

**Exploiting International and Product  
Diversification Strategies to Develop  
Innovative Capabilities: A Longitudinal  
Study of the World's Largest MNCs**

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# *Research Question*



**The study examines the individual and interactive effects of international and product diversification strategies on MNCs' *future* innovation,**

**Where do resources come from?**

# Theoretical Framework



- **Two complementary theoretical perspectives:**
  - **Dynamic capabilities (Teece, Pisano, & Sheun, 1997)**
  - **Evolutionary theory (Nelson, 1982)**

# Dynamic Capability Perspective



- Firms develop the capacity to renew competences appropriate for their business environment
- This capacity reflects a firm's business processes, market trends, and expansion paths
- Superior performance accrues to those firms that continuously develop and exploit firm-specific capabilities over a period of time
- Innovation is one of the most crucial capabilities that enable MNCs to sustain and exploit these intangible assets

# *Evolutionary Theory*



- Firms often develop heterogeneous resources in response to idiosyncratic situations but over time gradually acquire capabilities through functional and product-market experiences
- Idiosyncratic situations are defined in terms of technological exhaustion and international diversification
- Diversified firms, which by definition are active across a wide variety of product-market domains, are likely to exploit proximal and distal domains to generate new resources.
- Firms are bundles of path-dependent knowledge bases

# *International diversification (ID) & future innovation*



- Technological activity is more internationally dispersed than ever and MNEs could use cross-border knowledge flows to strengthen their competitive lead
- ID also gives MNCs the opportunity to capitalize on the diversity of national endowments of technological resources, knowledge and skills as countries specialize in particular technologies

# Model

- MNC size
- Liquidity
- Past ROA
- Tobin's q
- Country of origin
- Industry type

- Intl Diversification
- Product Diversification
- ID\*PD

MNC  
Innovative Performance

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- R&D spending
- Patents
- Technological strength

# *International diversification (ID) & future innovation (cont.)*

- Subsidiaries of MNEs can also take advantage of R&D spillovers that can have a significant positive impact on the returns that firms get from their own R&D investment
- MNCs also diversify internationally to develop and enhance their absorptive capacity, a key determinant of technological learning
- ID allows MNCs to protect their markets by meeting local needs through innovations and provide technical support

# *Product diversification (PD) & future innovation*



- PD generates combinative knowledge by allowing MNCs to capitalize on technological and marketing synergies that might exist among its different product classes.
- Combinative knowledge can enrich innovation
- MNCs with high PD can capitalize on their intangible assets as well as economies of scope in increasing their innovation while spreading risk
- If products are related, strong R&D spending is required to build on the synergies that might exist among these products
- If products are unrelated, then aggressive R&D spending is needed to support different lines of business.

# *Product diversification (PD) & future innovation (Cont.)*



- Intra-firm transfers give MNCs the knowledge flows necessary to increase product and process innovation and generate patents.
- Acquisitions give the firm access to new technologies and skills which intensifies technological learning
- Increases in R&D spending intensity and patents will continue until the MNC reaches a threshold beyond which these increases decline because of organizational rivalries, poor inter-unit communications, and excessive use of financial controls

# *Effect of ID and PD on future innovation*



- Technical experience is more valuable to a firm that has complementary product- market experience
- Distal experience is defined as the product-market experience that enhances a firm's complementary assets
- Distal experience leads to more global search – more advantages in exploration that underlies more radical product innovations. Low distal experience usually leads to suboptimal situations

# Hypotheses

R&D  
Intensity

Patents

Technological  
Strength

ID

H1 +

H2

+

H3 +

PD

H4

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H5

H6

ID\* PD

H7 +

H8 +

H9 +

# Sample



- Started with *Business Week* Top 200 Patent Scoreboard (1992, 1993)
- Combined with *Directory of Multinationals* (1992)
- 181 MNCs in 13 industries:
  - (89 US; 45 Japan & 46 European)
- Longitudinal research design

**Measures:**  
**Dependent Variables**  
**(1992-96 and 1996 to 2000)**



- **R&D intensity..... Compact Disclosure**
- **Patents (in the US) BW & CHI Research**
  - **5-year average**
  - **change between first (1992) and last year (1996)**
- **Tech strength (patents x citations)**

# Measures

- **Independent Variables (1989-1991 and 1992-1994)**
  - ID and PD were measured using the entropy index
- **Control Variables (1989-1991 and 1992-1994)**
  - Company size = log assets
  - Liquidity = current ratio
  - Debt leverage =  $[LTD / (LTD + \text{equity})]$
  - Past Performance = ROA
  - Stock on Intangible Resources = Tobin's q
  - Industry types = 8 dummies
  - Country of MNC's HQ = 2 dummies
  - Business strategy

# Analysis



- **We examined the correlation matrix.**
- **Performed OLS (R&D %) and Poisson regression (patents)**
- **Tested for changes in  $R^2$  (Cohen 1968)**

# Results for R&D Intensity



Predicted

Found

ID

+

Supported

PD

∩

∩

ID \* PD

+

Rejected

# Results for Patents



Predicted

Found

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ID	+	Supported
PD	∩	∩
ID * PD	+	Supported

# Results for Technological Strength

Predicted

Found

ID

+

Supported

PD

+

Supported

ID \* PD

+

Mixed

# Limitations



- **Sample consists of established, large & innovative MNCs.**
- **Effect of PD & ID: additive vs. multiplicative**

# Conclusion



- **International diversification (ID) and product diversification (PD) conducive to higher R&D spending intensity, higher patent counts, and higher technological strengths.**
- **PD moderates the relationship between ID and MNC innovativeness (R&D spending intensity, patents. & technological strength).**

# *What did we learn from this Study?*



- **ID & PD have different effects on innovation inputs [R&D spending] and outputs [patents].**
- **PD moderates the effect ID of on MNCs' innovative capacity.**

# *Questions not answered*



- **Do different patterns of relationships exist across world regions?**
- **How does ID foster technological learning and new knowledge acquisition?**
- **How do MNCs actually achieve the potential learning benefits of ID and PD?**