# Globalization through Alliances: Portfolio Configuration & Knowledge Positioning

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## Motivation

## In emerging technological fields

- Firms often need to track, develop and absorb knowledge from many globally dispersed sources.
- Knowledge development is uncertain and dynamic process
- Internationalization of R&D is risky and costly
- Firms need to position themselves to capture and develop knowledge and yet minimize risks and costs.

### **Alliance Portfolios**

- Alliances as a conduit for learning
- Alliances as a way of reaching beyond geographically and technologically local search
- Portfolio of alliances one of the relevant characteristics geographic configuration.
- Alliance partners as a conduit of country capabilities

### **Globalization and Alliances**

- Alliance configuration in a globalizing world
- Globalization common interpretations
  - Greater homogeneity across countries
  - Greater inter-connectedness and dependence
  - Shifts across time
  - Countries are themselves part of a network related and connected.
- Implications for alliance configuration and knowledge access

### **Research Questions**

- How does the geographic configuration of a firm's international alliance portfolio (taking in to account country similarity and connections) affect its positioning in the global alliance network?
- How does a position of knowledge advantage affect the subsequent level of internationalization?

## Model Relationships



Country Homogeneity, Connectedness and Knowledge Advantage

• Country Homogeneity: The extent to which countries' technological trajectories are similar or different

 Country Connectedness: The extent to which knowledge flows across countries

 Knowledge Advantage Position: The centrality of the firm in the overall industry network

# Hypothesis 1: Alliance Portfolio Country Homogeneity

- Complexity of managing and benefiting from *international* alliances is reduced
- Given different emerging technological trajectories, access to a relevant pool of resources and expertise that can be applied to the technological development and challenges.
- Technological coherence improves knowledge assimilation and increases firm attractiveness

# Hypothesis 1: Alliance Portfolio Country Homogeneity

 Hypothesis 1: The technological homogeneity of countries spanned by the focal firm's cross-border alliance portfolio is positively associated with the firm's centrality in the global alliance network.

## Hypothesis 2: Alliance Portfolio Country Connectedness

- Network literature suggests that firms that span unconnected knowledge resources can achieve powerful brokerage positions
- Signal valuable search capabilities which allow for the identification of countries that are not learning from one another
- Absence of knowledge flows creates valuable bridging opportunities, and increases firm attractiveness

## Hypothesis 2: Alliance Portfolio Country Connectedness

• Hypothesis 2: The technological connectedness of countries spanned by the focal firm's cross-border alliance portfolio is negatively associated with the firm's centrality in the global alliance network.

#### Hypothesis 3: Rate of Internationalization

- Position in global alliance network permits access to wide knowledge base
- Knowledge advantage stems not only from the direct knowledge flows from partners, but also from partners' networks that provide channels into other countries
- Knowledge positioning allows for internationalization through networks rather than direct presence

#### Hypothesis 3: Rate of Internationalization.

Hypothesis 3: A firm's centrality is negatively associated with the firm's level of internationalization in subsequent years.

## **Empirical Setting**

- Emerging fuel cell industry
  - Early stage of development
  - Wide range of designs
  - Several countries some narrow, others broad
  - No country dominates
  - Firms form several industries
  - Patenting common
  - R&D primarily in home country
  - Alliances primary mode of knowledge seeking investments

# Sample

- Sample comprises 55 firms
- 145 alliance portfolios
- 1984 to 2001 timeframe
- 9 international alliances in 1984,
  - 89 international alliances in 2001
- Portfolios encompassed 12 countries
- Number of countries in a firm's portfolio range from 2 to 7

## Variables

Country Connectedness : Calculated for fuel cell patents sub-classes and citations across countries.

- Cumulative number of patent citations between each pair of countries in firm's portfolio divided total possible pairs.
- Country Homogeneity : Calculated for fuel cell patents sub-classes and citations across countries.
  Herfindahl Index using patent sub-classes, 0 to 1 where 1 indicates complete homogeneity

## Variables

- Knowledge Advantage: Degree Centrality of the firm in the global alliance network
  - sum of the total direct ties for firm divided by the total number of firms in the global network not including the focal firm in time *t*.
- Internationalization: Change in number of countries spanned by firm's alliance portfolio
  - Ratio of number of foreign countries in firm's alliance portfolio in time t+3, to number of countries in t.
  - Ratio of foreign inventors on patents in time t+3, to time t.

Model : System of simultaneous equations, using the nonlinear two-staged generalized method of moments (GMM) estimator.

## Controls

### • Firm Controls

- technological capability, concentration, age

### • Partner Controls

 age, capabilities, equity alliances, multi-party alliances, structural holes, technological distance, ratio of foreign partners, partner's geographic and technological diversity

### Country Controls

- Home country Industry associations, corporatism
- Partner's countries political, economic, ideological dispersion

# Findings

- All three hypotheses supported
- Firm with alliance portfolios that are spread across technologically similar but less connected countries, obtain centrality in the global alliance network.
- Firms that are central in the alliance network have lower rates of subsequent internationalization.
- Several controls significant.

## Discussion

- Alliance portfolios and globalization
- Global reach with local organization?
- Multiple networks
- Acknowledging relationship between countries in international strategy research

### Conclusions

 Country configurations matter to firms' positioning for knowledge advantage.

• Positions of knowledge advantage convey capabilities that increase knowledge assimilation and dissemination

• Firms' alliance networks can be a useful way to source and utilize knowledge internationally