공급사슬관리(SCM) 관점에서의 물류허브(HUB)화 전략

윤 현 덕*
권 오 경**

Competitiveness of Logistics Hub from the Supply Chain Context

Kwon, Oh Kyoung (Inha University)
Yoon, Heon Deok (Soongsil University)

CONTENTS

* 숭실대학교
** 인하대학교

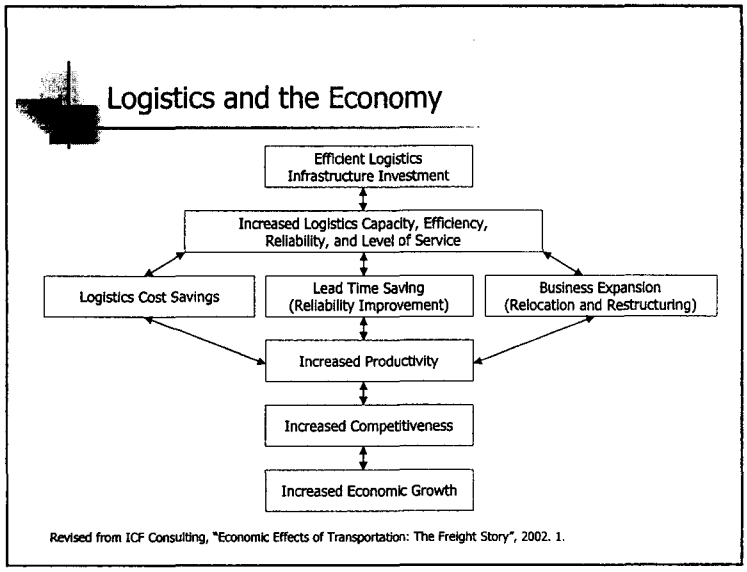
What is Competitiveness? (Michael E. Porter)

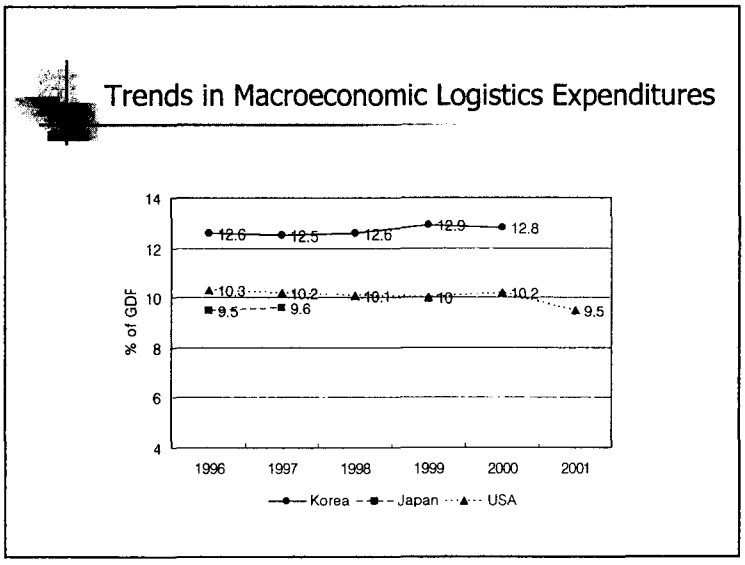
- Competitiveness is determined by the productivity with which a nation uses its human, capital, and natural resources.
  - Productivity depends both on value of products and services (e.g. uniqueness, quality) as well as the efficiency with which they are produced.
  - Productivity in a nation is a reflection of what both domestic and foreign firms choose to do in that location. The location of ownership is secondary for national prosperity.
- Nations compete in offering the most productive environment for business

Global Competitiveness Report 2002

	China	Hong Kong	Japan	Korea
Growth Competitiveness	33 (-6)	17 (+4)	13 (-8)	21 (-2)
Technology	63 (+10)	32 (-1)	5 (-18)	18 (+9)
Innovation	61	32	5	11
ICT	62	6	17	19
Macroeconomic environment	8 (+2)	3 (-1)	29 (+11)	10 (+2)
Macroeconomic stability	5	9	22	10
Country credit	32	25	15	29
Government expenditure	16	15	74	23
Public institutions	38 (-11)	13 (+3)	25 (+6)	32 (-11)
Contract and law	44	13	37	28
Corruption	39	15	21	38
Microeconomic Competitiveness	38 (-5)	19 (+1)	11 (+1)	23 (-3)
Company operations and strategy	38 (-1)	24 (+3)	7 (-1)	21 (-5)
Quality of national business environment	38 (-8)	16 (-1)	17 (+1)	23 (-6)

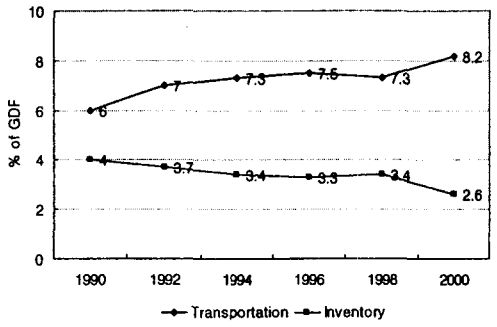
World Economic Forum (2002); ( ) difference 2001-2002.


Logistics and the Economy
Efficient Logistics Infrastructure Investment
Increased Logistics Capacity, Efficiency, Reliability, and Level of Service
Logistics Cost Savings
Lead Time Saving (Reliability Improvement)
Business Expansion (Relocation and Restructuring)
Increased Productivity
Increased Competitiveness
Increased Economic Growth
Revised from ICF Consulting, "Economic Effects of Transportation: The Freight Story", 2002. 1.

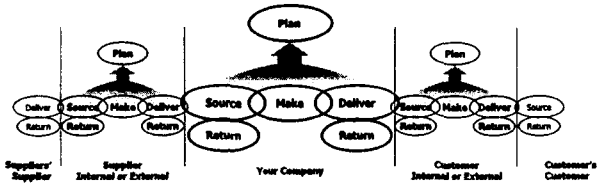

Trends in Macroeconomic Logistics Expenditures
% of GDP
14
12
10
8
6
4
12.6
12.5
12.6
12.9
12.8
10.3
10.2
10.1
10
10.2
9.5
9.6
9.5
1996
1997
1998
1999
2000
2001
Korea
Japan
USA

Tradeoff between Transportation and Inventory

- Firms began to substitute transportation expenditure for inventory expenditure.



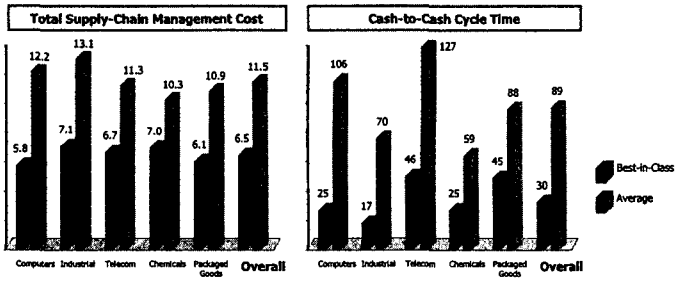
Scope of Supply Chain Management



Trends in Managing the Supply Chain

- The focus on competition has shifted from competition between companies to competition between supply chains
- Why is supply chain management important?
  - Best-in-class companies have an advantage in total supply chain management costs of 3%-6% of revenue
  - Leading companies have a 40%-65% advantage in cash-to-cash cycle time over average companies
- *Core developments in managing the supply chain*
  - Focus on core competencies driving increased logistics outsourcing
  - Globalization driving global supply chain management
  - Information technology driving supply chain optimization and visibility

Supply Chain Benchmarking, 1997

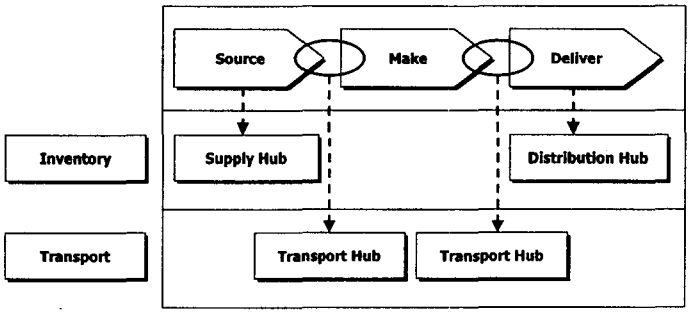


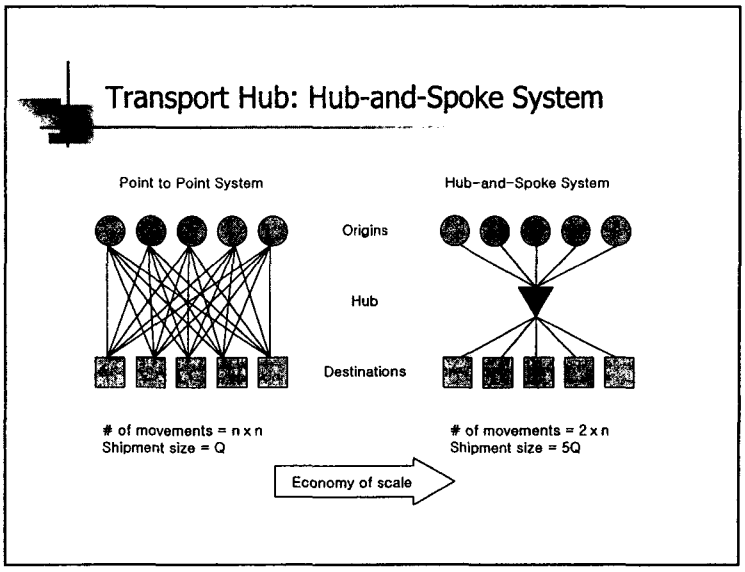
PRTM, 1997 Integrated Supply-Chain Benchmarking Study.

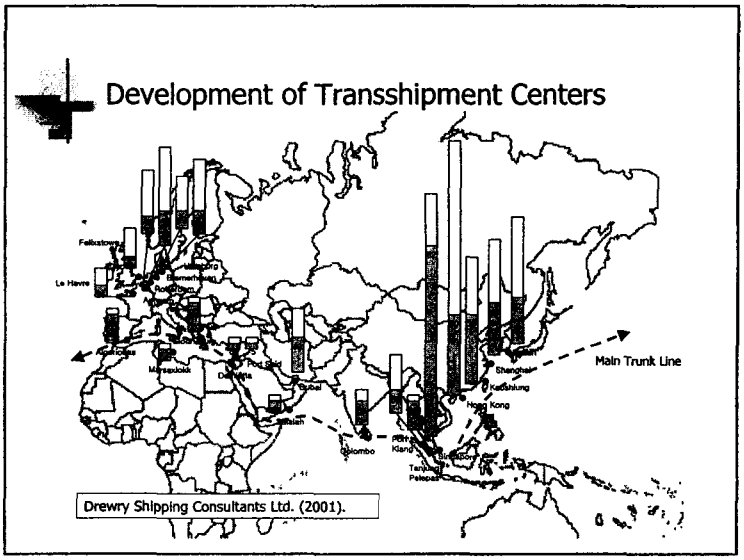
Logistics Industry is being transformed

- Logistics Industry Size
  - The logistics industry is estimated at $970 billion for U.S. (2001) and over $2 trillion globally (1999)
  - Logistics costs on average for 10-15% of the final cost of the finished product
- Logistics industry is being transformed as a result of following developments:
  - Focus on core competencies driving development of 3PL services
    - 74% of major U.S. manufacturers use 3PL services (2001)
    - 3PL market is estimated at $60 billion for U.S. (2001)
  - Increased globalization driving mergers between logistics companies
  - Information technology driving logistics service innovation (e.g., e-logistics services)

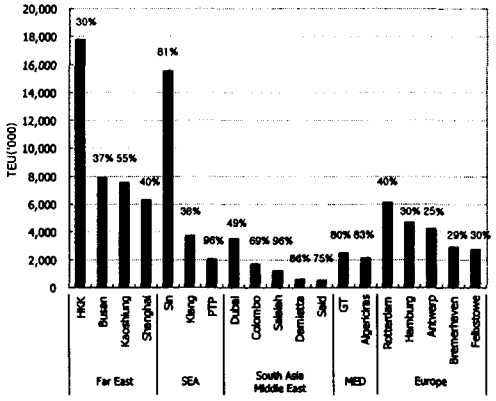
Positioning Hubs in the Global Supply Chain




Transport Hub: Hub-and-Spoke System
Point to Point System
Hub-and-Spoke System
Origins
Hub
Destinations
# of movements = n x n
Shipment size = Q
# of movements = 2 x n
Shipment size = 5Q
Economy of scale


Development of Transshipment Centers
Main Trunk Line
Drewry Shipping Consultants Ltd. (2001).

Transshipment Centers by Region



Key Success Factors as a Hub Port

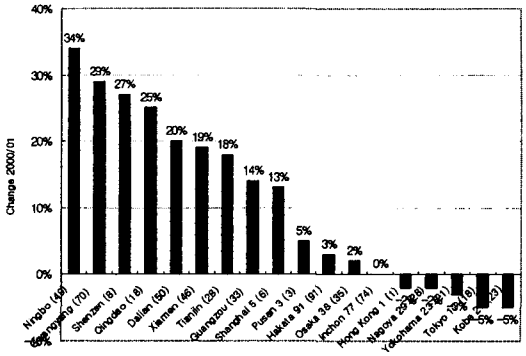
- *Strategic location*
  - Situated on main trunk routes; situated in or near production and/or consumption centers; with favorable natural conditions
  - Endowed with such location attributes as centrality and intermediacy (Fleming, 1997)
- High level of port efficiency
  - Speed and reliability of port services
- High port connectivity
- Adequate infrastructure
- Adequate infostructure
- Wide range of port services

Jose Tongzon (2001).

Top 30 Container Terminals in Asia, 2001

Rank	Port	TEUs 2001	TEUs 2000	2001-2000
1 (1)	Hong Kong, China	17,900,000	18,100,000	-1.10
2 (2)	Singapore	15,520,000	17,040,000	-8.90
4 (4)	Kaoshiung	7,540,000	7,425,832	1.50
5 (6)	Shanghai	6,340,000	5,613,000	13.00
8 (11)	Shenzhen	5,076,435	3,993,714	27.10
12 (12)	Port Klang	3,759,512	3,206,753	17.20
17 (16)	Manila	2,796,000	2,867,836	-2.50
18 (15)	Tokyo	2,770,000	2,889,452	-6.40
19 (25)	Qingdao	2,640,000	2,120,000	24.50
21 (21)	Yokohama	2,400,000	2,317,489	3.6
22 (23)	Laem Chabang	2,336,653	2,195,024	6.5
23 (20)	Tanjung Priok	2,222,496	2,476,152	-10.2
25 (22)	Kobe	2,100,000	2,265,992	-7.3
26 (110)	Tanjung Pelepas	2,049,000	418,218	389.9
27 (32)	Tianjin	2,010,000	1,911,920	5.1
28 (28)	Nagoya	1,890,000	1,884,494	6.4
30 (27)	Keelung	1,815,854	1,732,855	4.8

Throughput Changes 2000-2001: Container Ports of China, Japan and Korea



Cost Effectiveness of Korean Ports

		3,000 TEU		1,100 TEU	
Country	Port	Port Charges (US$)		Port Charges (US$)	
Korea	Busan	92,535	100	54,993	100
China	Shanghai	84,033	83	44,054	83
	Tianjin	75,706	78	40,120	76
Hong Kong	Hong Kong	205,000	211	129,026	224
Japan	Osaka	144,746	149	93,031	176
	Yokohama	359,882	370	226,229	427
Malaysia	Port Klang	68,928	71	43,353	82
Singapore	Singapore	157,459	162	99,419	188
Taiwan	Kaoshiung	123,926	127	78,808	149

Surveyed by Korea Maritime Institute (2000.6)

Top 30 Cargo Airports in Asia, 2002

Rank	Airport	Tones 2002*	2002-2001*
2 (2)	Hong Kong (HKG)	2,298,921	20.5
4 (5)	Tokyo (NRT)	1,819,062	18.2
7 (9)	Singapore (SIN)	1,522,138	8.8
13 (16)	Taipei (TPE)	1,261,350	16.2
17 (19)	Bangkok (BKK)	875,313	14.2
20 (18)	Osaka (KIX)	740,050	-7.5
23 (23)	Tokyo (HND)	628,433	-4.1
25 (28)	Beijing (PEK)	614,526	14.2
28 (>30)	Shanghai (PUG)	547,361	71.5
29 (>30)	Guangzhou (CAN)	542,622	11.6

Airports Council International (ACI); * January-November.

Comparison with Neighbor Airports

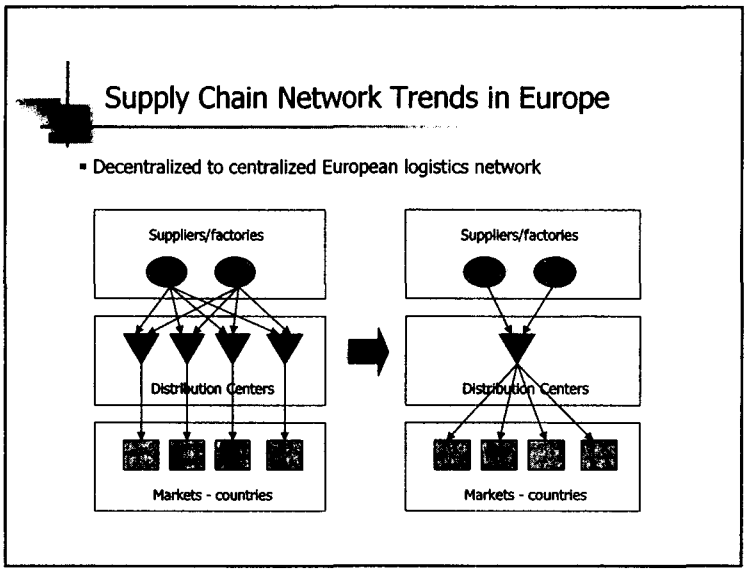
	Seoul (ICN)	Tokyo (NRT)	Kansai (KIX)	Shanghai (PUG)	Hong Kong (HKG)	Singapore (SIN)
Date Opened	2001. 3	1978. 5	1994. 9	1999. 10	1998. 7	1980. 7
Construction Costs (billion US $)	5.2	N/A	15	1.5	13	0.7
Runways (m)	2 (3,750)	1 (4,000)	1 (3,500)	1 (4,000)	2 (3,800)	2 (4,000)
# of Gates	44	53	33	53	48	53
PAX Capacity (million PAX)	30	35	25	20	45	44
Cargo Capacity (million tones)	2.7	2.0	1.4	0.75	3.0	3.5
Transshipment (%)	46.6%	16.4%	18.5%	N/A	< 20%	30%
A/C Movements (1,000)	240	200	160	126	160	360
# of Airlines	50	67	48	29	68	58
# of Cities Served	117	91	64	84	140	139
Landing Fees* (US $)	2,800	8,991	8,616	5,652	3,896	2,569

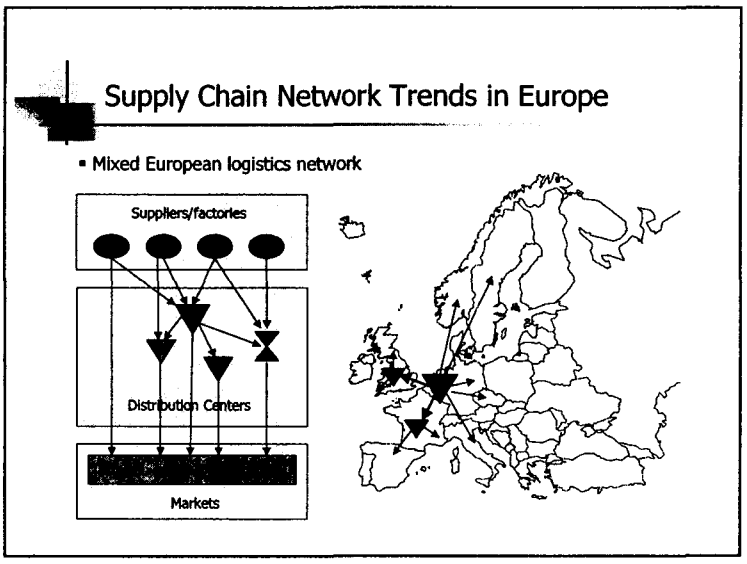
Incheon International Airport (2002. 7); * B747-400.

Supply Chain Network Trends in Europe

- Decentralized concept
  - Traditional European supply chain structure
- Centralized concept
  - The cost effective focus on the European supply chain structure
- Mixed concept
  - THINK global, MANAGE European and ACT local
  - Value Added Logistics (VAL)

Groenewout B.V. (2003. 4), "The Supply Chain Boomerang: Supply Chain Network Trends in Europe"


Supply Chain Network Trends in Europe
▪ Decentralized to centralized European logistics network
Suppliers/factories
Distribution Centers
Markets - countries
Suppliers/factories
Distribution Centers
Markets - countries


Supply Chain Network Trends in Europe
▪ Mixed European logistics network
Suppliers/factories
Distribution Centers
Markets

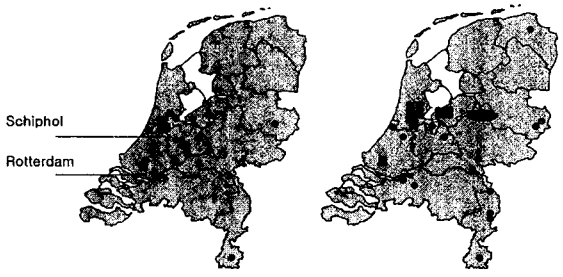
National Strategy for Logistics Hub: The Netherlands Case

- To develop the Netherlands as a logistics hub for Europe by
  - one hand developing a business climate and the infrastructure facilities needed for the development of an efficient market oriented logistics sector and
  - on the other hand attracting overseas multinational manufacturing companies making use of its logistics sector.

Larissa van der Lugt, Chris Blake, and Albert Veenstra (2001. 11)

European Distribution Centers in the Netherlands

- 620 European Distribution Centers located in the Netherlands (2002)
  - 60% North American, 25% Japanese, 8% Taiwanese



Buck Consultants International (1995).

Distribution Strategies to European Market: Port of Rotterdam Case

	Automotive	Electronics	Food	Health care	Textiles
Present Distribution Structure					
Direct distribution	+++	+	+	+	+
Central	+	+	+	+	+++
Regional	+	++	+++	++	-
Multi-stage	-	+	-	+	+
Future Distribution Structure					
Direct	++	+	+	+	+
Central	++	+	+	++	++
Regional	-	+	+++	+	-
Multi-stage	+	++	-	+	++

Buck Consultants International (1999).

Economic Effects of Logistics Hub

- Employment effect
  - EDCs 18,000
  - Related activities 25,000
- Financial effect
  - $2 billion annual contribution to economy
    - Transport 37%
    - Labor 22%
    - Equipment 10%
    - ICT 8%

Larissa van der Lugt, Chris Blake, and Albert Veenstra (2001. 11)

Major factors to locate RDC in the Netherlands

	EDC	RHQ	Call Center
Clustering of related and supporting industries	2	6	5
Central and strategic location	9	16	7
Superior international business environments	5	12	6
Efficient and professional logistics industry	5	1	0
Highly productive labor with work ethic	7	14	8
Multilingual work force	6	15	17
Flexible regulation and favorable tax incentives	3	4	1
Flexible labor systems	4	3	4
Assistance by government departments	5	6	3
Superb infrastructure well-connected to foreign markets	6	5	1
Sophisticated telecommunications infrastructure	2	4	8
Convenient access to ports, airports, railways and roadways	3	9	0
Total respondents	20	27	20

The Netherlands Foreign Investment Agency.

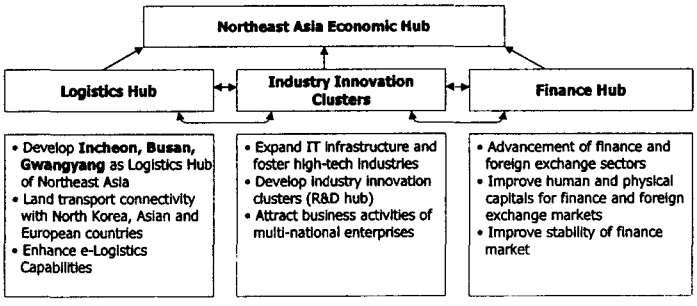
Developments leading to Supply Hubs

- Just-in-time (JIT) production
  - Suppliers are required to deliver frequently in small quantities
    - Some suppliers of Toyota deliver as frequently as four times a day
    - Many of Toyota's suppliers are single-source suppliers located close to points of delivery
    - Suppliers outside Japan are usually located far from points of delivery
  - The long haul, plus problems involving multiple suppliers, makes logistics management a complex problem
- Vender Managed Inventory (VMI) arrangements
  - VMI is an arrangement under which the supplier manages the customer's inventory at the customer's distribution center or at a retail outlet
  - Wal-mart and its suppliers Procter and Gamble (P&G) and Rubbermaid

Development of Supply Hubs

- A supply hub is a location physically close to manufacturer's facility where all or some of its suppliers warehoused
  - With the arrangement that the materials will be paid for only when consumed (Zuckerman, 2000)
  - Many companies in the high tech and electronics industry have set up hubs or VMI facilities to house many of the components, parts, and raw materials, necessary for the assembling or manufacture of a product
- Current industry development in Asia
  - BAX Global currently handles the supply hubs for Apple, Dell and IBM in Southeast Asia

"Combined Model" for Developing Korea as Economic Hub of Northeast Asia



Second Economic Subcommittee of the Presidential Transition Committee (2003)

Korea's National Strategy for Logistics Hub

- Korean government has recently established the national strategy to become a logistics hub for Northeast Asia
  - To further improve the competitiveness of nation
  - To provide the most productive environment for global logistics activities
- Korea has strong potential to become a logistics hub of Northeast Asia with
  - Central and strategic geographic location in the fast growing Northeast Asian region
  - Competitive manufacturing sector in the world market
  - Competitive sea port and airport facilities well-connected to foreign markets
  - Competitive ICT and e-business infrastructure

Major factors to locate RDC in the NE Asia

Determinants	Weight
Market size & growth potential of catchments region	4.24
Geographic location, transport linkage & market accessibility	4.19
Port, airport & inter-modal transport facilities	3.65
Skilled labor force & labor peace	3.62
Political stability	3.60
Pro-business government and officials	3.40
Modern logistics service providers and costs	3.40
Labor and other input costs	3.25
ICT/e-business infrastructure	3.23
Land availability & price	2.93
Corporate tax incentives	2.89
Availability of Free Trade Zones	2.87
Housing, schools, and environmental amenity	2.80
Competitive financial service sector	2.62

Korea Transport Institute (2002. 12); surveyed 57 MNCs; 5 point scale.

Competitiveness as a potential Regional Logistics Hub

Determinants	China	Japan	Korea
Market size & growth potential of catchment region	**4.40**	3.45	3.48
Geographic location, transport linkage & market accessibility	3.40	3.84	3.82
Port, airport & inter-modal transport facilities	2.98	**4.22**	3.98
Skilled labor force & labor peace	3.08	**4.06**	3.73
Political stability	2.83	3.98	3.53
Pro-business government and officials	2.98	3.60	3.62
Modern logistics service providers and costs	2.80	3.83	3.70
Labor and other input costs	**4.40**	2.40	3.42
ICT/e-business infrastructure	2.82	**4.38**	**4.06**
Land availability & price	**4.02**	2.10	3.12
Corporate tax incentives	3.49	2.98	3.41
Availability of Free Trade Zones	3.55	3.17	3.40
Housing, schools, and environmental amenity	2.53	3.72	3.52
Competitive financial service sector	2.60	3.83	3.57

Korea Transport Institute (2002. 12); surveyed 57 MNCs; 5 point scale.

Favored location for a single RDC in the NE Asia

1.	Shanghai	6.64
2.	Hong Kong	5.93
3.	Seoul/Incheon	5.92
4.	Tokyo/Yokohama	5.54
5.	Beijing/Tianjin	5.49
6.	Osaka/Kobe	5.19
7.	S. China	4.69
8.	Busan/Gwangyang	4.66
9.	Taipei	4.03

Korea Transport Institute (2002. 12); surveyed 57 MNCs; 9 point scale.

Recommendations

- Develop a logistics hub as "supply chain excellence hub" to support the global supply chain management of multinational manufacturing and logistics companies
  - Transport + Distribution + Supply Hubs
- Develop a "unique model" for logistics hub for NE Asia
  - Need to be differentiated from the models of the Netherlands, Singapore, and Hong Kong
    - Considering the different characteristics of NE Asian markets
  - Competitive or complementary relationship?
    - Competitive : Netherlands vs. Belgium, Singapore vs. Malaysia
    - Complementary : Hong Kong and S. China

Recommendations

- Develop the competitive "logistics clusters"
  - More emphasis on the competitiveness of industry cluster
    - Develop major sea port and airport areas as logistics clusters that will provide value added logistics (VAL) services
    - Improve inter-modal connectivity to NE Asian countries
  - Transform the logistics industry more competitive and innovative
    - Improve e-logistics capability utilizing the nation's strong ICT and e-business infrastructure and industry
    - Improve logistics knowledge and education