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11.481J / 1.284J / ESD.192J Analyzing and Accounting for Regional Economic Growth
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SUPPLY-CHAIN MANAGEMENT

Supply-Chain Management (SCM) and Industrial Restructuring

- What is a supply chain?
- What are objectives of SCM?

SUPPLY-CHAIN MANAGEMENT

- SCM has been restructuring industries' physical networks and coordination mechanism
 - automobile industry: information sharing
 - wholesaling industry: advanced Information Technology (IT)
 - computer-manufacturing industry: make to order

LITERATURE REVIEW

Modern Logistics and Industrial Location Choice

- *Neoclassic theories on industrial location choice*
 - *Dipasquale and Wheaton (1996)*
- *Application of logistic models to location choice*
 - *McCann (1998)*
- *Dispersion economies along supply chains*
 - *Pereira (1996)*
 - *Chen (2002)*
 - *Polenske (2003)*

Empirical Analysis

Assumptions

- *supply-chain configuration fundamentally determines demand for industrial space at macro level*
- *inventory requirement determines demand for industrial space at micro level*
- *at the regional level and from a sector perspective, the industrial real estate stock adjusts to its desired level gradually* ⇒ *The relationship between location-choice/inventory-holding and demand for industrial space holds over the time.*

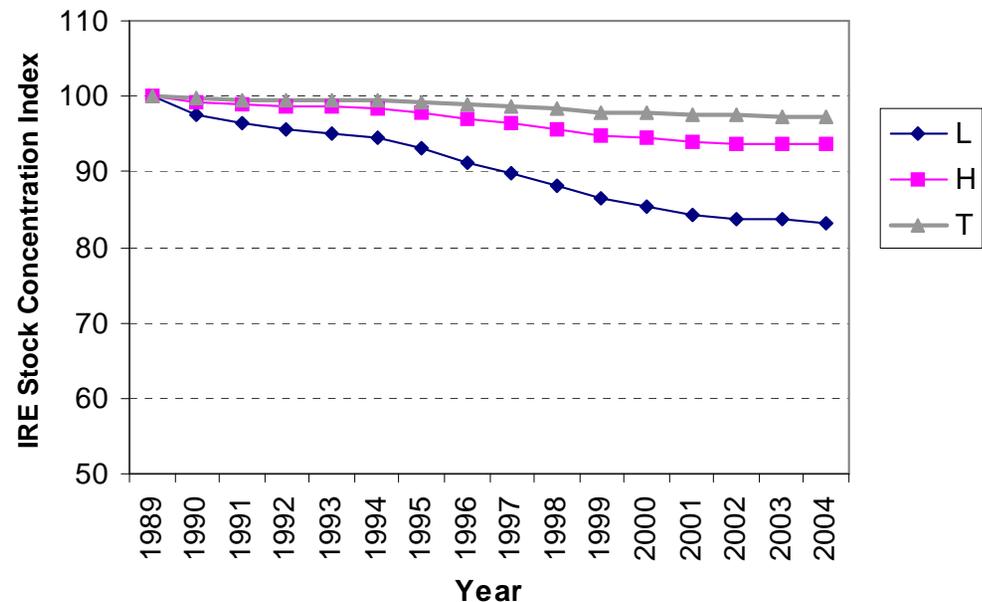
EMPIRICAL ANALYSIS

Consolidation vs. Dispersion

firms in manufacturing industries, in general, have dispersed their production and distribution locations

Sector Analysis

- *Manufacturing (Dispersed)*
- *Electronics/Computers (D)*
- *Transport Equipment (D)*
- *Miscellaneous (D)*
- *Food (Consolidated)*
- *Other five sectors (unclear)*



EMPIRICAL ANALYSIS

Summary of Empirical Analysis

1. Distribution sector has a more significant impact on location choice and property market than manufacturing sector.
2. As a whole, both manufacturing and distribution industries have dispersed to relatively small markets.
3. All manufacturing/distribution/retailing sectors, except metals, improved their inventory management.
4. In a supply chain, one player's gains in inventory reductions are not necessarily at the cost of its suppliers or customers.
5. Space demand generally follows inventory requirements.
6. Traditional partial stock-adjustment model does not work.

CHINA CASE STUDY

Background

- China has become global manufacturing center
 - *SCM has been playing an increasingly important role in industrial location choice and regional economic development*
 - *logistics in China are considerably inefficient: spending on logistics accounted for 1/5 of GDP in 2000 (1/10 in the U.S.)*
 - *no systematic data on inventories and industrial property market ⇒ rely on case studies ⇒ focus on two sectors—traditional steel-making sector and relatively modern electric-appliances sector*

CHINA CASE STUDY

- **Steelmaking Sector**

- supply chain: raw materials—steelmaking—manufacturing
- Steel firms in Liaoning: **two distribution channels**
 - large steel firms prefer direct shipping (cost-effective)
 - small steel firms use intermediate distributors (flexible)
- **consolidation**
- Bao Steel: strategic global supply chains
 - integrated supply chains with suppliers and customers
 - information technology-based
 - **centralize management and decentralize services**

CHINA CASE STUDY

- **Electric-Appliances Sector**

- products: customer goods

- intensive market competition ⇒ actively implemented modern logistics

- case study of Haier Group

- providing high-quality service is equally or even more important than reducing total costs

- successful SCM reform: (i) implementation of advanced information technologies, and (ii) proximity to end customers

- **location choice: dispersion of manufacturing/services**

- **demand for industrial space: CDC/total demand reduced**

CHINA CASE STUDY

Summary of Case Studies

- SCM has been a core component in firms' business models
- different supply-chain requirements in different sectors
 - electric-appliances sector: actual impacts similar to findings in the U.S. ⇒ improve service levels and reduce costs
 - steelmaking sector: consolidation ⇒ increase negotiation power and reduce costs
- **Modern logistics' increasingly significant impacts**
 - **generally consistent with the U.S. empirical findings**
 - **particularly true for modern firms, e.g., Haier Group**

CONCLUSIONS

Hypothesis Testing

- theoretical analysis does not provide clear conclusion
- **location choice hypothesis: incorrect** ⇒ **dispersion**
- **space demand hypothesis: correct** ⇒ **reduction**

Major Findings

- *distribution functions dominate location choice*
- *firms reap economies of dispersion by proximity to customers*
- *space demand follows improvement in inventory management*
- *manufacturing firms in China are catching up in SCM*

SUPPLY-CHAIN MANAGEMENT

Information in this presentation is from a dissertation by Dr. Yu Li, 2007. “Impact of Modern Logistics on Industrial Location Choice and Property Markets.” Ph.D. dissertation, Department of Urban Studies and Planning, Massachusetts Institute of Technology, September.