	●			●
Diversification	●		●	
Slack	∅		∅	∅
Agglomeration			●	●
Raw Coverage		0.16	0.21	0.30
Unique Coverage		0.03	0.07	0.16
Consistency		0.81	0.80	0.87
Solution Coverage			.40	
Solution Consistency			.81	

Outcome	Negation of Patent Citations		
	Attribute	P1	P2
R&D Intensity	∅		∅
Diversification			●
Slack	●		
Agglomeration	∅		∅
Raw Coverage		0.26	0.26
Unique Coverage		0.12	0.12
Consistency		0.75	0.80
Solution Coverage			.38
Solution Consistency			.78

Implications:

- Slack may work in some cases, but not consistently successful ones.
- R&D and diversification are substitutes in the presence of an agglomeration.
- Nonagglomerated firms should engage in both to “make up” for lack of knowledge spillovers