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Requirements for the development of a competitive Logistics Hub based on Northeast Asia studies

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Abstract

The main purpose of this study is to explore the concept of a logistics hub, identify key factors and milestones for its development, and give some recommendations and implications to developing countries in South America.

To attract capitals and cargo, and to improve business logistic activities, developing a scheme called logistics hub can be consider as a general aim of this study. The terms Free Trade Zone (FTZ), Special Economic Zone (SEZ), within other necessary variables for the implementation of a hub area will be discussed. Ideas of South Korea, Japan and China, competitors in Northeast Asia (NEA) to be Logistics hub are going to be described.

Important mega logistics hub as Singapore or Hong Kong for Southeast Asia, Rotterdam or Lyon for Europe or Jabel Ali in Dubai are just some examples of the idea for successful mega hub area. This successful city ports have develop its position as gateways to its regions on the basis of its excellent infrastructure and quality of services.

In the new "global" environment the world is still facing steps of regional integration; the countries that becomes hub in their specific region will achieve socio-economic benefits.

In Northeast Asia; Korea, Japan and China have under its priority policies the development of a logistics hub visioning to be the central area of the region. The winner will achieve micro economic and macroeconomic prosperity with developments in port, IT, R&D within other activities.

After reviewing cases in this region, five factors came up as key determinants for the success implementation of a hub project: 1. Logistics services support and infrastructure. 2. Business environment. 3. Economic determinants. 4. Political support and 5. Access to international markets. These are going to be analyzed together with its different variables.

Different governments of developing countries including South America should evaluate the challenge and milestones of the projects in Northeast Asia. National and local governments should start thinking in being central areas of their blocs or of different countries among the future Free Trade Area or the Americas in the economic integration scheme.

South America region has big amount of natural resources and it is still "virgin" in the development of different activities. From a logistic perspective, South America markets are ripe for innovation and integration to develop competitive supply chain activities.

The result of this study can be used as research material for project developers and governments of developing and also developed regions.

Key words: Logistics hub, Special Economic Zone, Free Trade Zone, Foreign Direct Investments, Regional Integration, Distribution Centers, Clusters, Competitiveness, Relaibility, Multimodalism, IT, Logistics Service Providers, Business Operations, Political Support, Fiscal policies.

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1. INTRODUCTION

This monograph aims to explain the concept of a logistics hub, identify key factors and milestones for its development, and give some recommendations and implications to developing countries in South America.

To attract capitals and cargo, and to improve business logistic activities[1], developing a scheme called logistics hub can be consider as the general aim of this study. The buzz- words Free Trade Zone (FTZ), Special Economic Zone (SEZ), within other essential variables for the implementation of a hub area will be discussed. Ideas of South Korea, Japan and China, competitors in Northeast Asia (NEA) to be Logistics hub will be analyzed.

The world is facing a "globalization" environment, an obligatory process consequence of revolutionary developments in different areas as logistics, computerization automation, engineering, telecommunications, transportation, technology, trade and managerial policies within others.

With this "new" phenomenon the competition is strong not just among companies and countries but especially between regions. Every region is trying to be more competitive and attractive; using in the best way possible the scarce resources available to improve their performance.

Capitals are shifting easily from one area to another affecting globally the different markets. Investors are moving their resources supported by several sources of reliable information to diversify and increase profits, reach more efficiently different markets and to fulfill better customers' demands.

The challenge of the different governments and project developers is to attract Foreign Direct Investments (FDI) and optimize internal capitals; regions want to be central areas of businesses (Logistics hubs). To be successful developments of different factors are necessary and an integrated efficient platform of activities connecting the full supply chain must be developed. Customers, governments, companies, shippers, 4PL companies etc, need to interact under an efficient compatible network.

The new "integrated" world economy is facing steps of regional integration. Europe, America, Southeast Asia, Northeast Asia or Africa, are working under different blocs or agreements as ASEAN, NAFTA, MERCOSUR, APEC or also under more complex integrations as the European Union (EU) and future Free Trade Area of the Americas (FTAA). Within these areas, regions are looking forward to be hubs attracting as much as possible investments and cargo, redistributing them to the different final destination.

Important mega logistics hub as Singapore or Hong Kong for Southeast Asia, Rotterdam or Lyon for Europe or Jabel Ali in Dubai are just some examples of the idea for successful mega hub area. This successful city ports have develop its position as gateways to its regions on the basis of its excellent infrastructure and quality of services.

The most dynamic area of the world now a day, where investments are flowing into, is Northeast Asia; composed by three suigeneris countries: China, a developing country with a big potential market and facing a successful transition face to an "open" market. Its purchasing power has already surpassed that of Japan and is now second only to the United States. Japan, one of the most powerful economic nations in a short term period with a high level of income per capita and Korea, a transitional country with an

[1] Also well known as Supply Chain Management SCH. See Business logistic management Ballou (1999)

interesting fast recovery after the general Asia crisis, with recognized companies around the world and leadership in Information Technology.

The governments of these three nations have under its priority policies the development of logistics hub visioning to be the central area of the region. The winner will achieve micro economic and macroeconomic prosperity with developments in port, IT, R&D within other activities.

Different governments of developing countries in South America should evaluate the challenge and milestones of the projects in these regions. National and local governments should start thinking in being central areas of their blocs or of different countries among the future FTAA in the economic integration scheme

In this research; literature review regarding different activities and topics as: Supply chain management, Foreign Direct Investments, Special Economic Zone, Free Trade Zone, multinational corporation decisions for investment, government performance and distribution centers involved in logistics hub will be evaluated. A questionnaire was submitted to different companies and experts in the topic in Korea to identify important factors for the implementation of a hub according to their view. Quantitative analysis as correlation, factor analysis, cronbah α and regression will be used to analyze the data also, to identify variances between groups the T test and One- way Anova test were used. The SPSS software will be the driver for the analysis.

The scope of this study is. I) To identify and analyze the factors for the development of a logistics hub according to business executives, governments officers and Scholars in Korea. Many studies have mentioned different factors but the environment is changing and review of the literature and opinion in the filed will be evaluated. II) Review the milestones of South East Asia countries in the challenge of the development of the project, especially Korea one of the pioneers in the process of the development of such area and China for its characteristics of developing country with similar problems of others and finally III) The objective is to give recommendations and implications to developing countries of the South American region based on the experience of the Northeast Asia countries.

South America region has big amount of natural resources and its still “virgin” in the development of different activities. From a logistic perspective, South America markets are ripe for innovation and integration to develop competitive supply chain activities.

This work is organized as follows: In chapter two Studies about different business activities of the Supply Chain, support activities, value added services of foreign direct investments are described and analyzed. In chapter three the situation in Northeast Asia, especially Korea, Japan and China regarding logistics activities is reviewed. In chapter four and five it is formulated the research design and it is described the empirical results. Also, It is explained the concept of Logistics hub and analyses the results and suggestions of the survey and brainstorming. Chapter six shows recommendations and implications to developing regions in Latin America. In the last chapter conclusions and recommendations for future researches are mentioned.

2. LITERATURE REVIEW

As the trends of globalization and trade liberalization have progressed, the geographical scope of international logistics expanded rapidly and the strategic importance of logistics continue to gain in importance.

For an economic structural reform in a country, it is necessary to establish as advanced and total-effective logistics system to strengthen companies' international competitiveness as well as increase consumer benefit. The Minister of Economy Trade and Industry (METI) in Japan for example is implementing measures for improving the logistics environment through promoting the use of IT, standardization and join logistic operations. Meanwhile, with the rising social needs to tackle environment-friendly logistics systems.

Many studies have been conducted in the different business activities of the supply chain. Also researches on Foreign Direct Investment have been analyzed due to the accelerate efforts of all regions to attract capitals and technology. Different papers and theoretical background of these topics were reviewed due to the importance for the development of a logistics hub.

2.1 Logistics centers

For instance, in the Northeast Asia Economic Forum celebrated in Seoul 2001, factors affecting the location of logistics centers were discussed. Traditionally, location criteria have emphasized cost-based variables such as economies of scale, transportation costs and factor costs advantages. Nowadays, it is shown that regional structure and local skills are given a great deal more weight than in the past. Also now, economic variables such as social and institutional characteristics are also considered important in selecting the best location. Bush et al. (1999) grouped location determinants into three categories:

- Proximity to other network nodes.
- Access to factors of production and
- National and regional characteristics. (See table 2.1).

His findings showed that proximity to important customers and suppliers is considered key determinant in location decision-making.

Table 2.1 Group, factors and determinants of plant location

Variable group	Factors	Determinants of Location
Network nodes	Proximity of downstream nodes	Proximity to important markets Proximity to key customers
	Proximity of upstream nodes	Proximity to key suppliers Proximity to other facilities
Access to factors of production	Access to raw materials and energy	Access to raw materials Access to energy
	Access to capital and technology	Access to capitals Access to local technology
	Access to skilled labor	Access to skilled labor
	Access to low costs labor	Access to low cost labor
National and regional characteristics	Government policies	Access to protected markets tax conditions Regional trade barriers Government subsidies Exchange rate risk.
	Societal characteristics	Language, culture, politics Advance infrastructure.
	Regulation	Labor practices and regulation. Environmental regulation.

Sources: Brush et al. (1999)

High tech industries have been a new trend target for many regions due to its technology and capacity to create added value products activating different markets. A survey focusing on the identification of location determinants for high tech manufacturing asserts that a global hub for high tech and logistics activities should satisfy the following factors (O'Brien, 2001).

Table 2.2 Factor that a high tech logistic hub may satisfy

1.A community desired to have a comprehensive hub development strategy. 2.Existence of comparative cost advantages. 3. A favorable fiscal environment. 4.Existing high tech manufacturing industry base 5.One-stop-shop local marketing organization that proactively promotes the location, supported by appropriate literature and materials.	1.Appropriate incentive package for foreign investors. 2. Supporting infrastructure at all terminal facilities. 3.Supporting human resources development programs. 4.Pool of high-tech research and development institutes.

O'Brien (2001)

The survey also reveals that the elements of time for customs clearance and overall transportation are more important to high-tech manufacturers than inherent cost. Since time of services seen as critical, more than 80 percent of high tech manufacturers prefer to locate their facilities near major airports. In order to minimize overall delivery time, most high-tech manufacturers indicate that special cargo facilities at major airports are

of primary importance. A comprehensive list of location determinants can be found in table 2.3. UNCTAD (1998) classifies location determinants into the following three categories: Policy framework, economies determinants, and pro-active business facilitation measures.

Table 2.3 Determinants of location selection for foreign Direct Investments

I**. Policy framework** Economic, political and social stability Rules regarding entry and operations. Standards of treatment of foreign affiliates Policies on functioning and structuring of markets (especially competition and M&A policies) International agreements on FDI Privatization policy. Trade policy (tariffs and NTBs) and coherence of FDI and trade policies. Tax policy.
II. Economic determinants A. Marketing seeking Market size and per capita income Market growth Access to regional and global markets Country-specific consumer preferences, structure of markets
B. Resources/ Asset-seeking Raw materials Low-cost unskilled labor Skilled labor Technological, innovative or other created assets (e.g brand name), including those embodied in Individual, firms and clusters; physical infrastructure (ports, roads, power, telecommunications)
C. Efficient-seeking Cost of resources and assets listened under B, adjusted for productivity for labor resources. Other input costs, e.g. transport and communication costs to, from and within host economy and costs of other intermediate products membership of a regional integration agreement conductive to the establishment of regional corporate networks.
III. Business facilities Investment promotion (including image-building and investment-generating activities and investment-facilitation services). Investment incentives. Hassle costs (related to corruption, administrative efficiency, etc.) Social amenities (bilingual school, quality of life, etc.) Post investment services.

Sources: UNCTAD (1988)

The role of legal institutional policies and economic determinants are considered very important in attracting foreign investment. Although business facilitation measures are not considered to be as important as the other two categories, they are gradually receiving more attention as the world economy becomes increasingly globalize.

In United States Friedman (1995), describes that there is a general consensus regarding the four factors that are most important in determining location for FDI. They are market size, wages rate, transportation infrastructure, and state promotion activities designated to attract foreign investment. It can be concluded as follow:

Domestic market potential and access to important foreign markets are positive and important.

Although governments cannot control factors such as market size and wages rates, they can still improve their chances of being selected by providing tax incentives and by actively promoting themselves to foreign multinational companies.

2.2 Foreign Direct Investments (FDI)

Tae Hoon Oum and Jong-Huk Park (2003), studied the "major factors that multinational corporations consider when they decided the location of their regional distribution centers (DCs)". The following critical determinants were identify: Geo-location linkage and market accessibility (Mean 4.27), market size and growth potential of catchments region (mean *4.28*); port, airport and Intermodal facilities (mean 3.80) Skilled labor force, labor quality, and labor peace (mean 3.62), modern logistic service provider (3PL or 4PL) and costs (mean 3.53), Pro- business government and officials (Mean 3.48), political stability (Mean 3.70). Also, they state that the heights of market-related and services related factors are generally higher than those of costs- related factors like labor-costs, land price and corporate incentives.

The study suggest that in order to be the logistic hub, a nation needs to secure not only enough hardware facilities such as well developed transport and logistics infrastructure, but also provide excellent software services including availability of world-class logistics services providers, and providing improved services to the foreign firms currently doing business in that country by continuously improving government support to those firms so that they would voluntarily expand their business activities.

Also, in the article "What attracts foreign multinational corporations to China?" Zhang (2000) indicates that multinational firms would allocate their investments among countries so as to maximize their risk-adjusted profit. The profit of FDI made by multinational firms in a country may depend on three groups of factors: 1) factors within the firm that enable it to grow and diversify more successfully than others at home or abroad (such as property, technology and management expertise); 2) Factors in the host country that make the country as the best location for the firm to produce across countries (such as cheap labor, growing market size, and tax incentives); and 3) Factors associated with the firm's trade-off between FDI and exporting and licensing (Such as transaction costs). Dunning(1981) has classified these three groups of factors, as three sets of advantages for a firm to go multinational: Ownership(O), location(L) and internationalization (i) (So-called OLI paradigm of electric theory).

Accordingly to the OLI framework, the ith firm with certain ownership advantages (Oi) would open a subsidiary in country j with location advantage (Lj) to respond to

expected return (Πij) as well as risk (Σij). Both advantages of Oi and Lj can best be captured by the internationalization (Ii) of production via direct investments, as summarized in the following equation:

OLI Model

FDI ij = f(Πij,Σij) = g(Oi,Lj,Ii)

In a demand-supply framework, the ownership Oi and internationalization (Ii) advantages might be view as the supply-side factors of FDI, and location (Lj) advantages are treated as the demand-side factors. Studies focusing Focusing on demand-side determinants, given the ownership and internationalization advantages, concern the question of why FDI goes to a particular country rather than other.

Focusing on the location factors, it is convenient to distinguish between export oriented and market-oriented FDI in the basis of multinationals' motivations. Location factors that influences the export oriented FDI include labor costs and infrastructure.

In the market-oriented investment, the size of local markets is expected to be critical determinant because the larger market size offers greater opportunities to realize effective economies of scale. (Zhang, 2000). Because this type of FDI involves advanced technology, it generally requires certain level of stock of human capital or skilled labor and good infrastructure conditions in the host countries.

Not every country has a big potential market, but it can attract FDI export oriented based on the competitiveness of services developing the economies of scale targeting a region.

Special attention should be given to the location factors and factors of the trade-off that are directly influenced by the host country and can be consider as opportunities or threats in a SWOT analysis[2]. In the case of China the local market size, labor costs, labor quality, agglomeration of economies, transportation costs, FDI incentives and cultural links with investors where identified.

Michael J. Enright (2000) in his article of "Regional Clusters and Multinational Enterprises" outlines a model of foreign clusters development in which the cluster and foreign multinational enterprises (MNEs) are interdependent. The case of Honk Kong financial services cluster is used to demonstrate that interdependent clusters provide types of investments opportunities, particularly for "marketplace-seeking" and "information seeking" investments, and benefits for foreign multinationals that go beyond those usually contemplated.

The analysis also challenges the conclusions of Porter(1990) and Porter and the Monitor Company(1991) that the conditions that attract foreign companies will necessarily foster local companies as well.

For policymakers from regions without strong indigenous developed clusters, policies focused on turning dependent clusters into interdependent clusters by investing in education, training, infrastructure, information and attracting firms to fill out the

[2] In a SWOT analysis, the Strengths and Weaknesses items are related to the factors that can be influenced directly by the system. The Opportunities and threats are identified as external factors that are not possible to have influence on it with decisions that are taken.

cluster can be used to embed the cluster more firmly into the local economy. (Singapore and Scotland have initiated such strategy).

Honk Kongs location specific advantages mentioned includes: political and social stability, economic freedom, sound legal treatment and rule of law, transparent government, unrivaled record of national treatment, favorable tax regimen, low regulatory costs efficient and modern infrastructure, free flow of information, relatively skill force, widespread use of English and cultural links with China.

Multinationals increase the level of trade not just selling their different products but also trading inter-subsidiaries. If the development of clusters is key item for the success implementation of a logistic hub multinational corporation settlements are correlated.

Warehouses or DCs can be established to target local markets or big areas. If the target is a local market the market size of the country is more important. If the objective is a region like Northeast Asia, which is the new trend, the market size (which is not any more a country but a bigger area) is implicit but other factors gain importance. Potential of catchment's region and accessibility to other markets using hub centers is more important.

For the location of FDI regarding to physical facilities companies intent to optimize customer satisfaction having a balance in trade off between different activities inventory and transportation is typical items to analyze.

For a warehouse or DCs, not just activities as space determination, stock layout and dock design, or stock placements have to be considered factors as agglomeration of economies and state promote activities are relevant to a decision.

Attract Distribution Centers (DCs) is determinant in the development of a mega logistics hub as part also of an effective supply chain management activity.

2.3 Port activity

In the port activities, important aspects have been mentioned. Jose Tongzon (2002) in his article Choice determinants in a competitive environment for example mentioned about the potential determinants of port choice, which may be qualitative or quantitative in nature. 1 Route factors, 2 Cost factors, and Service factors. Qualitative factors include subjective factors, such as flexibility and easy of use.

Port marketing efforts, traditions, personal contact and level of cooperation that may be developed between the shippers and the port where mentioned as important items.

Based on Malaysia, Singapore and Thailand experiment; within the principal factors that have a significant impact on the choice of ports among shippers located at the industrial center where: Frequency of ships visits (mean 4.2), efficiency (Mean 3.2), adequate port infrastructure (Mean 4.4), location (Mean 4.6), competitive port charges (mean 5.2), quick response to port users needs (Mean 5.4) and port reputation for cargo damage (Mean 7.1). Relative importance of factors differed according to the region but port efficiency, often measured by speed and reliability – on time delivery, is considered the most important determinant.

Foster (1978) has mentioned that port charges is a principal factor driving port choice, but this should be seen in the context of overall cost. It is mentioned that shippers are more concerned with indirect costs associated with delays, loss of markets/market share, loss of customers' confidence and opportunities foregone due to inefficient service,

than with the port charges. Subsequently studies by Murphy, Delay and Dalenberg (1991, 1992) found that some ports users are actually willing to accept higher costs in return for superior service.

The issue of port efficiency is important determinant in the port activity. To attract transshipment cargo, indispensable in a logistic hub, speed, reliability and multimodalism are necessary.

Marketing activity and cooperation between gates and the supply chain is necessary. Ports are main spot in the development of areas. Mega hub ports are always in healthy economic regions and vice versa; healthy economic regions require mega hub ports.

2.4 Air port activity

Regarding air hubs logistics, in the case of Korea, Hunsoo Lee and Whan Mo Yang (2000) look to a "strategy that may enable the incremental development of a Winged city around Incheon International airport". They mention that the success depends on weather the airport is capable of rapidly attracting a critical mass of global logistics providers.

According to their research, the objectives of the Asian Hub includes: 1) Infrastructure offering good interconnectivity of transport modes and integrated logistics facilities on par with global standards. 2) Good government policies and regulation 3) Intensive competitive strategies and aggressive marketing strategies. 4) Early adoption of E-commerce. 5) Friendly atmosphere for foreign companies. And finally 6) Various producer services, including finance and insurance and customer oriented administrative services.

They state that an Asia hub may be seen to consist of Asian hub center, Asian logistics center and an Asian business center.

The Hub center would be a marketing arm of the Asian hub and could ultimate developed into an international business hub. This would require the establishment of stable customer bases and an inflow of multinational corporations to promote the revitalization of neighboring industrial parks and the globalization of domestics firms. In the long term there would also need to be an improvement in the environment for attracting foreign direct investments. This may be possible through a combination of enforcement of foreign investment promotion laws and designed of customs Free Zone.

The major functions of the business center include international marketing supports, international information network services, consulting exhibition and conferences, lodging and shopping.

They conclude that air transport polices to support development of Incheon into a logistics hub includes the creation of sufficient origin-destination (O/D) and transshipment freight, minimization of rates and related logistics costs, accurate forecasting accompanied by continuous investments, and aggressive marketing strategies. The interest point is that they mentioned mixed-use development strategies. The development of an Asian hub that could provide a basic framework of logistics hub in North East Asia and Asian Business center and Asian Logistics center that are core projects of mixed-use development plans of a Winged city were suggested as a means of accomplishing this. The importance of marketing activities again is reveled.

Ming-Chin Tsai and Ying-So Su (2002) in the study "Political risk assessment on air hub developments in Taiwan" analyzes the political risk assessment (PRA) in air

performance review.[3] Since air hub developments are closely related to the government performance, the associated political risk becomes important for study.

The study concludes that micro and macro factors are approximately of equal importance to the development of air hub in Taiwan. In other words, apart from the air transport policies, the development of a hub is also sensitive to overall political and economic practices. Finally, as far as micro –risk factors are concern, they conclude that insufficient air logistics infrastructure, and ineffective road traffic management, and unclear business regulations relating to air logistics activities constitute the main barriers to the air hub developments in Taiwan.

Critical sub-items risk factors and their contribution degree are shown in table 2.4.

Table 2.4 Significant sub-item risk factors and their contributing degrees

Rank	Critical political risk factors	Weight	Accumulation (%)
1	B2 Freight vehicle parking	0.065	6.5
2	A4 Infrastructure development	0.059	12.4
3	A2 General airport infrastructure development	0.057	18.1
4	F1 Cross-strait relationship	0.051	23.2
5	B3 Land use of freight terminals	0.051	28.3
6	A3 Operation regulations of International express delivery IED zone	0.051	33.4
7	B4 Facilities requirement of freight terminals	0.05	38.4
8	F4 Entry to the WTO	0.05	43.4
9	D5 Maturity of legal systems	0.049	48.3
10	Government efficiency and incorruption	0.048	53.1

Note: The letter identifies different factors: A) Air hub policy, B) Inland freight policy, C) Foreign enterprises policy, D) Policy system, E) Macro-economic practices and F) International relationship. The number represents the items of the factors.
Source: Ming-Chin Tsai and Ying –So Su (2002)

Issues relating to inland vehicle parking, air logistics infrastructure developments and cross-strait relationship appear to be particularly crucial.

In the article "A new paradigm for a national development strategy: Building a logistics center in Northeast Asia" Il-Soon Jun (2001) expresses the trends of the different global companies to cope with the new operational environment. They are searching for a new production and logistics architectures as a way of gaining the advantage of standardized global production.

Factors such as increasing range of products, shorter product lifecycles, market place growth and the number of supply chains are influencing the complexity of the logistic task, which is increasing exponentially.

He states that the advent of globalization has encouraged global companies to concentrate production into fewer locations. Likewise, the globalization of production and marketing through focused factories required a new global logistics strategy. As a

[3] Political risk assessment review has long been practiced by multinational corporations, but rarely used for air performance reviews.

result, global firms have sought to implement their global logistics strategies in two ways: the use of centralized inventories and/or postponement of final assembly.

Since the end of 1980, global firms have been steadily reducing their number of national warehouses and consolidating them into regional distribution centers that serve a much wider geographical area. The centralization of inventory in fewer locations reduces total inventory requirements, resulting in enhancing competitiveness.

To cater to local differences in customers requirements, high value added and time-critical products are increasingly being brought to market based on the concept of postponed manufacturing. The final assembly and customization of products takes place at distribution centers, close to the end user. He also states that in most cases, regional distribution centers are located near airports or seaports so that changing demands can be met with agility, reliability and flexibility.

To handle the changes and improve logistics performance requires an information system that can provide complete demand visibility from one end of the pipeline to the other in as close to real time as possible.

Issues as IT and gates development arise in this article for the smooth and efficient movement of cargo. Creating value for the product is taken place completely close to the final customers so added value activities are key in the logistics hubs that are one of the reasons of the importance of efficient logistics providers.

2.5 Multimode transport activity

Also different studies have been done in multimode transportation. The efficient services of road, rail, shipping (including short sea/feeder service and inland shipping) are essential in a top class hub. In Europe is known that the Netherlands leads the use of the different modes of transport; important clues are mentioned in the print of the Rotterdam municipality port management.

Road: The connectivity between industrial sites and with the interconnected system of high ways spanning the major European countries is efficient. The major companies have branches out all over Europe with a door-to-door service price relatively low. The Dutch road haulier, who is internationally oriented and often speaks two or more languages, is well known for his reliability and flexibility, always ready to adapt their vehicles to the requirements of each customer. Telematic facilities enable road hauliers to work in the most efficient way possible.

Rail: The connection is with all major European areas. In connection with maritime container transport a network has been developed of Intermodal rail shuttles, which guarantee fixed schedule times to destinations as far as Moscow, Prague and Milan. Like inland shipping, increasing attention is being focused on rail transportation, prompted partly for environmental reasons and because rail is ideal for transport of bulk parcels like coal and ores. Due to cooperation of international companies a quality service can be offered.

Inland shipping: Is the most important means of hinterland transport for Rotterdam port, almost 50 percent of the cargo from and to the port is transported by barges. Inland shipping is a reliable and inexpensive mode of transport and it is ecologically sound.

Short sea/feeder service: The high frequency and links of the port are important factors for its successful development. All kind of cargo can be transported by short sea and feeder service.

Feeders are connected with deep-sea shipping. The possibility of transshipment with excellent feeder service makes it possible for deep-sea liner vessels to call at less European ports.

Short sea: Is the intra-continental sea transport. For environmental reasons the European Union stimulates short sea shipping.

For different reasons as congestions, security, costs, reliability and environment the use of rails, inland shipping and short sea feeder service is increasing.

Area with visioning to be mayor hubs should develop carefully rail and fluvial modes and liked to the road system. One of the reasons of Rotterdam to be the main port in the world is because of its inland transportation. Flexibility to accomplish customer demands is important issues mentioned by the port authorities.

After reviewing different literature and sessions of brainstorming different items and five factors come up for the development of a logistics hub. Access to international markets, economic determinants, political support, commerce determinants and logistics service support and infrastructure. This outcome was included in the questionnaire send it to the different respondents. (See table 2.5)

Table 2.5 lists of factors and items for the development of a logistics hub

Factors	Items
	Market opportunities and access to international markets.
1. Access to international markets	Efficient multimode system
	Air logistics
	Natural resources availability
	Economic stability (inflation, Interest rates, exchange rates)
2. Economic determinants	Level of high tech industries in the area.
	Level of agglomeration of economies (clusters)
	GDP of the region.
	Efficient customer clearance procedures
	Settlement of multinational corporations
3. Political support	Favorable tax regimen to attract investors.
	Cross trait relationship of the country (trading pact)
	Development of active capital market.

Continue table 1.5

Factors	Items
	Location of the gates (ports and airports).
	Settlement of big stores (retailers) as home depot, Carrefour, Walmart etc.
	Availability of Free Trade Zone (FTZ)
	Development of Special Economic Zone (SEZ)
4. Commerce determinants	Land costs
	Insurance optimal service
	Organization of trade fairs or Exhibition
	Availability of market information
	Cooperation with important express transportation companies (FedEx, UPS etc)
	Skilled manpower available (including logistic sector)
	Efficient Just in time (JIT) procedures.
	Information and communication infrastructure
	Efficient infrastructure facilities
5. Logistics service support and infrastructure	Value added logistic services in the port.
	Banking optimal service
	High port connectivity and ship frequency
	High airport connectivity and flight frequency.
	Rail logistics infrastructure
	Availability of world class logistics providers
	Efficient rail and road network.

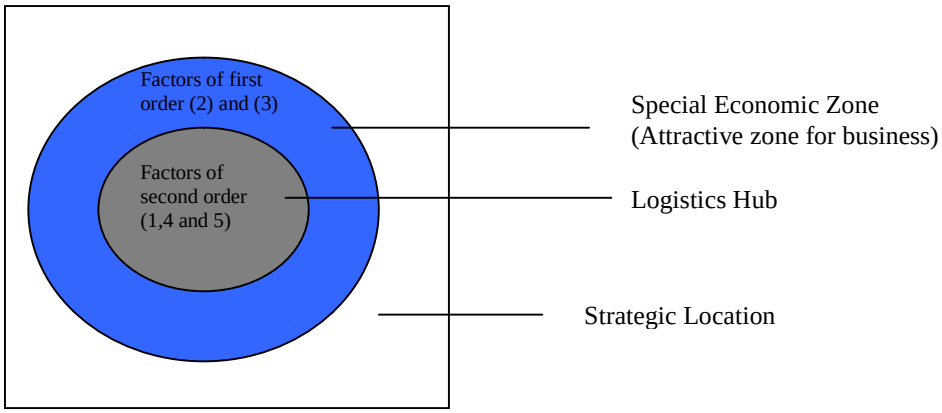
Note: factors shaded where not included in the final table due to results in the factor analysis according to respondents in Korea

The previous factors can be divided in two groups:

Factors of first order: Composed by factor Number two and three, include items of factors one and four. These are more stabilized in developed countries and with the project of the SEZ of developing countries the target is to improve these factors necessary for attracting FDI and smooth performance of an economy.

Factors of second order: Composed also by factor one, four and five. These are more related specifically to the logistics hub, to develop an effective movement of tangible goods.

Figure 2.1 Organization of the factors



Note: Factors 2 and 3 of first order are very inn stable in developing countries.
Factors 1, 4, and 5 are more related to obtain a differentiation in competitiveness among developed nations.

In a complex model of a mega logistics hub the factors of fist order require harmony and the second order require differentiation and be competitive. The strategic position is related to natural environment; for example easy access to shipping lines and connectivity to the principal international trunk lines; and location of the country related to main markets.

In Northeast Asia all the different countries have a relative strategic position but in the other factors the competitive advantages are sui-generis. Time and strategies will make the differentiation.

In South American countries factor of first order are less stable and factors of second level are open to innovation, more information about the region will be shown in chapter five.

3. NORTH EAST ASIA EXPERIENCE

3.1 The economic and logistic environment of the Northeast Asia

In the 21st century, Northeast Asia[4] is expected to be global growth center and will form one of the three poles of the world economy.

As global firms increase investments in the region to exploit the opportunities, they will need a global logistics system to effectively support their production, trade and distribution activities. The international logistics system in Northeast Asia is expected to change over the next ten years as follow:

- Markets will diversify and delivery times will be shorten.
- Information will be immediate and near perfect.
- Market segmentation will reach unprecedented levels of precision.
- Business models will be demand- and time-based.

Relative to Europe and North America, the development of logistics systems in Northeast Asia has not kept pace with the rapid growth in logistics demand. To appropriately respond to these environmental changes, certain strategies must be implemented. In particularly, it will be important to build logistics centers where efficient, cost-effective logistics services add a great deal of value to the products.

Like the major cities of Korea, the major cities of Japan, China and Taiwan are aiming to become regional hubs as part of their own national development strategies. The main variables that will determine the winner in this race are speed and effectiveness. In fact, most experts say that the window of opportunities is no longer than three or four years. Thus, within this frame, the different countries must make full use of its potential to provide better and more sophisticated transport, information and communication services that the other countries of the region. The first country to become the logistic hub of North East Asia will be at a great advantage, but such a position cannot be achieved overnight. Becoming the logistics hub will require two things: First, the establishment of clear goals and objectives, and second, the creation and execution of a detailed strategy.

According to a survey conducted in February 1998 by UNCTAD and the international Chamber of commerce, the majority of the 500 largest global firms in the world consider Asia an attractive place to invest in (UNCTAD, 1998). The survey also showed that those same corporations are most interested in the countries of Northeast Asia i.e. China, Japan and Korea. Global firms trend to use Japan as their center for R&D activity and for high value-added industrial manufacturing, as well as for the location of their regional headquarters. Meanwhile, global firms tend to put most of their China investment into the manufacturing sector, so as to take advantage of low wages and inexpensive inputs. Because Korea falls behind Japan in terms of knowledge base and its level of technological development and R&D activity; it is caught in a competitive nutcracker between Japan and China (Booz, Allen & Hamilton, 1997).

[4] In Northeast Asia region are consider the countries of Korea, China, Russian Far East, North Korea, Mongolia and Japan.

Korea will have to strengthen its attractiveness to global firms if it is to survive and compete in the coming century.

Many experts content that the countries that wanted to be the leader hub in Northeast Asia must develop and implement a national survival strategy for the 21st century, when successful nations and corporations will have to abide by two key principles: Speed and differentiation. In this age of global competition, where advanced digital technologies and the media have destroyed temporal and spatial boundaries, only those corporations and nations that gain a first-mover advantage and constantly strive for differentiation will succeed. Of course, China in the 21st century will pose a formidable challenge. In fact, many experts think that the coming century will belong to China. It's economic potential is estimated a ten times that of Japan, and most countries and firms are searching for opportunities to trade with and invest in China. China has successfully transformed itself into a global center for manufacturing. It is expected that the value-added brought by the growth of China will be enormous, Thus, the leader achieving the logistic hub must embrace a new strategy based on seizing new opportunities generated by these value-added activities. This is the same kind of national strategy being pursued by the Netherlands in Europe, Singapore in Southeast Asia and Taiwan in East Asia.

3.2 Logistics demand in North East Asia (NEA)

Trade volume within the Northeast Asia is expected to be 3.9 trillions U.S. dollars in the year 2010. Trade with other regions will increase in the order of North America, Europe and Southeast Asia. Logistic demand of NEA as starting and terminal point is approximately 9.3 trillions U.S. dollars. This figure is about 30% of total worldwide trade volume (See table 3.1)

Table 3.1 Logistics demand of Northeast Asia.

Areas	Within Northeast Asia	Northeast-Asia-Europe	Northeast Asia-North America	North Asia-Southeast Asia and Oceania	Total
Passenger (Millions)	91.9	20.3	38.3	98.8	249.3
Goods (Billions)	3,900	1,335	2,950	1,100	9,285

Source KIEP- Korea (2000)

However, inter-and intra regional trade and logistics volume of Northeast Asia will be affected by the followings. First, the future prospect of Chinese economy will be the most important variable along with the China's participation on WTO. However, China's dominance in the regional exports market will create a trade imbalance problem in this region, which should be analyze serious among the nations. Second, the progress of Tumen River Economic development Area (TREDA) program led by the UNDP, focusing on the development of Rajin-Sunbong area in North Korea, Northeast province of China and Russia Far East, will greatly the intra trade volume in the area of

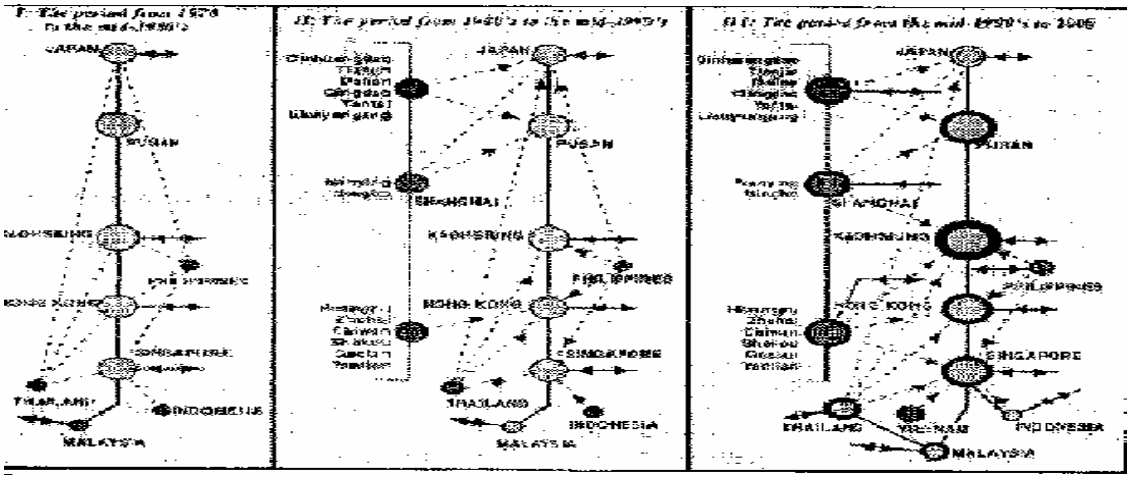
natural resources.[5] This will also strengthen the complementary among the economies in this region, thus accelerating the economic integration and growth of the intra trade volume. However, the project is going very slow. Finally of most significant factors to affect the economy of this region especially to the Koreans will be the challenge in the relation between South and North Korea including possibility of reunification. South-North Korea relationship will also play a key role in building up an efficient, integrated transportation network in this region connecting with Europe.

3.3 Logistics infrastructure systems in Northeast Asia and trends

3.3.1 Maritime transport

Shipping network has been restructured since the 1970s and 1980s. From mid 1990's, increased trade volumes and emergence of China and the new service with a range of vessels type of varying size and speed have effectively segmented the shipping patterns. The emergence of new regional ports is particularly important. Singapore and Hong Kong are high cost/ high mega hub ports in the first order network supporting high cost/high efficient vessels and services. Busan and Kaoshiung can be also considered in the first order but they have to maintain its effort to increase throughput and efficiency or they may be remained as key hubs of second order networks (Ross Robinson, 1998).

Figure 3.1 Development phases in Asia's hub/feeder networks, 1970 - 2000



Note: From left to right: I 1970 to mid 1980's, II 1980's to mid 1990's and III 1990 to 2000.
Source: Ross Robinson (1998)

[5] It is a program developed by UNDP where Democratic People's Republic of Korea DPRK is one of five member countries (the others are China, Russia, Republic of Korea and Mongolia). This is the only Inter governmental forum where both Republic of Korea ROK and DPRK sit together and discuss common issues since 1995. The programme has facilitated border crossing and transport, trade, investment and tourism. The establishment of the country's first economic zone with tax and other investment incentives can be credited in large to the TRADP, which provided a forum for study of incentives to develop the zone and attract foreign investors.

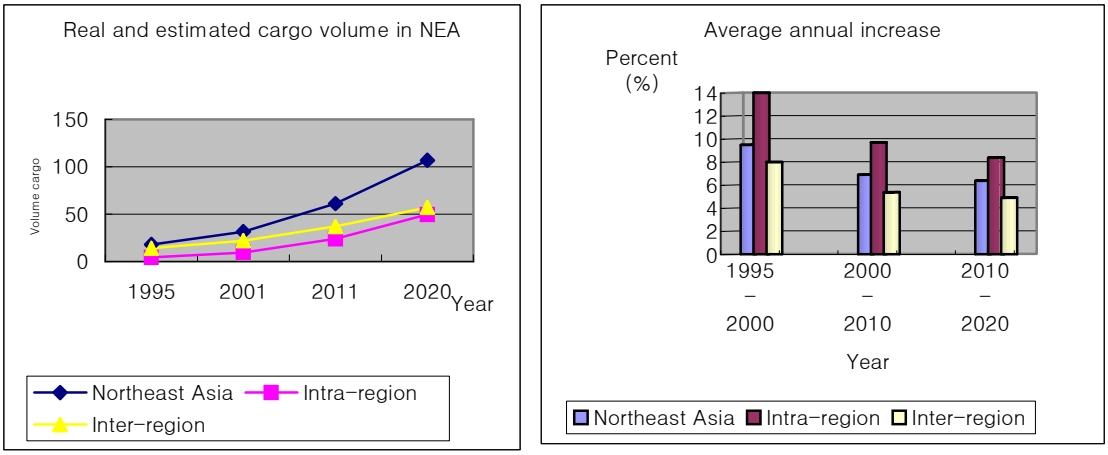
Within the growth of Northeast Asia economies, the volume of container cargo is expected to increase until 100 millions in 2020. The ratio of intra-regional container cargo in Northeast Asia will be 46% in 2020, increased from 23% in 1995. (See table 3.2)

Table 3.2 Volume of container cargo

					(Unit: million TEUs) Average annual increase (%)		
	1995	2001	2011	2020	1995 - 2000	2000 - 2010	2010 - 2020
Northeast Asia	18.2	31.5	61.2	106.9	9.5	6.9	6.4
Intra-region	4.2	9.5	24	49.7	14	9.7	8.4
Inter-region	14	22	37.2	57.2	8	5.4	4.9

Source: Korea Maritime Institute

Figure 3.2 Trade situations in Northeast Asia.



Korea maritime Institute

Transshipment cargo volume will also grow as a result of the increase of the trade volume among China, Japan and Russia. Among the Northeast Asia countries, trade between the costal regions in China and Southern region in Japan will increase rapidly. However, transshipment cargoes are fee to choose. There fore price/service competitiveness plays a key role for different ports to be a major transshipment hub port.

3.3.2 Air transportation

Air traffic demand in Asia-Pacific has experienced tremendous growth compared with any other regions during the past two decades. Over the 1990-95 period. Asia-Pacific airlines achieved international traffic growth of 10.8% per year, whereas the European airlines and U.S. airlines experienced 9% and 5% respectively. The reasons behind the rapid growth include strong economic growth in this region and thus, increase personal disposal income, relaxation of travel restrictions, and air transport reform/liberalization.

Along with development of airport facilities, the competitiveness of each international airport depends upon the liberalization of airline markets, which allow for free and open business environment for airlines. In order to become hub airports in Asia air transport bloc, there is a strong need for creating an open sky. The open skies agreement between U.S. and Korea was made in June 1998, giving all U.S.A. carriers unlimited fifth freedom rights and the freedom to operate intra Asian routes to and from Seoul with small and economical aircrafts. However the progress of Asia transport liberalization is very slow. China with Hong Kong, which will be the largest market in Asia by 2010, is not yet grant foreign carriers the freedom right (Which allows automatic right to hoverfly its territory) in international aviation. The first freedom right of North Korea, Russia and China are the most basic pre-requisites.

3.3.3 Rail and Road transportation

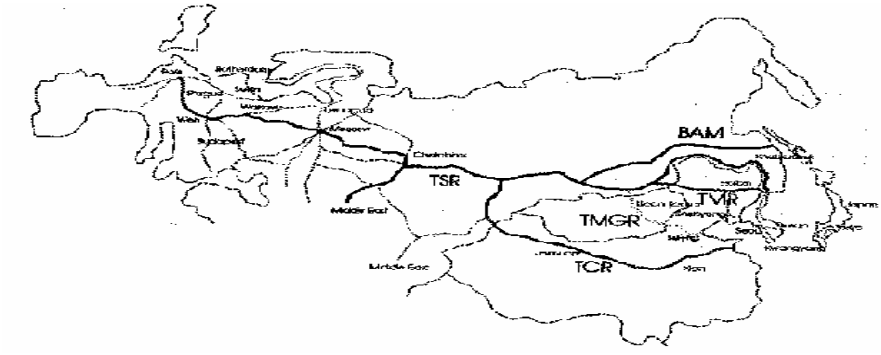
Railway is the main transport mode in Northeast Asia. Because of low quality of facilities, however, the network cannot be fully utilized now. Since railway network are already set up across the countries in Northeast Asia, with proper improvement the potentials of the networks are regarded as sufficient enough.

Trans Siberian railway (TSR), which was the only inter-continental transportation network in the past, is the key linkage in delivering major cargos from Northeast provinces of China (Jilin, Heilongjiang, Liaoning), and Russia Far east region (Nakhodka, Vladivostok) to Europe and to the Russian domestic and other markets. TSR suffers from seasonal operations difficulties caused by harsh climate.

Trasn-China railway (TCR) is a land bridge linking China with Europe. This railroad begins at the port of Lianyungang, connected Zhengzhou ~Xian~Ranzhou~Urumuchi with 4,018 km of total length. This is the shortest transport line from Northeast Asia to Europe. Although TCR can be connected with TSR, it needs transfer facilities because of the difference in track gauge.

Transmongolia Railway (TMGR) is another alternative, which connect TCR with TSR. TMGR can be connected with North Korean railway network. Trans-Manjulia is shortcut route from East Sea to Europe.

Figure 3.3 Trans-continental Railway in Northeast Asia



Source: Korea research institute for human settlement (1998)

In order to utilize trans-continent railways in NEA, there are obstacles to be solved, such as different or railways gauges and custom's procedures with countries. Among other, facilities and equipment of railways are insufficient and levels of services to be provided are poor in some lines. In order for transcontinental railways to be competitive like Europe railways, considerable improvements of facilities should be taken under cooperation of concerned countries.

Division of South and North Korea also limits the use of trans-continental railway due to the lack of proper entreport such as Pusan. Ports in Northeast province of China and Russia Far East have relative disadvantages as hub ports compared with Pusan with respect to port facilities and location. South-north railway corridor passing the Korea peninsula, so called Trans Korean Railway (TKR), will greatly enhance the functioning of the Northeast Asian Railway system.

Road, as means for short distance transportation of freight, is not sufficient to handle freight volume in Northeast Asia. With the exception of Japan and Korea, the density of road is very low. More important might be the present physical condition of roads. Low quality of road surface does not allow heavily loaded trucks to use. Even the roads are paved; the thin pavement and deterioration of bridge structure are not able to withstand a large volume of heavy vehicles.

An efficient multimodal node with cooperation among countries is an important issue for the development of the area. Top competitive ports as Shanhai, Busan, Kaohsiung, Qingdao, Yokohama, Kobe or Osaka are competing to attract as much cargo as possible. Price/service competitiveness is key factor of these ports to be mayor transshipment hubs.

In Air transport, the issue in the region is liberalization and construction of big and competitive facilities close to the logistics area and ports linking effectively both gates. Customs procedures and railway gauges are problems identified in NEA region.

Unification in the Korea peninsula will aloud to develop logistics system and connect the region more efficiently with Europe and Middle East. For Korea is main issue if want to win the battle of being hub in the area.

3.4 Korea, China and Japan situation.

3.4.1 Republic of Korea

Korea is strategically located between China and Japan but is behind both countries in terms of costs or technological development respectively, so have a more difficult work to do, to become logistics hub in NEA according to different authors.

According to the Study of Mr Jun Il (2001), In order for Korea to serve as a hub for the business and logistics activities, it will first have to do two things:

- Make itself the center of global firms' logistics networks in Northeast Asia.
- Exploit its location as the Geo-economic center of Northeast Asia in order to build an integrated transport network linking to every corner of the region.

Northeast Asia comprises a market of approximately 1.8 billion people. There are some 40 cities of over one million people within a three-and-a half hours flight of Incheon

Airport, with 26 of them located in China. In terms of both air transport and shipping, Korea is strategically situated along main international trunk lines that link East Asia with North America and Europe. Incheon airport is located at a crossroads flights within the Northeast Asia region, and connects flights to North America and Europe. Since it is on the great circle route, it allows for the shortest non-stop air routes to both America and Europe cities. For example, for travel from Sydney to London, Flying via Incheon takes two hours less than flying via Singapore. It is likely that Incheon Airport will become regional leader it terms of cost, time and service efficiency. The extension of shipping and airline network from Incheon International Airport, Incheon Port, Pusan Port and Kwangyang port will accelerate Korea's range of services to small-and medium-cities in the region and to major cities on other continents.

As mentioned previously, to meet the drastic increase of demand for parts, components, semi-finished products, and finished products in China, where markets will be diversified, the market strategy should be segmented down to the regional or provincial level. In terms of delivery time and immediate information, Korea is situated in a location befitting a regional logistic hub for global firms entering the Chinese market. Furthermore, the quality of Korea's workforce, its advanced telecommunications and the efficient of its international carriers are superior to those of China and Japan. Thus, Korea has a great deal to offer global firms.

In summary, since Korea is able to offer proximity to an enormous market, a world-class telecommunication infrastructure, and a high quality transport services providers, it has also the potential to be a regional hub for business, logistics, and information as long as it employs the proper development strategy and executes it in a timely manner.

Opportunities for Korea

Formation of Alliances has enable carriers to offer more direct all-water connections by increasing the number of direct port calls. Deep-sea container carriers make extensive port coverage in their services, although their strategy makes use of economies of ship size and speed in their respective service routes by making fewer direct calls and reducing the use of multi-port itineraries. This implies that a couple of ports in yellow Sea Rim will take on significant role as hubs due to the emergence of new service loops to fulfill shippers' requirements and exploit the rapid growth of container cargo volume within the region.

Particularly mention should also be made regarding the possible impact of recent technological developments in small container vessels that operate at high speeds and carry high-value, time-sensitive cargoes. Shallow draft, fast container vessels such as Japanese Techno Super Liner will play an important role in Sea-air Intermodal transport service in the region. Since China's international airline networks are not well developed due to its protective aviation policy, their air cargoes are transferred to the ports of Incheon or Busan by sort-sae vessels and then to transit at Incheon International Airport, which has excellent liner networks connecting to most of the major cities in the world.

Considering the recent trends in shipping and air transport in Northeast Asia, there is a good possibility that Incheon Airport, Kwanyang Port, Pusan Port, Incheon Port and Pyungtaek Port will become hubs, as long as they are able to maximum the advantage

of their geo-economically strategic locations by providing efficient and sophisticated service. It has been argued that first-mover advantage is of great strategic importance in competition. When two logistics systems are in competition, users (firms, transport companies, logistics services providers, etc.) do not make selections in a manner that is immediate, reversible and symmetrical with regard to the service level provided by logistics facilities (airport of seaports); rather, they change according to how the service changes. In other words, if a user makes the switch to a competing logistics facility, it is unlikely that the user will return to using to the airport and seaport that it originally used. When two airports (or ports) are competing; users will make a decision based on information regarding service levels at each airport (or port), selecting the alternative that provides the greatest benefits. Shippers have a tendency to develop hysteresis, or port loyalty, toward the airport (or port) that they are using at any given point. As such, first-mover advantage is critical factor in seizing and maintaining a leading position.

Threats and risks

There is no clear front-runner in the tough competition of the region. Incheon Airport and other Korean ports are aiming to be hubs for the business and Logistics in Northeast Asia. Koreas biggest competitive threat comes from China. Chinese cities and major economic regions such as Shanghai and Beijing-Tiajin are also battling for a hub status in Northeast Asia by taking the initiative to develop their ports and airports.

Shanghai's land size area is more than 10 times Korea's capital region (Seoul Metropolitan and adjacent areas, including Incheon), and its population is around 20% more.

Also, its hinterland includes all of the Channgjiang River Valley, whose trade volume accounts for 29 percent of the entire nation's trade, and its distribution service sector accounts for forty percent of the nation in 1999. Already 2.400 foreign multinationals companies are located in the Free Trade Zone in the Pudong area, suggestion that Shanghai has almost reached the level of Singapore and Hong Kong as a region business center. The government of China approved a plan "to build Shanghai into an international shipping center" in the newly published 10^{th} five-year Economic and Social Development plan, which aims to develop Shanghai into the hub of East Asia.

According to Dr Jun (2001) "A new paradigm for a national development strategy": Building a logistic center in Northeast Asia" In the beginning of the century Shanghai and other ports in the Changjiang River Delta witnessed a continue increase in container volume. Container volume in Shanghai and Ningbo ports is expected to grow to 15~17 millions TEUs in 2005 and 27~35 million TEUs in 2010. To cope with this drastic increase Shanghai has been upgrading and expending Wai Gaogiao container terminal. It has also been determined by the Chinese government that the Yangshan Island will be developed into the principal container terminal. This deep-sea project of Shanghai in the long run involves the creation of harbor and ancillary facilities on big and little yangshan Isalnd, about 36 Kilometers from the coast. The facilities will be

capable of handling the latest generation of container vessels, with a capacity of 20 millions TEUs annually[6].

Benchmarking Honk Kong, Singapore, Rotterdam and Hamburg, Shanghai plans to designate the Luyang Port area (Including the Yangshan Island, the area of Luchaogang area, and Luyang Bridge, which connects the two) as free port areas. In addition, Shanghai gives priority to the development of an international logistics center based on shipping and aviation in the new five years plan. With the opening of Pudong international airport in October 1999, Shanghai becomes the first Chinese city with two large large-scale international airports. Moreover, in order to build an air cargo hub in the region, Shanghai is working closely with international air-cargo service providers, which hope a presence in greater China will allow them to capitalize on the expected continued growth in air cargo volume.

Investments in Korea

According to a recent survey KRIHS (2001), the purpose of most foreign global companies invested in Korea is to gain easy access to the Korean domestic market and to have good access to the enormous potential of Northeast Asia.

However, the same firms listed factors that could discourage any subsequent investment, such as:

- Political instability
- Inefficient administrative procedures
- Lack of incentives vis-à-vis other countries.
- Social instability (Labor disputes)
- High wages

Another study Kim (1997) identified major barriers to foreign investment, by selected sector, as shown in table 2.3 for the manufacturing and service sectors, land-related regulations (including plant location, construction and administrative regulations) were the biggest barrier. The labor system (including labor disputes, hiring and layoff regulations, other labor-related regulations, etc.) and an insufficient logistics infrastructure were also listed as significant obstacles.

[6] The Shanghai Port Authority, International Shipping center and municipal plan to complete phase I on the plan by 2005, resulting un five berths with a total annual handling capacity of 2 millions TEUs

Table 3.3. Major barriers against foreign investment, by sector

Sector		Barriers			
		1st	2nd	3rd	4th
Manufacturing	Machinery	Land related regulation	Skilled labor	Logistics infrastructure	Intellectual property protection
	Semi-conductor equipment	Labor system	Logistics infrastructure	Land related regulation	Tax system
	Electric/Electronic	Land related regulation	Labor system	Infrastructure	Customs
Services	Distribution	Land related regulation	Customs	Market access	Logistic infrastructure

Source: Kim (1997)

A combination of these factors has contributed to Korea's failing behind Singapore, Hong Kong and Taiwan in terms of national competitiveness, according to a recent Korean study jointly conducted with Oxford University.

Global firms operating in Korea prefer to invest in Well-planned industrial parks, well known as Distripaks[7] with well-developed transport infrastructure. They also seek government assistance in providing transport infrastructure, and warehouse and distribution facilities. In order to attract foreign global firms, the provision of proper site should be made to meet their requirements. A striking feature of both existing firms and firms with an intention to invest is that demand for high-tech manufacturing sites within the capital region is increasing more than ever, despite the negative externalities experienced in the region.

In this regard, policy regulations that disfavor the capital region should be re-evaluated in order to enhance the competitiveness of manufacturing and logistics industries and to be more effective at inducing foreign investment.

In different studies, Singapore, Hong Kong, and Tokyo are highest-ranking cities in the Asia-Pacific region. At the same time, most of the Korean cities are related as being among the worst in the region, save from Seoul, which is generally ranked in the lower middle group. Seoul almost makes the top ten in terms of its level of internationalization, business environment, and urban infrastructure. But it is far behind the world's top cities in terms of quality of life, economic base and level of cultural sophistication.

According to Professor Heeyhon Song of the University of Incheon in Korea, the general conditions for FDI still need to be improved greatly if Korea is to be successfully competitive against other neighboring countries such as China, Singapore and Malaysia. FDI accumulation only accounted for 2.6 percent of Korea's GDP, for example, as compared to approximately 25 percent in China, 48 percent in Malaysia and 11.6 percent in Thailand. However, since the new foreign investment promotion

[7] Distripark is a relative small area combining a number of functions and operators in one area where all facilities and good hinterland connections (rail, road) are available. In general only distribution centers are found no freight sheds.

act[8] was promulgated on November 17, 1998, FDI in Korea has jumped from a level of 7 billions U.S. dollars in 1997 to 16 Billions U.S. dollars in 2000.

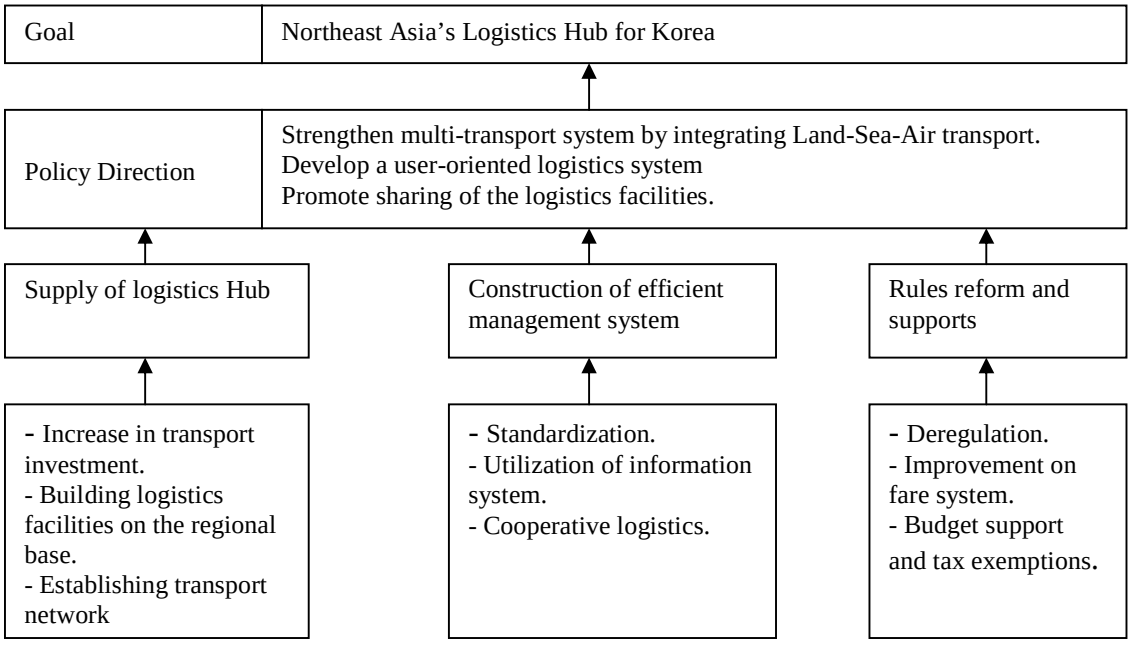
Korea is looking to act as a land bridge connecting from Korea peninsula to China, Russia, and Mongolia with Japan, with integrated transport network by roads, railways, airport, and sea transport. In the current situation, the northern half of Korea peninsula is restricted in transport space. That is, Korea remains as not a peninsula but an island partly in logistics connection. Therefore, logistics policies for a hub in Northeast Asia can be classified into two stages: before and after the reunification of Korea.

Before the reunification, it will formulate a "Regional Logistic Center" with maritime and air transport hubs in NEA. In the meantime, increasing of transport and logistics system efficiencies.

After the reunification, then "Gateway to Northeast Asia" policy can be adopted by formulating integrated multimodal transport system linking Korea peninsula with NEA countries directly.

In the following figure 2.4 it is presented a scheme to develop Korea as a logistic hub for Northeast Asia.

Figure 3.4 Basic schemes of Korea's logistics policy



Source: KRIHS institute (2000)

An article written by the Korea Transport Institute (KOTI) concludes: "Korea must carry out the following comprehensive, fundamental reforms":

The Government should prioritize development; it was recommended to first concentrate on developing the capital region and some areas as Kwangyang and Pusan ports to full capacity, and then to develop international logistics function in other parts

[8] It was promulgated on November 17, 1998. Includes provision for the liberalization of M&A purchases of real state.

of the country. Consequently, current policy regulations on the capital region should be re-evaluated in order to enhance the competitiveness of Korea's industries and to be more effective at inducing foreign investments.

Korea should make systematic and continues effort to have well-developed logistics infrastructure such as ports, airports, information and communications facilities, and distribution facilities. Free trade zone must also be actively developed to offer comprehensive logistics and production capabilities.

Korea urgently needs to improve the quality of logistics and service providers and to develop a solid workforce of logistics professionals. And
Korea needs a detailed strategy and action plan on a clear vision with relevant government bodies working closely for coordination.

3.4.2 Republic of China

The eyes of the world are looking to this country that is awakening. Still is behind Japan and Korea in Information Technology (IT), infrastructure and know how, but is moving fast toward structural changes started in the 70s with pilot decentralization projects in different areas. Certain areas like Shanghai or Zhenzhen are already competing face to face with capitalist countries leading in hosting FDI.

Comparing China today to what it was some twenty years ago is almost like comparing day and night. A central planning oriented system is step by step changing to a more efficient, market oriented. How to face the different milestones of the change while minimizing the social, political and economic costs was the question when China launched its economic reform program in the late 1970s.

China's process of economic transition began essentially with the establishment of Special Economic Zone (SEZ) in the late 1970s. To minimize the unnecessary economic, social, and political costs that often are associated with a drastic policy switch, and to gain necessary experience in carrying on the transition, the SEZs were set up as a first, experimental step. Numerous measures aimed at reforming the existing economic system and reaching a higher degree of economic openness were developed and tested in the SEZs. Serving both as a window to the outside world and as a laboratory to formulate various reform policies, the SEZ have play a pivotal role in China's overall economic transition during the past two decades. In many aspects, the impacts of the zone have gone far beyond their limited geographical boundaries. It is safe to say that without the successful operation of the SEZs, China's reform would have not gone so far, and the transition process would have not been so smooth.

Dr Wei Ge (1999) in the book "Special Economic Zone and the Economic Transition in China" remind that the concept of SEZ is not new. Its early, much simpler version can be traced back to the notion of economic enclaves, which was later extended to the formulation of free-trade or export processing zones.[9]

[9] Based on the type of economic activities that are most emphasized, the zone in practice have borne alternative names, ranging from free-trade zones, duty free zones, free-export zone, free investment zone , free economic zone, fee enterprise zone, free manufacturing zone, economic and technology development zone and industrial states, to industrial or scientific parks. Bonded warehouses, free ports and duty free shops can be regarded as zones of special type, where services are at the center stage of economic activities. Free banking zone or free insurance zone also falls into this category. To highlight the underlying economic structure of a zone, specific terms are often added to describe its main

As an integrated and critical component of China's gradualist approach toward economic reform and opening up, the SEZs have developed over the past two decades into self-contained mini-economies along the lines of "one country, two systems." As a result, the impact of the SEZs on the path of economic transition in China has been much deeper than would have resulted from a simple version of Export-Processing Zone or also named Free Trade Zones.

In this process of reengineering and supported basically with the big potential market and settlement of multinational corporation china is developing very fast different areas and cities cases of Shenzhen, Beijing and Shanghai. These cosmopolitans are developing moderns and efficient airports and seaports in the process of developing logistics hubs surrounded by SEZ or FTZ environment.

According to Arthur Andersen Consultant Company (2001), for example Shanghai is pointed already as a warehousing market while Singapore as a prime example of a distribution scenario.

The logistics sector in China

The concept of logistics continues to evolve and recently has become a "hot" topic in China. There is strong interest therefore in logistics services from both business and policy makers. Developing what might be called 'the logistics way of thinking' is taking up a significant part of seminar and management training time in China. There is an appreciation that systems, processes and perspectives, that is, the software of the business, is just as important as the physical assets, if not more so, in the growth of enterprises which are internationally competitive in logistics.

Evolution of transport services

Freight turnover in China has increased from 76 billion tone-km in 1952 to 4.381 billiontone-km in 2000. The volume increased by 3.8 times between 1980 and 2000.

In the political and economic environment of the early 1950s, China put heavy industries in a preferred position. A precondition for their development is the supply of cheap raw materials. This in turn demanded a supply of cheap transport. Rail and water are two modes of transportation in which can provide transport services for large volumes at a relatively low price.

Figure 2.5 shows the composition of freight carried by mode (measured in terms of weight). After 1978, the transport system in China was characterized by rapid development of road and air transportation. The market share of water and rail transport decreased sharply, reflecting the transformation from traditional heavy industries to more emphasis on light industries, which demanded speedy, flexible transportation services and which could bear a higher transport service price. The figure shows the rising share of road transport and the fall in the shares of rail and water in the total tonnage. Data for air transport were included in the construction of the chart: while those numbers are very small compared to those for other modes, and therefore are not evident in the columns of

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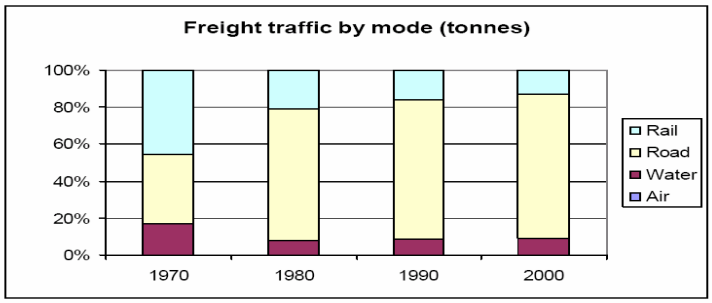
characteristics, such as electronics export processing zone to signify the dominance of electronics manufacturing.

the chart, airfreight volumes are growing fastest among all modes. Trip lengths vary significantly by mode and the length of road trips is relatively short on average. Rail and water show longer trip lengths and therefore account for much higher shares of the transport task measured in terms of tone kilometers performed. But even in these terms, the road share continues to grow, mainly at the expense of rail.

Figure 3.5 Choices of transport modes in China



Source: Luo and Findlay (2001)

Constraints on development

The program of economic reform has gradually changed the ownership of enterprises in China, especially in the manufacturing sector. But in the transportation sectors the change
has been relatively small. Large state-owned enterprises still dominate the sector. In recent years, the use of joint ventures increased, especially in the container berth, container freight station, and motor carrier activities. However these firms still account for only a small portion of the total number of enterprises. Road transport and shipping were deregulated in 1986 while rail and air transportation were also decentralized to some extent. The ownership structure has changed to different degrees in different modes of transportation. The road and inland shipping companies are dominated by collective
and private enterprises while coastal and international shipping, rail, and air transportation enterprises are still mostly state-owned.

The transport sector is still a weak link in China's economy: The number of either rail or road trunk lines linking different regions is insufficient. The major railway lines are over-loaded. The trunk lines of the highway system linking different provinces are not well networked and cannot meet the demand. These impediments also contribute to differences in growth rates between regions.

The coordination between different modes requires planning and development. Within each mode of transport, there are imbalances. In the rail sector, on the busy lines, the mixing together of passenger trains with cargo trains leads to slower speeds and low efficiency. In the air sector, there is an imbalance between the trunk and feeder lines, and in the number of big and small aircraft. In the road sector, the construction of the national level trunk road system has been accelerated, but in the rural areas the road network is far less developed.

Service quality is generally low and the technical level of the equipment is also low. For example, in the rail sector, the share of double lines and electrified lines in the total length of lines is relatively low. Less than 20% of the freight trucks can carry containers.

The warehousing and storage system in the planned economy before reform was characterized by department or sector administration and operations, that is, different sectors built and owned their own warehousing and storage facilities and served their own demands only. Many sectors formed their own closed warehousing systems.[10]

Meanwhile, each local government at the provincial, city and county levels also established their own warehousing system to serve their local economy.

Overall, therefore, government administration and enterprise functions are not separated which constrains enterprise performance, the administration is fragmented in both vertical and horizontal dimensions which inhibits the integration of services, and in some activities, the quality of the physical infrastructure is insufficient.

Demand for 3PL services

The demand for specialized logistics or 3PL services started to grow faster in recent years, especially that originating from the multinational companies, the leading Chinese state owned companies and some of the private companies, as well as that arising from the e-commerce sector. In the recent years, quite a few 3PL companies have appeared including a) international companies like Maersk, UPS, TNT, and b) traditional Chinese transport, warehousing and forwarding companies, like COSCO and Sinotrans, and c) emerging companies like the Bao Gong Logistics Group.

Relevant departments in the central government have paid greater attention from different perspectives to the logistics sector and its development. They have studied policies that they expect will promote the logistics sector. Local governments like Shenzhen, Beijing, Tianjing, Shanghai, Guandong, Shandong and others have also paid attention to the development of their local logistics sectors.

Most of the logistics activities are still operated in-house and demand for 3PL services is low among traditional Chinese firms. State-owned companies in China have inherited an operating model based on the provision of services in-house, including logistics. According to the investigations by the China Warehousing and Logistics Council, a third party undertakes only 18% of the inbound logistics. For outbound logistics 59.8% are operated together with a 3PL firm, and only 16.1% totally by a 3PL firm. Most of the Chinese firms keep their own logistics assets and personnel (Luo and Findlay, 2001).

Although quite a number of 3PL firms have appeared in the market, most of them offer a low standard of service and efficiency. The reasons include: One, most of the firms only provide simple delivery and warehousing services: value-added services like information services, inventory management, logistics cost control, or logistics system

[10] These operated in the *Wu Zi* (raw material and components), *Shang Ye* (manufactured consumer products), *Gong Xiao* (rural area supplier and distributor), *Wai Mao* (foreign trade goods) sectors, as well as the railway sector, and the *Jiaotong* (road and water transportation), military, and *Liang Shi* (basic food)

design are not offered; two, the scale of the firms is usually small and most of them come from among traditional firms with weak network and organization capabilities.

Moreover, modern logistics facilities such as transshipment facilities for different modes of transport, public warehousing and transport facilities and logistics centers are not available. The technology employed in logistics equipment is also at a low level. The extent of standardization of facilities and of application of information technology is at low levels. Logistics facilities are distributed unevenly; for example, transport facilities are less developed in the middle and western part of the country.

An important constraint on the capacity of service providers to offer integrated services lies in the administration system, in particular, in the vertical and horizontal separations in the administrative systems that have carried over from the planning system, the self-protection that remains the mixing of the enterprise with administration functions and the lack of transparency in policy measures.

These issues, and the extent to which they impede the scope to gain from reform in this sector, are examined in more detail after the review of the implications of China's WTO accession for the logistics sector.

Accession to the World Trade Organization has further stimulated China's economy, and binds the country to reforms that will allow foreign logistics and express companies to compete more freely in the Chinese market.

Rapidly increasing manufacturing and retail activity in China, coupled with current supply chain inefficiencies, mean that there will be strong demand for quality logistics and express services.

Foreign service providers with the right expertise and local partners can meet this demand. Logistics and express companies need to energetically and imaginatively market their presence, capabilities and strategy in China, to ensure that they capture their share of the demand.

3.4.3 Japan

According to the Minister of Economic, Trading and Industry of Japan (METI's) to improve in logistic issues there must be strength work focusing on the use of information technology.

The Japanese Government intends to implement a new logistics system suitable for the Japanese economy and society in the 21st century, aiming to achieve the following by 2005.

a) Establish of an advanced total-effective logistics system to realize an internationally competitive society.

Measures to establish an advance, total effective logistic system.

- Promotion of joint operations, use of information technology and standardization of logistics.
- Improvement of business practices.
- Regulatory reform, simplify and more efficient administrative procedures.

- Development and use of new technology.
- Promotion of unit loading
- Promotion of establishment of logistic infrastructure.

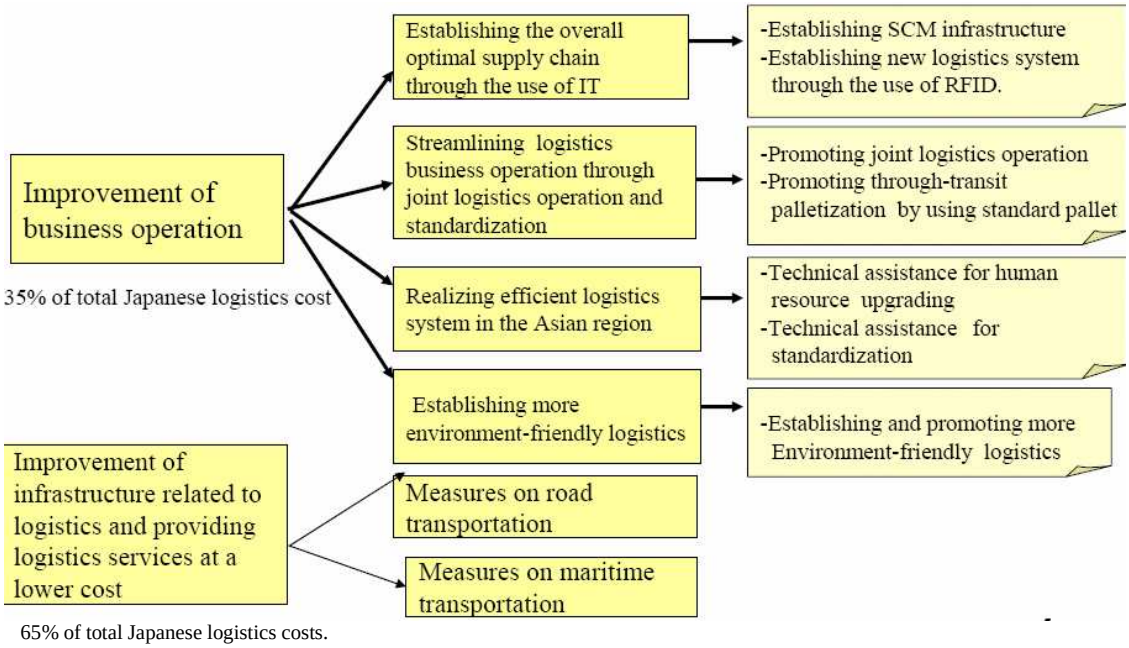
Measures to strengthen the function of international logistics bases.

- Establishment of infrastructure related to international logistics bases and enhancement of their functions.
- Measures to cope with 24-hours full opening of harbors.
- Electronic procedures, one-stop services.

b). Establish a logistics system to cope with social and environmental issues.

METI's program focus on improving of business operations from the viewpoints of establishing the overall optimal supply chain through the use of IT, streamlining the establishment of more environmental-friendly logistics system and, trough joint logistics operations and standardization, realizing efficient logistics system in the Asian region. (See figure 3.6)

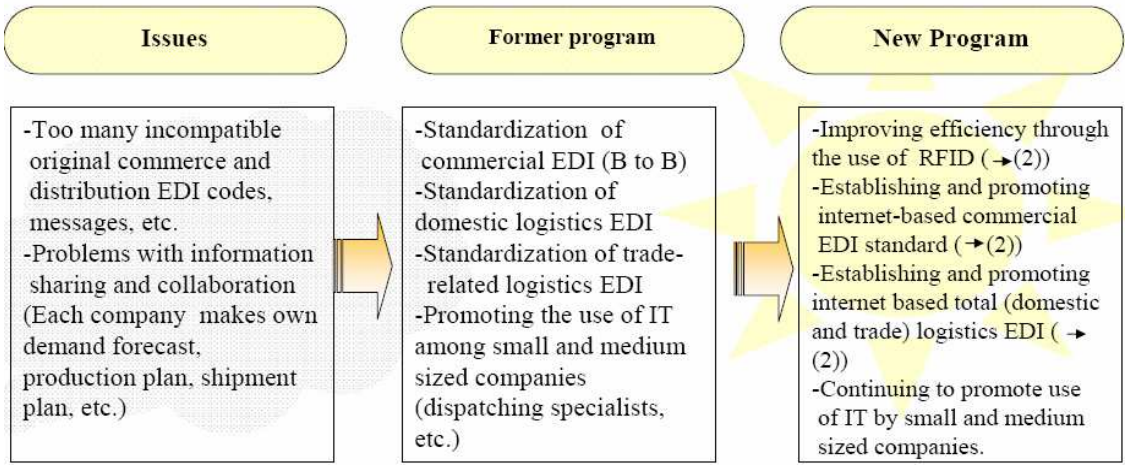
Figure 3.6 Business and logistics operations



Source: METI Information. (2001)

For promoting efficiency trough the use of IT, the former measures and new program are been developed (See figure 3.7): IT is shifting from intra-company use to inter-company use. For reducing the total cost of Supply chains, it is mentioned the importance of business cooperation and collaboration among manufacturers, wholesalers and retailers, and to manage flows of information and products to optimize the overall supply chain.

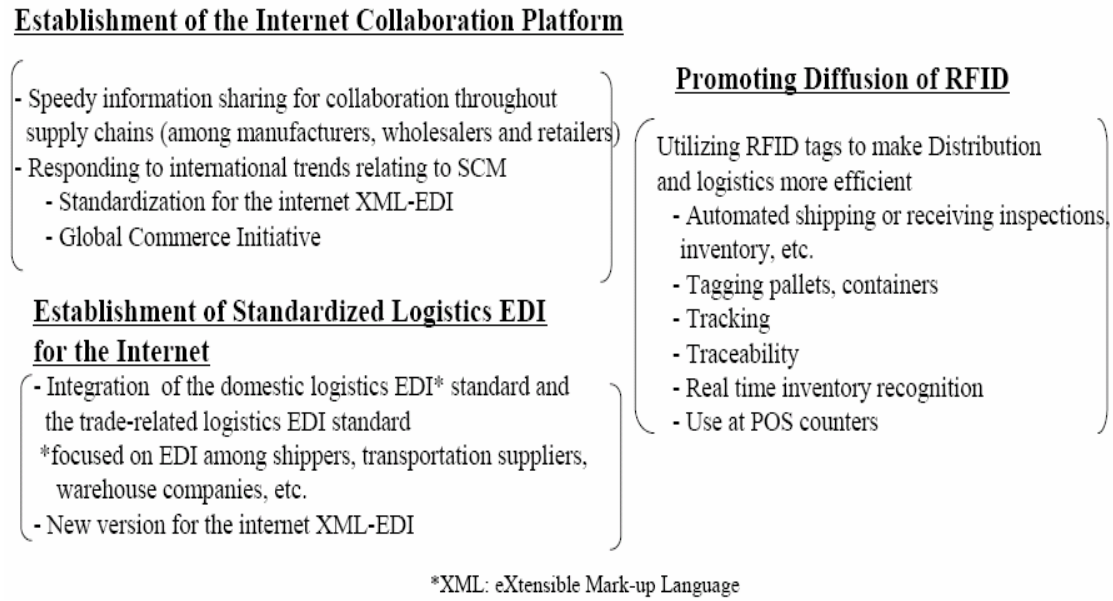
Figure 3.7 Information technology programs



* RFDI: Radio Frequency Identification.
Source: METI Information. (2001)

To promote SCM, which truly optimizes overall supply chains (beyond individual companies), METI is implementing a three years plan to establish a more efficient distribution system utilizing new technologies: The Internet and radio frequency identification (RFID)[11].

Figure 3.8 Establishment of the Internet collaboration platform

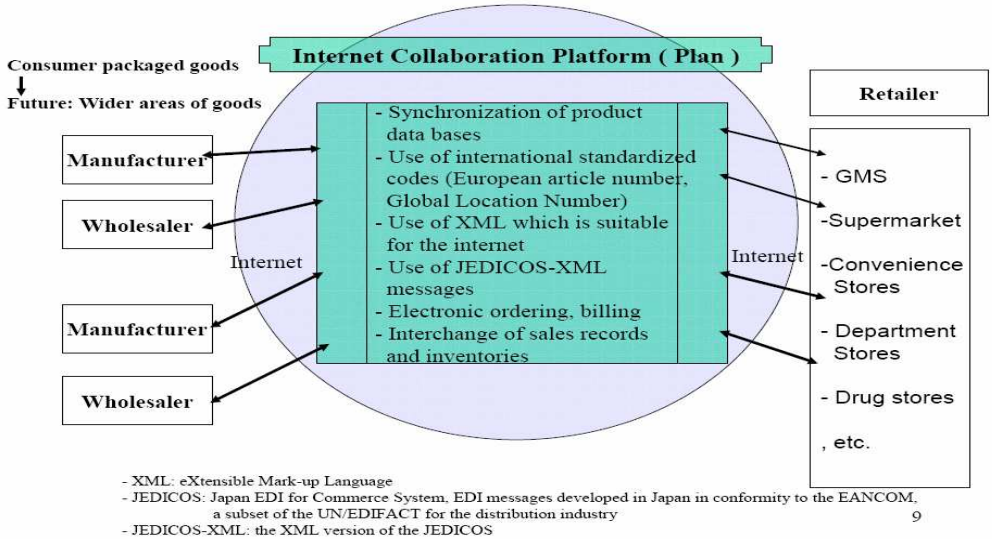


Source: Ministry of Economic, trade and Industry of Japan. (2001)

[11] Is among, the most advance product tracking technologies in use today, where microchips called - smart tags – attached to o products broadcast the information on an item by radio frequency once is near a reader. Provides quick and accurate information in product manager to retailers and manufacturers, while also improve inventory control and warehouse efficiency.

To have optimal Supply Chain through speedy information sharing utilizing IT, a reliable Internet collaboration platform is necessary.

Figure 3.9 Platform plan



Diffusion of RFDI is necessary due to different advantages over bar code as: (Large data storage capacity, remote- contact less data reading, Collective data reading, data renewal and additional data writing.)

Also different expectations are mentioned: (Great improvement of efficiency in logistics: Shipping and receiving inspection, inventory, etc and higher consumer safety for foods, drugs etc., Through improved traceability)[12].

Standardization is another key issue for the effective supply chain activity. By the end of 2005 Standardized logistic EDI for the Internet integrating Japan transport and the trade related logistic EDI is requested.

Operators and businesses in any of these countries are considering a whole host of items. These include incorporating emerging technologies such as e-commerce, instituting a preferred logistics supplier management program, designing a supply chain to support brand strategy, implementing reverse logistics processes and procedures, implementing direct shipment to customers to minimize cost and maximize cash flow, installing global enterprise systems to reengineer supply chains, leveraging the purchasing power of a large corporation, and utilizing new cost-effective communications technology to increase customer satisfaction.

These countries of the NEA, well known as the Asian tigers are improving their economic activities due to its continued effort on R&D and also their strong focus on logistics. Developing countries should notice this.

[12] Wal-mart stores has announced a policy that its top 100 suppliers should tag RFIDs on their pallets by Jan.2005.

4. RESEARCH DESIGN

4.1 Selection of the research topic

This session is directed toward the following objectives: the reasoning for the choice of dissertation topic, the development of appropriated research instruments, and a methodology to test the dissertation objectives. Therefore, after a brief enquiry as to the research topic selection, the type and design of the survey will be presented, followed by a discussion of the sample size and design. The remainder of the chapter will then detail the planned statistical and analytical techniques and the results of the model.

Attract Foreign Direct Investments and cargo is necessary for regional growth. How to be attractive in a long-term line is a question for project developers and governments. Developing countries need to be more competitive and break the tendency and economic gap with developed regions.

To develop big area or countries in South America like Brazil, Argentina, Colombia or Chile is complex so the idea is to start with strategic areas beside main gates and then pull adjacent regions directly or indirectly. The reasons for choosing my dissertation were:

- The World Bank (WB) forecast world trade to grow 6% per year through 2007. World gross national product (GDP) is forecasted to increase from approximately $30 trillions in 1998 to $39 trillions by 2007. Regarding maritime traffic they said, it is going to increase 4% to 5% annually through 2010, with an additional requirement for 200 to 300 container terminal ports in the world. With world trade comes the movement, and hence, warehousing and distribution of goods.

  This changes and increase in commerce requires competitive facilities and environment, and the logistics hub help to accomplish the smooth development.

- Hubs like Rotterdam, Hong Kong and Singapore, just to mention some, are well-developed regions. Why the success and how to improve results have been analyzed by Northeast Asian regions. Their suggestions are interesting for other developing regions.

- Korea, Japan and China are competing to be hubs. Their studies and R&D have important issues interesting for emerging countries in South American.

- Logistics Hub, Free Trade Zones and Especial Economic Zones are hot issues in every region. Understand and show the difference will help economic and trade development to governments and project developers.

The aim is to provide new ideas to project developers and give some guidelines based on Asia experiences also.

A positivist paradigm based on a quantitative measure, with relationship among variables shown by mathematical means was chosen as the appropriate methodological strategy.

4.2 Scheme to develop trade:

a) The Logistics hub (LH)

Logistics hub can be define as: An integrated, sophisticated set of transportation, warehousing and distribution facilities and services under a sophisticated flow of reliable and just on time information systems that provide access to a marketplace. An important requirement for a distribution and logistic hub is the ability to combine at one point (node), the smooth movement of goods using multimodal transport into and out of a country as well as a distribution within the country. This minimizes delays and duplication processes for a company.

Other important terms necessary to discuss in this work are the concepts of Free Trade Zone and Special Economic Zone, two ideas that are being developed by different countries as a strategy to attract capitals, have a pilot test with flexible policies and counteract lack of competitiveness with other countries. Especially developing countries are lying in such projects to face the globalization process and try to improve in its economic and social activities.

b) The Special Economic Zone (SEZ) and Free Trade Zones(FTZ)

SEZ is a territory of a country with a special economic system, polices and flexible measures given by the government, to attract internal and external private investments for the development of different clusters to increase international commerce, competitiveness and update technology. SEZ are big areas involving regions, they should generate high impact in a territory, and progress has to be together to succeed.

The Special Economic Zone for exports (SEZE) express more clearly the necessity of the competitiveness development of the companies exposed to the international economy, because they include infrastructure, social, economic and institutional factors that are not taking in account in the small capsules of the FTZ.

Free Trade Zones are smaller areas with less impact, with internal benefits for just a small group of companies.

In less developed countries, normally the Free Trade Zones are small rich areas in poor regions bringing particular benefits to a few persons. Some powerful companies and people take real advantages off their benefits to improve performance, others are using them just to improve their cash flow and reduce costs. The real search for competitiveness and global benefit sometimes is not clear.

When the SEZs are competing, it means really that the regions are the ones that are competing and improving and not just only small enclosures with few people. Development of one or another project is policy of different governments as a strategy for the macroeconomic development of its economies.

After identifying the difference between FTZ and SEZ it is necessary to annotate the distinction between SEZ and LH and its co-relation.

c) Special Economic Zones (SEZ) and Logistics hub (LH)

The Special Economic Zone model is created to develop economic, social and political factors based on its economic incentives in the first stage. It is created not just to develop facilities for cargo but also for settlement of manpower, establishment of foreign direct investments and create employment.

In industrialized countries these factors are more developed than in least developed economies or transitional countries that is the reason why, this concept is not mentioned occasionally in such areas.

The most unique characteristic of a hub system is that manufacturing, distribution and business hubs are placed in regions offering a high return on investment. Regions with a high return on investments are selected as hub where management activities are controlled for the region and management efficiency can be maximized. Such regions must be equipped not only with hard ware such as transport, logistics, information and communications infrastructure, but also with the right software, such as skilled labor and sound business practices.

Successful Logistics hub have within their factors for development the establishment of Free Trade Zones how important is this factor will be part of the study.

4.3 Research instrument

For this study, a questionnaire was developed based on discussion with different professors and colleagues of logistics engineering department, previous research, and brainstorming. The questionnaire was sent to private and public organizations, which need to be involved in the development of such an area in an open down approach.

Based on the results of a Correlation, Factor Analysis, Crobach's α and Regression using the statistical tool SPSS the information was analyzed. Also, Anova and T-test procedures where completed to see if the different groups selected have same opinion about the issue.

First I wanted to identify, what was considered the main outcome of a logistics hub according to the respondents. Firs, Ordinal scale and second, level of importance were compared using factor analysis. These were the dependent variables for the regression analysis.

Out-comes of a logistics hub.

- Increase cargo volume
- Settlement of foreign companies in the territory
- Enhancement of productivity
- Economic growth and efficiency
- Customer services

In the third session, five factors are shown for the development of a logistics hub, this where divided in primary stage related specifically to developing socio-economic and political environment and others more specific related to infrastructure, to create more competitiveness. The combination of these two creates an attractive environment.

The final factors are: 1-Logistics service support and infrastructure, 2- Business environment 3- Economic determinants, 4- Political support, 5- Access to international markets. Each of them has different variables.

Clear descriptions of Logistics hub (LH), Free Trade Zone (FTA) and Special Economic Zone (EEZ) were indicated to give a brief explanation to the respondents. Also other terms were described to give clarity to the respondents.

After analysis secondary information and session of brain storming the mentioned five factors came up, I select them because involves macroeconomic and microeconomic considerations. Also, some have been clearly identified and proved in different papers. All of them have a weight of importance in an efficient logistic model. Next point will indicate which instrument was used to collect the different data for the research.

4.4 Sample design

Primary and secondary data were used in this research (See table 3.1). Literature of China, Korea and Japan regarding their studies and milestones in the developing of a logistics hub was analyzed. Telephone interview as a source of primary data was not used.

Table 4.1 Primary and secondary data collection

Secondary Data	Description	Primary Data	Description
Internet search	Science Direct General search of logistic, SEZ, FTZ, FDI, and different business activities of the supply chain management.	Postal and e-mail questionnaires private and public sector	50 questionnaires were sent to public and private organizations.
Academic articles and journals	Logistics, marketing, ports, Investments, supply chain management	Informal personal interviews	With professors in the field.
Academic text books	Economics, port logistics and business logistics, supply chain management		
Other published sources	Government publications, port brochure and transport statistics.		

Information about the Business logistics is relevant; all the business activities related to the supply chain have to be integrated working efficiently.

The ideal sample was private and public companies involve in commerce activities[13] in Korea, especial emphasis in the following ones.

[13] Commerce activity involves aids for trade which are banking, insurance, 3pl etc.

Logistic companies [14]	Service companies
IT companies	Ports.
Manufacturer companies	Public companies.

There were different difficulties, first regarding language problem, second associated with using the stated sources as a base for the population. The questionnaires collected were not many, so it didn't represent the necessity of all different companies involved. Also, just a few answers from the manufacturing companies were collected.

The sample wanted to be tabulated according to the type of organization (divided in 5) and the size of the different companies, (less than 100 employees, between 100 and 1000 employees and more than 1000 people). This last was to identify size of the companies.

[14] Logistic companies or well-known 3PL or 4PL (Consultancy + ASP – Application service providers. + Logistic service providers), are important base in a hub port.

5. EMPIRICAL RESULT

For the empirical analysis 50 questionnaires were sent to the companies mentioned before which are part of private and public organization. Out of the total, 40 were return but in the analysis just 36 were chose due to unclear answers of the remain 14. The questionnaires were submitted to the different companies in the beginning of March and the last response was in April 15 2004.

5.1 Descriptive analysis of data.

The frequency concerning type of organization response is shown on the following table 5.1. The total questionnaires inputted for the analysis was 36.

Table 5.1 Frequency according to type of organization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	5.6	5.6	5.6
	2	13	36.1	36.1	41.7
	3	14	38.9	38.9	80.6
	4	4	11.1	11.1	91.7
	5	3	8.3	8.3	100
	Total	36	100	100	

*Note: The type of organization was divided in; 1) Manufacturing companies, 2) Service companies, 3) Logistics companies, 4) Public companies and 5) others.

As it is shown, the bigger percentage of respondents was logistics companies 38.9 percent codified as type 3 followed by Service companies with 36.1 percent codified as type 2. The respondents of public companies, codified as 4, were very small.

To identify the size of the company involve in the research and the frequency of respondence the following scale (see note) was used. (See table 5.2).

Table 5.2 Frequency according to size of company

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	16	44.4	44.4	44.4
	2	17	47.2	47.2	91.7
	3	3	8.3	8.3	100
	Total	36	100	100	

*Note: Type 1) > 100 employees, 2) Between 100 and 1000 employees, 3) < 1000 employees.

The scale to identify size (See previous note), was according to recommendations made by Korean researchers. Normally in this type of questionnaire they use similar scale.

The mayor respondents were companies of less than 100 employees (Small companies) followed by medium companies; they represent 91.7 percent of the total. Big companies only represent 8.3 percent of the sample.

This section presents the output of the specific questions involved in the survey. Analysis of these results involves the statistical techniques detailed previously.

First crosstabs descriptive statistic analysis was used to identify the main outcome for a logistics hub according to the different types of organization: manufacturing company, service company, logistics company, public company and others.

The main outcome options were: increase volume, settlement of foreign companies in the territory, enhancement of productivity, economic growth and efficiency and customers' service. The results are shown in table 5.3

Table 5.3 Cross tabulation analysis

	Less important		**Medium**		**More important**	**Total**
	1	**2**	**3**	**4**	**5**	**5**
a) Increase cargo volume			3 8.30%	13 36.1%	20 55.60%	36 100%
b) Settlement of foreign companies in the territory			4 11.10%	21 58.30%	11 30.60%	36 100%
c) Enhancement of productivity		1 2.80%	8 22.20%	20 55.60%	7 19.40%	36 100%
d) Economic growth and efficiency.		1 2.80%	7 19.40%	21 58.80%	7 19.40%	36 100%
e) Customer service			5 13.90%	19 52.80%	12 33.30%	36 100%

According to the level of importance chosen by the respondents, the results are summarized on table 5.4.

The most important outcome of the logistics hub for Korean companies, according to the frequency analysis, using the importance scale was: First Volume of cargo, second Settlement of foreign companies in the territory and Economic growth and efficiency, third enhance of productivity and finally customer service.

Table 5.4 Level of importance of outcomes.

	Less important		**Medium**		**More important**	**Total**
	1	**2**	**3**	**4**	**5**	
a) Increase cargo volume					XXXXXXXX	a) 20 Respondents 55.6%
b) Settlement of foreign companies in the territory				XXXXXXX		b) 21 Respondents 58%
c) Enhancement of productivity				XXXXXXX		c) 20 Respondents 55.6%
d) Economic growth and efficiency.				XXXXXXX		d) 21 Respondents.58.8%
e) Customer service				XXXXXXX		e) 19 Respondents 52.8%

Note: Level of importance according to importance scale.

The result of the frequencies involving the same outcomes and a decision-making based on an ordinal scale (1 to 5) s
hows similar results as the previous one; besides the third most important factor, which in this case is customer service and in the previous table was, enhanced productivity. (See table 5.5).

Table 5.5 Level of importance according to ordinal scale**.**

Outcome	Most important	2 most important	3 most important	Totals	%Totals
a) Increase cargo volume	17	7	6	30	83%
b) Settlement of foreign companies in the territory	4	11	7	22	61%
c) Enhancement of productivity	5	6	6	17	47%
d) Economic growth and efficiency	6	4	8	18	50%
e) Customer service	4	8	9	21	58%
Total	36	36	36		

Note: Frequency using type of company in row area and Outcome in Column area.

* Note: In both tables Increase of cargo and settlement of foreign direct investments are the main outcomes of a logistics hub.

As it is seen, 83 percent of the respondents consider the outcome of increase cargo volume as the most important factor only 17 percent consider it bellow third level in the scale of importance. Settlement of foreign companies in the territory is ranked second and Customer service third.

5.2 Correlation analysis

Second a correlation analysis was examined for significant inter items relationship within the different groups of factors. Values of X>0.350 and Sig (2 tails) < 0.05 were required.(see table 5.6).

Out of the 33 items, six coefficients where deleted due to there small value 0.35. With this analysis we look for the association but not necessary causation. The result may only show that the variables are simultaneously influenced by some third variable. The important items shaded were deleted based on results of the survey.

Table 5.6 List of factors and items for the development of a logistics hub

Factors	Items
	Market opportunities and access to international markets.
1. Access to international markets	Efficient multimodal system
	Air logistics
	Natural resources availiability
2. Economic determinants	Economic stability (inflation, Interest rates, excahnge rates)
	Level of high tech industries in the area.
	Level of agglomeration of economies (clusters)
	GDP of the region.
	Efficient customer clearance procedures
	Settlement of multinational corporations
	Favorable tax regimen to attract investors.
3. Political support	Cross trait relationship of the country (trading pact)
	development of active capital market.
	Location of the gates (ports and airports).
	Settlement of big stores (retailers) as home depot, Carrefour, Walmart etc.
	Availability of Free Trade Zone (FTZ)
	Development of Special Economic Zone (SEZ)
4. Commerce determinants	Land costs
	Insurance optimal service
	Organization of trade fairs or Exhibition
	Availiability of market information
	Cooperation with important express transportation companies (FedEx, UPS etc)
	Skilled manpower available (including logistic sector)
	Efficient Just in time (JIT) procedures.
	Information and communication infrastructure
	Efficient infrastructure facilities
5. Logistics service support and infrastructure	Value added logistic services in the port.
	Banking optimal service
	High port connectivity and ship frequency
	High airport connectivity and flight frequency.
	Rail logistics infrastructure
	Availiability of world class logistics providers
	Efficient rail and road network.

Note: factors shaded where not included in the final table due to results in the factor analysis according to respondents in Korea

5.3 Factor analysis

Third step was the factor analysis to explore the overall dimension of the selection criteria, rather than the specific variable used in the survey; the responded from the survey were factor analyzed using a maximum likelihood method followed by varimax rotation with Kaiser Normalization. Using the Scree method of factor determination five factors were determined, which explain 58 percent of the variance in the data with an Eigen values of 1.825. The use of the maximum likelihood method made it possible to test the hypothesis that five factors were sufficient. Factors loading of 0.649 and greater were used as determinant of the different variables, which loaded significantly on to the factors. These variables with the associated relevant factors loading denoted by shade colors and the coefficient alpha values for the constructs are shown in table 5.7.(Rotated component matrix).

Reliability test were performed through the calculation of Cronbah coefficient alpha for each construct. All alpha results ranged from 0.622 to 0.867, indicating internal consistency of the scales.

Table 5.7 Rotated component matrix

Component factor loading

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Items	Cronbah alpha
X1	0.019	0.032	(0.101)	(0.092)	0.844	Market opportunities and access to international markets	
X2	0.297	0.047	0.088	0.184	0.710	Connectivity of gates to international markets.	0.6215
X3	(0.143)	0.328	0.674	0.257	0.334	Economic stability (inflation, Interest rates, exchange rates)	
X4	(0.003)	0.300	0.644	0.006	(0.004)	Level of high tech industries in the area.	
X5	0.264	0.072	0.729	(0.106)	(0.000)	Level of agglomeration of economies (clusters)	
X6	0.247	(0.186)	0.666	0.146	(0.248)	GDP of the region.	0.6977
X7	0.138	0.340	(0.102)	0.654	0.137	Efficient customer clearance procedures	
X8	0.162	0.267	(0.145)	0.564	0.021	Favorable tax regimen to attract investors.	
X9	0.134	0.012	0.199	0.791	0.095	Cross trait relationship of the country (trading pact)	
X10	(0.119)	0.080	0.294	0.687	(0.159)	Development of active capital market.	0.7018
X11	0.153	0.649	0.138	0.207	0.347	Location of the gates (ports and airports).	
X12	0.097	0.763	(0.041)	0.138	(0.171)	Settlement of big stores (retailers) as home depot, Carrefour, Walmart etc.	
X13	0.085	0.636	0.076	0.047	(0.355)	Availability of Free Trade Zone (FTZ)	
X14	0.013	0.511	0.270	0.145	0.099	Land costs	
X15	0.249	0.771	(0.054)	0.074	0.128	Organization of trade fairs or Exhibition	
X16	0.221	0.664	0.298	0.026	0.335	Cooperation with important express transportation companies (FedEx, UPS etc)	0.8066
X17	0.675	(0.147)	0.464	0.210	0.127	Efficient Just in time (JIT) procedures.	
X18	0.742	0.217	0.165	(0.007)	0.121	Information and communication infrastructure	
X19	0.793	0.178	0.086	0.074	(0.038)	Efficient infrastructure facilities	
X20	0.712	0.067	0.079	(0.079)	0.287	Value added logistic services in the port.	
X21	0.594	0.220	0.159	(0.294)	(0.108)	Banking optimal service	
X22	0.622	(0.094)	(0.107)	0.420	(0.127)	High port connectivity and ship frequency	
X23	0.675	0.088	(0.131)	0.197	0.029	High airport connectivity and flight frequency.	
X24	0.764	0.269	0.154	0.157	0.187	Efficient rail and road network.	0.8667

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 8 iterations.

	Factors
	1. Logistics service support and infrastructure
	2. Business environment.
	3. Economic determinants
	4. Political support
	5. Access to international markets

Note: The result for each construct indicates no questionable loading and a result no scale items were dropped.

Factor 1: Considering factor of second order is focus in commerce activities involving trade and aids for trade. The items support competitiveness improving service, time and costs issues. The factors encourage efficient cargo movement, main outcome of logistics hub according to the frequency analysis of the respondents.

Factor 2: The factor has external and internal influence. Its items develop good environment for settlement of national companies and Foreign Direct Investments.

Factor 3: Considering factor of first order also is influenced by internal and external factors. It promotes attractiveness and shows the economic situation of the region.

Factor 4: The items are close related to the efficiency of the government to activate the economy and be more efficient. Tax incentive is an item of hot discussion regarding World Trade Organization trends but it is still the main instrument of developing regions to attract important capitals.

Factor 5: It is influenced strongly by external factors, which means the government and projects developers can't influence in the performance. These items are involved directly in internationalization and aids for it.

5.4 Regression analysis

5.4.1 Factors of Importance in the Building of an integrated Hub

After identification of factors and items, a confirmatory factor analysis was conducted to confirm the items consistently loaded on these factors and to assess the goodness-of-fit for each model. Because the goal in developing the measurement model is to identify distinct factors, ideally, inter-factor correlations are low X< 0.368. It was proved the difference between factors. (See table 5.8 a and b).

Table 5.8 a. Correlation between factors

	Mean	Std. Deviation	N
FACTOR 1	3.9436	0.509	36
FACTOR 2	3.6722	0.6011	36
FACTOR 3	3.5417	0.5053	36
FACTOR 4	4.0694	0.5057	36
FACTOR 5	4.2361	0.5276	36

Table 5.8 b. Correlation between factors.

		FACTOR_1	FACTOR_2	FACTOR_3	FACTOR_4	FACTOR_5
FACTOR 1	Pearson Correlation	1.000	0.368	0.289	0.236	0.229
	Sig. (2-tailed)	.	0.027	0.087	0.166	0.180
	Sum of Squares and Cross-products	9.067	3.940	2.605	2.123	2.149
	Covariance	0.259	0.113	0.074	0.061	0.061
	N	36.000	36.000	36.000	36.000	36.000
FACTOR 2	Pearson Correlation	0.368	1.000	0.339	0.354	0.162
	Sig. (2-tailed)	0.027	.	0.043	0.034	0.346
	Sum of Squares and Cross-products	3.940	12.648	3.602	3.769	1.796
	Covariance	0.113	0.361	0.103	0.108	0.051
	N	36.000	36.000	36.000	36.000	36.000
FACTOR 3	Pearson Correlation	0.289	0.339	1.000	0.247	0.056
	Sig. (2-tailed)	0.087	0.043	.	0.147	0.746
	Sum of Squares and Cross-products	2.605	3.602	8.938	2.208	0.521
	Covariance	0.074	0.103	0.255	0.063	0.015
	N	36.000	36.000	36.000	36.000	36.000
FACTOR 4	Pearson Correlation	0.236	0.354	0.247	1.000	0.071
	Sig. (2-tailed)	0.166	0.034	0.147	.	0.682
	Sum of Squares and Cross-products	2.123	3.769	2.208	8.951	0.660
	Covariance	0.061	0.108	0.063	0.256	0.019
	N	36.000	36.000	36.000	36.000	36.000
FACTOR 5	Pearson Correlation	0.229	0.162	0.056	0.071	1.000
	Sig. (2-tailed)	0.180	0.346	0.746	0.682	.
	Sum of Squares and Cross-products	2.149	1.796	0.521	0.660	9.743
	Covariance	0.061	0.051	0.015	0.019	0.278
	N	36	36	36	36	36

Correlation is significant at the 0.05 level (2-tailed).

5.4.2 Regression Model

First the multi simple linear regression model was implemented to identify the degree of association between dependent and independent variables; the regression line is given by the function $f(x) = \alpha + \beta_1 fator1 + \beta_2 factor2 + \beta_3 factor3 + \beta_4 factor4 + \beta_5 factor5$; the results are shown in tables 5.9.

Table 5.9 Multi regression model.

				Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	R	R Square		B	Std. Error	Beta		
1	0.29	0.084	(Constant)	2.20	1.34		1.64	0.11
			FACTOR_1	0.27	0.24	0.21	1.15	0.26
			FACTOR_2	0.06	0.21	0.06	0.29	0.77
			FACTOR_3	0.21	0.23	0.16	0.91	0.37
			FACTOR_4	0.27	0.23	0.21	1.19	0.24
			FACTOR_5	(0.21)	0.21	(0.17)	(0.98)	0.34

* Dependent variable: Y1 (Increase cargo volume).

* Predcitors: (Constant), factor 5, Factor 4, Factor 3, Factor 2, Factor 1

				Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	R	R square		B	Std. Error	Beta		
1	0.452	0.204	(Constant)	2.45	1.28		1.92	0.07
			FACTOR_1	(0.22)	0.22	(0.18)	(0.98)	0.34
			FACTOR_2	0.07	0.20	0.07	0.38	0.71
			FACTOR_3	0.06	0.22	0.05	0.28	0.78
			FACTOR_4	(0.03)	0.22	(0.03)	(0.15)	0.88
			FACTOR_5	0.53	0.20	0.45	2.67	0.01

* Dependent variable Y2 (Settlement of foreign companies in the territory).

* Predcitors: (Constant), factor 5, Factor 4, Factor 3, Factor 2, Factor 1

				Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	R	R square		B	Std. Error	Beta		
1	0.377	0.142	(Constant)	4.66	1.55		3.00	0.01
			FACTOR_1	(0.20)	0.27	(0.14)	(0.75)	0.46
			FACTOR_2	(0.07)	0.24	(0.06)	(0.28)	0.78
			FACTOR_3	0.30	0.27	0.21	1.11	0.28
			FACTOR_4	0.19	0.27	0.13	0.73	0.47
			FACTOR_5	(0.36)	0.24	(0.26)	(1.49)	0.15

* Dependent variable Y3 (Enhance of productivity)

* Predcitors: (Constant), factor 5, Factor 4, Factor 3, Factor 2, Factor 1

				Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model				B	Std. Error	Beta		
1	R	R square	(Constant)	1.25	1.36		0.92	0.37
	0.554	0.307	FACTOR_1	0.18	0.24	0.13	0.76	0.45
			FACTOR_2	0.60	0.21	0.50	2.86	0.008
			FACTOR_3	0.00	0.24	0.00	0.02	0.99
			FACTOR_4	(0.18)	0.23	(0.13)	(0.76)	0.45
			FACTOR_5	0.12	0.21	0.09	0.54	0.59

*Dependent Variable: Y4 (Economic growth and efficiency).

* Predcitors: (Constant), factor 5, Factor 4, Factor 3, Factor 2, Factor 1

				Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	R	R Square		B	Std. Error	Beta		
1			(Constant)	2.77	1.50		1.85	0.07
			FACTOR_1	0.11	0.26	0.08	0.40	0.69
			FACTOR_2	(0.01)	0.23	(0.01)	(0.04)	0.97
			FACTOR_3	(0.03)	0.26	(0.02)	(0.12)	0.91
			FACTOR_4	0.06	0.26	0.04	0.22	0.83
			FACTOR_5	0.22	0.23	0.17	0.93	0.36

*Dependent Variable: Y5 (Customer service)

* Predcitors: (Constant), factor 5, Factor 4, Factor 3, Factor 2, Factor 1

This model shows in table one, two, three and five no relation to the dependent variable of the different factors. The result is support by the high significance value, higher than 0.05. Table four shows association between business environment (factor 2) and economic growth and efficiency as an independent variable. This is supported by the significance level of 0.008.

The low result of the first model is due to the low R-value, which means weak relation between factors and dependent variable. Therefore, single regression models were carried on to identify the association and to look which factors are important to focus more on. $F(x) = \alpha + \beta_1$ factor 1……factor 5. The model was made separately due to the different meaning of the outcomes (See tables 5.10 a,b,c, d and e)

Table 5.10 a. Regression – Increase cargo volume (Model Y1)

Dependent variable	Model	Ind.	R Square	Unstandarized coeficient		Standarized coeficients	t	Sig.
				B	Std. Error	Beta		
	(Constant)			3.003	0.838		3.581	0.001
		Factor 1	0.84	0.373	0.211	0.29	1.767	0.086
	(Constant)			3.531	0.675		5.235	0
		Factor 2	0.056	0.256	0.181	0.236	1.414	0.167
Increase Cargo Volume- Y1	(Constant)			3.168	0.761		4.162	0
		Factor 3	0.081	0.368	0.213	0.285	1.731	0.093
	(Constant)			2.849	0.865		3.294	0.002
		Factor 4	0.095	0.399	0.211	0.308	1.89	0.067
	(Constant)			4.913	0.904		5.434	0
		Factor 5	0.07	-0.104	0.212	-0.084	-0.491	0.626

Table 5.10 b. Regression - Settlement of foreign companies in the territory (Model Y2)

Dependent variable	Model	Independent	R Square	Unstandarized coeficient		Standarized coeficients	t	Sig.
				B	Std. Error	Beta		
	(Constant)			4.392	0.835		5.257	0
		Factor 1	0.002	-0.0502	0.21	-0.041	-0.239	0.813
	(Constant)			3.865	0.66		5.856	0
		Factor 2	0.007	0.0897	0.177	0.086	0.506	0.616
Settlement of foreign companies – Y2	(Constant)			4.013	0.757		5.301	0
		Factor 3	0.002	0.0513	0.212	0.042	0.242	0.81
	(Constant)			4.188	0.868		4.826	0
		Factor 4	0	0.0016	0.212	0.001	0.007	0.994
	(Constant)			2.087	0.786		2.656	0.012
		Factor 5	0.177	0.498	0.184	0.42	2.702	0.011

Table 5.10 c. Regression - Enhancement of productivity (Model Y3)

Dependent variable	Model	Independent	R Square	Unstandardiized coefficient		Standardized coefficients	t	Sig.
				B	Std. Error	Beta		
	(Constant)			4.656	0.972		4.789	0
		Factor 1	0.017	-0.187	0.245	-0.130	-0.766	0.449
	(Constant)			4.063	0.776		5.234	0
		Factor 2	0.001	-0.00398	0.209	-0.033	-0.191	0.85
Enhancement of productivity- Y3	(Constant)			3.075	0.876		3.508	0.001
		Factor 3	0.027	0.238	0.245	0.164	0.97	0.339
	(Constant)			3.254	1.011		3.218	0.003
		Factor 4	0.013	0.163	0.247	0.113	0.661	0.513
	(Constant)			5.565	0.975		5.71	0
		Factor 5	0.079	-0.389	0.228	-0.281	-1.704	0.097

Table 5.10 d. Regression - Economic growth and efficiency (Y4)

Dependent variable	Model	Independent	R Square	Unstandarized coeficient		Standardized coefficients	t	Sig.
				B	Std. Error	Beta		
	(Constant)			2.254	0.912		2.471	0.019
		Factor 1	0.093	0.429	0.229	0.305	1.869	0.07
	(Constant)			1.667	0.647		2.575	0.015
		Factor 2	0.272	0.62	0.174	0.522	3.564	0.001
Economic growth and efficiency- Y4	(Constant)			3.02	0.853		3.541	0.001
		Factor 3	0.043	0.261	0.238	0.185	1.095	0.281
	(Constant)			3.427	0.99		3.461	0.001
		Factor 4	0.008	0.127	0.241	0.09	0.527	0.602
	(Constant)			2.87	0.974		2.945	0.006
		Factor 5	0.035	0.254	0.228	0.187	1.112	0.274

Table 5.10 e. Regression - Customer service (Model Y5)

Dependent variable	Model	Independent	R Square	Unstandarized coeficient		Standardized coefficients	t	Sig.
				B	Std. Error	Beta		
	(Constant)			3.575	0.889		4.021	0
		Factor 1	0.014	0.157	0.224	0.12	0.703	0.487
	(Constant)			3.964	0.708		5.597	0
		Factor 2	0.003	0.0628	0.19	0.056	0.33	0.743
Customer services- Y5	(Constant)			4.112	0.811		5.069	0
		Factor 3	0	0.0233	0.227	0.018	0.103	0.919
	(Constant)			3.847	0.927		4.148	0
		Factor 4	0.004	0.0853	0.226	0.065	0.377	0.708
	(Constant)			3.174	0.91		3.486	0.001
		Factor 5	0.036	0.241	0.213	0.19	1.129	0.267

Note: R square which increase the fitness of the model is of highest standard when, its value is high (close to 1). The lower result is consequence of the quantity of questionnaires. The Sig is considering of more importance to conclude the relationship of the factors.

According to the probability of significance, determine by Sig or P.value < 0.1, to develop the first dependent outcome, factors one, three and four are of especial relevance. Settlement of foreign companies in the territory (outcome two) is affected especially by the factor access to international markets. Outcome number three, enhancement of productivity shows close dependence with factor Number five also. Economic growth and efficiency shows close relation with the factors of Logistics service support and infrastructure and the factor of Business environment. Last outcome, customer service, shows a high sigma value in the different independent variables, which, indicates that other external factors influence them.

5.4.3 One-Way analysis and t-test.

Finally, two procedures for analysis of variances; Anova and T-test were included to confirm the perception of the different groups.

In the case of the Anova test it was confirm that the different types of companies referred as type 1 (service companies), type 2 (Logistics companies) and type 3 (other) have the same perception related to the different independent factors. (Factor 1, Factor 2, Factor 4 and factor 5) (See tables 5.11 a, b, c, d and e).

Table 5.11 a Anova test – Related to factor 1.

Test of homogeneity of variances

FACTOR_1			
Levene Statistic	df1	df2	Sig.
0.602	2	33	0.554

FACTOR_1							
			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		0.13	2.00	0.07	0.24	0.79
	Linear Term	Unweighted	0.00	1.00	0.00	0.01	0.94
		Weighted	0.00	1.00	0.00	0.00	1.00
		Deviation	0.13	1.00	0.13	0.48	0.49
Within Groups			8.94	33.00	0.27		
Total			9.07	35.00			

Table 5.11 b. Anova test – Related to factor 2

Test of homogeneity of variances

FACTOR_2			
Levene Statistic	df1	df2	Sig.
0.452	2	33	0.64

FACTOR_2							
			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		0.45	2.00	0.23	0.61	0.55
	Linear Term	Unweighted	0.44	1.00	0.44	1.20	0.28
		Weighted	0.43	1.00	0.43	1.15	0.29
		Deviation	0.02	1.00	0.02	0.07	0.80
Within Groups			12.20	33.00	0.37		
Total			12.65	35.00			

Table 5.11 c. Anova test – Related to factor 3

Test of homogeneity of variances

FACTOR_3			
Levene Statistic	df1	df2	Sig.
1.46	2	33	0.25

FACTOR_3							
			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		0.33	2.00	0.16	0.63	0.54
	Linear Term	Unweighted	0.09	1.00	0.09	0.36	0.55
		Weighted	0.13	1.00	0.13	0.49	0.49
		Deviation	0.20	1.00	0.20	0.76	0.39
Within Groups			8.61	33.00	0.26		
Total			8.94	35.00			

Table 5.11 d. Anova test – Related to factor 4.

Test of homogeneity of variances

FACTOR_4			
Levene Statistic	df1	df2	Sig.
2.61	2	33	0.09

FACTOR_4							
			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		0.69	2.00	0.34	1.37	0.27
	Linear Term	Unweighted	0.21	1.00	0.21	0.82	0.37
		Weighted	0.14	1.00	0.14	0.55	0.46
		Deviation	0.55	1.00	0.55	2.19	0.15
Within Groups			8.27	33.00	0.25		
Total			8.95	35.00			

Table 5.11 e. Anova test – Related to factor 5

Test of homogeneity of variance

FACTOR_5			
Levene Statistic	df1	df2	Sig.
1.71	2	33	0.20

FACTOR_5							
			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		0.47	2.00	0.24	0.84	0.44
	Linear Term	Unweighted	0.40	1.00	0.40	1.42	0.24
		Weighted	0.43	1.00	0.43	1.54	0.22
		Deviation	0.04	1.00	0.04	0.14	0.71
Within Groups			9.27	33.00	0.28		
Total			9.74	35.00			

Note: Parameter for the probability of significance is >0.05 (Variance same) and <0.05 varianza different. Anova P.value higher than 0.05 indicates the same perception between groups.

* The companies for this test were divided into type one-named Service companies, type 2 logistics companies and type 3 includes (manufacturing, public and others).

A second Anova analysis was run to identify the opinion of the group related to the outcome chosen as the most important result of a logistics hub and the different factors affecting the result. (See table 5.12 a,b,c,d and e). The result shows similar attitude of the group related to the factors beside factor 1 where the Sig shows a low value of 0.03 indicating discrepancy in opinion between groups.

Table 5.12 a Anova test between outcome group and factor1

Test of Homogeneity of variances

FACTOR_1			
Levene Statistic	df1	df2	Sig.
0.95	2	33	0.40

FACTOR_1							
			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		1.79	2.00	0.89	4.05	**0.03**
	Linear Term	Unweighted	0.90	1.00	0.90	4.08	0.05
		Weighted	0.80	1.00	0.80	3.63	0.07
		Deviation	0.99	1.00	0.99	4.48	0.04
Within Groups			7.28	33.00	0.22		
Total			9.07	35.00			

**** 0.03** Shows different perception among groups.

Table 5.12 b Anova test between outcome group and factor 2.

Test of Homogeneity of variances

FACTOR_2			
Levene Statistic	df1	df2	Sig.
0.67	2	33	0.52

FACTOR_2							
			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		0.58	2.00	0.29	0.80	0.46
	Linear Term	Unweighted	0.24	1.00	0.24	0.66	0.42
		Weighted	0.21	1.00	0.21	0.57	0.45
		Deviation	0.37	1.00	0.37	1.02	0.32
Within Groups			12.07	33.00	0.37		
Total			12.65	35.00			

Table 5.12 c Anova test between outcome group and factor 3.

Test of Homogeneity of variances

FACTOR_3			
Levene Statistic	df1	df2	Sig.
0.30	2	33	0.74

FACTOR_3							
			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		0.52	2.00	0.26	1.02	0.37
	Linear Term	Unweighted	0.51	1.00	0.51	1.99	0.17
		Weighted	0.50	1.00	0.50	1.95	0.17
		Deviation	0.02	1.00	0.02	0.09	0.77
Within Groups			8.42	33.00	0.26		
Total			8.94	35.00			

Table 5.12 d Anova test between outcome group and factor 4.

Test of Homogeneity of variances

FACTOR_4			
Levene Statistic	df1	df2	Sig.
0.63	2	33	0.54

FACTOR_4							
			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		0.14	2.00	0.07	0.25	0.78
	Linear Term	Unweighted	0.13	1.00	0.13	0.48	0.49
		Weighted	0.13	1.00	0.13	0.49	0.49
		Deviation	0.00	1.00	0.00	0.01	0.92
Within Groups			8.82	33.00	0.27		
Total			8.95	35.00			

Table 5.12 e Anova test between outcome group and factor 5.

Test of Homogeneity of variances

FACTOR_5			
Levene Statistic	df1	df2	Sig.
0.14	2	33	0.87

FACTOR_5							
			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		0.93	2.00	0.46	1.74	0.19
	Linear Term	Unweighted	0.06	1.00	0.06	0.23	0.64
		Weighted	0.04	1.00	0.04	0.14	0.71
		Deviation	0.89	1.00	0.89	3.34	0.08
Within Groups			8.82	33.00	0.27		
Total			9.74	35.00			

Note * The companies for this test were divided into 1. Increase cargo volume 2. Economic growth and efficiency and 3 others (Increase cargo volume, Settlement of FDI, enhance productivity and Customer service).

Finally a group comparison T-test was run to identify if the small or big companies have the same opinion about the factors affecting the development of a logistics hub. The result shows same perception among them; the final result is shown in table 5.13.

Table 5.13 T-test relation between sizes of company

		Levene's Test for Equality of Variances	T -test of equality of means	
		F	Sig.	Sig. (2-tailed)
FACTOR_1	Equal variances assumed	0	0.986	0.975
FACTOR_2	Equal variances assumed	1.864	0.181	0.253
FACTOR_3	Equal variances assumed	0.256	616	0.469
FACTOR_4	Equal variances assumed	0.179	0.675	0.705
FACTOR_5	Equal variances assumed	0.256	0.616	0.469

***** Note: Values Case I > 0.05 shows same criteria and II < 0.05 shows different criteria

5.5 Interpretations of results.

According to the cross tabulation analysis, the respondents in Korea consider as main outcomes of a logistics hub.

1. Increase cargo volume and
2. Settlement of Foreign Direct Investments

Due to the different results according to the importance scale and ordinal scale showed in table 5.4 and 5.5, outcome number three has two possible results: 1. Economic growth and efficiency or 2. Customer service.

In the correlation analysis, six important items according to my view were deleted. I consider that the reason was:

1. Diversification of the respondents and amount of questionnaires received and/or
2. Misunderstood of items' meaning, after translation of the questionnaire into Korean.

One support to this hypothesis is the exclusion of the SEZ item related to commerce determinants and the inclusion of FTZ.

The factor analysis result using Varimax rotation method with Kaiser Normalization shown on table 5.7, indicates high level of importance to its factors, the items within facto loading between 0.6 and 0.9 shows the external consistency.

Factor loading superior to 0.6 or more was the parameter. The results show an Eigen value for the five final factors of more than one, which is recommended.

The cronbah coefficient alpha shows the good internal coefficient between factor items within a range of 0.622 and 0.867 indicating the internal consistency of the different items involved in the logistics hub.

The final consistent five factors involve commerce activities, adequate environment, economy issues, efficient of governments and internationalization.

The confirmatory factor analysis show no significance relation between any of the five variables, which confirm a goodness fit for the model. The factor loading of each group is $X<0.5$ evidencing the opposite relation.

The separate regression model shows the dependency among factors with the different proposed first four factors.

Outcome five results indicate that external factors (other factors out of the model) affect this dependent variable.

Anova and T test procedures confirm the similar opinion among almost all the established groups related to the type of organization, size and preference of outcome. In case of factor one, related to the different out comes group, is the only exception. The Sig. Value of 0.030 confirms the diverse opinion regarding Logistics service support and infrastructure.

This result might be due to the similar mean between group opinions (group 1- 4.03, group 2 - 4.29 and group 3 – 3.71). According to the different groups, factor one is dependent to different outcomes depending on the criteria.

With this work it was specified how factors are important in the logistics hub and how do they affect the dependent variables (Logistics performance). If logistics industries want to improve performance they can identify important points.

6. RECOMMENDATIONS AND IMPLICATIONS TO DEVELOPING REGIONS

6.1 Situation in Latin America

Industry experts suggest that the biggest impact on distribution in Latin America is Free Trade Agreements. Currently, Mercosur, which encompasses Argentina, Paraguay, Uruguay, and Brazil, and the Andean Pact with Bolivia, Colombia, Ecuador, Peru and Venezuela, are uniting to create a unified Free Trade Zone by the year's end. The goal of the 10-country pact is to allow goods and services to cross borders at reduced tariff rates and achieve what the European Union did for its member countries.

Not everyone is sure this goal will be achieved, but freight forwarders and transportation/logistics operators are cautiously optimistic.

"From a logistician's perspective, South American markets are ripe for innovation and integration," says Ray Greer, general manager for global markets and solutions for Ryder Systems. "But we have to be cautious about how quickly the region can move to adopt this kind of new thinking."

Holding back a unified South America is border clearance, taxes, and currency issues, as well as information infrastructure. "These all impede trade," he says. As a result, warehousing and distribution in South America is predominately handled either by local entities or those with a global presence. Manufacturers in this area tend to outsource their warehousing and distribution to these players.

Outside of Miami, FL, which is not part of South America, most freight forwarders and logistics specialists do not see one city or location in Latin America as prime for single distribution, according to the article “International Logistics hubs” issued by Pricewaterhouse Coopers (PWC).

According to Nadia H. Ribeiro, country manager of danzas AEI Brazil, there are very few examples of hubs in the Mercosur, although many studies have been carried out,".

Brian Edlich, BAX director of sales for Latin America based in Miami, FL, comments that Miami provides the easiest and least expensive alternative into Central, South America and the Caribbean. "There is no question, hands down," he says.

Steve P Laposa, director of real estate research for pricewaterhouse Coopers (PWC) in Denver Colorado concurs, citing that Miami International Airport offers a key location and good weather for distribution needs.

But if BAX had to consider a distribution hub in South America, Edlich comments that he would select Brazil, since it is, by far, the largest market in South America. "The problem is the infrastructure is not as developed in Latin America as in the United States," he says. Also there was recognized, that there is a bit of cargo still going into the Sao Paulo area, perhaps one of the free ports like Vitoria, Buenos Aires, Montevideo.

On South America's West Coast, Edlich points to Inquique, Chile, as one of that coast's few free-trade zones. "Almost every major Asian manufacturing company has some representation in Iquique," he observes. "From there they distribute not only to Chile but also Argentina, Peru, Bolivia, Paraguay, Uruguay, Brazil, and to some lesser extent Colombia and Venezuela."

Challenge Air Cargo, recently acquired by UPS, operates its major Latin American distribution hub from a state-of-the-art 165,000-square-foot center in Miami. B.F. (Bill) Spohrer, Challenger's founder, points out that Miami developed as an air hub "because it is very difficult to get cargo from one Latin American country to another."

In Spohrer's opinion, the only location that has the potential for a pan-Latin American cargo distribution hub outside of Miami is Panama. "Many airlines operate to and through Panama, and Panama has the canal where a lot of maritime traffic offloads," he says. Today Panama also has one of the largest free zones in the Western Hemisphere.

Miami is taking the leadership in being hub for North area of South America, while Brazil is leading for the middle and Southern part, according to secondary information presented by PWC consulting company. Important countries like Colombia, Chile or Argentina, with increasing markets and raising economies are starting to develop also different areas apt for business proposals.

International business environment comprises two main components that should be address in a hub area:

1. International financial system (International capital market [15] and foreign exchange market[16]): In South America a more dynamic stock and bonds capital market is required. The debt market has international standards, and interest rates are focusing in attracting investors.
   Foreign exchange is weak and many countries had faced economic shocks in the past, recently currency conversions are more stable and corporate managers are more use to techniques as currency hedging and arbitration.
2. International trade and investment: Can free a nation's entrepreneurial spirit and bring economic development. As any other region, South America has become involved in international business to accomplish social. Economic, and military goals by regulating international flow of products, labor, information, and capital.

In this work the financial scope is not covered deeply but it is important to mentioned, the main focus is investment and policy recommendation:

6.2 Foreign Direct Investments (FDI)

One of the main problems of developing countries is the level of conflict due to redistribution of resources and security issues. To break this cause-effect circle is necessary for the adequate settlement of businesses. How to decrease insecurity and bring equity first to the areas where the logistics hubs are establish is main questions for the Government to be addressed. IT development to tackle this issue is necessary.

The World Trade Organization and United Nations Conference for Trade and Development (UNCTAD) are working to develop a framework to support smooth

[15] Capital market is a system that allocates financial resources in the form of debt and equity according to their most efficient uses. Purpose of the capital market: Expanding money supply for borrowers, reducing the cost of money and reducing risk for lenders.

[16] An international market for currencies that facilitate international business transactions. Purposes currency conversion, currency hedging, currency arbitrage and currency speculation.

trading and improve developing countries performance. Countries should ask for more support to these organizations and flexibility according to their principals.[17]

The first principal (without discrimination) contrast with the implementation of Free Trade Zones and Special Economic Zones that are factors included in the logistics hub. Tax incentives or any kind of subsidies given by governments goes opposite with WTO trend but, policy number four and five support benefits for developing countries to counteract the lack of competitiveness – Policy 4. "Trading should be more competitive" and policy 5 "Trading should be more beneficial for less developed countries - open a window for the implementation of especial systems.

A clear understanding of these policies and flexibility of WTO plus a more integrated work will help to develop new projects looking for more equally distribution of resources, principals of WTO, WB and IBRD.

Developing countries should gradually change from a focus of tax incentive to a one of good business environment and productivity incentives systems but it will take time, so the projects of FTZ and SEZ should be continued as factors of the development of Logistics hub for a transitional model.

Rules and international agreements regarding entry and operation of FDI should be closely evaluated according to standards given by international organizations and experiences of successful countries such as Singapore, Hong Kong and especially China pilot zones. Necessary deregulations will improve attractiveness and secure higher competitiveness. In the case of Korea for example, accelerated deregulation in the logistics industry is suggested, especially in the truck transportation business. The implication is to transform the current supply driven logistics industry into a demand-driven logistics industry, which will contribute to secure competitiveness.

Privatization is a hot issue especially in developing countries, not just is applying for the maritime sector but also in different types of industries. Developing countries should study the privatization of some industries due to low performance. This privatization should be first presented to internal investors.

Natural resources is one of the principal attraction of South American countries, the well exploration is necessary for the economic success of the region and long term mutual benefits not jus for the parts but also for the community in general. Developed and transitional regions in Asia are experts in transforming primary commodities into added value products this are part of its well-known success. The attraction of enterprises from these regions to make the transformation in the region should be the outcome of the project developers.

Other attraction of the region is the low labor cost, similar situation of china. Although, this is not main factor for FDI decision now a days, in manufacturing companies is important variable in the decision making, The combination of an adequate labor cost with improving in supply chain activities is recommended.

Various FDI incentives should not be listed in Detail, since this might weakened the position of project managers when thy attempt negotiations with foreign investors. Therefore, only a general maximum range of incentives should be disclosed instead of specific, detailed incentives.

[17] The principals of WTO express the trading should be: 1.Without discrimination, 2.Freer, 3.Predictable, 4. More competitive and 5. More beneficial for less developed countries

Periodical economic cost-benefits analyses of FDI business firms and Free Industrial Zones should be conducted and continued in order to evaluate and improve existing related policies.

It is necessary to set up definite and firm national strategies for FDI within the context of national interests. Simply, the size of FDI and employment effects can be the only sensible objectives regarding FDI. A firm motivated effort to attract FDI must be maintained by the government, along with national development strategies. This will reassure foreign investors, thereby, making them more prone to invest.

Activate employment is one of the main policies of a government; Activate employment is one of the main policies of a government; attracting high-tech organizations and companies with added value products activates the level of economy. This activates other types of industries, which sells their different goods and services to the foreign organization. Some specific factors mentioned by O' Brien 2001. were described in chapter 2 table 2.2.

The survey reveled the very interesting fact that the element of time for customs clearance and overall transportation is more important to high tech manufacturers than inherent costs. Time is critical so the preferences of this type of industries are near efficient airports.

The policy direction in developing countries of South America as it was suggested for Korea should be to strengthen multi-transport systems by integrating land-sea-Air transport. Also, develop a user-oriented logistics system with sharing logistics facilities.

6.3 Policy Recommendations for Attracting Center

After identifying geographical location as a first factor and a consensus view is achieved, it is necessary for a central government and regional government to embrace the idea of a logistics hub; it should be one of the very important national development strategies as it is in different successful developed nations. Starting and implementing the strategy should be done early.

Physical infrastructure of logistics should be efficient provided in lead-time, along with logistics centers. The development of an integrated land transportation system servicing identified areas is necessary to develop desirable logistics hub area.[18]

Research ability on logistics should be strengthened to ensure a quick and efficient response to the ever-changing global environment of logistics system and technologies. The nature of logistics demand, system, information, information and communication technologies should be sensible projected in order to provide proper hard and soft infrastructures in advance.

Fundamental reforms as prioritizing of developments of certain areas focus on logistics improvement and identify a detailed strategy and action plan on a clear vision with relevant governmental bodies working closely for coordination.

South America is a big region compare to Europe and seems bigger with inefficient links between areas, the movement of cargo from the Southern part of Chile to Colombia can take a few weeks. The well development of intermodal transportation

[18] For example Korea: to develop an integrated land transportation system servicing the Korea peninsula, China, and Siberia in particular will be helpful to make Korea Peninsula as a logistics hub in the Northeast Asia.

is necessary to accomplish the necessities of the new regional integration that is arising and open a wide range of opportunities for the competitive regions.

Strategies being persuaded by countries as Netherlands in Europe, Singapore in Southeast Asia, Taiwan in East Asia and now Korea in Northeast Asia should be addressed. They are seizing new opportunities generated by value added activities brought by growth of closest important markets. South American regions especially the ones closed to big markets like Mexico and U.S.A, case of Colombia, Venezuela or also Ecuador should look more carefully to identify potential opportunities for them.

The greatest challenge of transportation system is to move people and cargo in timely, cost-efficiency manner. Doing so involves considering both individual modes and combination of modes. Multinational carriers are using whatever combination of equipment is necessary to perform the service so the different infrastructure should be improved in developing regions. Close focus on multimode transport with efficient nodes and close cooperation among countries is necessary for a successful development.

Logistics hub requires good infrastructure network and connectivity between gates to move internal cargo as transshipment. In the case of Colombia, only South American country with cost in two oceans an intermodal link between them can be attractive for future investors and also an alternative of the Panama Canal for the movement of cargo.

Regarding rail development the issues of customs' procedures with other countries and cooperation procedures have to be addressed. These are problems in the transcontinental railways departing from Northeast Asia.

Developments of different projects like efficient airports and Distripaks have to be done looking for the long-term demand. Incheon internationa airport in Korea is a clear example of an airport looking to the future and is part of the policies to develop Korea as a logistics hub. The analysis of Distripark areas in Korea shows the preference for FDI.

In the Air transport the experience of Asia shows that the relaxation of travel restrictions and liberalization of airline market will improve growth and promote a free business environment. The implication in these concerns is the entrance of foreign competition that can replace internal capitals. The cost effect of deregulation vs regulations have to be carefully analyzed due to the problem of competitiveness between developed and developing countries.

The opening up of a market due to improvement in transportation and logistics services can also have effects on competition in the local market. Competition has a number of additional effects.

One is the impact on the rents available. Suppliers that previously had more power are constrained by options of supply form outside the region. The implication is an "easier" development and ad equation of facilities.

In the middle term development strategy of a region or Country, it is highly advisable to develop certain cities like the case of Shanghai and its Waigaoquiao Free Trade Zone in China. Cities besides efficient air and maritime gates are recommended to be Free cities in the designated area. The benefits most be transfer to other regions.

A more efficient logistics sector will benefit people living in poor areas in a number of ways. First, as implicit in the example above, their terms of trade will improve. Cost of items they buy from other companies, the rest of the country, or from outside will be less. The prices they receive for the items they buy from others also

will be less. The prices they receive for the items they export to the rest of the territory or out side also will be higher. The impact of reform, which reduces logistics costs, also generates extensive real gains: the impact on a real income are greater than those of the removal of a tax, for example, the impact on real incomes are greater than those of a removal of a tax, for example, the impact of which includes transfer effects – when logistics costs are reduced resources are saved (the rectangle effects are gains, not just transfers, in other words).

Reduction in transport costs can also lead to significant increase in trade orientation. Some of the orders of magnitude involved in these effects are illustrated by the work on Africa by Limao and Venables (2001). Of more interest here is the estimate of an elasticity of 2.5, which could be applied to the reduction of 35% in logistics costs according to the assessment reported above.

One important recommendation in the trend of the different activities is the necessary cope with social and environmental issues. Countries as Japan are highly concern with this issue together with IT developments to connect the supply chain.

7 CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCHES

Main factors for the development of a competitive logistics hub according to Korean experience are 1) Logistics service support and infrastructure, 2) Business environment, 3) Economic determinants, 4) Political support and 5) Access to international markets. In the factor analysis, market opportunities and access to international markets shows the highest factor loading.

Logistics service support and infrastructure has the most variables including; efficient just in time (JIT) procedures, information and communication infrastructure, efficient infrastructure facilities, value added logistics in the port and efficient rail and road network.

The main outcome of the logistics hub was considered the movement of cargo (increase cargo volume). According to the regression results factor one, three and four shows close dependence to this outcome.

The second more important outcome was settlement of foreign companies in the territory. Factor five, shows a close dependence. It is related to internationalization and its different support activities, has strong influence by external factors.

Additional to the evidence of the empirical analysis, is important to mention that a logistics hub requires two principals: Establishment of clear objectives and execution of a detailed strategy, considering social and environmental issues. International organization framework supports and advice implementation of different milestones.

WTO is the only global international organization dealing with the rules of trade between nations. The goal is to help producers of goods and services, exporters, and importers conduct their business. The principals of this international organization express that the trading should be: 1.Without discrimination, 2.Freer, 3.Predictable, 4. More competitive and 5. More beneficial for less developed countries.

Principle one goes against fiscal exemptions and subsidies but, points four and five support the interest of developing nations and to encourage this competitiveness still is necessary the FTZ and SEZ ideas as part of the development of a Logistics hub.

Korea and China are developing special economic areas to be attractive while countries like Colombia has stopped such similar projects due to the compromise with WTO plan.

WTO policies have to be clearly defined to implement appropriate incentive measures or help different groups of industries.

Speed and efficiency are important considerations for implementation of logistics hub projects is South American region, as it is happening in Northeast Asia. Provide better and more sophisticated integrated transport, information and a communication service is necessary for the different types of cargo and the well service to different Distribution centers or Distriparks.

Integrated transportation is necessary in an efficient logistics hub, not only for the movement of imports or exports but also for the handle of transshipment cargo, efficient ports and airports are main factors for its development.

Progress of different programs and projects of the hinterland of the logistics hub should be evaluated; this can affect intra and inter regional volume trade.

The work of 3PL and now 4PL service providers are also important issue to integrate activities as transportation, IT or assembly necessary for the smooth flow of goods within the supply chain. These suppliers have grown fast in the recent years and are main parts of successful logistics hubs.

IT has been developed and also has been shifting from intra-company use to inter-company use. For reducing the total cost of Supply chains, it is mentioned the importance of business cooperation and collaboration among manufacturers, wholesalers and retailers, and to manage flows of information and products to optimize the overall supply chain.

For example, the Internet and radio frequency identification (RFID) has been developed by Japan. Diffusion of RFDI is necessary due to different advantages over bar code as: (Large data storage capacity, remote- contact less data reading, Collective data reading, data renewal and additional data writing.)

World trade agreements influence the flow of cargo. It is necessary to examine where the flow of cargo is and will go as a mean of determining the best warehousing and distribution location. This includes the North American Free Trade Agreement (NAFTA), European Union (EU), and Asia Free Trade Agreement.

With the new trend in commerce and regional integrations the imbalances problems in regions should be analyze serious among nations. Logistics hub can bring more imbalances.

For future researches I recommend:

- This study is focus on a region and it will be interesting to have the point of view of another countries.
- It is interesting to confirm this factors with another regions and with a bigger sample of questionnaires involving a large type or organizations.

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