



Working Paper Proceedings

Engineering Project Organization Conference

Cle Elum, Washington, USA

June 28-30, 2016

Decision Framework for Private Participation in Airport Development: The Case of Incheon International Airport in South Korea

Soh Young In, Stanford University, USA

Luiza Casemiro, Stanford University, USA

Julie Kim, Stanford University, USA

Proceedings Editors

Jessica Kaminsky, University of Washington and Vedran Zerjav, University College London



Decision Framework for Private Participation in Airport Development: The Case of Incheon International Airport in South Korea

Soh Young In¹, Luiza Casemiro², Julie Kim³

Abstract

The private sector has increasingly participated in operation and management of public airports. However, policymaking on airport development remains challenging because the properties of public airports as public goods often involve complex principal-agent problems. The government, as a principal, defines requirements to improve the airport's infrastructure and service levels, and the private sector, as an agent, is responsible to meet the requirements. Yet the objectives of the principal and agent are different and often conflict with each other; the private sector aims to maximize the economic profit while the public sector's primary goal is to maximize the social welfare. A public airport development policy should, therefore, align the interests of these two parties. This study proposes a policymaking framework to determine and execute the optimal policy for airport development. As the outcome of the new policy may be highly context-dependent, the present discussion focuses on a concrete case – the central airport of Korea, Incheon International Airport (IIA).

We identify six private participation structures. Each structure shifts ownership, risks and responsibilities of the airport business to different degrees and in varying modes. We find that public private partnership (PPP) is the least intrusive form to incorporate with private sectors, but precise risk and liability structure must be elaborated. With partial privatization, private sectors tend to commit more long-term while the public airport owner continues to be the airport sponsor. Nonetheless, policymakers should reduce future conflict between private-sector and public-sector owners by setting a clear, specified and long-term agenda. Ex-post regulation on some aspects of airport business should also be planned ahead in order for the government to maintain a limited control in providing public services. To legitimize the proposed policy, making it politically acceptable is important. In the case of IIA, the general public is primarily concerned about potential radical changes of public airport operation and the loss of domestic control over the public infrastructure to foreign investors. These concerns should be preemptively addressed during public decision-making process. Lastly, policymakers should evaluate the economic and social value that the new policy is expected to provide over the lifecycle of the asset. The expected outcome should be evaluated from the perspectives of both the public and private sectors.

Key words: airport development; public infrastructure ownership; public policy; public-private partnership; privatization

¹ Doctoral Student, Civil and Environmental Engineering, Stanford University, si2131@stanford.edu

² Stanford University, luizacasemiro@alumni.stanford.edu

³ Stanford University, mjuliekim@gmail.com

1. Introduction

Private participation in publicly owned airports has become a global trend. The Centre for Aviation (2015) reports that 40 of 100 largest airports around the world in terms of revenue are either fully or partially owned or controlled by private investors. Private sectors participate in managing and operating public airports through various schemes ranging from public-private partnership (PPP) to full privatization. London Heathrow Airport, for example, has been fully privatized and is now owned by an investor consortium led by Ferrovial S.A. The Danish government has divested its shares in Copenhagen Airport since 1994 and is currently holding a partial share. The government of India has developed and modernized its four major airports in Delhi, Mumbai, Bengaluru and Hyderabad on a PPP basis.

However, private participation in the airport sector remains highly controversial because public airports are public goods and often involved with complex principal-agent problems. First and foremost, policymakers should carefully consider whether there are incentives, or barriers, to promote private participation. They must understand both the technical constraints of the asset and institutional factors that may affect the policy outcome. Which ownership/governance structure would attract the private sector in the most efficient and politically acceptable manner should also be considered. Although many studies have examined various private participation structures from a contractual perspective, relatively few studies have addressed principal-agent conflict regarding airport development.

This study proposes an integrated public decision framework to determine and execute the optimal policy for airport development. Since the outcome of the new policy may be highly context-dependent, the present discussion focuses on one concrete case – the central airport of Korea, Incheon International Airport (IIA). It first identifies the core issues regarding IIA's management and operation, as well as critical institutional factors that are likely to affect the value of the chosen policy. The study discusses how to formulate a quality-enhancing policy to involve private sectors and assesses the benefit and risk the chosen policy would bring into the development of IIA. It specifically focuses on two options: PPP and partial privatization through share floatation. The discussion also considers how the government regulates a company once the new ownership and governance are implemented when the government wants to maintain a limited control on airport business. The study reviews Korea's previous privatization plan on IIA and discusses how a policy proposal should be legitimized. Lastly, the study recommends key considerations in implementing a new policy and discusses how to project and evaluate the outcome of the policy.

The objective of this study is to assist policy makers around the world in structuring the public decision making process and managing various stakeholders. It may also provide a valuable resource for private investors to assess investment decisions, prepare proposals and raise awareness of relevant matters of analysis.

2. Private Participation in the Airport Sector

Private investors have a vast interest in the airport sector for its revenue security, limited competition and steady growth of air transport. Airports are a unique asset class for private investment. Historical data shows that airports have reported a moderate degree of cash flow certainty and greater potential for growth than other traditional infrastructure assets (Radia, 2013). Such revenue security has become robust because airports face limited competition both from other airports and from other modes of transportation. Recently, private interest has been further accelerated with deregulation and the establishment of “open skies” agreements among countries, which have boosted air transport and its revenues (Silva, 1999). The growing presence of the private sector has shifted the airport business to become more revenue-driven. Gillen (2011) observed that the modern airport business model puts an increased importance on non-aeronautical activities. As a result, the use of airports has become a lot more diverse; many public airports have transitioned from public utilities to multi-product firms that deliver airside, retail and other ancillary services.

The transition may also bring advantages to the public sector because the government can utilize private capital and capacities to improve and develop public airports. Private airports tend to have the advantage of charging efficient prices and responding to market incentives for capacity expansions (Craig, 1996). Oum (2008) shows a statistical analysis of 109 airports worldwide with a variety of ownership forms and finds that airports with private ownership are more efficient than those with traditional public ownership. Moreover, private participation can increase government access to sources of private capital and therefore unburden the public budget for airport development (Tang, 2016).

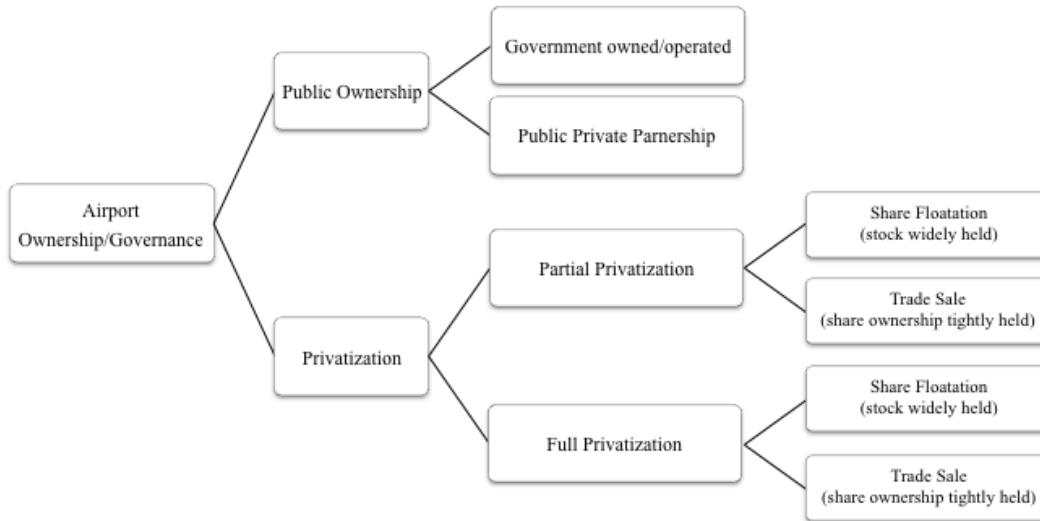
Six broad categories of private participation structures can be identified (see Figure 1). Gillen (2011) categorizes ownership/governance structures of airport business by degree and mode of airport ownership from public to private. Based on his findings, we illustrate six available policy options, which include (1) maintaining the 100 percent public ownership, (2) selling part of its shares and (3) shifting to a privatized holding company structure.⁴ Each option is sub-categorized into two groups depending on how and through what channel the private sector is involved. Once private sector involvement is thought, the next decision to make is whether this involvement should come from concession (PPP) or from privatization by transferring shares. If the PPP option is chosen, its precise risk and liability structure must be elaborated. On the other hand, if privatization is chosen, the government must decide whether this privatization is to be undertaken through share floatation or trade sale, and how much of the asset is to be sold. That is, the government may choose to give up to 100 percent of the asset (full privatization) or keep a percentage of the asset ownership (partial privatization).

Policymakers chose private participation, whether PPP or privatization, over traditional public procurement primarily because they expect to use private capacity and/or capital to improve and develop public airports. One of the largest problems facing governments is the low quality and reliability of infrastructure assets and services. Many countries have budget constraints that limit

⁴ Gillen (2011) in his original study has seven categories. But we exclude the “independent not-for-profit corporation” option in our discussion because the Korean government does not consider this option in the case of IIAC case. Gillen also mentions that the excluded model has not been observed elsewhere except Canada.

their available capital for maintaining a high quality of service in these areas. Furthermore, poor planning and coordination, corruption, and inefficient project selection can also hinder the efficacy of public procurement. Limited resources are often spent on unsuitable projects that have high costs and low efficiency.

Figure 1. Decision tree



Because airports are considered to be public goods, airport business, like other public infrastructure, is likely to exhibit economies of scale, possibly leading to natural monopolies and limited competition. At the same time, some airport business may be socially desirable but not privately profitable (Henckel, 2010). Thus, it is typically difficult to align the private and public sectors with two contrasting goals: maximizing profit and protecting social welfare. To reframe this misalignment into principal-agent theory, the government plays the role of “principal”, defining the necessary specifications to improve the airport’s infrastructure and service levels, whereas the private partner plays the role of “agent”, responsible for the delivery of service and acts according to the provided guidelines.

In this process, government requirements should be held at an acceptable level to balance the interests of the two parties. Some airport privatization cases turn out to be not so successful as expected because the government regulations misplace the incentives. Unregulated commercial-oriented airport owners, on the other hand, are likely to overcharge for externalities and cause large inefficiency and social deadweight losses (Basso, 2008). But there is no clear-cut answer to how and by whom the public airport should be owned and operated. Airport development tends to be more politically sensitive and attract high attention from general public. If a new policy on airport encounters some setbacks, for instance, the wide public attention can damage the airport’s reputation and responsible politicians may have to pay the cost in the next election (Morgan, 2013).

Different private participation structures involve different degrees of control and risk transfer from public to private sectors. The terms PPP and privatization, for instance, are sometime used interchangeably, but they have very different implications. Most importantly, privatization involves the transfer of total or partial ownership from the public to the private sector and the

delivery of what are traditionally considered “public goods” or “public services” by the private sector, while the public sector retains only a regulatory role. On the other hand, PPP contracts bring private operators and/or service providers varying on contract duration, but the government makes key managerial decisions because it holds the full ownership along with its risk and obligations.

Each structure has its own pros and cons and can be suitable to achieve some of the objectives of private participation. The outcome of a particular form of private participation may be subject to special sectorial characteristics and technological development, legal and regulatory regimes, and public and political perception about the services in a sector provides (United Nation 2008). Hence simply benchmarking an accredited option to one airport or country cannot guarantee success in other places. For instance, airport privatization has been less popular in the United States than in Europe and Canada because major airports in Europe and Canada are mostly owned by national governments, whereas most airports in the US are owned by local or state governments. The airport owners in the US are less likely to have financial incentives from involving private investors because their borrowing cost with the tax-favored status is low enough to maintain public ownership (Tang 2016).

3. Issue Identification

3.1. Overview on Incheon International Airport

Incheon International Airport (IIA) is a relevant example that has generated considerable controversy. It is the central airport of South Korea and it is owned and operated by Incheon Airport International Corporation (IIAC), whose shares are 100 percent owned by the Korean Government. In 2014, IIAC’s asset is valued USD 7.5 billion and it paid a dividend of USD 126 million to its owner, the government. Its service quality has been highly ranked by a number of international associations; the Airports Council International (ACI) has consecutively nominated IIA for the best airport service provider since 2005 up to 2015.⁵ For the long-term growth of IIAC, the government is looking into enhancing global competitiveness as an Asian hub and securing the financial feasibility of upcoming expansion projects.

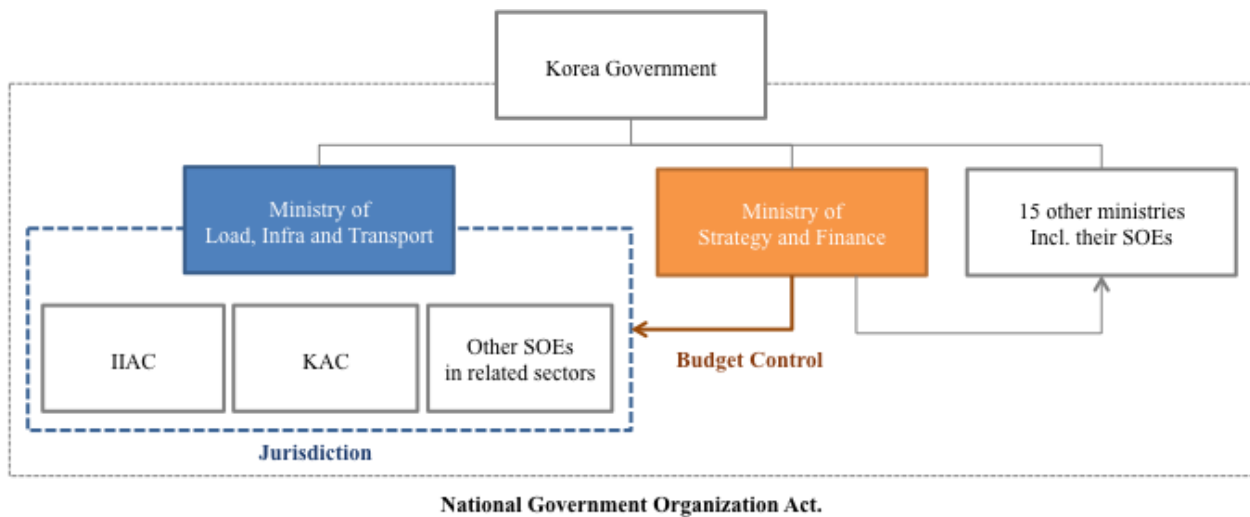
The airport began its operations in 2001, after it had become clear that Seoul’s Gimpo International Airport could no longer cope with the rising number of passengers and the increased freight demand after the Seoul Olympic of 1988. IIA is designed, built, financed and owned by IIAC. IIAC was established in 1999 under the Incheon International Airport Corporation Law, and it is an independent public authority that develops and manages airports and other related infrastructure

⁵ ACI, a non-profit organization based in Montreal, consists of 591 members operating 1,861 airports in 177 countries as of 2014 and is the only global trade representative of airports. ACI nominates Airport Service Quality Awards every year based on passenger satisfaction surveys and its evaluation is industry acceptable.

to increase global market competitiveness of IIA. For efficient management of airport facilities, IIAC also holds shares of Incheon Airport Energy Co., Ltd⁶ and Incheon Airport Fueling Co., Ltd⁷.

In Korea, two public authorities own all 15 public airports: IIAC and KAC. While IIA is a standalone, single asset of IIAC, the KAC owns, operates and manages all the other remaining public airports, including Gimpo, Gimhae and Jeju Airports. The government had initially planned to privatize IIAC, which explains in part why IIAC was created as an entity separate from KAC. Both authorities are under the jurisdiction of the Ministry of Land, Infrastructure and Transport (MOLIT) and under budget control of the Ministry of Strategy and Finance (MOSF) as shown in Figure 3. Competition among the 15 public airports and their major management decisions are strictly controlled by the national government. The minimum level of performance is secured by the state, but it also bears constraints on managing the organization, serving customers, employees and other stakeholders, and exploring new business opportunities.

Figure 3. National Government Organization Act



IIA has high potential to be an Asian hub. First, due to strained relations with North Korea, South Korea has become a de facto “island”, in the sense that ground transportation to other countries is nonexistent, making air transportation the utmost preferred way to leave the country over other modes of transportation. Second, IIA has a dominant monopolistic position in Korea, unlike competing airports like Kyoto Kansai and Tokyo Narita in Japan, or Shanghai and Beijing airports in China. Although the Gimpo International Airport services some international flights, it is extremely limited to short route flights to neighboring Asian nations. In addition, it is located in Incheon city, 30 miles west of Seoul, and is a convenient commute to downtown Seoul via either Incheon International Airport Railroad or Incheon International Airport Expressway.

⁶ Incheon Airport Energy Co., Ltd operates a combined heat power plant to provide energy services to IIA and its neighboring areas. As of 2014, IIAC holds 99 percent of its share and Asiana Airlines Inc. holds 1 percent.

⁷ Incheon International Airport Fuel Facilities Co., Ltd owns and operates a fueling facility and distributes fuel at IIA. 61.5 percent of its share is owned by Korea Airport Services Co., Ltd, a subsidiary of Korean Airline Co., Ltd., 34 percent by IIAC and 4.5 percent by GS Caltex.

As of 2014, IAC generated the revenue of USD 1.6 billion and net profit of USD 562 million, which translates to a 35 percent net profit margin.⁸ IAC's steady revenues stream has significantly lowered its debt-to-equity ratio down to 18 percent from 166 percent in 2001. It IAC's major source of income is rendering of services. About 90 percent of the total revenue comes from aeronautical activities (e.g. flight and passenger income) and non-aeronautical activities (e.g. commercial, rent and utilities income). Non-aeronautical activities are the most significant contributor to top-line growth; commercial facilities charges bring almost 50 percent of the total revenue.⁹ Aeronautical services are also important to IAC because commercial facilities revenues are highly correlated to passenger traffic volume. Thus, IAC focuses on broadening its customer base.

The total number of passengers of IIA has shown a stable growth trend except for occasional crisis periods, such as during 2008 and 2009. IIA currently operates as a main hub for the national airlines, Korean Airline and Asiana Airlines, and their subsidiaries. During the period from 2009 to 2014, the average annual growth of the passenger and cargo and aircraft traffics were 10 percent, 2 percent and 8 percent respectively. In 2014, the passenger traffic was 45.5 million, which has already exceeded its current capacity, 44 million.¹⁰

Out of the 45.5 million passengers, however, only 7 million were transfer passengers. The proportion of transfer passenger is relatively lower than the average of other international hub airports such as Frankfurt Airport and Schiphol Airport whose transfer rates are 40 percent and 42 percent respectively. The number of transfer passengers has increased by about 10 percent during 2001-2013, but IAC reported its first decrease in 2014; there was 6 percent decrease in the number of transfer passengers, and the share of transfer passengers (of total passengers) has dropped from 18.5 percent to 15.9 percent during 2013-2014. IAC reported two primary causes for the recent decrease. First, there has been an increase in the number of direct routes to other hub airports in China and Japan, taking business away from IIA. Second, two major domestic airlines focus more on origin and destination (O&D) services as O&D sale is more profitable for them. More passengers take direct flight to Korea, especially from China and Southeastern Asia.

IAC has scheduled two expansion projects that are planned to be executed by 2020. The current facilities have been completed by two initial construction phases; the first phase of construction took eight years to complete from 1992 to 2001, and the second phase was followed soon after. The government originally planned to complete IIA's construction in three phases, incrementally increasing airport capacity as the demand grew. However, the plan was changed to four phases after the airport was opened. The third phase is currently underway with scheduled completion by 2017. By completion of the fourth phase, an aggregate annual capacity is projected to be 100 million passengers and 11.4 million tons of cargo.¹¹

3.2. Challenges to IAC

⁸ Appendix I and II

⁹ Appendix III

¹⁰ Appendix IV

¹¹ Appendix V

IIAC currently confronts four major challenges. Three of them are directly related to the operation of the airport, which include (1) enhancing the operational efficiency of the current facilities until completion of the scheduled expansion; (2) completing two expansion projects on time and on budget; and (3) achieving market competitiveness as an Asian hub. The last and the most controversial challenge is mitigating a large disagreement among diverse stakeholders such as the national government (i.e. MOSF and MOLIT), national airport owners (i.e. IIAC and KAC), general public and potential investors.

IIAC is facing an urgent need to increase the operating capacity of existing facilities. IIA's passenger capacity has already reached its limit in 2014 and IIAC is experiencing saturation of facilities such as parking lots, check-in counters and passenger apron areas and congestion problems. Some improvements to upgrade airport facilities are currently undergoing, but there is still a great need to further increase the operational efficiency of existing facilities until the next phases of construction are completed. As an intermediate measure, IIAC aims to optimize slot usage, to rebalance traffics over peak and off-peak times and to promote SMART airport operations by using information and communications technology. However, the question is whether IIAC will be able to execute these operational transitions for optimal cost and time. Alternatively, IIAC can let some experienced private operators to take some of the landside operation. The contract can vary from simple outsourcing to contracting-out the concession. Korea policymakers should assess which structure would bring optimal outcome, while not losing government control over the airport business.

This brings to the second challenge, which is the expansion of the physical domain and its financing. The estimated cost for the two upcoming expansion projects is USD 9.9 billion, which is about 127 percent of corporation's total asset value. It is highly likely that IIAC may have to get debt financing from external sources. With a rough calculation, IIAC's retained earning in 2013 is USD 1.9 billion and the accumulated retained earning by 2020 is projected to be USD 7.8 billion with the same high growth rate 7 years from now. Yet it still falls short on USD 9.9 billion. However, the government and IIAC diverge on the financing strategy. The government, currently under tight budget constraints, is not looking into paying additional capital into IIAC. If IIAC self-finance the project, it may have problems in meeting short-term debt and contractual obligations (Korea Investors Service Rating 2014). As of 2013, USD 2 billion in liabilities are tied to the contractual maturities of financial liabilities and its current ratio has decreased from 0.54 to 0.32 due to a 328 percent increase in payables in this period. To compare with other international airports, Changi Airport Group's 2013 current ratio is 5.97, Beijing Capital International Airport reports 0.59 and Narita International Airport reports 0.46. Such financial prospects are one of the critical reasons why the government initially chose to raise funds by selling partial stakes. The government attempted to involve private investors' capital in order to finance two expansion projects and to infuse liquidity in the short term.

IIAC considers seriously about its low transfer rate. The number of transfer passengers is a direct indicator of IIA's competitiveness as an Asian hub. IIAC has already spent USD 20.7 billion to provide convenient services to passengers and airlines; USD 13.5 billion for the airport construction and USD 7.3 billion for facilitating transportations such as the airport railroad, the airport expressway and the Incheon Bridge. However, there are on-going public debates whether this investment is truly worthwhile, how much more investment would be additionally required for its success and whether these investments would have decent returns. Moreover, the

government has heavily intervened airside service pricing to attract airlines; it has regulated the fee like landing and terminal charges lower than other competitors. Some assert that IIA's low fee scheme should be sustained to keep global market competitiveness. But, its cost and benefit should be rigorously analyzed so that IIAC can facilitate reasonable pricing for its users.

High dependency on chaebols may hinder fair competition and affect IIA's hub competitiveness in long-run. Chaebols are the large, conglomerate family-controlled firms (e.g., Samsung, Hyundai) who own major business enterprises in Korea, including retail, national airlines and financial institutions. IIAC has strategic partnerships with large retailers owned by chaebols such as Lotte and Hotel Shilla, one of Samsung Group's subsidiaries, and their hotels and duty-free retail contribute to more than 10 percent of IIAC's revenues. Moreover, their financial subsidiaries, Lotte Capital Ltd. and Samsung Life Insurance, are the primary short-term debt providers to IIAC. Korean Air and Asiana Airlines are also owned by chaebols, Hanjin Group and Kumho Asiana Group respectively.

The last challenge is disagreement among stakeholders. Firstly, opinions of the government and IIAC differ on whether the income from IIAC should be reinvested for the development of IIAC. In 2014, more than 60 percent of IIAC's dividend payment to the government was used for government's railway and highway projects. According to the original version of the Act on Special Accounts for Traffic Facilities in Korea, the dividend payment of IIAC had to be reported and managed under the airport account. However, the amendment made on 2008 enabled the balance in the airport account can be transferred to accounts for railways and roads. At this point, MOSF and IIAC take different standpoints; MOSF argues that this profit reallocation is for the efficient public budgeting but IIAC wishes to have more investment be allocated to its own development. Also, two public airport authorities, IIAC and KAC, have a disagreement on nation's air traffic control system and its future. Both of them are under the jurisdiction of the MOLIT, which controls competition between them. As KAC is willing to increase its service to international routes so as to secure a stable and diversified revenue stream, KAC asserts that the competition should be integrated among all the 15 domestic airports. IIAC, on the other hand, insists on concentrating international traffics toward IIA for efficiency matters. In 2014, for instance, 11 regional airports, except Gimpo, Gimhae and Jeju airports, recorded net loss of USD 59 million.

In 2008, therefore, it announced to partially privatize IIAC by selling partial stakes of its shares to private investors. The government also expected to ease its fiscal burden from increasing public debt and to reuse the share sale income on other public transport sectors. The plan, however, drew negative responses from citizens, many of whom argue that private investors could hamper the airport's long-term value and put the nature of public service in jeopardy. We find that the public's resistance is mostly from radical change of airport's public service role and losing public's control over national gateway. This public concern together with four challenges that we have identified should be considered in the decision framework for private participation in public airport development.

4. Policy Formulation

4.1. Option One - Public Private Partnership

PPP is a long-term contractual arrangement between public and private partners. PPP differs from typical service contracting in that private sector usually makes substantial cash, at-risk, equity investment in the project. Instead, primary players create a separate entity (called as “special purpose company” or “SPC”) that performs design, development, construction, operation and/or financing under one single contract for a set number of years. At the end of the specified period, the facility is returned to public sector. This PPP structure introduces market mechanisms that appropriately assign resources and risks to relevant players.

Many international development agencies suggest PPP because it can promote transparency of public infrastructure procurement. The airport sector, for instance, often involves a number of issues such as land use, permits and environmental regulation where political advocacy plays a critical role. Thus arbitrariness of the public-sector owner may further be intensified. PPP structurally address this issue by removing the owner from acting as a middleman.

Governments often turn to PPP (1) when they have insufficient funds to allocate to starting a project or to improving an asset; or (2) when private operators have a higher capability to run the business so that they can save on the cost for the same performance improvement. PPP can help the government to overcome some of these challenges by injecting additional sources of funding and financing opportunities for infrastructure assets. There is, in general, a belief that private sector is always more efficient than the public sector, and, very often, the expected performance of privatized assets is higher than that of public assets. Private sector can also bring value drivers to infrastructure by helping to improve, for example, service delivery and maintenance as well as assist with the introduction of innovations (Oum, 2008). One of the reasons for this higher performance is the fact that the performance of PPPs is specified in terms of outputs rather than inputs, which fosters innovation. Engaging in a PPP also helps the government to diversify portions of risk away from themselves (e.g. construction risk, technology risk, operation risk) and instead towards the private sector.

There is a range of possible PPP agreements and the government can choose a gradual transition in partnering with the private sectors in different degrees and parts.¹² Thus, the private sector may be as minimally involved in a PPP structure as the government would wish. Moreover, although the private sector may be involved in building, operating, maintaining, financing, etc., the asset is still owned by the government under a PPP structure. The scope of private participation is limited and private sector companies may have less commitment and motivation in developing the airport in long-term perspective.

¹² Different nomenclature can also be used to distinguish different PPP contract structures. In some cases, PPPs are described by the functions transferred to the private party. For example, a ‘Design-Build-Finance-Operate-Maintain’, or DBFOM contract would allocate all those functions to the private party. Other nomenclatures such as ‘Build-Operate-Transfer’ focus rather on the legal ownership and control of the assets. (See World Bank’s Public-Private Partnership Reference Guide (2014))

4.2. Option Two - Partial Privatization through Share Floatation

Alternatively, the government may consider partial privatization through share floatation. Full privatization does entail complete transfer of ownership, along with its economic risks and management rights, to the new private owner. Through partial privatization, however, the public airport owner continues to be the airport sponsor. It means that the public owner still retains a portion of ownership, control and primary responsibilities of airport business and be able to promote the public interest (Ernico 2012). Some governments cling to holding the majority shares (51 percent or above) so that they can have a strong control of a company. There are two most common reasons that the government considers partial privatization. The first is to finance its expansion projects and thereby support its further growth. Recent governments lack capacities to finance high quality airport development because of their limited fiscal resources. Secondly, the public owner can enlist the market-oriented private sector in certain airport functions and facilities and improve their qualities while retaining primary responsibility and control over the airport. The partial transfer of ownership brings stronger commitment from private owners to improve the quality of infrastructure and services and maintain the airport business profitable under a regulatory framework. Compare to full privatization, partial privatization tend to have less implementation risk and regulatory dis-incentives and, therefore, less political objections.

Shares of public airport company are traded either publically or privately in the market, that is, through a public offering (or share floatation) and trade sale respectively. With share floatation, share capital of the airport company are issued and publicly traded to individual and institutional subscribers through the stock market. After IPO, the first sale of stock to the general public, shares trade freely in the open market and money passes between investors. A group of public investors who purchase the tradable shares will be the new owner of the privatized airport company. The advantage of the share floatation is that the government can tap into a wide range of investors and the raised capital goes directly to the government. A company selling common shares is never required to repay the capital to its public investors because it is the investors' risk to price and trade their shares. Once it is publicly listed, the company has flexible access to the capital market when it needs to raise funds for business purposes; it can be faster than raising corporate debts or bonds and large amounts of capital can be raised without rigorous financing terms. Moreover, the government can set some specific limitation on selling its shares such as limiting share occupancy so that it does not compete with dominant private owners, especially chaebol or foreign companies that could come in through trade sale. Additionally, as opposed to trade sale, share floatation can keep one or a few private owners from dominating the business.

On the other hand, public offering may disadvantage company's management. It may exhibit agency dilemma; managing interests of shareholders and management board may require higher costs and time while it is important to give some level of control to the corporate management. Moreover, the publicly traded company is obliged to disclose its financial and management information to the public, but public dissemination of information can be undesirably used by direct competitors and disturb the management board in embarking long-term planning.

4.3. Ex-post Regulation

During the public discussion about IIAC's privatization, how to maintain government's control on IIA management and how to secure the provision of its public services were critical points. Thus, the government should also specify ex-post regulatory framework, especially for aeronautical charges after implementation.

The government often controls airport's revenue through two types of regulation - single till and dual till schemes. Under single till, all of its aeronautical and non-aeronautical activities are taken into revenue control so profits from non-aeronautical activities are deducted from the revenue requirement for aeronautical services before determining the level of aeronautical charges. With dual till, on the other hand, the two activities are viewed separately and only the aeronautical activities are regulated. Dual till schemes recognize the elasticity of demand as a function of two activities' qualities is different. Thus, private owners can invest in and get profit of the unregulated revenue from commercial businesses of an airport.

Failure to deliver specified regulation may result price hike or unexpected expense. In practice, no public owner has ever fully dissociated from an airport's aeronautical operation. But it is also true that the privatized airports worldwide have revealed price increases at varying degrees. While private owners have higher incentives from raising prices thus the firm's revenue, the government wishes to stabilize the price. When interests of private owners and the government conflict, overwhelmed private owners sometimes request a compensation package for the potential loss due to government's reluctance to increase price. This may impose additional expenses to the government if the contract is unfavorably made to it.

Some governments maintain its minimum level of control by issuing a golden share of fully privatize airports so that public interests can be protected (Graham, 2013). The golden share is a nominal share that can outvote all other shareholders. The UK government's golden share in the British Airport Authority (BAA), for example, gives ministers the final say in any major business decisions and restricts investors to take more than 15 percent of the company's share.¹³

5. Policy Legitimatization

Once a policy proposal is formulated, the process comes down to legitimize the government policy decision. However, the previous privatization plan for IIAC failed to execute this phase. The government's proposal to privatize IIAC was halted due to strong nationwide opposition; a national poll in 2010 showed that 56 percent of citizens opposed IIAC privatization.

In 2008, the Korean government embarked on a grand privatization drive as a part of the *National Enterprise Advancement Plan* and announced a plan to sell stakes 27 SOEs, including the IIAC. The rationale was largely based on two premises; one was that privatization could relieve the government from the burden of financing public infrastructure and utilities, and the other is that privatization could improve their performance as private sector companies are often more efficient

¹³ However, it was ruled illegal in the European Court of Justice in 2003 as it entails restrictions on the movement of capital between the European Union's member states.

than the public sector. The amendment of the IIAC Law that was submitted to the National Assembly in 2009 proposed to sell 49 percent of the government's share of the airport to private companies. The essential part was that the government would maintain 51 percent ownership and foreign ownership would be capped at less than 30 percent.

There was a strong nationalist feeling toward ownership of the airport, and the majority of the public did not feel comfortable with what was viewed as "handing IIA over to foreign owners". Opposition parties and civil groups argued that a private operator would inevitably increase fees to boost profits, thus hindering citizens' access to what, in their view, should be a "public service". Domestics concerned that (1) national wealth would be drained once the airport was sold to foreign owners; (2) lack of government's capability in privatization could result in an undervalued sale; (3) airport fees might hike up; and (4) special favors potentially be granted to corrupted interest groups. However, the government did not adequately address these concerns, although the public needed to understand why the stake sale was considered necessary in order to accept it. Coincidentally, a speculation that the Australian financial group Macquarie was seeking to purchase shares of IIAC was leaked.

Those who proposed the amendment, argued that the airport privatization is a universal market phenomenon and that it enable to secure investment capital, to increase operation efficiency and to diversify funding sources. In particular, the expected outcomes were: (1) private partners would attract more airlines coming in and thus increase transfer rates; (2) efficient management by private partners would save operation cost and thus improve the revenue; (3) their advanced airport operation know-how would be acquired and improve the airport business in Korea; and (4) the revenue from the sale of the government's share could be re-invested to financing pending expansion projects.

There is another notable disagreement among public decision makers such as IIAC and MOSF because it is not clear that the additional capital would actually be reinvested in IIA itself, or would instead be directed toward other SOEs or towards servicing the government's debt obligations. Opponents concern that IIAC would lose its control in using its revenue, especially the revenue from privatization. On their view, there is no need to sell a share of the company to the private sector with the goal of raising funds for expansion plans. They believe that it is feasible to finance them by combining its retained earning and corporate debt with relatively low interest rate. However they expect that the funding would come from public financial institutions such as Korea Development Bank (KDB) and the Korean Exim Bank (Kexim), which are also under MOSF's budget control.

We have generalized three lessons to learn. Firstly, policymakers should have a clear objective and agenda when executing new policy. There are a number of variables that decision makers are willing to address but each policy can particularly address some of them. In case of partial privatization, for instance, the government would miss out a portion of dividend payment that is annually paid by IIAC to the government's account. In exchange, it would receive one-time proceeds from share sale. Policymakers should be consistent in evaluating and prioritizing expected outcomes. Secondly, policymakers should conduct a reasonable projection with considered option, which enables a clear understanding on tradeoffs for the new policy. The decision-making should be based on economic and social values that the new policy is expected to provide. The powerful projection comes from profound understanding of dynamics among

business performance, financial conditions, political factors and global market conditions. It should also include understanding general public's concerns.

6. Policy Implementation

6.1. Key Considerations in Implementing PPP

Many governments and policymakers presume that PPP is always a safe bet, but they should note that it also has a few limitations, particularly with risk allocation. Although, theoretically, risk should be distributed among public and private sectors, the asset itself is still owned by the government and so it may end up accepting greater fiscal risk or offering more financial guarantees under PPP structures than they had expected to. When PPP projects have unclear or unforeseen costs and be under financial distress, governments may have to step up financially to avoid service disruption. Governments may provide repayment of debt provided by commercial sources in case of default by the private party, for example. Thus, PPP often needs to be complemented by other measures in order to improve financial performance and discourage the possibility of political or personal gains from interference with project selection.

Moreover, choosing the right partner is important in implementing PPP. Most public owners do not have relevant experiences or skills in airport operation like private operators, but they have full risks and responsibility of their decisions. Thus, the success of PPP depends on how the partnership can meet mutual interests among public and private partners. IIAC may consider collaborating with international airport operators and/or domestic airlines that seek business expansion into airport operation. With the latter option, IIAC can bring strong domestic ties into the airport business. Korean Air, for example, considered entering the airport operation line of business, starting with its main hub, IIA.¹⁴

6.2. Key Considerations in Implementing Partial Privatization

The incentive misalignment between public and private owners can create pushback from the population. Many private owners put more attention to non-aeronautical business, which bring higher commercial revenue, but lower priority on aeronautical business, which however is more critical for public transportation functions. However, government's regulatory control plays a direct role in intervening airport management. Gillen (2006) demonstrates minimal de facto difference existing between the two partially private models through regulation and oversight, whether or not they have majority ownership. The government should create the political climate of local regulations and jurisdiction, which are acceptable not only for private entrepreneurship but also for public provision.

¹⁴ However, policymakers should also consider that IIAC's high dependency on chaebols, including two major national airlines, may counteract with the advantage from having national airlines as main concessionaire.

Determining dividend payment to the level that is acceptable to private sectors while maximizing the government's utility is also important. Under the full public ownership, the government arbitrarily sets the dividend pay-out ratio and the historical ratio has been extremely high compare to other private airports. The priority of the government stays in national level such as improving public budget condition whereas private owners have a specific focus on growth of IIAC. The public owner should set a reasonable dividend payment so as to prevent possible conflict between the government and future private owners of IIAC.

It is also important to use proceeds from the sale or lease of airport property only for airport development purposes. IIAC assert that the proceeds from selling its partial shares should be reinvested into IIAC development as per the original purpose of privatization. Share issuance may be an option in this case; it makes a direct transfer of ownership by issuing new shares in the company in exchange for paid-in capital contributions from the private investors. With this option, the newly raised capital from the private owners can be destined for capital improvement of the airport business.

Lastly, IIAC should promote a reasonable pricing for the airside business that can secure a stable and competitive projection of future revenue. The government, who strongly believes that lower fee is a critical driver for competitiveness, strictly manages IIAC's pricing scheme, but this may demotivate potential private owners to step in.

7. Further Discussions

In order to reduce potential conflict between private and public sectors, policymakers should set a clear and detailed agenda on airport development. It should particularly plan out how to balance between aeronautical and non-aeronautical businesses. As previously mentioned, private participation have transitioned the nature of the airport business to be more revenue-driven. Some privatized airports, like the Copenhagen Airport and the Frankfurt Airport, have achieved large-scale expansion in both complementary retail business and non-complementary business. However the direction or degree of transition may be against the government's wishes for its national airport. Having a specific agenda also include having well thought-out ex-post regulations. Private owners complain about excessive government control over airport management and unwarranted political interference in its operations. The government should clarify the range and objective of its regulatory control; for instance, to limit private owners from hiking prices on basic transportation services or abusing its monopolistic power.

Policymakers should precisely evaluate economic and social values of the new policy in both short-term and long-term. By privatizing IIAC for example, MOSF would trade off its full or partial future dividends from IIAC with an upfront proceeds from share sale. The assessment must compare the appropriately discounted NPV of future dividend payments from holding a portion of shares to the value of receiving proceeds of share sale today and relinquishing perpetual dividend payments. The social benefit from reinvesting them in public transportation sectors or other SOEs and/or repaying national debt should also be included in the evaluation criteria. In this regard, the value for money (VfM) analysis can be considered to evaluate the option that would maximize the

public benefit with the resources available. The term *value for money* refers to “the optimum combination of life-cycle costs and quality (or fitness for purpose) of a good or service to meet the user’s requirement.” In the infrastructure sector, public sector project sponsors use quantitative and qualitative methodologies to evaluate and select optimal procurement models (US Department of Transportation, 2012). VfM is a frequently used decision-making tool in the industry – especially because the government can quantify the value of risk transfer over lifecycle of the project and address it in public budgeting. It is also important to evaluate the value of IIAC in the eyes of potential investors. If the price is too high, the government may fail to attract highly-qualified private owners, but, if the price is too low, the government may lose potential income that it could otherwise have been accruing. The most common asset pricing tool is Capital Asset Pricing Model (CAPM).

In execution of new policy, it is critical to communicate with general public and minimize political resistance. From IIAC’s case, we find that the public’s resistance is mostly from radical change of airport’s public service role and losing control to foreign capital. Similar resistance is often observed when privatizing public airports in developing countries such as India. To this, enticing national elements may be an option – such as using public pension fund as financing source for airport development and/or contracting with domestic enterprises like national airlines. The government of New Zealand, for example, has publically listed the Auckland International Airport on the stock market through an IPO in 1998. During the sale, the government oversaw and promoted 80% of share is owned by New Zealanders. As a result, privatization of the public airport was well received by the general public and the loyal shareholders provided a sustainable base for the company and strengthened its overall investor perception (Sharma and In, 2016).

Lastly, policymakers should strategically plan airport expansion based on reliable traffic forecasts. The current IIAC expansion plan is based on assumption that the total number of passengers is to be doubled up soon after 2020, the completion of Phase 4. Despite its increasing trend of passengers and flights, IIAC should understand possible limitations on its future growth. For instance, there is the growing competition among other hub airports in Asia and IIAC’s location being adjacent to North Korea may **weaken its competitiveness**. Airports in the Asia region, such as Tokyo Narita, Shanghai Pudong and Hong Kong International airports, are also expanding and competing for a larger market share, especially for the status of the most important regional hub. There is a sufficient demand to meet the additional capacity from Phase 3, but it is still unclear that the capacity of 100 million passengers is necessary. This adds up to the question about the necessity and timing of the fourth phase expansion, which is scheduled to start right after the completion of Phase 3, and also of private capital involvement.

8. Conclusion

Public decision-making for airport development should address technical, operational, managerial, financial and political perspectives. The most challenging task for policymakers is stakeholder management because airport business is often associated with principal-agent problems and there are no clear-cut answers. Policymakers are required to choose and execute the policy that is considered to maximize the benefit of the public airport. However, public and private sectors tend

to have divergent opinions on what “the benefit” is. Policymakers should create enough incentives for key stakeholders to support the policy. Or, at least, potential barriers should be minimized and neutralized towards the chosen option.

In this study, we discuss six distinctive ownership/governance structures. We find that a public private partnership (PPP) is the least intrusive form to incorporate with private sectors but a precise risk and liability structure must be elaborated. With partial privatization, private sectors tend to commit more long-term while the public airport owner continues to be the airport sponsor. However policymakers should set a clear and detailed agenda with a longer provision so that the new policy can minimize risks and costs from interest misalignment. We also highlight the importance of an ex-post regulatory framework that may enable the government to hold a desirable level of control after the new policy.

The study emphasizes that private participation should be politically acceptable. Public opinion should be assessed and preemptively addressed in public decision-making. In the case of IIAC, we find that the primary concerns of the general public are potential radical changes and excessive control from foreign capital on operation of airports. We suggest maintaining a strong level of domestic control with the use of domestic capital and/or partnership with domestic enterprises. Phased recapitalization may also be an option to alleviate public concern. For example, the government can adopt PPP in the limited scope and progress to partial privatization.

Lastly, a reliable evaluation of the economic and social values of the chosen policy is critical for the success of public decision-making. Because private and public sectors have different evaluation criteria, changing the ownership/governance structure of public airports may generate a considerable trade-off of costs and benefits. Thus, policymakers must understand the perspectives of both the public and private sectors so that the chosen public decision can meet the original objective.

8. Bibliography

- Asia Development Bank, "State-owned Enterprise Reform", Pacific Private Sector Policy Brief. Issue No. 1. 2008.
- Ballati, Deborah, *Privatizing governmental functions*, Law Journal Press, 2001.
- Basso, Leonardo J, "Airport deregulation: Effects on pricing and capacity", *International Journal of Industrial Organization* 26, no. 4: 1015-1031, 2008.
- Centre for Aviation (CAPA), "The outlook for airport privatisation and financing, Part 2: CAPA now tracking 475 airport investors", 2013.
- Centre for Aviation (CAPA), "CAPA Airport Finance and Privatisation Review 2014/15; Emerging Markets Attract Investor Interest", 2015.
- Chua, Jeffrey, Dinesh Khanna, Hean Ho Loh, "A Win-Win Approach to Regulating Public-Private Partnerships", Boston Consulting Group, 2012.
- Craig, E.D., "The Benefits and Costs of Airport Privatization", in *Privatizing Transportation Systems*, Hakim, S., Seidenstat P. and Bowman, G. eds, Praeger Publishers, Westport US. 87-96, 1996.
- DiNitto, Diana M., and David H. Johnson, *Social welfare: Politics and public policy*. Pearson, 2015.
- Elliott, Dan, "Setting Airport Regulated Charges: The Choice between Single-till and Dual-till." *Frontier Economics*, 2015.
- Ernico, Sheri, *Considering and Evaluating Airport Privatization*. Vol. 66. Transportation Research Board, 2012.
- Forsyth, Peter, Hans-Martin Niemeier, and F. H. Bremen, "Submission to Productivity Commission Inquiry: The Economic Regulation of Airport Services", 2011.
- Gillen, David, and Hans-Martin Niemeier. "Airport economic, policy and management: The European Union." In *Comparative Political Economy and Infrastructure Performance: The Case of Airports Conference*, Madrid, 2006.
- Gillen, David, "Airport governance and regulation: three decades of aviation system reform", *Chapters*, 2011.
- Graham, Anne. *Managing Airports 4th Edition: An International Perspective*. Routledge, 2013.
- Hakim, Simon, Paul Seidenstat, and Gary W. Bowman, eds. *Privatizing transportation systems*. Greenwood Publishing Group, 1996.
- Henckel, Timo, and Warwick McKibbin, "The Economics of Infrastructure in a Globalized World: Issues, Lessons and Future Challenges", The Brookings Institution, Washington DC, 2010.
- Holden, Paul, "Pacific Private Sector Development Initiative: Progress Report 2013-2014", 2014.

- Hwang, Sang-kyu and Kim, Gunyoung, *50 Praxes for Better Transport in Korea*. Korea Transport Institute, 2014.
- Incheon International Airport, “2014 Airport Traffic Report”, 2014.
- Incheon International Airport, "Incheon International Airport Corporation and Its Subsidiaries Consolidated Financial Statements for the Years Ended December 31, 2013 and 2012." N.p., 2014. Web. 9 Apr. 2015.
- International Civil Aviation Organization, “Ownership, Organization and Regulatory Practices of Airports and Air Navigation Services Providers, 2007”, 2008.
- Korea Investors Service Rating, “Rating Report: Incheon International Airport Corporation, December 29, 2014.” Korea Investors Service Inc. 2014.
- Low, Alicia, “What makes airports more attractive than the airlines?”, Schroder Investment Management Australia Limited, 2013.
- Malavolti, Estelle, "Single till or dual till at airports: a two-sided market analysis", In *WCTR 2010, 12th World Conference on Transport Research*, 2010.
- Morgan, Anthony, “When Airport Projects Fly Off Course,” *The “New Normal” For Airport Investment*, PwC, 2013.
- Oum, Tae H., Jia Yan, and Chunyan Yu, "Ownership forms matter for airport efficiency: A stochastic frontier investigation of worldwide airports", *Journal of Urban Economics* 64, no. 2: 422-435, 2008.
- Park, Jin Woo, Kee-Woong Kim, Hae-Jong Seo, and Hong-Woo Shin, "The privatization of Korea’s Incheon international airport", *Journal of Air Transport Management* 17, no. 4: 233-236, 2011.
- Posner, Paul L., Shin Kue Ryu, and Ann Tkachenko, "Public-private partnerships: The relevance of budgeting", *OECD Journal on Budgeting* 9, no. 1: 1-26, 2009.
- Radia, Romil, Constantinos Orphanides and Robert Behan, “Has the trend line shifted? The impact on airport valuations”, PwC, 2013.
- Sharma, Rajiv and Soh Young In, “Infrastructure: an emerging asset class for institutional investors”, Global Project Center Working Paper, Stanford University, 2016.
- Silva, Gisele F., “Private Participation in the Airport Sector: Recent Trends”, The World Bank, 1999.
- Tang, Rachel Y., “Airport Privatization: Issues and Options for Congress”, Congressional Research Services, 2016.
- US Department of Transportation: Innovative Program Delivery, *Value For Money Assessment For Public-Private Partnerships: A Primer*, 1st ed., 2012.
- Villard, Philippe, and Julián De La Cámara, "Case Studies on Commercialization, Privatization and Economic Oversight of Airports and Air Navigation Services Providers—A tool for policy-

makers, policy analysts and practitioners 1", *Journal of Airport Management* 6, no. 2: 133-140, 2012.

World Bank Group Public-Private Partnerships, "Public Private Partnership: Reference Guide Version 2.0", World Bank Group, Washington, DC, 2014.

Yeo, Hyung-Koo. "Public-Private Partnership in IIA Project". Ministry of Construction and Transportation, Korea, 2004.

Appendix

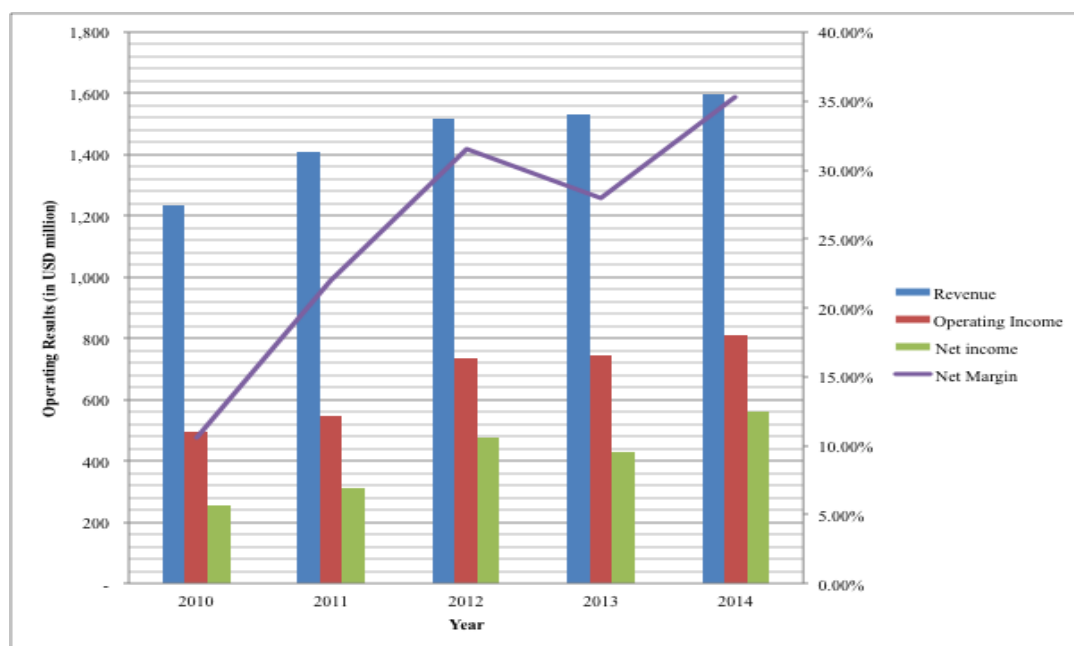
I. IIAC's Financial Analysis

Year	2010	2011	2012	2013	2014
Financial Status					
Asset	7,124	7,071	7,228	7,118	7,467
Liability	3,080	2,779	2,526	2,097	2,008
Equity	4,044	4,292	4,702	5,020	5,458
Current Asset	179	298	342	214	213
Current Liability	630	1,003	633	660	1,290
Current Ratio	28.5%	29.7%	54.0%	32.4%	16.5%
Operating Results					
Revenue	1,236	1,408	1,517	1,533	1,595
Operating Income	494	546	736	746	809
Net income	254	310	478	429	562
ROA	3.56%	4.38%	6.61%	6.03%	7.53%
ROE	6.27%	7.22%	10.16%	8.55%	10.30%
Net Margin	20.53%	22.02%	31.51%	28.00%	35.25%
Operating Margin	39.96%	38.81%	48.51%	48.67%	50.73%
Stability					
Debts	2,131	1,780	1,521	1,104	957
Debt-to-Equity	52.69%	41.47%	32.35%	21.99%	17.52%
Dividend Payment					
Dividend Payment	44	62	69	113	126

Unit: USD million, Exchange rate: KRW1,100/USD1

Source: IIAC annual reports 2010-2014

II. IIAC Operating Results

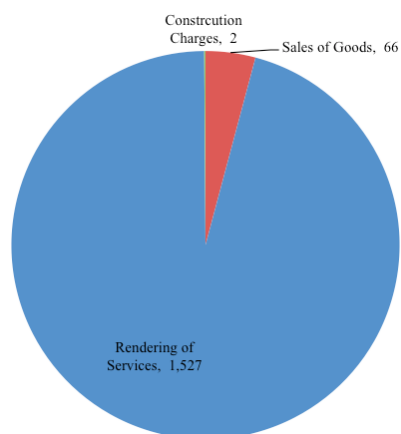


Source: IIAC annual reports 2010-2014

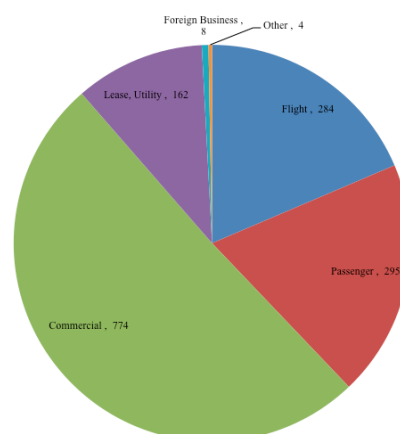
III. IIAC Revenue Breakdown

Year	2012	2013	2014
Revenue from Sales of Goods	94	77	66
Revenue from Rendering of Services	1,422	1,456	1,527
Flight Revenue	276	270	284
Passenger Revenue	250	264	295
Commercial Revenue	736	747	774
Lease, Utility Revenue	149	165	162
Foreign Business Revenue	7	5	8
Other Revenue	4	4	4
Revenue from Construction Charges	-	4	2
Total Revenue	1,517	1,537	1,595

Revenue Breakdown by Sources

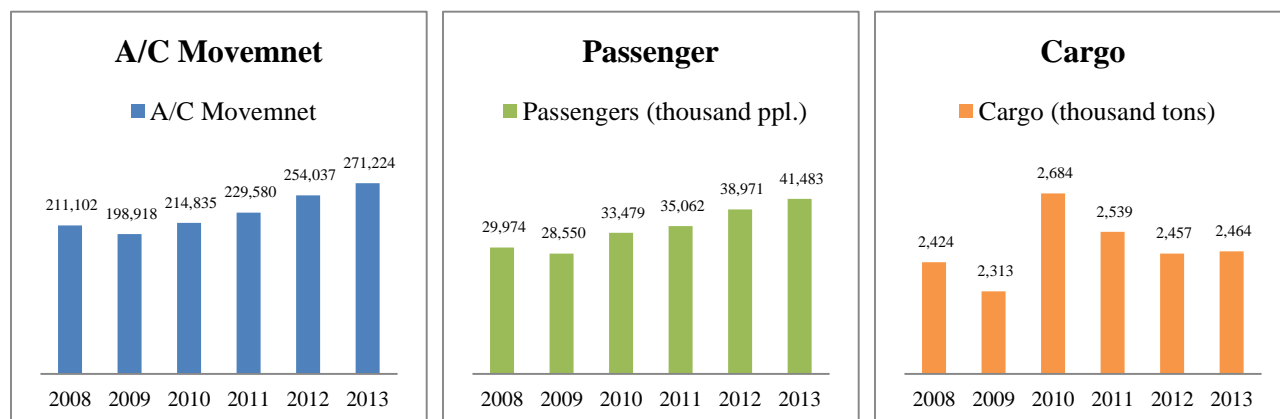


Components of Revenue from Rendering of Services



As of 2014, USD million
Source: IIAC annual report 2014

IV. IIAC Airport Traffic Report



Source: IIAC Airport Traffic Report 2013

V. Incheon International Airport Expansion Plan in Four Phases

	Phase 1	Phase 2	Aggregate	Phase 3	Phase 4	Aggregate
Construction Period	1992-2001	2002-2008		2014-2017	2018-2020	
Total Cost (US billion)	6.2	4.2	10.4	4.9*	5.0*	20.3*
Airport Capacity (per year)						
Flights (thousand)	---		---		-----	---
Passenger (million)	30	14	44	18	38**	100
Cargo (million tons)	4.5	-	4.5	1.3	5.6**	11.4

* estimated by IIAC

** master plan for the fourth phase is currently under-going

Source: IIAC website (<http://www.airport.kr>)