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**Economic Impacts of an Airport: Incheon New  
International Airport Case in Korea**

by

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## **I. Introduction**

### ***Purpose of Study***

The Korean economy has achieved continuous rapid growth over the last 30 years. Until recently, most of the development efforts were made for expansion of the two areas with the greatest developmental potential, Seoul and Pusan. Most of transportation facilities connected these two parts of the country. As a result, the economic prosperity accrued mainly along the Seoul-Pusan corridor. The regional disparities in economic development became larger compared to this economic axis. Public demands for balanced development has increased.

In addition, good transportation infrastructure is essential for a nation to maintain high economic productivity. It is evident that most of the developed countries after the Second World War have invested heavily on transportation infrastructure. This trend is easily found in Korea. Economic development plans of the early 1960s included the investments on the development of transportation infrastructure such as expressways, airports, ports, and railroads. This trend continued until the early part of the 1980s. Since then, the importance of the transportation infrastructure to economic development has been overlooked. Because of this overlook, serious transportation congestion problems emerged in early 1990s. These congestion problems became the obstacles to economic growth and became inconveniences to people's everyday life.

To respond to these demands for regional balanced development and to cope with the traffic congestion problems, the Korean government increased transportation

investment willingly. For example, the Korean Government is constructing a few domestic airports and Incheon New International Airport near Seoul and will construct Muan International Airport near Kwangju. Because transportation facility like airport is thought as an economic development generator, Incheon citizens and Muan county people expect increased economic development due to the new international airports.

In this paper, I will estimate the economic impacts of the Incheon New International Airport to the local area, Incheon, in which the international airport is located.

### ***Methodology***

The purpose of this study is to examine the economic boost that an international airport would bring to the area in which the airport is located. To estimate the economic impact of transportation investments, there are two methods, cost-benefit analysis and input-output analysis which are commonly applied to transportation facility impacts analysis.

Traditional cost-benefit analysis involves measuring all costs (economic, social, and environment) incurred for providing a service and all benefits realized from the service, based on a monetary value on each item. The resulting ratio of costs to benefits is then used for policy decisions. The difficulty that this cost-benefit analysis has is to quantify each and every cost and benefit.<sup>1</sup>

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<sup>1</sup> National Council for Urban Economic Development, Airport Growth: Creating New Economic opportunities (Washington D.C.: 1989), 13.



In this paper I used input-output analysis to estimate the economic impacts of the new airport. The best way to estimate the new airport economic impacts on Incheon area is to use the Incheon regional input-output table, until now, however, in Korea regional input-output tables have not been surveyed. For this reason I used the national input-output table to estimate the impacts on national economy. To obtain the impacts on Incheon area, I multiplied the ratio of Incheon employment to national total employment to that results.<sup>2</sup>

The data necessary for analysis are gathered from much useful secondary data that exist in various forms. These include administrative data used by government agencies at all levels and common statistics gathered, compiled, and published by government agencies. In addition, for theoretical background, various planning and economic literatures were referred.

### *Structure of Paper*

This paper will consist of four parts. First, the introduction discusses the purpose of the study, methodology, and the structure of this paper. Secondly, the theoretical background will be dealt with regarding the concept of economic development, the relation between transportation, especially airport, and economic development. In addition, this part includes the explanation on input-output analysis that is used to estimate

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<sup>2</sup> Young Sun Yoon, The Study of Application of Input-output Analysis for Regional Economic Analysis (Master's Thesis The Graduate School of Environment at Seoul National University: 1983), 1-32.

the economic impacts. Third part shows the economic impact estimation. The airport development plan including construction costs and the analysis of economic impacts are the main components of the third chapter. Though an airport is an economic development generator, some airports act as economic beneficiaries and others do not. In the fourth chapter, I will analyze the conditions for the success of the airport as an economic development generator through the literature survey. This will be able to show the Korean government ways to succeed with the Incheon New International Airport. The final chapter is the conclusion.

## **II. Theoretical Background**

### ***Meaning of Economic Development***

Economic development can be defined as a set of deliberate and planned interventions into the economic process by a government or another public body with a view to accomplishing some predetermined goals.<sup>3</sup> Although economic development goals are various, they almost always involve the encouragement of private investment within a specific geographic area in order to increase that area's employment, tax base, property values, commercial viability, and economic stability. In addition, the retention of jobs and wealth are added goals of economic development.<sup>4</sup>

This definition connotes that economic development is incurred by the attracting funds and firms into a certain local area. For economic development, none can deny that exogenous factors are regarded as important, even though nowadays, the economic development concept is being shifted to community based economic development that emphasizes endogenous policies using the potential of local human, institutional, and physical resources,<sup>5</sup>

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<sup>3</sup> U.S. Department of Transportation, Transportation and Urban Economic Development (Washington D.C.: 1982), 1.

<sup>4</sup> Thomas S. Lyons and Roger E. Hamlin, Creating an Economic Development Action Plan (New York: 1991), 8-15.

<sup>5</sup> Edward J. Blakely, Planning Local Economic Development (Thousand Oak: 1994), 48-51

## ***Economic Development and Transportation***

Among other factors, transportation is a very important to economic development in any region. Transportation provides an important competitive advantage. Industries need to move raw materials and final products in and out cheaply and on time.

Adequate transportation facilities have supported economic development by increasing accessibility to resources and markets, facilitating the movement of goods and services, and playing a important role in trade. According to location theory, good transportation is one major strong point to attract firms and businesses into a certain region because firms tend to minimize their cost by selecting the best location that is on the cheapest transport link between raw materials and market.<sup>6</sup>

The magnitude of expenditures on transportation illustrates its economic role: in the U.S. nationally, about 20 percent of GNP is spent on transportation, as is nearly 13 percent of total business expenditures for new plant and equipment. Moreover, nearly one job in ten of total U.S. employment is in transportation or transportation related activities.<sup>7</sup>

Economic development reacts to transportation investments. Economic development has long been recognized as an important rationale for transportation investment. Transportation investments add employment in the short-run and increase long-run productivity. The relation between economic development and transportation

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<sup>6</sup> *op. cit.*, 55-56.

<sup>7</sup> Elizabeth A. Deakin, Transportation and Economic Development: Recommended options for California (Berkeley: 1987), 1-2.

investment can be observed. Public infrastructure investment in the United States decreased from 2.4 percent of gross domestic product in 1966 to below one percent in 1988. The U.S. productivity has slowed dramatically since 1973 and it is said that the declining public infrastructure investment accounts for as much as sixty percent of the decline in private sector productivity.<sup>8</sup>

For the 1960s and 1970s in Korea annual public infrastructure investment was over than 2 percent and close to 3 percent of gross national product. As mentioned in the introduction chapter, however, for 1980s the importance of infrastructure was overlooked and the percent of the money invested on public infrastructure accounted for less than 2 percent of gross national product. Because of the lack of investment, from the early 1990s congestion on highways, inner cities, airports, and ports accrued, which increased transportation cost rapidly. For example, the size of transportation cost regarding vehicles was 15.6 percent of gross national product in 1990. It became 17 percent in 1991. Transportation congestion cost became a major factor in deteriorating industrial productivity in Korea.

### ***Economic Development and Airports***

There are economic, demographic, and social impacts that result from airport development that in some cases may be of long duration and in others more or less permanent. Of them, economic impacts are the secondary effects of capital expenditures

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<sup>8</sup> Donald J. Harmatuck, "The Influence of Transportation Infrastructure on Economic Development," Logistics and Transportation Review Vol 32 No 1 (March, 1996): 63.

on the regional economy. Scholar Peter Batey divided these economic impacts into two types: those associated with the construction of the infrastructure; and those associated with its operation. Most researchers broadly classify economic impacts into three types: direct, indirect, and induced impacts.<sup>9</sup>

Direct impacts are consequences of economic activities directly related to an airport itself during construction and operation. Indirect impacts derive primarily from off-site economic activities associated with the production of intermediate goods and services required for construction and operation of the airport. Air passenger expenditures on entertainment, shopping, and accommodations are examples of indirect impacts. This category also includes the expenditures of aviation-related industries that were located on or near an airport but can not be considered completely airport dependent. These impacts are referred to as industrial development impacts and include a few non-aviation-related business that leased space at an airport.<sup>10</sup>

Induced impacts are the multiplier effects of the direct and indirect impacts when direct and indirect impacts indicate net increases in final demand. For example, assume an aircraft maintenance worker is paid \$300 a week. Approximately \$100 of this salary goes toward his monthly apartment rent. The landlord of the apartment then take \$50 of the \$100 and hires a plumber to maintain apartment pipelines. Then the plumber spends \$30 of the \$50 to buy tools, and so on. In this example, the initial \$300 is considered a direct impact of the airport; the other consecutive transactions represent the multiple impacts of the \$300 on other sector of economy.

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<sup>9</sup> Donald R. Drew, "Overview of Methodology," Transportation Research Record 1274 (1990): 281.

<sup>10</sup> Julie K. P. Dunbar, "Economic Impacts of Aviation on North Central Texas," Transportation Research Record 1274 (1990): 223-225.

The economic roles of airports for economic development are the following.

*1) Attracting industry*

Most new industrial plants are being built in nonmetropolitan areas because of room to expand, lower taxes, and better living and working conditions for employees. Without flexible air transportation services, this may be not possible. The airport has become vital to the growth of business and industry in communities by providing air access for companies that must meet the demands of supply, competition, and expanding marketing areas.

Recent surveys of plant location criteria indicate that access to high quality scheduled air passenger and airfreight services are critical factors in determining where companies locate. In fact, for many manufacturing companies quality of air service now ranks in importance with labor availability, operating costs, energy availability, incentives, and training. In most cases, high valued items or products where timeliness of delivery is critical are those most likely to be shipped by air.<sup>11</sup> According to the survey by Charles Minshal, Richard Buxbaum, and Cathy Wright who surveyed manufacturing activities in Ohio with the highest utilization rates for air freight shipping, manufacturing activities such as transportation equipment, machinery, chemicals, electronic equipment, jewelry, silverware, printing, and publishing depend on air transportation to ship cargo.

Air transportation is even more significant for many non-manufacturing activities.

Numerous trade and service firms depends on air transport to ship important financial

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<sup>11</sup> Charles W. Minshall, Richard W. Buxbaum, and Cathy J. Wright, "The Economics of Aerospace in Ohio," Transportation Quarterly (Summer, 1995): 107-112.

documents, plans and reports, samples and specimens, high value stock items, and so on. Finally, the growth of recreation and tourism activities, conventions, trade shows, and professional meetings and seminars depend on quality of air transportation. Simply, communities without airports place limitations on their capacity for economic development.

## *2) Stimulating economic growth*

Airport and related aviation and nonaviation businesses located on the airport act as a major source of employment. Employment opportunities are generated by fixed base operators, repair and modification companies, rental cars, passenger related restaurants, hotels, and stores, and a range of airport support personnel related to fire and safety, maintenance, administration, air traffic control, and others.

The wages and salaries paid by airport-related businesses can have a significant effect on the local economy by providing the means to purchase goods and services. In addition to this direct effect the employee expenditures generate successive waves of additional employment and purchases that are more difficult to measure but are nevertheless substantial. This so-called multiplier effect operates in all cities as aviation-related dollars are channeled throughout the community.

The airport also stimulates the economy through the consumption of local services for air cargo, food catering to the airlines, aircraft maintenance, and ground transportation on and around the airport. In addition, purchases of fuel, supplies, equipment, and other services from local merchants pour additional income into the local community.



Airports provide an additional asset to the general economy by generating billions of dollars per year in state and local taxes. These tax dollars increase the revenues that can be used for projects and services to benefit the residents of each state and community.

Good airport facilities also attract tourist and convention business into the community. This can represent substantial revenues for hotels, restaurants, retail stores, sports and nightclubs, sightseeing, rental cars, and local transportation, among others.<sup>12</sup>

### *3) Influence on real estate value*

Beyond the benefits that an airport brings to the community as a transportation facility and as a local industry, the airport has had influence on real estate values in adjacent areas. Due to the benefit from the presence of the airport, land located near airports almost always increases in value. The increase of real estate value incurs the increase of property tax base.

### *Input-output analysis*

The Russian-born economist Wassily Leontief developed input-output tables during the 1930s to understand the workings of a modern economy and later to help with postwar planning in the United States. About the same time, the Russian economist

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<sup>12</sup> Alexander T. Wells, Airport Planning and Management (New York: 1996), 41-42.

Kantrovovich developed the same tool to help planners in his country set quantity targets for Soviet production.<sup>13</sup>

The aim of an input-output table is to display output from one industry to another industry and from industries to final users such as consumers, investors, and exporters. Input-output analysis views the economy as a set of interdependent industries and activities each of which requires the productive output of the others as input to its productive process.

Input-output analysis postulates a single set of industry outputs (i.e., one feasible solution) as being uniquely determined by a specified set of final demand. Because of this power, input-output analysis can be used to measure the effects of exogenous injections to local economies.

However, input-output analysis also has some drawbacks. First, the model assumes fixed coefficient. That means present coefficient will remain constant under projected condition and assume the technology and relative price is unchanged. That may be reasonable for short-term impact assessment and forecasting, but it is problematic for long-term forecasting. In the long-term, coefficients can be changed by the change of relative prices, appearance of new industry, and development of technology in production process.<sup>14</sup> So the greater the rate of economic change and innovation in the study area industries, the less reliable the technical coefficients for long-term analysis. In addition, input-output analysis also requires separate and detailed projections or estimates of final

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<sup>13</sup> Malcolm Gillis, Dwight H. Perkins, Michael Roemer, and Donald R. Snodgrass, Economics of Development (New York: 1992), 135-136.

<sup>14</sup> Edward J. Kaiser, David R. Godschalk, and F. Stuart Chapin, Jr., Urban Land Use Planning (Urbana and Chicago: 1995), 158-159.

demand sales data by industry, for consumption within the study area, and for export. Such data are commonly incomplete or unavailable and may have to be estimated partly.

Despite of these shortcomings, input-output analysis is a useful tool. In the United States, the Bureau of Labor Statistics began publishing official input-output tables in 1952. There have been a number of studies, in the U.S., using input-output techniques to analyze the impacts of developing and expanding airports. The Federal Aviation Administration report by Butler and Kiernan, 1986, identifies input-output methods as one way of measuring impact, advocating use of the Bureau of Economic Affairs Regional Input-Output Modeling System (RIMS II).<sup>15</sup>

*1) Explanation of Input-output Analysis*

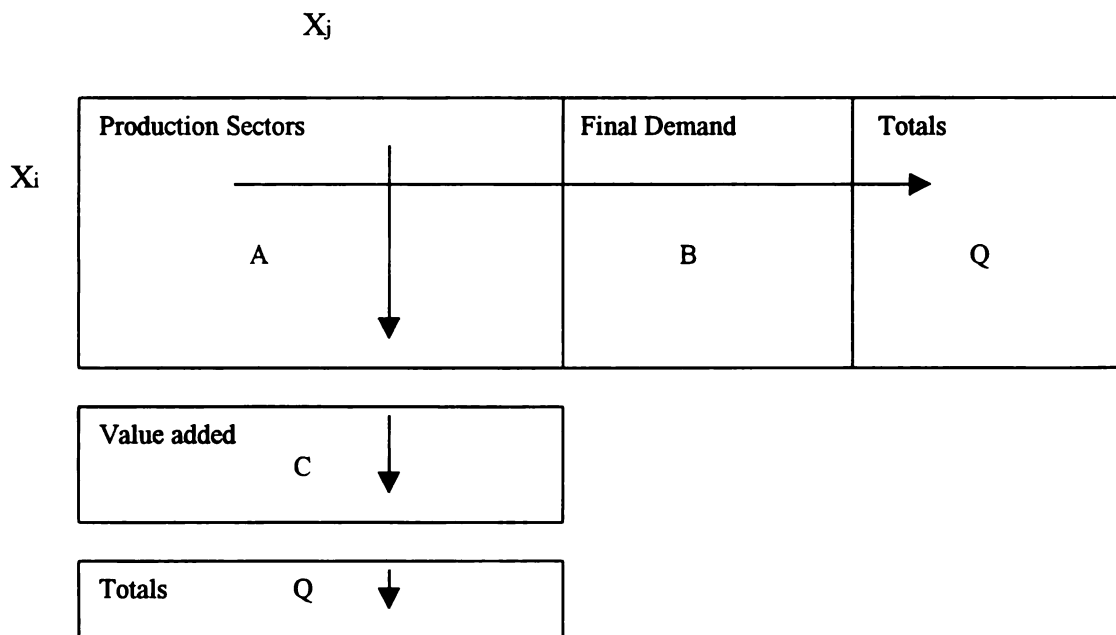


Figure 1. Accounting framework of I-O analysis

<sup>15</sup> Peter W. Batey, Moss Madden, and Graham Scholefield, "Socio-economic Impact Assessment of Large-scale Projects using Input-Output Analysis: A Case Study of an Airport," *Regional Studies*, Vol. 27.3 (1993), 179-180.

Input-output analysis shows the matrix of input and output between industries. Columns show purchases from each industry by column industry. Rows show sales to each industry by row industry.

In the above <Figure 1> matrix A records the flows of intermediate goods and services traded between different production units, called industries. Matrix B shows the flow of each product into final demand sectors such as private and government consumption, investment, and export. Value added sector called as primary inputs. These consist of the industry's own resources which produce its value added (wages and gross profits) and indirect taxes. Row totals equal column totals for each industry. This means that the value of an industry's sales (rows) must equal the total value of its output (columns).

Direct input coefficient is the ratio of input, that one industry receives from other industries, to the industry's gross output in columns. In other words, it represents the direct requirements of the output of  $X_i$  industry per unit of  $X_j$  industry. That is the amount required from  $X_i$  industry to produce  $X_j$  industry 1 unit. It can be expressed as the following:

$AX + Y = X$  Where, A = matrix of direct coefficient

X = vector of industry output

Y = vector of final demand

A, the direct coefficient, is estimated empirically from data for over a period of time. The coefficient is important for analyzing the national economy. The governments of most countries survey and make the input-output analysis. In Korea, the Bank of Korea

surveyed directly and formulated input-output tables in 1960, 1963, 1966, 1970, 1975, 1980, 1986, 1990, and 1993.

From the above equation we can get the direct and indirect coefficient (Leontief Inverse coefficient).

$$X - AX = Y$$

$$(I - A)X = Y \text{ where, } I = \text{unit matrix}$$

solving for X,

$$X = (I - A)^{-1} Y$$

$$X = BY \text{ where, } (I - A)^{-1} = B$$

B is the direct and indirect coefficient. It represents the direct and indirect effect of industries generated by one unit of final demand of one industry.

By using this direct and indirect coefficient, the economic effects of Incheon New International airport can be estimated. As mentioned, the new airport would attract many new business regarding air transportation service and increase tourist and various events at a convention center. To assess the all effects from the new international airport, these all effects should be considered. However, it is very difficult job, because it demands various and deep field survey and may take a long time. I will estimate the direct and indirect economic effects produced by the construction of an airport. I can create this estimation by using the direct and indirect coefficients and the increase of final demand to construction demand. Final demand of construction may be obtained from the Korean government airport development plan.

### **III. Estimation of Economic Impacts**

#### ***Inchon New International Airport***

##### ***1) Background***

With the development of the Korean economy, passenger and cargo aviation demand is increasing accordingly. Kimpo International Airport, presently the main international airport located in Seoul, is expected to reach its capacity in the mid 1990s. This results in aircraft delay and ground transportation congestion negatively impacting international trading and economic activity. Kimpo airport is located near a residential area, so the maximum use of airport is impossible. So as not to disrupt the neighbor's sleep, the airplane taking off and landing is prohibited from midnight to 4 o'clock at dawn. To cope with the increasing aviation demand, the expansion is urgently needed. However, the large scale expansion of Kimpo airport is not possible due to obstacles such as sporadically located hills, closely located residential areas and limited air space. Therefore, construction of new airport is necessary to handle expansive aviation demand and promote the nation's progress.

The new airport construction began in 1993 and will be completed in 1999. After that, considering the demand increase, expansion will be carried out. To proceed the work related to the new airport construction, the Korean government created the Korea Airport Construction Authority (KACA). The Ministry of Construction and Transportation is in charge of the decision-making about location, scale, time, and financing regarding airport development plan. The actual developer of the new airport is KACA, which is in charge of design, construction, issuing bonds, and loans.

## *2) Location*

The Incheon New International Airport is being constructed on reclaimed land between Youngjong Island and Yongyu Island located at the middle of the Korean peninsula, 50km from downtown Seoul City. Originally, this area belonged to Kyunggi province, but in 1989, this area was incorporated into Incheon City, an important gateway to the West Sea. Transportation time from downtown Seoul to the new airport will be less than 45 minutes. The major access road will be an eight-lane expressway with a total length of 54.5km and a speed limit of 120km per hour. In addition, a 66km double track railroad will be constructed for easy access to the new airport. Trains on it will travel at 110km per hour. A 4.4km double-deck suspension bridge will link Youngjong Island with the northwestern part of Incheon city. On the upper part of this bridge a 6-lane road will be installed and on the lower part of this bridge a 4 lane road and double track railroad will be installed.

## *3) Facility*

The new airport is constructed on a 56,168,000m<sup>2</sup> site, which can be divided into two sections; the airport area and the community. In the airport area, four runways, passenger terminals, cargo terminal, the other buildings to help airplane maintenance and repair will be constructed. An international business center also will be constructed to help the airport emerge as the hub of trade and business.

To support the functions of the airport itself and the nearby urban area, an airport community will be constructed on a site of 8,740,000m<sup>2</sup>. It will include a residential

section, a commercial section, public facility, and distribution facilities. The central commercial section will provide commerce, business, international exchange, entertainment, and distribution facilities. In the residential section, detached houses and tenement houses, and apartments will be constructed for people who will work for the new airport. Distribution and public facilities will include warehouses, transportation services, distribution centers, social welfare facilities, public buildings, and various open green spaces including a rest area.

### ***Economic Impact Estimation***

#### ***1) Construction Cost***

The construction cost of the airport and facilities is estimated 3,987 billion won(4.69 billion USD). Financing is made in various ways such as loans, sale the site, government budget and so on.

**Table 1. Cost and Financing Plan**

<b>Cost (billion won)</b>		<b>Financing (billion won)</b>	
• Airport Facilities	2,876	• KACA Investment	312
• New Transportation Link	1,111	• Sale the reclaimed land	677
		• Loans	899
		• Private Sector Investment	195
		• Government	1,904
<b>Total</b>	<b>3,987</b>	<b>Total</b>	<b>3,987</b>

**Source: The Korean Ministry of Construction and Transportation**



The construction costs invested annually are the following:

**Table 2. Airport Facility Investment Plan** (million won)

	93	94	95	96	97	98	99	Total
<b>Airport Facility</b>	241,763	450,501	421,402	401,463	370,204	437,289	231,858	2,554,624
<b>Business Center</b>			1,683	3,482	8,110	7,700		20,975
<b>Support Facility</b>		22,007	49,134	61,375	57,315	29,678		219,510
<b>Design &amp; Supervision</b>	34,962	11,320	10,293	7,914	10,054	5,877		80,420
<b>Total</b>	276,698	483,328	482,512	474,406	445,683	480,544	231,858	2,875,529

**Table 3. Access Transportation Facility Investment Plan** (million won)

	93	94	95	96	97	98	99	Total
<b>Land</b>	6,029	72,079	57,034	57,034	35,076	35,076	35,076	297,404
<b>Fishery Right Compensation</b>		8,500	8,500					17,000
<b>Road</b>		40,000	40,000	65,661	65,661	65,661	65,661	342,644
<b>Bridge</b>	5,000	55,990	92,435	92,435	92,435	92,435		430,730
<b>Design &amp; Supervision</b>	13,178	1,862	1,215	1,446	1,044	2,666	1,825	23,200
<b>Total</b>	24,207	178,395	199,184	216,576	194,216	195,838	102,562	1,110,978
<b>Total (airport &amp; access facility)</b>	300,905	662,223	681,696	690,982	639,899	676,382	334,420	3,986,507

## *2) Economic Impacts Estimation*

The estimation of economic effects of airport construction can be obtained through the multiplication of the construction cost to each industry's direct and indirect coefficients. The annual construction costs are obtained from the development plan set up by the Korean Ministry of Construction and Transportation. The direct and indirect coefficients are obtained from the input-output analysis reported by the Bank of Korea.

From the estimation of national impacts, the estimation of impact on Incheon can be induced through some calculations. By multiplying the ratio of the number of Incheon's one industry's employment to that industry's national employment to the national economic impact estimation, the Incheon's benefits can be obtained. The ratio of employment may be replaced by the ratio of output or payroll of industry. In this paper I used the employment numbers obtained from statistics surveyed by the Korea Census Authority and Incheon City. The results are shown in the next page. (see the appendix for detailed result)

From the result, the new airport promotes the products of industry directly and indirectly by 5,303,848 million won. The total economic impacts on Incheon will be 484,057 million won and this is 5.2 % of the total national impacts. The construction of the new airport increases the national products by 9,290,355 million won and Incheon's regional products by 484,057 million won.

These are only the effects originated from the airport and access transportation facility constructions. The estimation of the new airport economic impacts seems to be underestimated. From 2000 when the new airport is completed and operated, the

economic effects will increase. Passenger and cargo handled in this new airport will be handled by this airport. This means final demands for services such as food, hotel, rental car, shopping, forwarding, and catering service will increase. The increases of these industries' final demands will influence the other industries.

Table 4. Estimation of Economic Effect

(million won)

	Construction Cost	Economic Effect	
		National	Inchon
1993	300,905	701,244.1	36,537.04
1994	662,223	1,543,278	80,409.67
1995	681,696	1,588,658.4	82,774.16
1996	690,982	1,610,299	83,901.70
1997	639,899	1,491,253	77,699.00
1998	676,382	1,576,274	82,128.91
1999	334,420	779,349.09	40,606.57
<b>Total</b>	<b>3,986,507</b>	<b>9,290,355</b>	<b>484,057.05</b>

#### **IV. Policy Implications**

Most studies concluded affirmatively about the economic benefits of airport development including expansion of existing airport and construction of new airport. These studies indicated that airports no longer serve as mere transportation center; today, they are economic development generators. According to Mary Jo Waits and her colleagues, in Southern California, more than 400,000 jobs and a total annual economic impacts of \$37 billion can be directly or indirectly attributed to Los Angeles International Airport.<sup>16</sup> In addition, the trend of international free-trade generated by Uruguay Round will foster the use of airport and give airports the possibility to grow as the global economic center. However, Watis' study indicated that for airports to take a great role in economic development, there are some conditions to be followed. They are the following.

##### *1) Management*

An airport facility should be operated by an independent airport authority. Authorities are not under the control of complex state and local regulations that can arbitrarily constrain purchasing and hiring decisions. They can operate like business and also are less vulnerable to government raids on airport revenues. This raid would not be possible if an independent authority managed the airport.

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<sup>16</sup> Mary Jo Waits, Rick Heffernon, and Marcie Katler, "How to Keep Your Airport from Idling on the Tarmac," Spectrum (Fall 1993): 28.

In Korea, airports are also operated by an independent authority, the Korea Airport Authority (KAA). The KAA is in charge of operating, maintaining, and constructing airport facilities. However, the new airport is being constructed by the Korea Airport Construction Authority (KACA) which was created for the new airport construction. The KACA was made because the KAA, whose organization was oriented to existing facility operating, was not assumed to be appropriate for the construction of Incheon New International Airport. It has not been decided which authority will operate the new airport. However, it is certain that it will be managed by an independent authority according to Korean airport management system in that the government would not operate airports personally.

## *2) Intra-regional Competition*

All airports in the same area should be controlled by the same entity. A unified arrangement helps neighboring airports focus on competition outside the region, not on cutthroat wars among themselves. By doing so, it is possible to reduce administrative costs and allow the revenues from one airport to help support or upgrade others. For instance, the Los Angeles area suffers from inefficiencies caused by four entities operating five commercial airports. The result of this multiple management is that three of the airports do not make full use of their facilities, while the Los Angeles International Airport is in danger of exceeding its capacity.

As for Incheon International Airport, the authority that manages the new airport is not decided yet. All other civil airports including Kimpo International Airport are placed

under the control of KAA. If the Korean Government follows Watis' opinion, it is better to place the new airport under the KAA's control.

### *3) Finance*

According to Watis' report, the new financing options like passenger facility charges should be introduced. In comparison to traditional funding methods like the federal fund, a primary advantage of passenger charges is that they may be used for development at any airport managed by the same entity.

In Korea, passenger charge was already introduced, because the Korean Government was short of funds. KAA collects fees for passengers who use airport facility and uses this money to maintain facilities and construct new facilities. For the passengers using the new airport, a passenger charge will be imposed. In addition to this, due to shortage of government funds, the Korean Government tried to introduce private investment into facilities. As the results, the access bridge and gasoline storage facility for airplanes are constructed by private investments.

### *4) Land and Land Use*

The amount of land required for an airport is considerable, but it is difficult to predict how much will be enough. Generally, buying more land than seems necessary is recommended because land may never again be available, or as inexpensive. Airports promote the development of a surrounding area. As a result, the surrounding area is developed and price increases. As mentioned, one of the reasons not to expand existing Kimpo International Airport is that the airport is surrounded by residential growth and

community development. For these reasons, the acquisition of land is impossible. The noise imposed on adjacent residential areas is another reason to prohibit the efficient use of the airport.

To avoid high land cost and environmental problems, the new airport is constructed on reclaimed land between two islands in the Yellow Sea (West Sea). Total land area is 56,168,000m<sup>2</sup>, among them airport area is 47,428,000m<sup>2</sup> and community area is 8,740,000m<sup>2</sup>. Of airport area, 10,980,000m<sup>2</sup> is used for the first construction that is now planned and implemented. The remained area will be reserved for the next construction phase which will be decided according to aviation demand. The land for airport can be said ample.

##### *5) Statewide Integration*

Airports should be integrated into statewide transportation plans. Ground transportation systems should not be lag behind airport construction. State and federal agencies must be brought in early to plan access to the airport from all directions. In addition, airports should be integrated into statewide economic development plans. Airport officials must be included in discussion of economic development policies.

The access transportation facilities for Incheon New International Airport are being constructed simultaneously with the construction of airport facility. As for the economic development plan, the new airport plan is included in the five-year economic development plan with the other transportation investment such as Kyung-bu highspeed railway, some new expressways, and Kwangyang port. This five-year economic development plan was made through the discussion among the ministries such as the Ministry of Construction

and Transportation, the Ministry of Finance and Economics, the Ministry of Trade and Industry and the other related governmental agencies.

#### *6) Community Support*

For the success of an airport, community support is essential. The wisest move is to include all groups related to development project and reflect their interest into development plan. Otherwise, it takes time to proceed and the project may be blocked. In addition, it should be first determined that which communities will benefits and which will lose from construction of a new airport. Then equitable compensation must be given for those who bear the costs.

In Korea, however, the airport development projects are controlled by central government, excluding the participation of local community. The reason is that central government thinks that local interest, like NIMBYism, conflicting with national interest precludes the process of airport development. This was also applied to Incheon New International Airport development. For example, Incheon International Airport is being constructed in the west of Incheon and Seoul is located in the east of Incheon. An expressway connecting the airport and Seoul is planned, but to prevent Incheon Citizens from using the expressway for commuting to Seoul, the entrance to Seoul bound is prohibited. Because of this, Incheon Citizens and Incheon City government protested to the central government and Incheon City government would not be helpful to the project. On the contrary, in the U.S. an individual airport is planned by state under the guidance of



national plan of FAA. Resultantly, local community can participate in the planning process.<sup>17</sup>

For the efficient process of airport development, the Korean central government should try to consider local community interest and give local government the opportunity to participate in the airport development plan.

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<sup>17</sup> American Society of Civil Engineers, Urban Planning Guide (New York: 1986), 179-183.

## **V. Conclusion**

Inchon New International Airport will provide production increase effect to the national and Inchon local economy. Through the projection using the coefficient, the estimation of effects to national economy is 9,290,335 million won by the 3,986,507 million won investment. The economic effects to Inchon economy is estimated 484,057 million won. These are the effects incurred by the construction from 1993 to 1999. If the effects generated by airport operation such as increase of tourists and cargo from 2000 is considered, the economic effects will increase.

For the role of airport as an economic development generator and smoother development process, the local community's participation in the airport development process should be increased and institutionalized.

## **Appendix**

Estimation of Economic Effects

	Coefficient <sup>1</sup>	1993	1994	1995	1996	1997	1998	1999	Total
Investment		300,905	662,223	681,696	690,982	639,899	676,382	334,420	3,986,507
Agriculture, forestry, fisheries	0.05456	16417.3768	36130.88688	37193.33376	37699.978	34912.8894	36903.40192	18245.9552	217,504
Mining	0.02748	8268.8694	18197.88804	18733.00608	18988.185	17584.4245	18586.97736	9189.8616	109,549
Food, drinking	0.07542	22694.2551	49944.85866	51413.51232	52113.862	48261.1826	51012.73044	25221.9564	300,662
Clothes, leather	0.02399	7218.71095	15886.72977	16353.88704	16576.658	15351.177	16226.40418	8022.7358	95,636
Woods, furniture	0.03355	10095.3628	22217.58165	22870.9008	23182.446	21468.6115	22692.6161	11219.791	133,747
Paper, printing	0.03193	9607.89665	21144.78039	21766.55328	22063.055	20431.9751	21596.87726	10678.0306	127,289
Petroleum, chemical	0.14158	42602.1299	93757.53234	96514.51968	97829.232	90596.9004	95762.16356	47347.1836	564,410
Nonmetal	0.13142	39544.9351	87029.34666	89588.48832	90808.854	84095.5266	88890.12244	43949.4764	523,907
First metal	0.12806	38533.8943	84804.27738	87297.98976	88487.155	81945.4659	86617.47892	42825.8252	510,512
Machinery	0.19648	59121.8144	130113.575	133939.6301	135764.14	125727.356	132895.5354	65706.8416	783,269
Other manufacturing	0.00404	1215.6562	2675.38092	2754.05184	2791.5673	2585.19196	2732.58328	1351.0568	16,105
Electricity, gas	0.03026	9105.3853	20038.86798	20628.12096	20909.115	19363.3437	20467.31932	10119.5492	120,632
Construction	1.01827	306402.534	674321.8142	694150.5859	703606.24	651589.955	688739.4991	340529.853	4,059,340
Whole and retail trade	0.06989	21030.2505	46282.76547	47643.73344	48292.732	44722.5411	47272.33798	23372.6138	278,617
Eating and lodging service	0.01079	3246.76495	7145.38617	7355.49984	7455.6958	6904.51021	7298.16178	3608.3918	43,014
Transportation, communication	0.06623	19928.9382	43859.02929	45148.72608	45763.738	42380.5108	44796.77986	22148.6366	264,026
Finance, insurance	0.19821	59642.3801	131259.2208	135118.9642	136959.54	126834.381	134065.6762	66285.3882	790,166
Governmental service	0.00194	583.7557	1284.71262	1322.49024	1340.5051	1241.40406	1312.18108	648.7748	7,734
Other service	0.04385	13194.6843	29038.47855	29892.3696	30299.561	28059.5712	29659.3507	14664.317	174,808
Nonclassified	0.0425	12788.4625	28144.4775	28972.08	29366.735	27195.7075	28746.235	14212.85	169,427
Total	2.33046	701244.057	1543277.59	1588658.443	1610299	1491252.62	1576274.432	779349.089	9,290,355

1: Source: The Input-output Table (1990), The Bank of Korea

Ratio of Incheon Employment to National Employment (1,000 persons)

	Nation	Incheon	Ratio
Agriculture, forestry, and fishing	3025	11	0.00364
Mining	60	0	0
Manufacturing	4768	357	0.07487
Construction	1652	72	0.04358
Wholesale, Retail trade and other ser	9461	397	0.04196
Total	18921	837	0.04424

Source: The Statistics of Employed persons (1992), The Korean Census Authority  
Incheon Statistics (1993), Incheon City

### Economic Impacts on Incheon

	Ratio	1993	1994	1995	1996	1997	1998	1999	Total
Agriculture, forestry, and fishing	0.003636	59.693582	131.3719	135.23496	137.07712	126.94327	134.18077	66.342293	790.8439
Mining	0	0	0	0	0	0	0	0	0
Manufacturing	0.074874	17268.539	38004.1	39121.63	39654.541	36722.956	38816.667	19191.921	228780.35
Construction	0.043584	13354.248	29389.642	30253.859	30665.974	28398.897	30018.022	14841.653	176922.3
Wholesale, Retail trade and other services	0.041962	5854.5643	12884.555	13263.432	13444.105	12450.208	13160.04	6506.6496	77563.555
Total	0.044237	36537.045	80409.67	82774.156	83901.698	77699.003	82128.91	40606.566	484057.05

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