

"A man is
great by
deeds, not by
birth"

-Chanakya

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Regulatory Pricing Mechanism in the context of privatization of Delhi and Mumbai airports: double down or pivot

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- *“Competition is indisputably the most effective – perhaps the only effective means – of protecting customers against monopoly power. Regulation is essentially the means of preventing the worst excesses of monopoly; it is not a substitute for competition. It is a means of ‘holding the fort’ until competition arrives.” – Littlechild, 1983*

Until the turn of the last century, airports, with their huge investment requirements, substantial land requirements in urban locations, large tracts of open space requirement, requirement, and long gestation period, made it look like a classic case of *natural monopoly*. It was believed that other than the state, no one would be interested to invest in such assets. To make the investment viable, there has to be guaranteed stable traffic over a long period, a kind of localized monopoly. However, since the 80s, starting with the UK, there is a proliferation of private airports worldwide.

In India, the privatization of airports began with a Public-Private Partnership (PPP) in Cochin International Airport Limited (CIAL), which was commissioned in 1999. After CIAL, Hyderabad, and Bangalore Greenfield airports were awarded to private operators in partnership with the Airports Authority of India (AAI) and State Government. They were commissioned in 2008. After that, Chhatrapati Shivaji International Airport (CSIA), Mumbai, and Indira Gandhi International Airport (IGIA), New Delhi were structured as PPP. While the new terminal at the Delhi airport had to be completed before the commonwealth games commenced in 2010, there was no such event deadline on Mumbai airport. An invitation seeking expression of interest to invest in these two airports was issued in 2004. After a two-year-long bidding and evaluation process, GMR group and GVK group were awarded the rights to operate IGI Airport New Delhi and CSI Airport Mumbai, respectively. While the GMR Group agreed to share 45.99% of revenues with AAI for the IGIA, the GVK group agreed to transfer 38.70% of for CSIA.

It may be noted that, with private investment, the monopoly power¹, essential to make such investments profitable, will now be passed on to the private sector. This lead to a lot of concern

¹ Airport operators in India possess monopoly power in the local area since the current rules do not allow a new airport to come up within 150 kms of an existing airport, and if due to some constraint, it is necessary to have another airport, then the existing airport operator has the right of first refusal.

among different political parties. So much so that a prominent political party leader wrote a letter to the then civil aviation minister asking him to ‘shelve any plans to privatize airports in our country’². Their primary concern is that there can be a potential abuse of market power resulting in tariffs that may not be welfare optimal in the absence of proper regulation. Hence, the airside charges need to be regulated. But in doing so, the concern is that the process of regulation can itself create distortions worse than abuse of market power.

Accordingly, during the privatization of Mumbai and Delhi airports, the State Support Agreement (SSA) states that the Ministry of Civil Aviation intends to set up an economic regulatory authority within two years. This institution will be responsible for, among other things, the determination of aeronautical charges. The SSA further details the process of calculating the aeronautical tariff and states that ‘...Aeronautical Charges as set forth in Schedule 6 will not be negotiated post bid after the selection of the successful bidder and will not be altered by the JVC under any circumstances.’³

The document lays down the principles that should guide Airport Economic Regulatory Authority (AERA) while fixing tariffs:

- (i) Incentivise efficient operations
- (ii) Enable the operator to earn a reasonable return on investment proportional to the risk involved over the asset's economic life.
- (iii) The approach will be transparent, independent, consistent, and regulate only those lines of business where the Joint Venture Company (JVC) has a monopoly power to ensure pre-set service quality benchmarks.
- (iv) Within a set price cap, the JVC will have the freedom to charge a tariff that would cover the cost of facilities and services used by passengers and ensure a fair return to the operator.
- (v) These charges have to be non-discriminatory and should ensure the safety of passengers.

² Govt may rethink on airport privatization issue. 2004, June 3. Outlook.

<https://www.outlookindia.com/newswire/story/govt-may-rethink-on-airport-privatisation-issue/226065>

³ Government of India. 2006. *State Support Agreement In relation to the Modernisation and Restructuring of the Mumbai Airport*. Delhi. Government of India. P.8

Accordingly, they formulated the tariffs for the two airports broadly following the RPI-X approach. A detailed description of the methodology with an illustration is given in the SSA so that bidders could factor it in their bids (Reproduced in Exhibit 1). Following the Multi Year Tariff Principles (MYTP), the regulators set the length of a regulatory price control period as five years. As a first step, the target revenue is computed so as to ensure a fair rate of return for a given scale of investment after accounting for operational and financial expenses. From this estimated revenue, following a hybrid till arrangement, 30% of the gross revenue generated by the JVC from revenue share assets⁴ is deducted. Finally, the price per passenger is determined following equation (a) in Exhibit 1.

Airport Concessions & Aeronautical charges

Since the late 80s, airports are independent economic units that provide an array of services to passengers⁵. Broadly, airport services are classified into aeronautical services and commercial operations, a.k.a. concessions. Concession revenues can be a mechanism to check airport operators' monopoly power and to control the aeronautical charges⁶. Put differently, airport operators would try to increase the number of passengers with good airside services to stimulate airport concession services. Thus, there exists a complementarity in the airside and the airport concession services provided.

The regulatory framework that governs the recognition of revenues and expenses of the aeronautical⁷ and non-aeronautical⁸ services provided by an airport operator is known as 'Till Arrangement'. Aeronautical charges are in turn influenced by the till arrangement followed by an airport. There are three broad approaches to regulatory till arrangements (methods of recognizing revenues):

⁴ Revenue share assets comprise of (i) Non-aeronautical assets and (ii) assets required for providing aeronautical services arising at airport and not considered in revenues from non-aeronautical assets (Eg. Public admission fee etc.)

⁵ Doganis, R. (2005). *The airport business*. Routledge.

⁶ Starkie, D. (2002). Airport regulation and competition. *Journal of air Transport management*, 8(1), 63-72.

⁷ Aeronautical services at an airport has been defined in the Airport Economic Regulatory Authority of India Act, 2008 as consisting of service provided for: navigation, surveillance and supportive communication thereto for air traffic management; landing, housing or parking of an aircraft or any other ground facility offered in connection with aircraft operations at an airport; ground safety services at an airport; ground handling services relating to aircraft, passengers and cargo at an airport; cargo facility at an airport; and supplying fuel to the aircraft at an airport

⁸ In general anything else is classified as non-aeronautical service. However, to be specific, non-aeronautical services shall include Retail, Food and Beverages, Hotels and Lounges, Car Parking and Car rentals, Advertisement, Commercial Property rentals, Travel and Forex related services, Telecom and Wi-Fi etc.

- (i) Single Till: In this arrangement, there is no distinction between aeronautical and non-aeronautical revenues and expenses; they are all recorded in one consolidated income statement. As a result, the aeronautical charges are determined to ensure a fair rate of return on the investment made. It covers the operational (airside) and financial (depreciation and taxes) expenses after adjusting for the surplus from non-aeronautical services⁹. Put differently, non-aeronautical surplus directly subsidizes aeronautical costs. Thus, there is little incentive to earn non-aeronautical revenue. Prior to privatization, AAI followed the single till approach in the Delhi and Mumbai airports. At that time the share of non-aeronautical revenues in total revenues for Delhi and Mumbai airports was 26% and 17%, respectively¹⁰. Globally, it is commonly accepted that in single till arrangement, airport operators have little incentive to enhance non-aeronautical revenue.
- (ii) Dual Till: In this arrangement, the aeronautical and non-aeronautical revenues of the airport are recorded separately. The implicit assumption is that non-aeronautical revenues are derived solely due to the ability of the airport to provide non-aeronautical services rather than due to the efficiency and extent of airside services. The aeronautical charges so determined will not have the subsidizing effect of the surplus arising from non-aeronautical services¹¹. In other words, the operator is forced to meet airside expenses using airside revenues. Studies in support of dual till state that the approach leads to a superior improvement in economic efficiency, particularly at busy airports, because higher commercial revenues cannot be used to drive down airside charges. On the other hand, if there is no competition, any operational inefficiency can be passed on to the passengers under a dual till arrangement. This may not be in the best interest of passengers.

While single till arrangement may better approximate the welfare-optimal aeronautical tariff in non-congested airports¹², a dual-till may be better in congested airports¹³.

⁹ Aeronautical charges following dual till approach is determined as: $[\text{Regulated asset base} \times \text{Fair rate of return} + \text{Aeronautical operating cost} + \text{Depreciation} + \text{Taxes} - \text{non-Aeronautical Surplus}] / \text{Forecasted Passenger traffic}$

¹⁰ Jain, R., Raghuram, G., & Gangwar, R. (2007). *Airport Privatization in India: Lessons from the Bidding Process in Delhi and Mumbai*. IIM Ahmedabad Working Paper No. 2007-05-01. IIM Ahmedabad. <http://vslir.iima.ac.in:8080/jspui/handle/11718/233>

¹¹ Aeronautical charges following dual till approach is determined as: $[\text{Regulated asset base} \times \text{Fair rate of return} + \text{Aeronautical operating cost} + \text{Depreciation} + \text{Taxes}] / \text{Forecasted Passenger traffic}$

¹² Czerny, A. I. (2006). Price-cap regulation of airports: single-till versus dual-till. *Journal of Regulatory Economics*, 30(1), 85-97.

¹³ Starkie, D. (2002). Airport regulation and competition. *Journal of air Transport management*, 8(1), 63-72.

(iii) Hybrid Till: Unlike single and dual till, Hybrid till arrangement, posits that aeronautical and non-aeronautical services are neither wholly independent nor dependent on each other. The efficiency of aeronautical services would impact the extent and type of passenger traffic, type of flights, and routes. These factors influence amount of non-aeronautical revenues earned. Thus, a portion of the non-aeronautical revenue surplus is used to cross-subsidize aeronautical costs.

In Europe, 52% of airports applied a single till, 37% applied a dual till, and 10% applied a hybrid till in 2016. Single till airports handled 26% of European traffic, with hybrid till and dual till receiving 29% and 39%, respectively¹⁴.

In Delhi and Mumbai Airports, a hybrid till¹⁵ regulation is followed wherein 30 percent of non-aeronautical (revenues) surplus is used to subsidize aeronautical expense. Further, one of the conditions of privatization of these airports was that at least 40% of the total revenues should come from non-aeronautical sources.

Aeronautical Tariffs in Delhi and Mumbai airports pre and post-privatization

In 2006, despite its constraints, airport charges in the said two airports were among the highest in Asia. To illustrate: the landing, parking and navigation charges at these two airports are around 70% higher than in Changi. As reported in the Financial Express¹⁶ Warwick Brady, the Chief Operating Officer at Air Deccan, said, 'Airport charges in India are 50% more expensive than in European countries'. In the same report, Centre for Asia Pacific Aviation's Kapil Kaul reasoned this phenomenon to the inability of Indian airports to capitalize on Non-aeronautical income stating: 'In India, airports have not been able to fully capitalize on such revenue potential, resulting in higher dependence on aviation related revenues. Non-aeronautical income, including retailing, is only 30% here.'

These deficiencies were to be addressed through privatization, which was premised on a hybrid till and mandated a minimum of 40% total revenue share from non-aeronautical sources.

¹⁴ Airports Council International Europe. 2018. Behind the Regulatory Till Debate. Airports Council International Europe <https://www.aeroport.fr/uploads/documents/telecharger-le-document-en-anglais.pdf?v12>

¹⁵ Aeronautical charges following dual till approach is determined as: [Regulated asset base*Fair rate of return + Aeronautical operating cost + Depreciation + Taxes- 30%*Non-Aeronautical Surplus]/ Forecasted Passenger traffic

¹⁶ Airports most expensive in India. (2006, July 30). *Financial Express*. <https://www.financialexpress.com/archive/airports-most-expensive-in-india/172786/>

However, in 2009, despite privatization Delhi and Mumbai were among the most expensive airports in their group¹⁷. Richard Leigh, MD of www.airportcharges.com, a UK-based portal, states: 'Indian airports are more expensive than their Asian counterparts, especially for international operations'¹⁸.

The scenario did not change by 2013 either. Talking of the tariff levied and the service received at Indian airports, Albert Tjoeng, Asia spokesperson of IATA said, 'Though India is the second highest among Asian airport, airlines do not get value for money at Indian airports. Airlines pay more yet receive service levels that are way below those of Singapore, Kuala Lumpur, Dubai and Bangkok.'¹⁹

Something seemed amiss in India's privatization of airports. Analyzing this phenomenon in a recent paper²⁰ the authors, among other things, attributed this to an error in the pricing formula mentioned in the SSA. In treating the X-factor as a variable that equates the present value of the target revenue of the regulatory period and the present value of the permissible revenues,²¹ the regulator has turned a RPI-X approach to a Cost plus fixed margin approach in which there is no incentive for efficient operations.

In reality, the X-factor is a forward-looking, positive number indicating expected annual improvement in efficiency for a given control period. It is exogenously determined by comparing the airport with the best service providers in its category. The X-factor, so estimated, is the rate at which the said airport should increase its operational efficiency to be among the best in its class. In other words, the private operator is mandated to reduce operating costs by X percentage points annually. This improvement in efficiency is supposed to account for all positive network externalities²² that the private operator would enjoy due to the transfer of monopoly power. Expecting the private operator to increase efficiency or reduce operating costs by X per cent results

¹⁷ Mishra, L. (2009, Aug 17). Delhi among most expensive airports. *Hindustan Times*.

<https://www.hindustantimes.com/india/delhi-among-most-expensive-airports/story-q2aytZfL1Pkpk3zCkP0IeN.html>

¹⁸ Balasubramanyam, K.R. (2009, Aug 5). India's Costly Airports. *Business Today*.

<https://www.businesstoday.in/magazine/features/indias-costly-airports/story/3915.html>

¹⁹ Sanjai, P.R. (2013, Feb 5). India's airport charges second highest in Asia. *Business Standard*. https://www.business-standard.com/article/economy-policy/india-s-airport-charges-second-highest-in-asia-107071301011_1.html

²⁰ Nair, A.S. and Upadhyayula, R.S. (2017 Feb 28). Airport Public Private Partnerships need to tweak some basic issues to avoid current pitfalls. *The Economic Times*. <https://economictimes.indiatimes.com/blogs/et-commentary/airport-public-private-partnerships-need-to-tweak-some-basic-issues-to-avoid-current-pitfalls/>

²¹ [Regulated asset base*Fair rate of return + Aeronautical operating cost + Depreciation + Taxes- 30%*Non-Aeronautical Surplus)]/ Forecasted Passenger traffic

²² For example, good air connectivity from City B to City C makes the airport at City B a possible hub for flights from City A to City C.

in infusing the spirit of competition and transferring the network benefits to the consumers in advance. The basic premise being that incentive-based regulatory contracts would motivate the private operator to be efficient and benefit the consumer by lower tariffs, thus infusing the spirit of competition.

However, instead of the X-factor being exogenous, SSA deems it as the equating factor, thus turning the spirit to be efficient on its head. Is it surprising, then, that much of the deliberation between the airport operators and the regulator has been on bargaining for the appropriate **negative** X-factor!!!!

Exhibit 3 presents a summary of X-factors submitted by, Mumbai International Airport Ltd. (MIAL) the special purpose vehicle that operates CSIA, at various stages of the tariff determination process for the first regulatory period. The X-factors demanded range from -439.25% to -872.34%²³. The X-factor accepted by AERA for the first control period after doing a sensitivity analysis states: 'The Authority has accordingly calculated the target revenue with respect to the 'X' factor as of 1st January, 2013 at (-)151.56% as compared to (-)873.36% given by MIAL....'²⁴

Some questions are in order:

- (i) Why did policy makers follow the RPI-X approach to tariff fixation?
- (ii) Does a negative X-Factor make any sense?
- (iii) If not why isn't the tariff determination mechanism not being corrected?

The dilemma here is that while there is an evident mistake, should we tweak the existing pricing mechanism, in an adhoc manner, to ensure welfare optimal tariff or should we correct the mistake once and for all. Data related to the Regulated Asset Base (RAB), Weighted Average Cost of Capital (WACC) etc. used while bidding is given in Exhibit 2. The inflation rate used for purposes of tariff fixation for the first regulatory period is 8.94%²⁵.

²³ Airports Economic Regulatory Authority of India. 2012. Determination of Aeronautical Tariff and Development Fee in respect of Chhatrapati Shivaji International Airport, Mumbai for the 1st Regulatory Period (01.04.2009-31.03.2013). *Airports Economic Regulatory Authority of India*. <http://www.aera.gov.in/aera/upload/aeracp/5524fb6fb278f22-12-13nw.pdf> pg 15

²⁴ *ibid* p 258

²⁵ *Ibid* p 267

Exhibit 1: Calculating the aeronautical charges in the Hybrid till inflation – X price cap model

The revenue target is defined as: $TR_i = RB_i \times WACC_i + OM_i + D_i + T_i - S_i$, where

TR = target revenue

RB = regulatory base pertaining to Aeronautical Assets and any investments made for the performance of Reserved Activities etc. which are owned by the JVC, after incorporating efficient capital expenditure but does not include capital work in progress to the extent not capitalised in fixed assets. It is further clarified that working capital shall not be included as part of regulatory base. It is further clarified that penalties and Liquidated Damages, if any, levied as per the provisions of the OMDA would not be allowed for capitalisation in the regulatory base. It is further clarified that the Upfront Fee and any pre-operative expenses incurred by the Successful Bidder towards bid preparation will not be allowed to be capitalised in the regulatory base.

WACC = nominal post-tax weighted average cost of capital, calculated using the marginal rate of corporate tax

OM = efficient operation and maintenance cost pertaining to Aeronautical Services. It is clarified that penalties and Liquidated Damages, if any, levied as per the provisions of the OMDA would not be allowed as part of operation and maintenance cost.

D = depreciation calculated in the manner as prescribed in Schedule XIV of the Indian Companies Act, 1956. In the event, the depreciation rates for certain assets are not available in the aforesaid Act, then the depreciation rates as provided in the Income Tax Act for such assets as converted to straight line method from the written down value method will be considered. In the event, such rates are not available in either of the Acts then depreciation rates as per generally accepted Indian accounting standards may be considered.

T = Corporate taxes on earnings pertaining to Aeronautical Services

\underline{S} = 30% of the gross revenue generated by the JVC from the Revenue Share Assets. The costs in relation to such revenue shall not be included while calculating Aeronautical Charges .

“Revenue Share Assets” shall mean (a) Non-Aeronautical Assets; and (b) assets required for provision of aeronautical related services arising at the Airport and not considered in revenues from Non-Aeronautical Assets (e.g., Public admission fee etc.)

i = time period (year) i

$RB_i = RB_{i-1} - D_i + I_i$, where: RB_0 for the first regulatory period would be the sum total of

- (i) the book value of the Aeronautical Assets in the books of the JVC and
- (ii) the hypothetical regulatory base computed using the then prevailing tariff and the revenues, operation and maintenance cost, corporate tax pertaining to Aeronautical Services at the Airport, during the financial year preceding the date of such computation.

I = investment undertaken in the period

The X factor is calculated by determining the X factor that equates the present value over the regulatory period of the target revenue with the present value that results from applying the forecast traffic volume with a price path based on the initial average aeronautical charge, increased by CPI minus X for each year. That is, the following equation is solved for X:

$$\sum_{i=1}^n \frac{RB_i \times WACC_i + OM_i + D_i + T_i - S_i}{(1 + WACC_i)^i} = \sum_{i=1}^n \sum_{j=1}^m \frac{AC_{ij} \times T_{ij}}{(1 + WACC_j)^i} \quad (a)$$

Where AC_{ij} = average aeronautical charge for the j^{th} category of aeronautical revenue in the i^{th} year

T_{ij} = volume of the j^{th} category of aeronautical traffic in the i^{th} year

X = escalation factor

n = number of years considered in the regulatory period

m = number of categories of aeronautical revenue e.g. landing charges, parking charges, housing charges, Facilitation Component etc.

The maximum average aeronautical charge (price gap) in a particular year 'i' for a particular category of aeronautical revenue 'j', is then calculated according to the following formula:

$$AC_i = AC_{i-1} \times (1 + CPI - X)$$

Where CPI = average annual inflation rate as measured by change in the All India Consumer Price Index (Industrial Workers) over the regulatory period.

The following is an illustrative numeric example of a price cap model showing how the X factor is determined. The example relates to a five-year regulatory period where the X is calculated as an average factor for each of the five years.

Source: Government of India. 2006. *State Support Agreement in relation to the Modernisation and Restructuring of the Mumbai Airport*. Delhi. Government of India. Pp. 26-28.

Exhibit 2: Target Revenue Calculation for the current control period

(Rs.in Crores)	2009-10	2010-11	2011-12	2012-13	2013-14
Regulatory Base	1,713.21	2,069.56	2,429.85	3,213.14	5,994.63
WACC	10.77%	10.77%	10.77%	10.77%	10.77%
Return on Capital Employed	184.50	222.88	261.68	346.03	645.57
OM-Efficient Operation & Maintenance cost	394.49	186.18	320.54	565.25	639.39
Depreciation	89.35	126.07	149.57	183.98	322.03
Corporate Tax	-	32.61	3.71	-	50.33
Share of Revenue from Revenue Share Assets	151.52	203.76	237.15	221.94	226.92
Target Revenue	516.82	363.99	498.35	873.32	1,430.40

Source: Airports Economic Regulatory Authority of India. 2012. Determination of Aeronautical Tariff and Development Fee in respect of Chhatrapati Shivaji International Airport, Mumbai for the 1st Regulatory Period (01.04.2009-31.03.2013). *Airports Economic Regulatory Authority of India*. <http://www.aera.gov.in/aera/upload/aeracp/5524fb6fb278f22-12-13nw.pdf>. P 258

Exhibit 3: Summary of X-Factors submitted by MIAL at various stages during the tariff determination process

	Oct-11	Nov -11	Apr-12	Aug-12	Aug-12	Sep-12	Sep-12
X-Factors	(-)439.25%	(-)591.95%	(-)652.08%	(-)655.46%	(-)619.35%	(-)935.92%	(-)872.34%
CPI - X Factors	(+)448.19%	(+)600.89%	(+)661.02%	(+)664.40%	(+)628.29%	(+)944.86%	(+)881.29%

Source: Airports Economic Regulatory Authority of India. 2012. Determination of Aeronautical Tariff and Development Fee in respect of Chhatrapati Shivaji International Airport, Mumbai for the 1st Regulatory Period (01.04.2009-31.03.2013). *Airports Economic Regulatory Authority of India*. <http://www.aera.gov.in/aera/upload/aeracp/5524fb6fb278f22-12-13nw.pdf>. P. 15

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