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Airport Privatization and Economic Regulation: An Indian Experience

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Abstract
Airports are designed and developed to support and provide infrastructure facilities to airlines. Since many decades, the airports remained as natural and public monopolies with large economies of scale. Only recently and after the corporatization and privatization, airports come under economic regulation. Particularly, during last few decades the nature of the airport industry has undergone a drastic change. The business and commercial objective with profit/ revenue maximization in a corporate frame work have been adopted by almost all airports worldwide including Indian airports in particular. Regulating the profit maximization objective and increasing the efficiency, various effective regulation and different types of privatization have been dynamically encouraged by public authority with the informed and planned aim of increasing social welfare. Thus majority of privatized airports come under economic regulation with the objective of improving efficiency and augmenting social welfare during recent decades.
India is not exception to the above trend and the major six airports viz. Mumbai, Delhi, Bangalore, Hyderabad, Cochin and Nagpur have been privatized under PPP (Public Private Partnership) mode between 2000 to 2009. With the onset of privatization, Airport Economic Regulatory Authority (AERA) was established by an act of Parliament in 2008 for economic regulation of Indian Airports. With this background, this paper deliberates in detail the various regulatory approaches adopted by AERA since May 2009.

Keywords: Regulation, Privatization, Efficiency, Airports, AERA

1. Introduction
Airports are designed and developed to support and provide infrastructure facilities to airlines. Since many decades, the airports remained as natural and public monopolies with large economies of scale. Only recently and after the corporatization and privatization, airports come under economic regulation. Particularly, during last few decades the nature of the airport industry has undergone a drastic change. The business and commercial objective with profit/ revenue maximization in a corporate frame work have been adopted by almost all airports worldwide including Indian airports in particular. Regulating the profit maximization objective and increasing the efficiency, various effective regulation and different types of privatization have been dynamically encouraged by public authority with the informed and planned aim of increasing social welfare. Thus majority of privatized airports come under economic regulation with the objective of improving efficiency and augmenting social welfare during recent decades.
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At the outset of this study, we touch on some background details. The next section presents review of literature followed by methodologies in section three. The section four presents the result and discussion. Findings and concluding remarks of the study have been given in the last section.

2. Review of Literature
The neoclassical theory of the firm states that competition leads to increased productive and allocative efficiency as a result of lower prices and higher outputs. In the case of indivisibilities, as typically occurs in the provision of infrastructure based services and

utilities, one large firm might be able to produce at lower costs leading to monopolistic conditions. In this case, in order to encourage efficiency and avoid abuse of market power, the natural monopolist should be subject to economic regulation (Lipczynski, 2009) [14].

In Europe, airport charges have traditionally been regulated according to a rate of return or cost-plus principle (Reinhold, 2010) [18]. Such regulation permits airports to generate sufficient revenue to cover total expenditures, including the depreciation of capital and an expected rate of return on capital. However, according to Averch and Johnson (1962) [5], this form of regulation may lead to overcapitalization, which does not engender productive efficiency. To solve the problem of overinvestment, Littlechild (1983) [15] proposes an incentive based price-cap regulation. Price-caps are generally set over a regulatory period of five years according to the RPI-X formula where RPI represents the retail price index and X is the efficiency improvement that the regulators consider reasonable within the time frame. If the airport management achieves greater cost reductions over the five year period, the gains are enjoyed by the company. In the case of airports, the single till principle is applied in the UK, in which case both aeronautical and non-aeronautical revenues are constrained. Over the years, price-cap regulation has been emulated by other European authorities. However, unlike the UK model, a dual till approach [1] is applied whereby aeronautical revenues alone are subject to regulation (Gillen and Niemeier, 2008) [12]. Compared to traditional rate of return regulation, Gillen and Niemeier (2008) [12] provided a comprehensive overview of the current economic regulation at European airports.

Price-cap creates incentives for cost savings hence encourages efficiency, however it equally may lead to underinvestment on the part of firms with heavy infrastructure sunk costs. Consequently, it may be necessary to regulate in order to ensure a reasonable level of quality with respect to the products or services offered. Another approach to stimulate efficiency is yardstick competition originally proposed by Shleifer (1985)[21]. This form of regulation implies virtual competition amongst regulated firms by comparing their cost levels and determining the permitted price based on an average level. The British CAA argued that the heterogeneous character of airports and the challenge to obtain appropriate data contribute to their reluctance to apply this type of economic regulation (Authority, 2000) [4].

In the theoretical literature, the debate as to the necessity for and type of airport regulation seems to be rather controversial. Gillen and Niemeier (2008) [12] argued in favor of price-cap regulation but also that commercial and ground handling activities might be disciplined to some extent by potential competition, hence the dual till price-cap approach was preferable. Czerny (2006) [9] argued that market power exists in both the aeronautical and commercial spheres of activity. For non-congested airports, he suggested that the single till outperforms dual till price-cap regulation in maximizing social welfare. For large, congested airports, Beesley (1999)[7] argued that the single till is inappropriate because increasing concession profits would lead to lower airport charges over time. In addition, Starkie (2002)[23] found no evidence of economies of scale for airports with large throughput and argued that demand complementarities across aeronautical and terminal activities will prevent airports from abusing market power, obviating the need for any regulation. In particular, airports generating additional revenues from non-aeronautical activities are likely to lower their charges and cross-subsidize using commercial revenues in order to attract both passengers and airlines (Zhang, 2010) [24]

To the best of our knowledge, the impact of regulation on efficiency and airport pricing has been empirically investigated by very few scholars. Barros and Marques (2008)[6] have advocated that regulatory procedures contribute to cost savings. Oum *et al.* (2004) [16] observed that airports under dual till price-cap regulation tend to have higher levels of gross total factor productivity than those with a single till price-cap or those that operate under the single till rate of return regulation. Furthermore, dual till approaches together with rate of return regulation appear to provide incentives to improve efficiency but are very complex to estimate. Bel and Fageda (2010) [8] examined the impact of privatization, regulation and regional and intermodal competition on airport charges at European airports in 2007. Utilizing regression analysis, they found that private unregulated airports charge higher prices than public and regulated airports which is supporting the analytical findings of Oum *et al.* (2004) [16].

Shapiro and Willig (1990) [20] had a view that the government is better informed and more capable of regulating state-owned firms. Opponents of this point-of-view sought evidence to demonstrate that state intervention leads to inefficiency. Shleifer and Vishny (1994) [22], for example, opined that the relationship between politicians and managers is governed by incomplete contracts leading to inefficient incentives.

Parker (1999) [17] employing DEA technique to estimate the technical efficiency opined that British Airport Authority (BAA) remains subject to economic regulation and hence incentives to operate more efficiently are distorted as a result of government intervention.

Several tasks are to be performed to analyze airport regulation. One of these is to observe the ownership and regulatory pattern in a city or country, and seek to explain it in terms of efficiency and other objectives. Another task is to outline which approaches to airport ownership and regulation are most likely to be conducive in efficient operation of airports- have some countries implemented promising models, and are the approaches taken by others flawed? Finally, there is the task of assessing what ownership and regulatory frameworks can best promote efficiency while recognizing the constraints imposed by the non-efficiency objectives imposed by governments- does a particular framework represent a good compromise between objectives and is it possible to meet the non-economic objectives at less cost in terms of efficiency (Gillen D., 2007) [10].

In summary, whereas research to date has analyzed the effect of ownership, regulation and competition on efficiency, the impacts of regulation may be of great interest. Consequently, efforts have been made in this paper to review and analyze the regulatory approaches of Indian airports.

3. Methodology

The methodology adopted for this study is based on the review of AERA orders viz. (i) Regulatory Objectives and Philosophy in Economic Regulation of Airports and Air Navigation Services (AERA, 2010) [1], (ii) In the matter of Determination of Aeronautical Tariff in respect of IGI Airport (AERA, 2012) [2] and (iii) In the matter of Determination of Aeronautical Tariffs in respect of Kempegowda International Airport (Earlier Bengaluru International Airport) (AERA, 2014) [3].

The implication of this study focus light on effectiveness of economic regulation on price control and its impact on traffic growth and capacity addition of Indian Airports.

4. Result and Discussion

4.1 Airport Regulation in India

Privatization of Indian airports started in 2000 with the privatization of Cochin International Airport. Subsequently, Bangalore, Hyderabad, Mumbai, Delhi and Nagpur airports were also privatized with PPP mode under BOT (Built Operate Transfer) approach. The additional four more airports are on way to privatization. With the privatization of above mentioned airports, necessity for economic oversight/ regulation was felt and a frame work for this was established in December 2008 by creating Airport Economic Regulatory Authority.

The Airports Economic Regulatory Authority of India Act, 2008 was enacted on 5.12.2008. Under the Act, AERA's mandate covers determination of tariffs for aeronautical services, user charges and monitoring of set performance standards in respect of major airports [2]. Presently 17 airports in the country have annual passenger throughput in excess of one and a half million. These 17 airports include 6 joint venture airports and 11 public airports. The other 73 minor airports are regulated by Ministry of Civil Aviation (MOCA), Government of India (GoI). The air navigation services (ANS) are provided by Airport Authority of India (AAI), GoI at all civil airports.

The basic objectives of AERA are to create a level playing field and foster healthy competition amongst all major airports (government owned, PPP- based, Private), encourage investment in airport facilities, regulation of tariffs of aeronautical services, protection of reasonable interests of users, operation of efficient, economic and viable airports (International Civil Aviation Organization, 2013) [13].

4.2 Regulatory Approaches Adopted in India

In the context of statutory functions of AERA under the Act and regulatory objectives & principles for regulatory process, the regulatory approach on a number of important aspects are discussed below. The regulatory approaches adopted by AERA are also discussed here in the context of international examples, the context of Indian airports and air navigation services.

4.2.1 Price Cap Regulation

Price cap regulation is now a common way of setting prices in a wide range of monopoly or near-monopoly situations. Typically, the formulae for determining prices under such a cap incorporate terms that automatically reflect inflation (e.g. CPI) and it is commonly known as 'CPI-X regulation' or in exceptional situation CPI-X+Y. The 'X' factor principally takes into account the expected changes in business parameters pertaining to investments, depreciation, & cost implication of increased level of service on one hand and anticipated efficiency improvements (through reduced operating costs), and growth in volumes on the other and the benefit of Y factor is given to the airport operator if the huge investment has been undertaken recently and more investment is also required.

The formulae under such a form of regulation reflect the maximum possible percentage increase in prices over certain base parameter(s). The base parameter(s) itself can be (i) an aggregate term like yield per passenger or (ii) individual tariffs. This works with reference to a given level of base parameters at the initial year (T=0) of the regulatory cycle. These parameters are allowed to increase by the given formula. The increase (over the base parameters) is structured to give a reasonable rate of return (on investments or equity) to the investors in airport infrastructure (AERA, 2010) [1].

While the initial concept works best for firms with easy to measure unit costs, the form of regulation has evolved to account for investing and service performance as well as operating expenditure. However, in case of qualitative service parameters it is not possible to measure precisely and this has been implemented through Airport Council International – Airport Service Quality (ACI-ASQ) survey. This survey is executed by the local consultant to be appointed by the airport operator and possibility influence by the airport operator cannot be ruled out. ACI undertakes survey design, data processing and report preparation. It has been observed that overall rating is higher than all the 33 parameters included in the survey which is not feasible if the survey is executed scientifically.

In the same way as for operating expenditure, it provides incentives for an airport to develop commercial revenues (AERA, 2010) [1]. Price Cap Regulation was originally proposed for economic regulation of monopoly utilities as a way of encouraging incremental improvements in performance[9] and, initially in the telecoms sector, to provide a route to eventual deregulation. Regulators in a number of countries have evolved the methods of Price Cap Regulation to address a wide range of circumstances. In the United Kingdom, CPI-X (or its UK equivalent, RPI-X) has been used in the regulation of designated airports since the privatization of British Airport Authority (BAA) in 1987 (AERA, 2010) [1]. In India price cap regulation has been implemented for Airport charges that is landing, parking, housing charges (Aircraft related charges) and passenger service fees, security charges etc.

4.2.2 Rate of Return Regulation

Rate of Return Regulation is the name for a form of regulation that permits the regulated firm to set prices at such a level that it recovers its costs, including a rate of return on an appropriately defined value of capital employed.

The predominant consideration under such a form of regulation would be determination of nature of return and the appropriate base / value of capital employed. Rate of return regulation is extensively used in the US across regulated sectors and is also used at certain airports in Europe. Traditionally, this form of regulation has been primarily used for publicly owned entities. In India rate of return regulation has been implemented for air navigation services (ANS) with a view that investment in upgradation technology is undertaken liberally and safety is not compromised.

4.2.3 Light Touch Regulation

A number of academic commentators have argued that the intrusive process of regulation itself creates distortions that can be worse than the effects of monopoly abuse[10] and that light touch regulatory approaches can deliver better performing sectors than formal price control (AERA, 2010) [1] in competitive and non-substantial services. In this case threat of regulation restrains the airport operator for abuse of monopoly power.

Commentators and the regulatory authorities point out that an important component of light touch approaches is meaningful price monitoring and a realistic long term commitment to intruding regulation in the event of unacceptable outcomes. The light touch regulations is suitable for the services which are provided on mutually negotiated term or competitive bidding basis. These may include the firm setting prices at

unacceptable levels, earning profits deemed excessive, reducing quality beyond some point or some other behavior or outcome considered a clear abuse of monopoly.

Light touch regulatory approaches in the airports sector have been adopted in New Zealand and Australia, and arguably wherever airports are free to set their own charges, subject for example to competition law constraints. Australia had a system of incentive regulation for its airports, which encountered problems, and was replaced by a loosely specified monitoring system. New Zealand has operated with no explicit regulation, but the threat of regulation exists in case performance is unsatisfactory.

In India light touch approach has been adopted for ground handling services, cargo services and oil refueling services etc. AERA has also defined the competitive services are those services where two or more service provider are operating. AERA has also defined non substantial services where the numbers of aircrafts movement are less than a pre-defined limit.

The price cap regime for airport regulation in Australia moved to price monitoring in 2002. In 2006, the Productivity Commission [10] reviewed airport performance under the new regime. Generally, airports supported the current arrangements, while airlines argued that it did not sufficiently restrain the use of market power. The Australian Competition and Consumer Commission (ACCC) was also critical of current arrangements, agreeing with the airlines that restraints on the use of market power, were unspecific and too weak.

New Zealand took a different approach to light handed regulation, sometimes referred to as Shadow Regulation. Instead of an explicit review/sanction mechanism, the New Zealand approach involved a general provision in the relevant legislation to enable a review of pricing in industries such as airports to be initiated by the Minister at any time. Though they are not formally regulated, they are subject to the threat of price controls (AERA, 2010) [1].

Academic commentators have pointed out that the assessment of light handed regulation depends on what it is expected to achieve. From a broad efficiency perspective, it has performed well, though it has not been without problems, especially those associated with investment. If the objective is to keep prices close to cost, and minimise the use of market power, the system may be seen as less successful (AERA, 2010) [1]. It is also not clear whether and to what extent light touch approaches depend on the commercial, governance and regulatory traditions of a country.

Light touch approach has been used in case of cargo services, ground handling services and Aircraft refueling services where either the services are competitive or they are not substantial in nature. In case the services are non-competitive and substantial in nature then price cap regulation will be applied for the above services also. The competitive and substantial services have been defined by AERA in the revision of respective charges.

4.2.3 Single Till and Dual Till Approaches

It is a generally accepted principle, endorsed by ICAO, that airport users should pay their full and fair share of the cost of providing the airport. However, a modern airport is engaged in a complex mix of aeronautical activities (handling passengers and aircraft) and non-aeronautical activities (retail, catering, car parking, property rents). A critical question is whether, and to what extent, non-aeronautical activities should be taken into account in determining that fair share.

One approach is to adopt the 'single till' principle, where all airport related assets and costs are taken into account in determining allowed tariff rates or return or a general price cap, after considering all revenues from non-aeronautical services (AERA, 2010) [1].

Single till approach does not make any distinction between aeronautical and non-aeronautical services at an airport and treats an airport as an integrated business and helps set airport charges so that the airport as a whole can generate appropriate returns for its investors. As a first step, total assets (aeronautical and non-aeronautical) are considered for allowing a certain

return. The return is then adjusted for allowed depreciation and efficient operating expenditure (aeronautical and non-aeronautical). The adjusted return so obtained is then subsidized by the total non-aeronautical revenues to arrive at the net revenue required by the airport from aeronautical charges.

Effectively, single till uses profits from non-aeronautical activities at an airport to offset the aeronautical cost base for determining airport charges. Under this approach the allocation of costs between aeronautical and non-aeronautical services is less significant, given that the allowable revenue figure is based on total costs.

An alternative approach is to adopt a 'dual till', in which the revenues, costs and assets of an airport are allocated between two heads - aeronautical and non-aeronautical. In a pure dual till, the 'regulatory till' is made up of revenues, costs and assets (and thus the costs of financing those assets) that are solely associated with aeronautical activities plus a share of the common

costs and assets that support both aeronautical and non-aeronautical activities (AERA, 2010) [1].

Variants of the pure dual till include hybrid approaches that reflect some of the revenues, costs and assets directly associated with non-aeronautical activities in the cost base for airport charges. It is generally supposed that, under conventional cost allocation methods, non-aeronautical activities generate a higher rate of return on their assets than the airport's cost of capital. As such, a dual till approach (pure or hybrid) may tend to lead to a higher computation of required airport charges.

AERA has adopted single till approach in India however for Delhi International Airport Ltd. (DIAL) and Mumbai International Airport Ltd. (MIAL) the Operation Management and Development Agreement (OMDA) was signed before establishment of AERA and in the OMDA it was one of the condition that hybrid till with 30:70% will be applied i.e., 30% of non-aeronautical revenue will be counted towards fixation of aeronautical charges and 70% will be retained by the airport operator. In view of the above hybrid till has been applied for Delhi and Mumbai Airport, subsequently BIAL also approached AERA for the hybrid till on the pattern of Mumbai and Delhi airport.

While BIAL's letter dated 30th July 2013 indicated a request for review of proposal under what it calls as Hybrid Till, the Authority had noted, from the submissions made by BIAL that it had considered Shared Revenue Till model wherein 30% of Gross Revenues from Non-Aeronautical Services had been set off from the Aggregate Revenue Requirements computed for the Aeronautical Services, without taking into account the costs associated with providing these Non-Aeronautical services (AERA, 2014) [3].

A Shared Revenue till of 40% would strike an appropriate balance between the needs of expansion of the airport as well

as passenger interest, in terms of keeping the user charges at reasonable level. Therefore, 40% of gross revenue generated by BIAL from Non Aeronautical Services may be reckoned towards subsidizing Aeronautical charges and User Development Fees (UDF) (AERA, 2014) [3]. However AERA accepted Hybrid till with 40:60 ratios. At remaining 14 airports single till approach has been adopted.

5. Conclusion and Policy Implication

The economic regulation in airport infrastructure in India was implemented after privatization which resulted into the adaptation of different regulatory approach for private and public airports. In the first cycle of revision of airport charges by AERA in 2009 the prices has been increased more than four-fold with the result that Indian airports has come in the category of costliest airports of the world i.e. consumer has not been benefited as has happened in case of competitive industry such as telecommunication. Also the high traffic growth of Indian aviation sector, which started after introduction of low cost airports in 2003-04 was adversely affected by steep hike in prices by private airport operators. However, the aviation has been benefited out of privatization in terms of creation of adequate capacity and quality of world class infrastructure. The efficiency in use of resources has also been improved after privatization but it is not known whether the same is because of economies of scale or privatization which needs to be researched further.

The policy implication of this study suggests that the privatization and regulation is good for capacity addition, improving quality of infrastructure and efficiency in use of resources. However, the price control should be implemented rigorously to keep them within reasonable limit and at the same time growth in traffic should not be adversely affected. The pricing should be matching with Indian cost structure and should be capable of attracting investment in airport infrastructure. The leakage of public revenue by creating number of subsidiaries by private operators may be checked

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