

What kind of aviation infrastructure privatization is needed in China?

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Abstract—Aviation infrastructures used to be considered critical to national security and public interest. They were also considered natural monopolies. Consequently, it was believed that government or public entities should be responsible for the ownership and management of aviation infrastructures. However, since the late 1970s, commercialization and privatization began to become increasingly widespread in airports. This paper will investigate underlying rationales for the introduction of private sector participation in aviation infrastructures, be it in terms of privatization or in terms of delegated management, and all this both in the cases of China's and developed economies' airports and air traffic management. It is argued that partial privatization may be much more appropriate in the case of China's aviation infrastructure sector.

Keywords- aviation infrastructure; privatization; china

I. INTRODUCTION

Air transportation is a fast growing sector and is forecasted to keep on growing in the future. Airbus (2009) suggests that overall world passenger traffic is expected to increase by 4.7% per annum and the numbers of frequencies offered on passenger routes will more than double during 2009-2028. This also means that more flights and aircrafts are needed so as to accommodate those increases. But one critical problem for the aviation industry lies in the fact whether sufficient and qualified infrastructure services could be provided so as to accommodate those increases. Nowadays, most of the aviation infrastructures, i.e., airport and air traffic management (ATM), are provided by government or some other public entities. And there exist controversies in many countries about how to operate and develop these infrastructure services (Button and McDougall 2006).

II. REGULATIONS IN AVIATION INFRASTRUCTURE SECTORS: RATIONALES AND PRACTICES

Although most industries are regulated to varying degrees, few of them are regulated as heavily as the aviation industry (Vasigh, Tacker et al. 2008). This is especially the case for the infrastructure aspect of the industry. Aviation infrastructures used to be managed by governments or public organizations around world. There are several rationales in favor of public management of aviation infrastructures.

A. Theory of natural monopoly

According to natural monopoly theory, industries with such characteristics would enjoy the benefit of economies of scale, scope and density (Chen, Tan et al. 2004). Hence, it is economically efficient that only one firm exists in the market. It is believed that both the airport and ATM segments are natural monopolies, in which only one service provided is required for the optimal economic efficiency. More providers can only increase average costs for services provided. Hence, monopolistic airport and ATM service provision is optimal so as to achieve lowest service cost.

B. Public interest consideration

As for monopolistic markets, one is generally worried about the possibility of monopolistic firm's abuse of market power. It is believed that, compared with private firms which set profit maximization as their ultimate objective, public organization would take more responsibility as to public interests. Especially referring to the aviation industry, it is argued that simply emphasizing business practices could cause damage to certain public interests. For example, if airports allocated their slots simply based on profit maximization considerations, regional carriers and general aviation users would find it difficult to compete with network legacy carriers and would lose many slots allocated to them. Hence, it is argued that public organizations would better consider public interests.

C. Worries about service quality and safety standards after privatization

One incentive for privatization lies in the fact that cost optimization associated with privatization could reduce production cost and make organizational operation more efficient. But referring to the aviation industry, as safety is the most important factor for the sustainability of the industry, there exist worries that cost reduction introduced by privatization would cause a lowering of service quality and safety standards (Donohue 1999).

Based on such considerations, government tends to use public service providers to operator airports and/or ATM infrastructures and supply services herewith. As to airports, it

used to be government or some other public entity that provided airport services. A survey conducted by ICAO in 1999 shows that “the large majority of airports remain under government or public ownership either wholly or through a majority holding” (World Trade Organization 2006, p.91), although airport privatization became much more popular in the sector.

ATM service has a much higher tradition of being managed by government or public entities. Up to now, there is only limited privatization (or as commonly labeled as “commercialization”) in this regard. Except for the rationale for natural monopolies, proponents of privatization also argue that air traffic management is critically important for overall system safety and that a private party would sacrifice ATM safety standards for profitability.

III. PRIVATIZATION DEVELOPMENTS IN AVIATION INFRASTRUCTURES

Since the late 1970s when deregulation began in the aviation industry, there are more and more cases of airports and/or air traffic management organizations privatization or at least conversion into businesslike organization. But the term privatization remains ambiguous. Vickers (2008) suggests that, “privatization is the transfer from government to private parties of the ownership of firms”. Even though in aviation infrastructures this definition seems quite unrealistic, U.K. style airport privatization follows this very idea. The majority of airport privatization only takes forms of partial privatization or even of no ownership transfer. For example, in the case of the U.S. airports, there are few examples in which government or other public entities try to sell their airport ownership to private parties. As for the ATM sector, there exists no full privatization at all. Therefore, it is much more realistic to define aviation infrastructure privatization from a board sense and abandon the effort to simply base aviation infrastructure privatization on ownership structure. In this paper, it is suggested that aviation infrastructure privatization should be considered as the transfer of some degree of control from government to private or businesslike entities.

With the development of economic theories and industry practices, it is argued that the past understanding of a natural monopoly may not be appropriate. Some economists argue that past entry regulation for natural monopoly industry is not necessary, as potential competitors could help to increase economic efficiency of the incumbent supplier (Chen, Tan et al. 2004). Especially there exists significant space for competition in the airport segment. It can be seen that some airport services like catering and ground-handling services, lift of entry limitation always lower charges concerned and increase the service quality provided. This was also the rationale for the EU’s initiatives to reform its ground-handling market since 1993.

Another incentive for aviation infrastructure privatization lies in the soaring demand for air service, which also increases the demands for aviation infrastructure services significantly. Confronted with fast increasing air service demand, governments or public organizations responsible for airports and air traffic management find that they lack the flexibility to

generate sufficient revenue needed for aviation infrastructure improvement. As there exist complicated regulation and procedures regarding to public expenditure, investment in aviation infrastructure always lags behind industry demand. For example, there are several independent commissions report that the infrastructure for air traffic management in US is deteriorating and has an inadequate source of capital funds needed to modernize (Donohue 1999). Also, congestion in many hub airports simply implies that more efficient ATM services, together with airport services, are needed for the sustainable operation of the airline industry. All those theoretical and practical developments are incentives for privatizing aviation infrastructures.

Up to now, most of the aviation infrastructure privatization cases happen in the airport segment. The benchmark for airport privatization is the U.K. model. Driven by the Thatcher government’s national privatization campaign, the Airports Act was passed in 1986. Under this act, the U.K. government transformed the British Airport Authority into the private BAA plc and all other airports with a turnover of more than £1 million were required to be corporatized. By 2007, all main airports in the U.K. (except the Manchester airport group) were transferred to private ownership and most are 100% privately held (Graham 2008). Since the late 1990s, Australia and New Zealand have also changed the ownership of their major airports to private ownership, a move similar to that of the U.K. (Forsyth 2008).

While in the airport segment, U.K. style full airport privatization is quite radical for most countries, even US and other European countries do not follow this full privatization strategy. U.S. airports are primarily publicly owned and belong to local governments. The US privatization approach has been quite different from the dominant privatization doctrine, as there were generally no ownership transfers to private entities. Neufville and Odoni (2003) argue that U.S. airports can nevertheless be considered to be the “most privatized airports”, as airport operators extensively outsource most of their airport business and operational functions to private entities. Also, many airports in Europe are still owned by national, state, or local government. However, and although there was no full airport privatization like in the U.K., the governance structure and business orientation of several public European airports has been changed and become more profit oriented (Gillen and Niemeier 2008).

Airport privatization is also prevailing in many developing countries. Those countries have followed a proactive, yet cautious approach when transferring airport ownership to private entities. From 1990-2008, 47 developing countries introduced private participation programs granting 132 airport programs. Latin America and the Caribbean countries were the pioneers of airport privatization among these countries (World Bank 2009). Concessions were the predominant type of airport privatization in Latin America. For instance, in 1998 the Argentine government transferred 33 of the country’s total 59 airports to private Aeropuertos Argentina 2000 for the duration of 30 years, with the total investment amounting to 2.2 billion US\$ (Lipovich 2008).

Compared with the airport segment, the privatization efforts in ATM occurred much later and was more limited. Up to now, there is not even though any example of full privatization in this segment. Even there are no cases of ATM privatization, there exist a variety of institutional arrangement, including U.K.'s public private partnership arrangement, Canada's "not for profit" private corporation, together with other countries' government corporation or "not for profit" joint-stock corporation (Goodliffe 2002; Button and McDougall 2006). Due to the difficult of quantitative measurement of ATM performance and different standards applied in different system, it is difficult to measure efficiency improvements after the introduction of those institutional changes in the ATM sector. But Button and McDougall (2006) suggests that some commercialized ATM provider reduced their cost per instrument flight rules movement on average by about 15% during 1997-2004, while state-owned FAA had an increase of 23% in the same period¹. They also indicate that ATM providers become more responsive to user demands. Another research done by the US General Accounting Office (GAO) suggests that data from the five air navigation service providers indicate that since commercialization, the safety of air navigation services has remained the same or improved (United States. Government Accountability Office 2005)

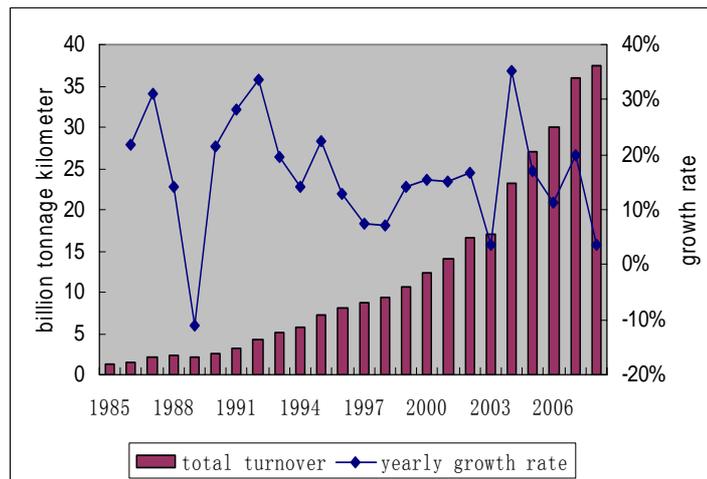
IV. DEVELOPMENTS IN CHINA'S AVIATION INFRASTRUCTURES

Due to the fast paced economic expansion, especially after 1992 when China began its transition from a planned economy to a market economy, the air transportation market has maintained a rapid growth pace. From figure 1 it can be seen that China's civil aviation market has sustained an average yearly growth rate of 16% during 1985 – 2008. According to International Civil Aviation Organization (ICAO)'s statistics, since 2005, China's total air transportation turnover (not including Hong Kong, Macau and Taiwan) has been ranked second only to that of the US. China's fast growing air transportation market places great pressure upon airport operators and air traffic management service providers (Civil Aviation Administration of China 2008).

With fast growing air service demands, the gaps between China's aviation infrastructure capacity and soaring air service demands also increase rapidly. In the late 1970s China had about 70 civil airports, and this number had increased to 152 by 2008 (Zheng, Lu et al. 2009). In the past three decades, about 80 new airports have been built and significant improvement projects have been introduced to the existing ones. Yet, for the world's second largest air transportation market, this figure still lags behind market demand and causes an inevitable bottleneck effect for the further development of China's civil aviation market. According to World Economic Forum's statistics, for all 133 countries surveyed, China's airport density is ranked 125 for 2009, while the quality of aviation infrastructure is ranked 74 for the 2008-2009 period (Schwab and Porter 2008).

¹ But Button and McDougall (2006) also indicate that some other commercialized ATM providers also had increased such costs of between 4% and 38%.

Figure 1 China's Air Transportation Market Development Pace (1985-2008)



Source: Civil Aviation Administration of China (2008).

The problem of China's ATM sector is even worse. Currently, the sole ATM service provider in China is the Air Traffic Management Bureau (ATMB) of the Civil Aviation Administration of China (CAAC). As a result of fast growing air service demand, ATMB finds that hub airports are reaching their capacity to handle aircraft landing and taking off. According to CAAC statistics, 17.52 – 26.11% flight delays in 2009 can be attributed to ATM reason (Civil Aviation Administration of China 2009)². Under these circumstance, CAAC has to set more restrictions so as to ease the serious flight delay problem. For example, CAAC set an official restriction for a daily slot ceiling in Beijing Capital Airport. The slot ceiling was originally set at 1,150 operations daily before July 2007, then it was reduced to 1,100 in July and was further reduced to 1,000 after late Oct 2007 (YU 2007). Besides, CAAC had to issue a ban that no new domestic airlines would be permitted to operate before 2010 so as to reduce pressure for airspace resources. But all these measures could only reduce the serious conditions for ATM temporarily, as it can not address the gap between fast growing demands and limited ATM capacity. New measures are badly needed so as to increase ATM efficiency and to accommodate fast growing air service demands.

As a result for above mentioned tensions, CAAC proposed that China's civil airports will amount to 190 by 2010 in the Outline of the Eleventh Five-Year (2006 – 2010) Plan for the civil aviation industry (Wang 2007). In 2008 CAAC published the master plan for China civil airports, where it was said that by 2020, China's civil airports would reach 244 (Civil Aviation Administration of China 2008). Also, government encourages the introduction of private entities in airport projects through a variety of regulation concerned. As to the ATM sector, CAAC tries to introduce significant institutional reform so as to increase the overall efficiency of China's ATM system. ATMB

² Those data are based on monthly statistics which mean that delays caused by ATM show significantly variation in different months of 2009

used to be a branch of CAAC which not only provides ATM service, but also plays a role as a regulator. In 2007, CAAC started the new round of reforms of the ATM segment. ATMB was transferred to a public institution which should operate in a business like manner. All the policy setting and regulatory function in the ATM area were transferred to the office of ATM affairs of CAAC. Another objective of the 2007 ATM reform is to integrate different levels of ATM services, as local ATM branches were used to be subordinates of local CAAC branches. After the 2007 reform, those local ATM branches were set as subordinates of ATMB and ATMB became an integrated ATM service provider across China. All those changes increase the autonomy of the ATM service provider and make it possible for ATMB to operate like a business organization.

V. CONSIDERATIONS FOR POSSIBLE PRIVATIZATION AS TO CHINA'S AVIATION INFRASTRUCTURES

It can be assumed that China's civil aviation market will still maintain its fast growth rate for quite a long time. But the capacity insufficiency of the aviation infrastructure will be the most obvious obstacle for this scenario. Obviously, that past government owned and operate model can no longer cope with developments in aviation market. Hence more commercialized and market oriented approaches are badly needed so as to improve operation performance of China's aviation infrastructure. That is the main reason why China wants to follow aviation infrastructure privatization approaches in developed economies. Also experience of China's past State Owned Enterprises (SOEs) reform can enlighten us in this regard, including following 3 recommendations for the Chinese aviation infrastructures:

A. *Privatization should be considered as an intermediary measure for improving aviation infrastructure performance, rather than as an ultimate objective.*

Ever since the introduction of economic reform in 1978, the reform of SOEs is a focus of policy makers. Partial privatization is also a widely applied approach, as many SOEs are changed into corporations and listed on stock exchanges (Aivazian, Ge et al. 2005; Chen, Firth et al. 2006). Some researches indicate that few years after a share issue privatization (SIP) program, there is a declining tendency in the profitability and performance for the privatized SOEs (Huang and Song 2005; Chen, Firth et al. 2006; Li, Moshirian et al. 2007). The privatization program itself is not necessary for the continuous improvement of operational performance. Especially some SOEs do not display well developed corporate governance structure during their privatization program. As for the aviation infrastructures, what really matters is to improve the performance of infrastructure services so as to accommodate soaring market demands. Privatization programs should not be treated as a one-off effort to generate capital needed for infrastructure investments.

B. *Necessary regulation is needed so as to curb market power of monopolistic service providers*

Even though new developments in economic theories indicate that potential entrants can place competitive pressure

upon the monopolistic firm in natural monopolies, one cannot deny the fact that firms concerned do enjoy certain extent of market power. Especially in China where generally there is only one airport in each city, the airport has significant market power. That is the reason why airports should be regulated even after the introduction of a privatization program. For ATM service, also it is true as more service providers are not feasible for this sector. After the introduction of a privatization program, it is still necessary to maintain a regulatory system so as to avoid market power abuses. Also, regulations are needed so as to maintain service quality and safety standards in airport and ATM services. But the regulatory framework should be adjusted so as to cope with privatization and interests of private partners. For example, currently CAAC sets the single fixed airport and ATM charges for all the aviation infrastructure services around China. Obviously, it does not consider the price change factor and cost differences among different places. It could be valuable to consider approaches taken by Western regulators like the CPI-X approach, which takes both the price change factor and operational efficiency increases into consideration.

C. *Full privatization may not be appropriate at this stage, while partial privatization arrangement like corporatization and/or commercialization can be very helpful to improve operational performance of service providers in China's aviation infrastructure.*

The main problem of China's aviation infrastructure lies with the low operational performance, rather than with insufficient capital. Past government direct management and monopolistic market position made service providers lack business incentives to improve their economic efficiency and accommodate user demands. Privatization programs can help to establish an autonomous corporate governance structure and place much more market pressures upon top management of those service providers. But on the other hand, aviation infrastructure services are also important public goods which are crucial for the overall civil aviation industry. Up to now, there are only limited cases of full privatization of airports and no such case in ATM. Considering the corporate governance conditions of China's aviation infrastructure service providers, it is much more important to establish well governed corporate structures so as to make airport and/or ATM service providers operate more efficiently. Radical full privatization approach is not suitable for China's airport and ATM sector, not only because full privatization is likely to cause political tensions in China, but also because of the fact that it may be optimal for governments to carry out corporatization of airport and ATM providers before eventual privatization.

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