

# Relationship Management and Supply Chain Integration in China



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# Introduction

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- **Global competition has made companies increasingly focus on their core competency and leverage over the strength of their supply chain (SC) partners**
- **Competition is not between firms, but between SCs**
- **Strategic collaborations and coordination with SC partners are becoming increasingly important**
- **Supply chain integration (SCI) has become an increasingly popular topic for research**
- **Companies in china are playing very important roles in global supply chains**



# Introduction

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## What is supply chain integration (SCI)?

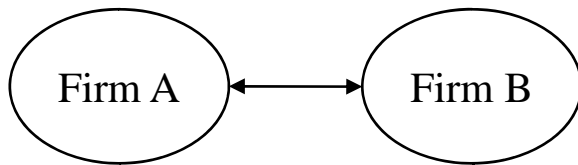
- **SCI** is the degree to which the firm can **strategically** collaborate with their SC partners and collaboratively manage the **intra- and inter-organization processes**

to achieve the **effective and efficient flows** of products and services, information, money and decisions

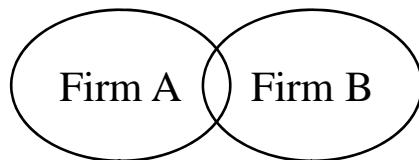
with the objective of providing the **maximum value** to the customer at **low cost and high speed**

(Source: Zhao, Huo, Flynn and Yeung, 2008, JOM).

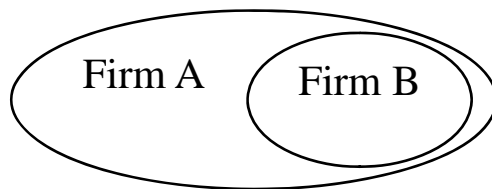
# Transaction cost theory & SCI



**Spot Market Transaction:**  
No decision control over the other party, Arm-length relationship, High transaction costs



**SCI (quasi-integration):**  
Collaboration and cooperation, information sharing, Long-term oriented partnership,  
Low transaction costs



**Vertical Integration:**  
Complete control over the other party,  
Hierarchy, No transaction costs



# Social Exchange Theory (SET)

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- Social exchange theory states that social behavior is an exchange of not only material goods, but also non-material ones, such as the symbols of approval or prestige (Homans 1958)
- Relationship governance/management can also help to exchange social relationships in addition to economic exchange.



## Trust in SCM

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- Trust reduces the perception of risk associated with opportunistic behavior and thus increases the exchange partners' confidence in the effectiveness of future relational exchange.
- Trust can enhance relationship commitment and reduce opportunistic behavior and transaction cost
- Proper use of power will help to enhance relationship commitment and SCI

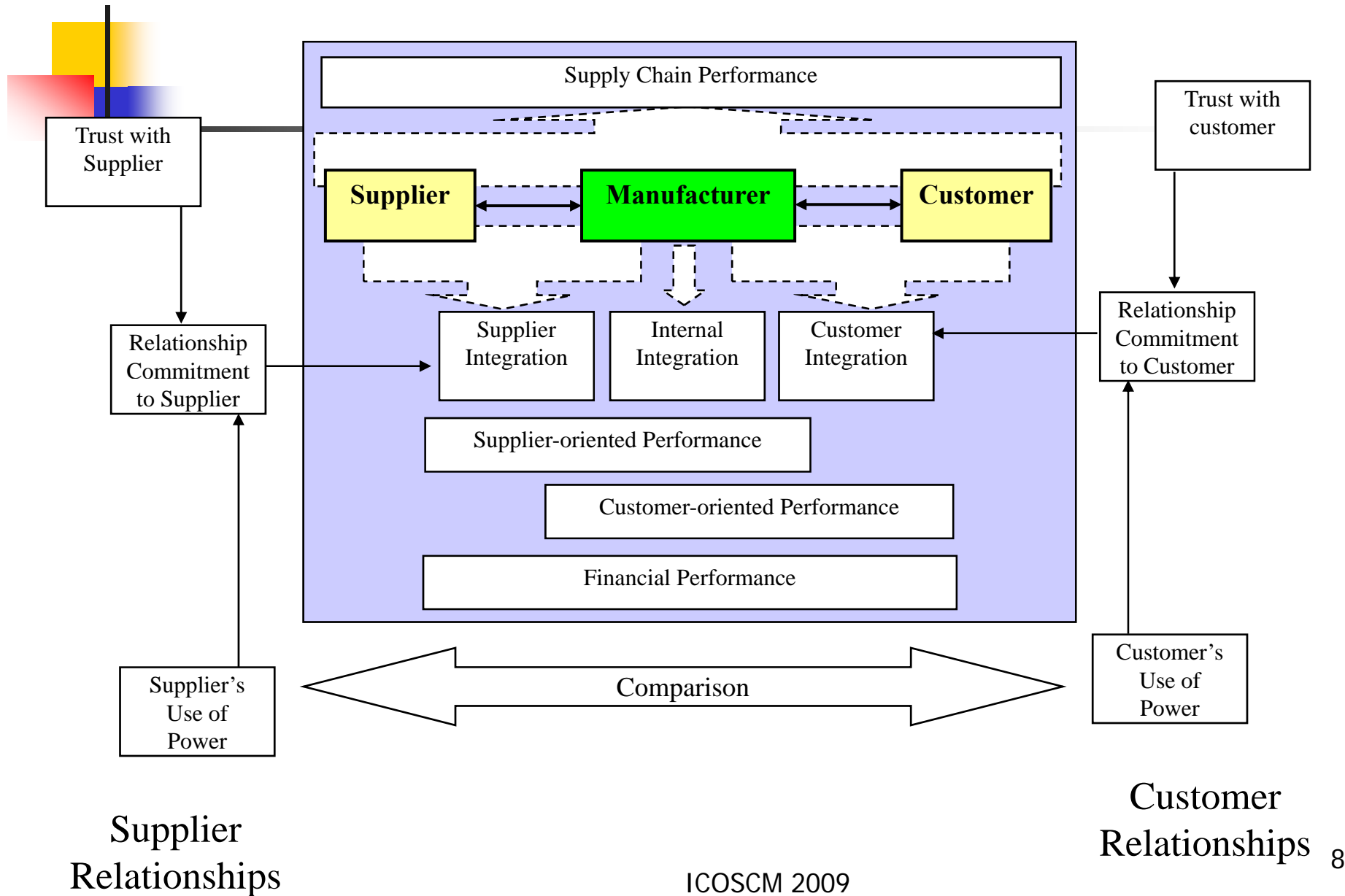


# Research Questions

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- How does the use of power influence the relationship commitment (RC) and
- How does relationship commitment influence Supply chain integration?
- How does supply chain integration influence the performance of the firm in the supply chain?
- How do TCT and SET interact to explain the relationship commitment and SCI?
- What roles does Chinese Culture play in these relationships

# Framework of Relationship Management and SCI





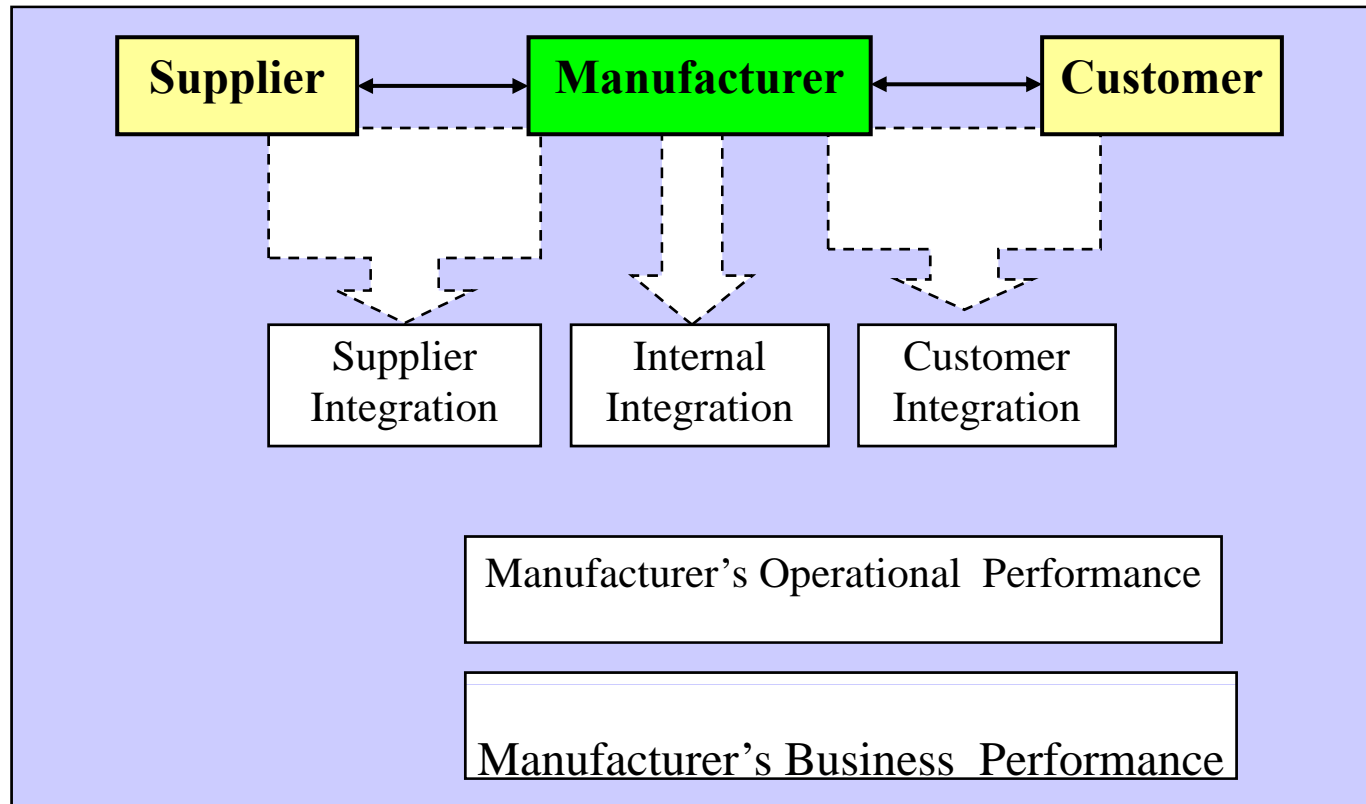
**The Impact of Supply Chain Integration on Performance:  
A Contingency and Configuration Approach**

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**Flynn, B. , Huo, B. & Zhao, X.**

**Journal of Operations Management, Forthcoming**

# Scope of this study





# Research Objectives

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- To study the impact SCI on operational and business performance of manufacturers
- To apply both the contingency and configuration approaches to examine the effects of internal, customer and supplier integrations
- To provide implications for supply chain design from the perspectives of different types of SCI



# Theoretical Background

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## Dimensions of SCI

### 1. Internal integration

the degree to which a manufacturer structures its own organizational strategies, practices and processes into collaborative, synchronized processes, in order to fulfill its customers' requirements (Cespedes, 1996; Chen & Paulraj, 2004; Kahn & Mentzer, 1996).

### 2. External integration (customer integration, supplier integration)

the degree to which a firm can partner with its key supply chain members (customers and suppliers) to structure their inter-organizational strategies, practices, procedures and behaviors into collaborative, synchronized and manageable processes to fulfill their customers' requirements (Stank et al., 2001).

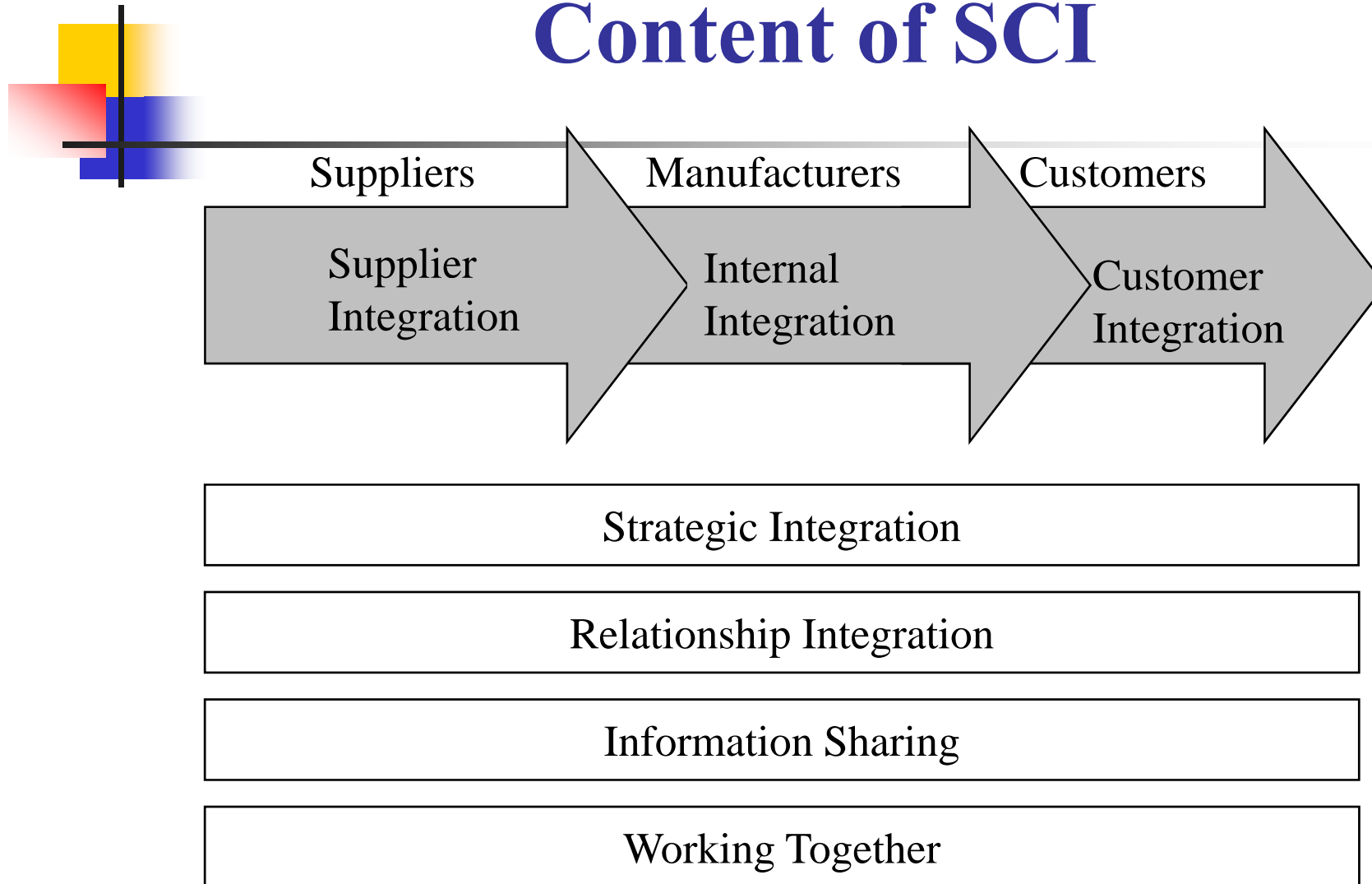


# How to measure CI?

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- CI1: The level of linkage with major customer through information network.
- CI2: The level of computerization for our major customer ordering.
- CI3: The level of sharing of market information from our major customer.
- CI4: The level of communication with our major customer.
- CI5: The establishment of quick ordering system with our major customer.
- CI6: Follow-up with our major customer for feedback.
- CI7: The frequency of periodical contacts with our major customer.
- CI8: Our major customer shares Point of Sales (POS) information with us.
- CI9: Our major customer shares demand forecast with us.
- CI10: We share our available inventory with our major customer.
- CI11: We share our production plan with our major customer.

# Content of SCI





# A balanced approach for performance measurements

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- A combination of qualitative and quantitative measures and a broader conceptualization of performance measures (Kaplan & Norton, 1992, Maskell, 1991; Gunasekaran et al., 2003).

Two categories of performance measures:

- Manufacturer's operational performance
- Manufacturer's business performance



# Hypotheses - Contingency

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***H1a:** Internal integration is positively related to the operational performance of the manufacturer within a supply chain.*

***H1b:** Internal integration is positively related to the business performance of the manufacturer within a supply chain.*



# Hypotheses - Contingency (Continued)

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***H2a:** Customer and supplier integration are positively related to the operational performance of the manufacturer within a supply chain, given the relationship between internal integration and operational performance.*

***H2b:** Customer and supplier integration are positively related to the business performance of the manufacturer within a supply chain, given the relationship between internal integration and business performance.*



# Hypotheses - Contingency (Continued)

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- **H3a:** *Customer and supplier integration will moderate the relationship between internal integration and operational performance.*
- **H3b:** *Customer and supplier integration will moderate the relationship between internal integration and business performance.*



## Hypotheses - Configuration

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***H4.** An emergent taxonomy of manufacturers can be developed, based on their patterns of supplier, internal and customer integration.*

***H5a:** The patterns of SCI are related to the operational performance of the manufacturer within a supply chain.*

***H5b:** The patterns of SCI are related to the business performance of the manufacturer within a supply chain.*



# Research Methodology

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## Survey of Manufacturers in China

### Data Collection

- Target samples cities:
  - Chongqing, Tianjin, Guangzhou, Shanghai, and Hong Kong.
- Pilot test: 15 companies.
- Key informant: knowledgeable about SCM
- **617** usable questionnaires from 4569 contacted companies (13.5%) or 1356 questionnaires (45.5 %) sent out.



# Reliability & Validity

Construct	Number of Questions	Cronbach's alpha
Internal integration	9	0.92
Customer integration	11	0.90
Supplier integration	13	0.94
Operational performance	6	0.86
Business performance	7	0.94

Content validity

Construct validity (convergent validity, discriminant validity)



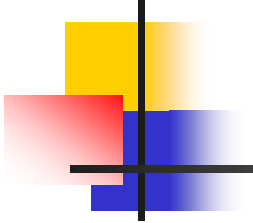
# Analyses and Results

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## Contingency approach

- How do the three dimensions of SCI and their interactions influence performance?
- Multiple regression

# Regression Results for Operational Performance



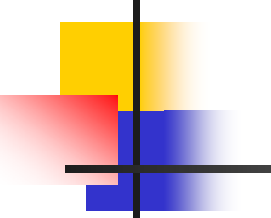
Model	Independent Variables	$\beta$	t	R <sup>2</sup>	F	$\Delta R^2$
1	Constant	4.34	40.78***	.163	119.58***	--
	Internal Integration	.27	10.94***			
2	Constant	3.78	30.10***	.237	63.51***	.074
	Internal Integration	.14	4.62***			
	Customer Integration	.27	6.97***			
	Supplier Integration	-.02	-.57			
3	Constant	3.55	19.90***	.255	29.71***	.017
	Internal Integration	.16	4.75***			
	Customer Integration	.30	7.47***			
	Supplier Integration	-.03	-.93			
	II x CI Interaction	.00	.15			
	II x SI Interaction	.00	.10			
	CI x SI Interaction	.06	2.50*			
	II x CI x SI Interaction	-.01	-.73			

8/26/2009  
\*p<0.05

\*\*p<0.01 \*\*\*p<0.001.

ICOSCM 2009

## Regression Results for Business Performance



Model	Independent Variables	$\beta$	t	R <sup>2</sup>	F	$\Delta R^2$
1	Constant	2.85	21.91***	.123	86.24***	--
	Internal Integration	.28	9.29***			
2	Constant	2.73	17.00***	.126	29.38***	.003
	Internal Integration	.25	6.42***			
	Customer Integration	.04	.78			
	Supplier Integration	.03	.60			
3	Constant	2.53	11.00***	.131	13.08***	.005
	Internal Integration	.27	6.33***			
	Customer Integration	.05	.87			
	Supplier Integration	.05	1.02			
	II x CI Interaction	.02	.71			
	II x SI Interaction	.01	.29			
	CI x SI Interaction	-.03	-.96			
	II x CI x SI Interaction	-.01	-1.08			

8/26/2009 <sup>\*</sup>p<0.05 <sup>\*\*</sup>p<0.01 <sup>\*\*\*</sup>p<0.001. ICOSCM 2009



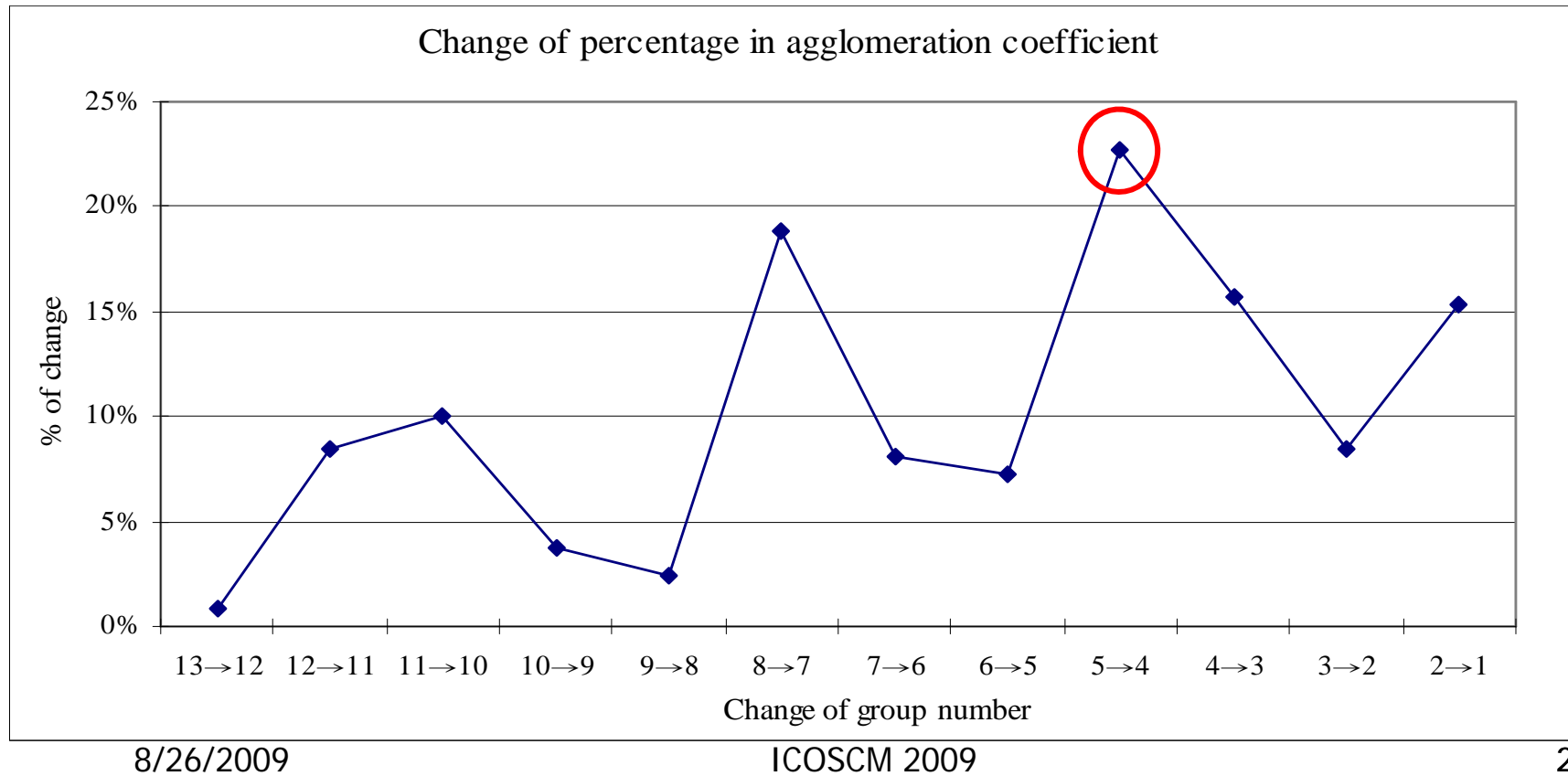
# Configuration Approach

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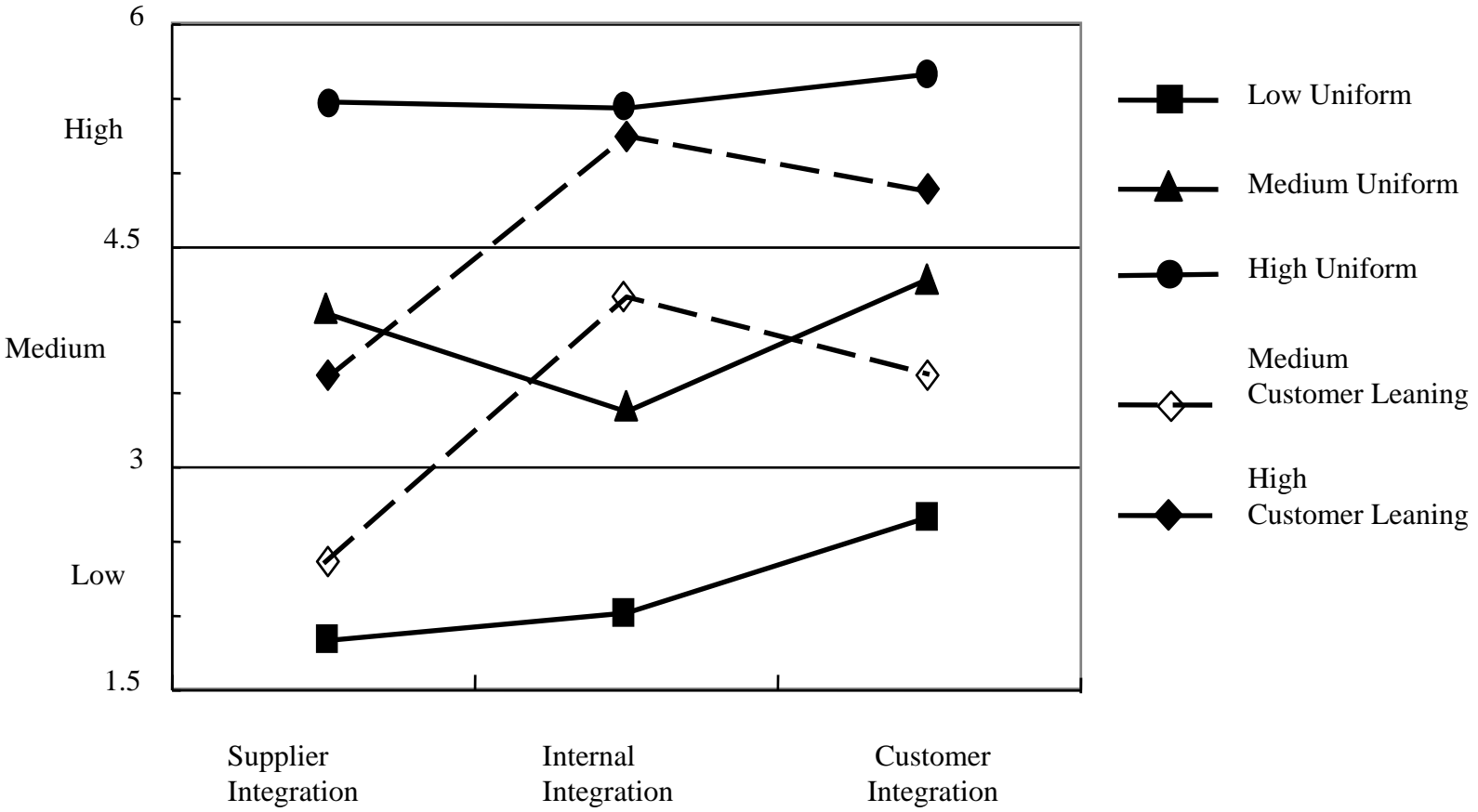
- **How SCI patterns influence performance?**
- **Cluster analyses based on**
  - Internal Integration (II)
  - Supplier Integration (SI)
  - Customer Integration (CI)

# Analyses and Results

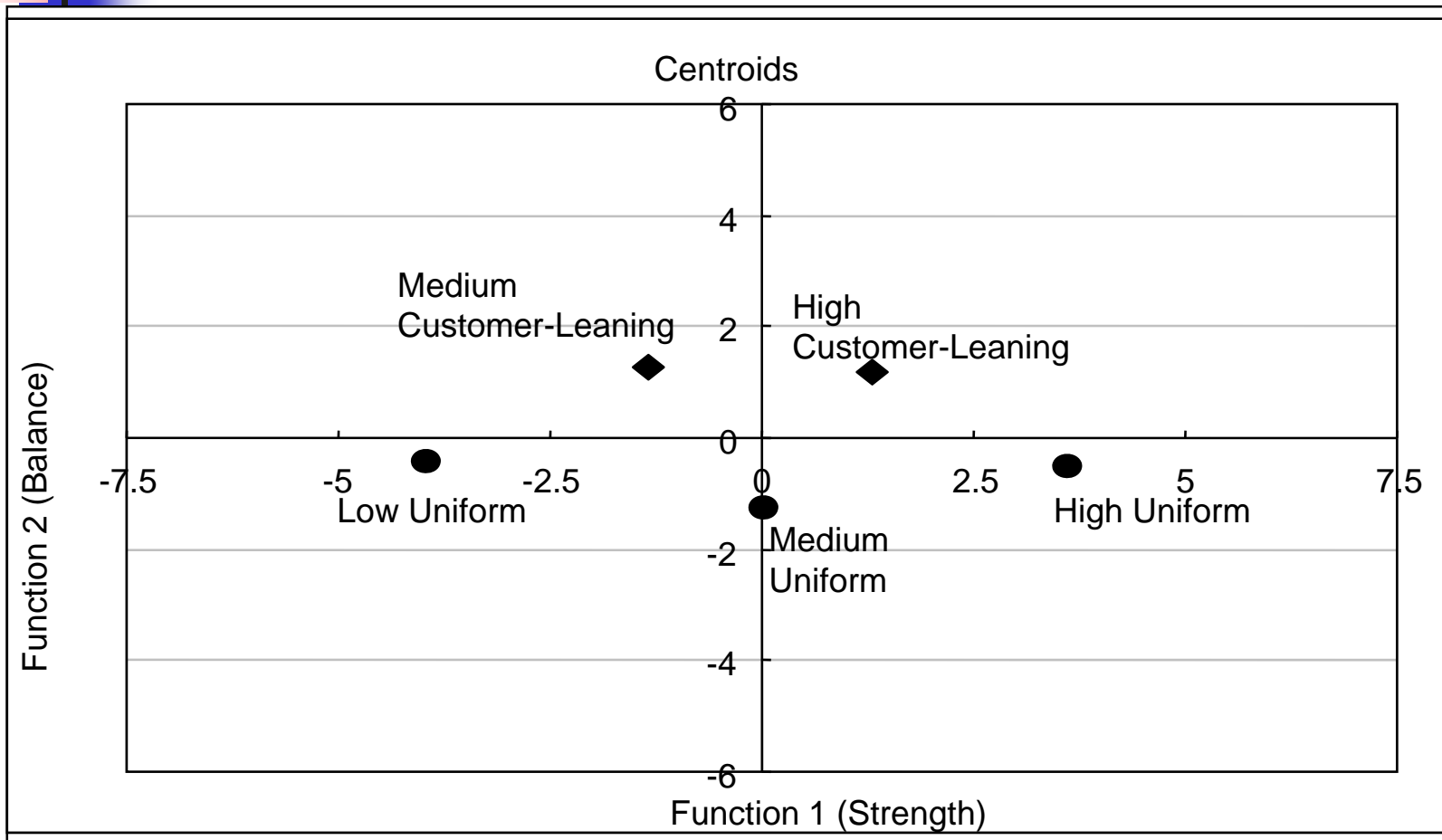
## ■ How many SCI patterns?



# Taxonomy of SCI



# Cluster Centroids





# The Impact of SCI on Performance

	Medium Customer Leaning (Cluster 1)	High Customer Leaning (Cluster 2)	Low Uniform (Cluster 3)	Medium Uniform (Cluster 4)	High Uniform (Cluster 5)	F
Operational Performance	5.18 (2,5)	5.79 (1,3,4)	4.96 (2,5)	5.12 (2,5)	6.12 (1,3,4)	38.67***
Business Performance	3.99 (3,5)	4.30 (3,4)	3.42 (1,2,5)	3.73 (2,5)	4.50 (1,3,4)	18.20***

Numbers in parentheses indicate the cluster(s) from which that cluster is significantly different at \*p<.05 \*\*p<.01 \*\*\*p<.001



# Closer look at performance

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- **Operational performance:**  
High Uniform = High Customer Leaning >  
Low Uniform = Medium Uniform = Medium  
Customer Leaning
- **Support H5a**

- **Business performance:**

High Uniform = High Customer Leaning

High Customer Leaning = Medium Customer Leaning

Medium Customer Leaning = Medium Uniform

Medium Uniform = Low Uniform

Scheffe test	Subset for alpha = .05			
	1	2	3	4
Low Uniform	3.4250			
Medium Uniform	3.7303	3.7303		
Medium Customer Leaning		3.9929	3.9929	
High Customer Leaning			4.2960	4.2960
High Uniform				4.5042
Sig.	.322	.483	.329	.703

- **Support H5b**



# Contributions

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- Conceptualization and measurement of three dimensions of SCI.
- A taxonomy of SCI based on the three dimensions
- Impact of SCI patterns on operational and business performance of manufacturers in the SC.
- Main and interactive effects of II, CI and SI.
- II and CI are more important than SI in improving both operational and business performance
- SCI is a cumulative capability



# Limitations and Future Research

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- Cross-sectional data can not reveal how SCI patterns evolve over time
- Data from China only, can the results be generalized to other countries?
- International comparisons
- What factors influence the level and patterns of SCI?

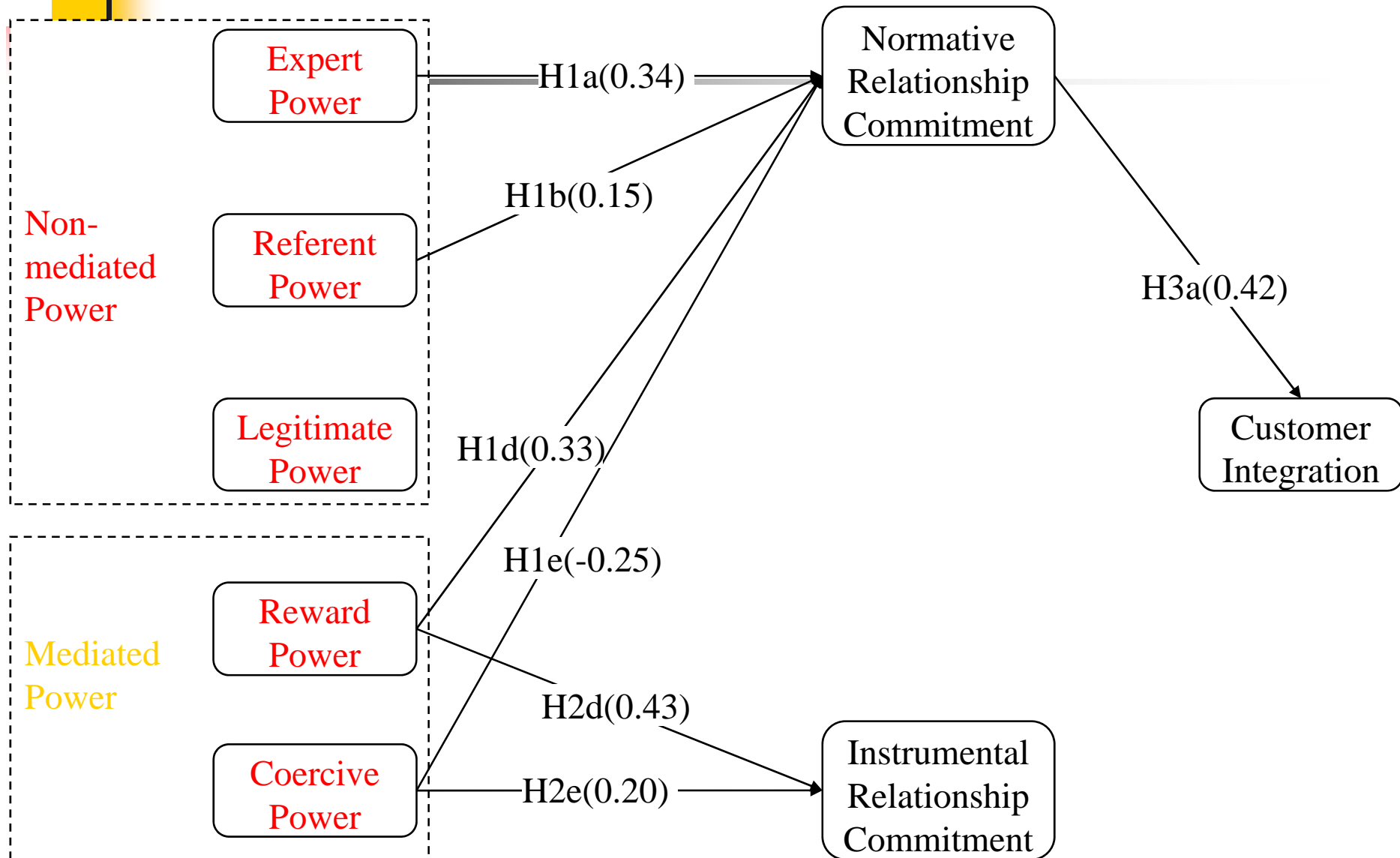


# Further Readings

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1. Zhao, X., Huo, B., Flynn, B., Yeung, J. 2008. The impact of Power and Relationship Commitment on Integration between Manufacturers and Customers in a Supply Chain. *Journal of Operations Management*, Vol. 26, No. 3, pp. 368-388.
2. Flynn, B., Zhao, X., Huo, B., Yeung, J. “We’ve Got the Power! How Customer Power Affects Supply Chain Relationships”. *Business Horizons*, Vol. 51, 2008, pp. 169-174.
3. Yeung, J., Selen, W., Zhang, M., Huo, B. “The Effects of Trust and Coercive Power on Supplier Integration”. *International Journal of Production Economics*, 2008, forthcoming.
4. Huo, B. 2007. An Exploratory Study of Power, Relationship Commitment, Supply Chain Integration and Performance. *Ph.D. Dissertation*, The Chinese University of Hong Kong.

# SEM\_Estimates

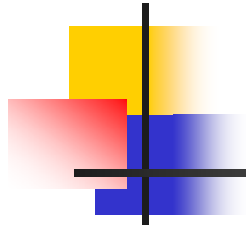




# WIP papers

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1. The Impact of Relationship Commitment and Internal Integration on External Integration: Empirical Evidence from China
2. The impact of ownership on relationship commitment and supply chain integration in China
3. Business Environment, Supply Chain Information Sharing and Supply Chain Performance: An Empirical Study in China
4. Power used in Chinese supply chains: A taxonomy perspective
5. The impact of power and relationship commitment on supply chain integration: A triadic analysis
6. The mediating effect of trust in supply chain integration: Evidence from China



**Q & A**

**Thank you!**