REGULATORY OPTIONS AND PUBLIC UTILITY BEHAVIOR UNDER LONG LEASE CONTRACT: INDIAN PUBLIC-PRIVATE PARTNERSHIP AIRPORT PERSPECTIVE

A thesis submitted to

University of Petroleum and Energy Studies

In

Infrastructure Management

By

Akhil Damodaran

March 2022

SUPERVISOR(s)

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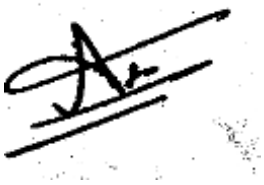
DECLARATION

I declare that the thesis titled ***Regulatory Options and Public Utility Behavior Under Long Lease Contract: Indian Public-Private Partnership Airport Perspective*** has been prepared by me under the guidance of Dr Tarun Dhingra, Professor, Department of General Management and Dr Prasoom Dwivedi Professor, Department of Economics and International Business University of Petroleum and Energy Studies. No part of this thesis has formed the basis for the award of any degree or fellowship previously.



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CERTIFICATE

I certify that Mr Akhil Damodaran has prepared his thesis entitled **" Regulatory Options and Public Utility Behavior Under Long Lease Contract: Indian Public-Private Partnership Airport Perspective"** for the award of PhD degree of the University of Petroleum and Energy Studies, under our guidance.He has carried out the work at the Department of General Management, University of Petroleum and Energy Studies.

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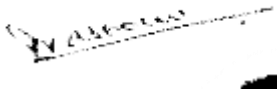

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ABSTRACT

A contract is binding between two or more people or agencies which creates a fundamental rule for any activity between them and the boundaries in which they play. The thesis is the result of explorations related to the interplay between stakeholders associated with PPP in aviation. Though the contract is a binding agreement, the PPP is only an incomplete contract. The incompleteness of the contract creates a series of uncertainties as the contract progresses. In aviation, as the contract period ranges between 30 and 100 years, the probability of having uncertainty becomes much higher. The most critical part of Airport PPP is its monopolistic nature. The airport is a highly regulated sector. As private players assume an essential role in PPP, the regulators' supervision and guidance become critical. For further research, the business problem has been identified: "The current public-private partnership model leads to a decrease in attraction for private operators to share risk, improve efficiency, reduce cost, leading to a decrease in participation and conflict of interest among stakeholders". In order to address this business problem, we have explored published literature across various themes, including airports, economic regulation, stakeholder relationship, and tariff regulation. Reviewing the literature on these themes, it was realized that this problem could be addressed using the incomplete contract theory. The incompleteness of the contract generates procedural and operational issues as the long-term PPP contract progresses. With further exploration of incomplete contracts, gaps have been identified that need to be addressed. The following gaps have been identified that need to be addressed: Although commercial revenue is already discussed by various literature, it is unknown which Till regulation ("Till" is a method of defining which airport business should come under economic regulation) will be better for airports long-term PPP contract. Many works of literature discuss the incentive schemes in PPP and the importance of regulation. However, the type of regulation of PPP contracts under Revenue share agreement on firms Profit and consumer price is unknown.

The effect of economic regulation is well discussed in the literature, but its relation with competition issues under price-cap regulation in the long-term PPP contract is unknown.

The above gaps helped us to create the research objective as below :

Although in existing Literature various regulatory models are suggested, and their impact on public utility behaviour is known, existing literature does not answer how a contract agreement between principal and agent affects firm (public utility) behaviour under the regulatory regime.

This research attempts to answer the three basic questions: what kind of regulation should be in the airport PPP? Do we need further enhanced policy guiding the bidding process for PPP? What should be the basic framework which can guide stakeholders to improve PPP in the long run? To answer these questions, we have created three basic Research questions;

- RQ1: How contract between principal and agent affects agents' incentive to develop commercial revenue when price cap regulation is in place?
- RQ2: How regulation affects a firm's behaviour under a revenue share contract agreement on Firms Profit and Pricing?
- RQ3: What kind of contract model can help improve the competitiveness of the agent and reduce the opportunity for abuse of dominance under a long lease contract agreement (PPP) of public utility?

To understand it further, we used two approaches, both qualitative and quantitative. For the first two research questions, we have used game theory design, and for the third question, we have used a qualitative approach by using focus group discussion. We played a game between the government(principal)and private player(agent) under different regulatory regimes; in the second question, we played a bidding game comparing the outcomes under revenue share agreement with different Till regulations in play. Both the first and second research question's results became crucial, guiding the creation of questions for the third research

question. For the third question, focus group discussion methodology has been used in which 12 experts were invited from various areas of aviation who have experience in the PPP setup. A set of related questions were asked to guide the conversation. The answers were converted into the transcript. It was then coded using MAXQDA. The codes then helped create the themes. The themes helped to design the PPP framework. The participants then reconfirmed the framework. The essential factors that will improve airport PPP sustainability, in the long run, are Viability of the Airport, Bidding Process, Risk Allocation, and Price Regulation.

The research outcomes of this thesis will help policymakers improve the contract for the long term PPP contract system. The factors will also help stakeholders like airport operators and public agencies to evaluate the project better for the long-term sustainability of the business.

Acknowledgement

Firstly, I want to express my sincere gratitude to my supervisor Dr Tarun Dhingra and co-supervisor, Dr Prasoom Dwivedi, for the continuous support and patience they have given to me in my PhD study. I could not have imagined having a better advisor and mentor for my PhD study than them.

This research presents an essential piece of Price regulation and its impact on Public-Private Partnership Projects. I have been dealing with agencies and airports for the past four years on the same topic. However, I was involved with price regulation in airports. I was lucky to learn more closely about the critical infrastructure sector, particularly the airport's economic regulation. It is inevitably God's grace to have the chance to finish my doctoral research in the area which you love to learn and work, in this case, Economic Regulation. Research on "regulatory options and public utility behaviour under long lease contract".

This journey took me to the Competition Commission of India, GMR Delhi Airport, Cochin International airport, and the Institute of Public Finance and Policy. I am glad to have travelled this journey. I am thankful to my supervisors Dr. Tarun Dhingra(Professor and Assistant Dean Research School of Business) and Dr. Prasoom Dwivedi (Professor, School of Business UPES), for their treasured guidance, scholarly and valuable inputs, and encouragement throughout the research work. Both of them were an inspiration for me to complete this research work. This achievement was possible only because of the unconditional support provided by them. Both of them have always made themselves available to me for all help and clarification despite their busy schedules. I consider it an excellent opportunity to do my doctoral program

under their Mentorship and learn from their in-depth knowledge and research expertise. I once again consider it my primary duty to thank them for the kind help and guidance given to me for completing this research.

The learning journey led me to study the works of Jean Tirole, Oliver Hart, Micheal Beesley, and other great authors whose seminal work was fundamental to our research

I was very privileged to have access and learn from many publications of ACI, IATA, ICAO, MoCA, DGCA, Leigh Fisher, ICF, Frontier Economics**,** Europe-Economics, Oxford Economics, AERA and CCI. I was charmed by the depth of thought on airport economic regulation explained in these publications describing even complex problems with simplicity. I place my humble gratitude to all these organizations for making my research an enjoyable mission and a too intensely learning process. I owe my special thanks to Sri. S.L. Bunker Ex. Member Competition Commission of India to make me understand the interrelationship between Competition issues and the regulatory practices/regimes. His briefings were inspiring and thought-provoking.

I want to thank Dr Rupesh Kumar, Dr Ashwani Khanna, Dr Chandra Prakash Garg, Dr DP Singh, Dr Hiranmoy Roy, Mr Baiju Radhakrishnan, Dr Neeraj Anand, Dr Joji Rao, Dr K Deeppa, Dr Sheetal Khanka, Dr Anshuman Gupta, all of them have been very kind to me to extend their help at various phases of my research whenever I approached them, and I do at this moment acknowledging all of their help and support. I also want to thank Dr Githa Heggde (Dean School of Business UPES) for supporting my PhD journey. Lastly, I want to thank my father, Dr KV Damodharan, who has guided and inspired me throughout my life, my mother for being the pillar of my family, and my wife, who supported me throughout my PhD. I am immeasurably indebted to all of them.

CONTENTS

LIST OF ABBREVIATIONS

Abbreviation	Meaning
AAI	Airport Authority of India
ACCC	Australian Competition and Consumer Commission
ACI	Airports Council International
AERA	Airport Economic Regulatory Authority
APR	Airport
BIAL	Bengaluru International Airport Limited
BOO	Built Own and Operate
BOOT	Build Own, Operate and Transfer
BOT	Build, Operator Transfer
BT	British Telecom
CAB	Civil Aeronautics Board
CAGR	Compound annual growth rate
CAPA	Centre for Aviation
CCI	Competition Commission of India
CEO	Chief Executive Officer
CPI	Consumer Price Index
DGCA,	The Directorate General of Civil Aviation
DIAL	Delhi International Airport Limited
DT	Dual Till
FCC	Full Cost Carrier
FDI	Foreign Direct Investment
FGD	Full Group Discussion
GMR	Based on Founder name Grandhi Mallikarjuna Rao
GVK	GVK Industries Limited
ICAO	International Civil Aviation Organization
ICC	Initial Conceptual Constructs
IMF	International Monetary Fund
IPP	Independent Power Producer
MIAL	Mumbai International Airport Limited
NHAI	National Highways Authority of India
P3	Public Private Partnership
PFI	Private Finance Initiative
PPPAC	Public Private Partnership Appraisal Committee
SBI	State Bank of India
US,	United States

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CHAPTER 1

INTRODUCTION

The Airports in India are undergoing major reform process in the last 2 decades.Specially after the rise of public private partnership mode of infrastructure development in aviation,the Airports have seen a tremendous transformation.From GMR Delhi airport and the new Noida international airport,PPP has been a story of remarkable progress and global recognition.The progress also had its challenges.Indian Airports are regulated airports and the PPP contract are generally for a period of 30 to 100 years, which is a very long lease period.Due to which, ongoing PPP projects generally gets into challenges like pricing , differences with government , environmental uncertainity and as Indian PPP contract do not address future uncertainity or the remedial practice to tackle PPP issues that's the reason long term contract are under the category of incomplete contracts.Due to monopoly nature of the airports,government always keeps airports under economic regulation.Economic regulation for Indian airports are under AERA(Airport Economic Regulatory Authority) they decide the prices to be charged by airports(part of economic regulation).Due to uncertainities of future,high infrastructure cost and pressure to gain profit, airports may abuse the monopoly power to exploit the market like increasing price by showing higher cost , forcing airlines to pay higher charges , increasing prices of commercial shop products etc.Against this background it is very crucial to study the airports contracts from the lens of economic regulation.The central role of economic regulation is to define who will receive the benefit , who will get the burden of regulation and the effect of regulation on allocation of resources.So in Indian airport settings economic regulation plays a critical role.

The chapter begins with a brief background about industrial growth in India and the contribution of infrastructure sectors to the economy. The chapter highlights the role of the PPP. Its types and their impact on the infrastructure sector. Further, the problem discussion summarization is done to explain the current problem in the

Airport PPP. After that, it is narrowed down to present the problem formulation of this research study. The potential significance of this research study is also deliberated in this chapter. In the last section, thesis deposition is presented to explain this research report's complete thesis chapter

1.1 BACKGROUND

With the country's rising infrastructure growth, the need for investment funds has increased, the government may not always have budget enough to fund infrastructure development (Auriol & Picard, 2013). It gives rise to the private sector's participation in the infrastructure growth in the Public Private Partnership model. Despite the increasing trend, however, the consideration of PPPs as a model for procurement and funding for building projects is still not a sought after mechanism. The long term disappointments are much higher in the private sector.

In India, the lack of better infrastructure has always been a limiting factor for better economic growth. With the government's lack of investment capacity worldwide, private funds were allowed (with specific regulations) in the public utility sector, namely railways, airports, hydro projects, etc. With the more significant infrastructure intention of the government, more participation of the private sector was sought. This gave rise to the Public Private Partnership in India.

"A Public Private Partnership (PPP, 3P, or P3) collaborates between two or more public and private agencies. The relationship can be of short term or longer-term nature (world bank, 2019)**.** *In other words, it consists of a relation between an entity of government and an entity of private that brings better services or improves the project's efficiency to operate effectively. PPPs are also known as an example of multi-stakeholder governance."*

1.2. TYPE OF PPP

Public Private Partnership has evolved in many different ways figure.1 shows the type of PPP existing today. Generally types of PPP can be broadly classified as

Build-Operate-Transfer (BOT): The government finances the project which is then build by private entity and then transferred back to government after concesstion completion of concession period, Build-Own-Operate (BOO): The private entity finances and builds the project and then transferred back to government after completion of concession period, Build-Own-Operate-Transfer (BOOT):same as BOO, Design-Build-Finance-Operate (DBFO), Design-Construct-Manage-Finance (DCMF):The private entity owns the responsibility of designing,constructing,operating and financing the project for the period of concession. and Independent Power Producer (IPP) works same as DBFO.

Contract management is crucial in the area of Services and in the area of public-private partnership.The outcomes of one project impact subsequent network projects. Therefore, the public sector must understand the importance and opportunities provided by successful PPP contract management and establish a strategic plan to capitalize on this model over the project's life cycle to develop the project seamlessly.

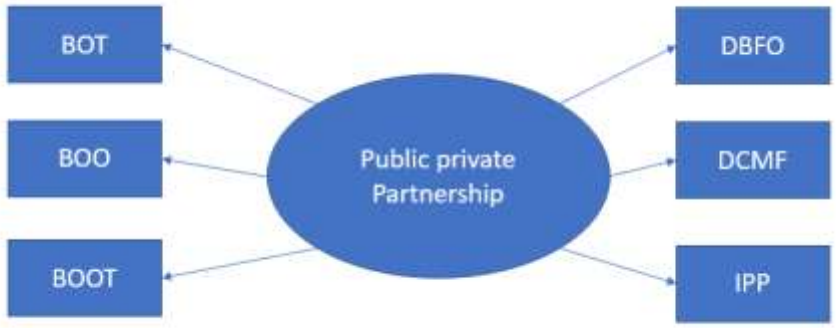

Figure 1: Factors important for Private Partnership in Infrastructure

1.3. STATUS OF INDIAN PPP

Indian PPP's came to highlite in the early 2000's when government of India decided for PPP model for airport investments.The news was a surprise for the market because of its long lease period and the amount of investments which was

estimated.In its Annual Report for 2012/13, the Ministry of Finance announced that the "Government of India is advancing Public-Private Partnerships (PPPs) as a viable tool for getting private sector investments and expertise to improve public infrastructure. It will assure best in class quality of service to the customer." It proceeded to take note that India has developed as one of the "main PPP lead in the world, because of a few policy changes and institutional activities taken by the Central government." More than 900 PPP ventures with a Total Project Cost (TPC) of Rs. 543,045 crore were affirmed from 2010 to 2013 and are at various usage phases, for example, development and operational stages. Before this, somewhere in the range of 600 undertakings with a TPC of Rs. 333,083 crore had been affirmed, showing a remarkable increase in Project development. This makes the Indian PPP program one of the biggest in the world as far as the number of ventures approved for execution as PPPs are concerned. India has also built up a solid framework for accomplishing tasks at a local government level with appropriate monitoring by agencies regarding PPP performances. The Public-Private Partnership Appraisal Committee practised this oversight (PPPAC) set up in January 2006. PPPAC has endorsed 276 Infrastructure venture with a TPC of Rs. 277,338.30 Crore till 2018 (PPPindia,2018).

The difficulties in the project's bidding procedures and long-term development have made the private sector sceptical regarding PPP projects. Therefore, there is a genuine risk that PPPs' risk probability as a method for creating and financing PPP options in India is not highly favoured among the Private Sector. Both from a private sector and higher authorities of government dissatisfaction are evident; the issues slow the project's growth.

PPP Project Sectorwise India	
Sector	Number of Projects
Airport	10
Housing	9
Ports	37
Railway	2
Road	257
Sports	5
Tourism	4

Table 1:PPP project sector-wise: From 20th December 2005 - 17th December 2019. (Source:pppindia.gov.in)

As declared by the National Public-Private Partnership Policy 2011, a Public-Private Partnership (PPP) indicates a generally longer-term strategic plan between the government/institutions on one side and a private sector on the other for the development of public utility and additionally public administrations. It is done through different execution modes, where there is all over all characterized allotment of risk between the private sector and the public sector, and the private sector gets executed connected incentives that (or are benchmarked) to indicate and pre-decided execution guidelines, quantifiable by the public authority. The above definition comprehensively demonstrates a restricted period course of action where a private party gives his skills and resources to the government sector for a specified period. It also means that there should be strict guidelines and monitoring regulation to guide the overall PPP. The progression and globalization of the economy during the 1990s supported our financial development pace, which never happened before. The times of the 1990s and 2000s saw us competing at a worldwide level. Keeping ourselves competitive at a global level consistently will

be a difficult task that needs a supporting framework to support national development. It was thought that public utility was a public sector responsibility that is now changing as more and more projects are going to the private sector due to their risk-taking ability, funding, and skills.

Private participation in projects is not a new phenomenon in India. However, the PPP mode of involving the private sector in public projects has gained momentum (See table 1 PPP project sector-wise) . The previously mentioned condition was soon noticeable in the Indian monetary situation with an expanded number of PPP projects and developed a measure of interest in greenfield projects (Project started

Table 2:Growth in PPP projects and investment in different five year plans of Govt. of India. (Source: NITI Aayog 2016)

Growth in PPP projects and investment

Figures in INR Billion

Period	Approximate Infrastructure investments	PPP infrastructure investment	Estimated PPP %
10th Plan	9061	2252	25
11th Plan (Revised)	20542	7429	36
12th Plan (Projected)	40992	20496	50

Planning Commission projections of Investment in infrastructure during the Twelfth Five Year Plan

12th Plan (Projected) 40992 20496 50

Planning Commission projections of Investment in infrastructure during the Twelfth Five Year Plan

from scratch or in this case an airport completely developed from scratch in a newly acquired land. A brownfield project or in this case brownfield airport is an airport which is remodels or improve upon existing facility). During the most recent couple of years, the country has seen a growth in development in the figures.

The above table uncovers the enormous increment in venture under PPP projects in India during the tenth, eleventh, and twelfth arrangements. From 25% during the tenth five-year plan, it ascended to a change of 36% during the eleventh five-year plan and the anticipated half during the twelfth plan (see table 2). This shows that the endeavours to make an environment favourable for PPP in India have been fruitful since expanded private division support in the PPP framework.

1.4. ROADS AND HIGHWAYS

India has an extensive system of 3.3 million kilometres of roads, positioning second globally (Newsonair, 2020). These roads convey 61% of cargo and 85% of traveller traffic. The highways and interstates together add up to just 2% of the whole road area while representing 40% of street traffic. The goals include building 8,737 km of roads, mapping 3,846 km of national highways for the North East, four-lane 20,000 km of national highways, four-landing 6,736 km on North, South, and East-West passageways, six-laning 6,500 km of the Golden Quadrilateral and selected national highways, and converting 20,000 km of national highways to two lanes. The National Highway Authority of India (NHAI) is the governing body for managing National Highway roads in India, which awards projects through BOT mode. 100% FDI is permitted (FDI) with 100% annual expense exclusion for a considerable amount of time. Road development is viewed as significant for India's financial improvement and serves the national building. The passenger traffic is expected to grow 12-15% every year (timesofindia,2019). With such development possibilities, there is an excellent scope of further expantion the Public-Private Partnership.

1.5. RAILWAYS

The Indian Railways is a changed picture today. From a loss-making element, it has been changed over to a profit-making body. The project scope under Railways is immense, namely, expanding the railway track. The rapid growth in worldwide exchange and domestic travel has dramatically strained the Delhi-Mumbai and Delhi-Kolkata rail track. With the growing containerization of payload, the interest in its development by rail has gained momentum. Likewise, up until now, rail compartment development was the primary business model of a CONCOR public sector. Today, Competition has been allowed in compartment development, and private sector features have been added to qualify for running freight trains. According to plans, the Indian Railways will get Rs.5.2 trillion in the Twelfth Plan (2012-17), with the Indian Railways Corporation contributing Rs.1 Trillion

(Hindustan Times, 2017a). The remaining is expected to be served from PPP investment. The Railway Ministry is now working out methodologies for granting PPP ventures and creating financing mechanisms for PPP. The ministry plans to set up train and manufacturing sites, developmental underground passage for fast rails, committed cargo hall, and multi-modular Logistics centre points (Hindustan Times, 2019)

1.6. AIRPORTS

There is an overwhelming interest in expanding the aviation sector in India due to huge traffic demand and infrastructure development in the industry(figure 2 shows the traffic growth of PPP Airports from 2010 to 2018). Both passenger and freight traffic has increased at a compound annual growth rate (CAGR) of 15% and 20%, respectively (IBEF, 2019).The emergence of PPP airports played a significant role in the growth of aviation market in last 10 years(see figure 2). Other than the enormous metro urban communities of Chennai, Kolkata and Trivandrum, where you have Brownfield airports and a huge urban population to travel, Greenfield airports are also considered in many places, such as Greater Noida, Navi Mumbai,

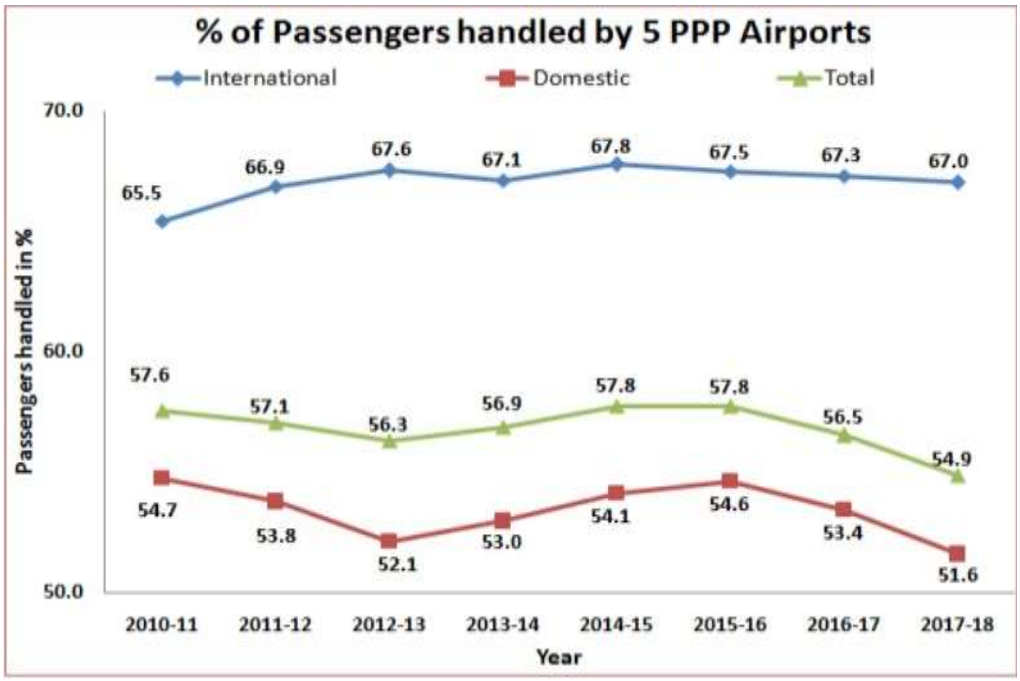

Figure 2Passengers handled by 5 PPP airports (Source : APAO)

Kannur, Goa and Pune. Positive socioeconomics and fast financial development point to rapid residential passenger traffic and global outbound traffic. Also, the thriving travel industry is likewise expected to give a much-wanted boost to the aeronautics business. Through the open sky policy and other such empowering measures, the government is also attempting to make a good situation for PPP interest in India.PPP also gave rise to international investments in Indian airports in last 10 years(see figure 3). The government of India is likely to develop 100 more airports and tier 2 and 3 cities under PPP mode (Livemint, 2020).

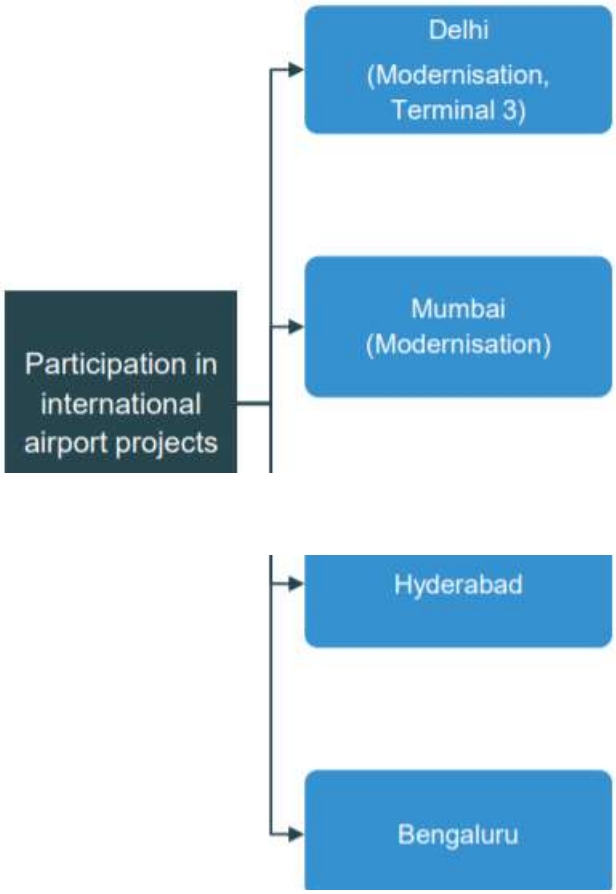

Figure 3: Major Private Sector Investments in Airport PPP (Source: APAO)

1.7 PROBLEMS, CHALLENGES, AND RISKS IN PPPS

PPP in India is still an emerging area. As said before, the public-private partnerships in India are just 15 to 20 years of age (or new), and a significant piece of movement on those grounds has occurred during the last 15 years. The reports and audits mentioned that the PPP work in India points towards the economy's favourable position towards such partnerships (ibef, 2016). The empowering condition made by the local and the state governments to welcome the private sector interests in more significant projects has produced a conducive need for such partnerships. However, there are a few cases and situations where the PPPs have not been exceptionally progressive. Most of the issues occurred when the project was ongoing. PPPs for big projects are long-term in nature, and this reality makes them progressively powerless against external challenges(epec, 2015).In PPP, more the years in the project that much uncertainty it has. The definition of each PPP contract is different from the others. PPP contracts cannot be compared on the same parameters; no two arrangements are always the same. It is because of the differences in each contract it is difficult to institutionalize a PPP framework.The parameters used in creating the contract differ as per place, type of projects, and other parameters. Hence, a PPP can vary on different grounds, for example, the nature and kind of infrastructure required, the sector in question, the model received, and so on. The stake of the Central and State governments and the income, duty, and risk partaking in the venture are conditional and will probably differ, starting with one agreement then onto the next. Only the roles and responsibility and financial part are separately addressed in the contract rest parts are generally not known before the project begins; that is why institutionalizing the PPP framework is a bit difficult. As per an examination article on how to improve the PPP network in India: by experience from the past, any PPP venture needs to, for the most part, go through four fundamental periods of defining roles, venture

acquirement, venture advancement, and activities. A very cautious level of separation of responsibilities is required at each stage. So it is hard to consolidate steps and answers for conditional issues that may manifest while the task is in progress in a PPP contract.

As of now, there is no concrete PPP guideline in India. Since public-private partnerships are very new, enough research is not done in the Indian context. The National PPP Policy 2011 is an excellent legal framework but does not help address the long-term issues in PPP. The above issue of non-institutionalization of PPP agreements can be dealt with by making an autonomous administrative PPP body. This may prompt a superior and progressive investment by the private sector and pull in increasingly worldwide financing. In Indian PPP, generally, the financial options are unviable in a project which is non-urban. This has been most felt in the national highways sector. The un-viability emerges when financing agreements go beyond bidder's capability, which results in a gap in expectation and increases in risk to the bidder due to specific terms in the concession understanding.

One of the most examined issues identified with PPPs is the absence of transparency and long term understanding of contractual nature. Even though many exertions have been made to build the future roadmap during the bidding procedure and grant of agreements, individuals by and large appear to develop confusion because of non-clarity in PPPs, which is not without reason. The whole process of making a PPP course of action is exceptionally long and ridden with a lot of legal clauses. There have been numerous situations where the private party has increased undue political favours from their public sector partner, causing the entire procedure to appear questionable. The absence of transparency becomes larger and larger as the project ages. The whole agreement becomes complex and irrelevant with time between the government and the private sector. Numerous projects need a specialized skill set for execution, which is generally available with a private entity. When the parties cannot anticipate future challenges, project planning becomes weak from the start of the project. What may seem like a typical issue of the paper in due course may become unresolvable issues of the Execution hour.

Ordinarily, because of inappropriate and wrong estimations, the project gets postponed causing cost and time overrun.

Typically, the tasks which require land securing and other clearances lie with the government. This is because the government, because of its authority and position, can achieve these things better. The specialized and operational portion of the undertaking is taken care of by the private sector. Over the years, delays are caused chiefly by issues experienced in obtaining the land and making it accessible to a private entity (world bank, 2019). This delay brings on additional time and cost, making the task unviable most of the time. Worldwide prescribed protocol proposes that land should be finished before the project is offered and granted. Research shows that in Indian PPP settings, approx 30% of the land is obtained when the undertaking is given. The delay in land procurement is considered the single most significant factor liable for the PPP network's low rating at times. The most specific explanations behind this are the undervaluation of the land value and reliance on government authority.

Combined with the above delays, a few other support from the External Finance Committee, Public Investment Board and Cabinet Committee for Economic Affairs, etc., are also required for PPPs. In India, government organizations experience the ill effects of the old way of working. Also, nobody in an individual capacity is ever considered responsible for any lapse. In particular, an instance of PPPs, effectiveness in execution and adhering to time calendar should be made the government's joint obligation and responsibility just as the private sector. Another issue that is experienced has been the non-adherence to the ethical code of conduct. It should be recollected that the primary reason for public sector creation is social welfare through government monitoring. While for the private sector, it is merely one more business motivation. Regardless of whether the social goal is achieved or not, the private sector will only focus on its return on investments. To summarise the above points, issues and bottlenecks are felt at almost every PPP phase directly from conceptualization, arranging, execution and usage.

Additionally, personal stakes and non-bargaining perspectives of civil servants, directors, and legislators make further human-made deterrents making the undertakings difficult and risky. It has been recently felt that in PPP ventures, financing would show up as a significant issue later on. To a great extent, the private sector, financial institutions, and funding agencies are now profoundly saturated. Further accessibility of funds would not be simple (business-standard, 2020).

1.8. AN OUTLOOK OF PPP IN AVIATION

India's decision to allow private capital to invest in the renovation of significant metro airports has resulted in significant benefits for travellers', airlines, and the government. GMR and GVK (and now Adani), the two leading private companies in the sector, have implemented state-of-the-art airport developments in Delhi, Mumbai, Bengaluru, and Hyderabad, which have changed the travellers experience, improved proficiency and conveyed a huge profit to the state-owned Airports Authority of India. PPPs are now showing their success in Indian aviation ecosystem which is visible from the growth of traffic in the PPP Airports (see table 3 and table 4).

With time, there are significant issues to address the effect of essentially higher charges on air services and passengers. The risk about the financial, administrative framework coupled with more extensive working difficulties with India's aeronautics business has also made investors careful regarding investments in aviation. The execution of the PPP projects needs to be relaxed in terms of the contract to mitigate future stakeholder issues.

1.8.1 **Current Indian PPP Airports**

- 2 airports – AAI's Mumbai and Delhi airports are managed as a public-private partnership (PPP), with a majority of private investors.
- 4 airports – Bangalore, Hyderabad, Cochin and Goa (under progress) being private airports with minority government share –All under PPP model.

Table 3 : Percentages of passenger handled (Source:APAO 2017)

		2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Passengers handled by all Airports in millions	International	29.8	31.6	34.4	37.9	40.8	43	46.6	50.8	54.7
	Domestic	87.1	77.3	89.4	106	122	116	122	139	169
	Total	117	109	124	143	162	159	169	190	224
Passengers handled by 5 PPP Airports in millions	International	17	21.1	22.4	24.8	27.3	29.1	31.3	34.4	37
	Domestic	36.2	43.5	49.7	57.8	65.4	60.7	64.8	75.4	92.2
	Total	53.2	64.7	72.1	82.6	92.7	89.8	96.1	110	129
% of Passengers handled by PPP Airports in comparison with all Airports	International	56.8	66.9	65.3	65.5	66.9	67.6	67.1	67.8	67.5
	Domestic	41.6	56.3	55.6	54.7	53.8	52.1	53	54.1	54.6
	Total	45.5	59.4	58.3	57.6	57.1	56.3	56.9	57.8	57.8

Table 4: Air Traffic Movement in PPP Airport (Source:APAO 2017)

Cargo Traffic										
		2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Cargo handled by all Airports in '000 tonnes	International	1147	1150	1271	1496	1468	1406	1443	1543	1658
	Domestic	568	552	689	853	812	784	836	985	1046
	Total	1715	1702	1960	2349	2280	2191	2279	2528	2704
Cargo handled by PPP Airports in '000 tonnes	International	695	826	914	1073	1058	1043	1107	1193	1292
	Domestic	297	374	448	541	517	496	534	647	682
	Total	992	1200	1362	1615	1575	1539	1642	1840	1974
Cargo handled by PPP Airports in comparison with all	International	60.6	71.8	71.9	71.7	72.1	74.2	76.7	77.3	77.9
	Domestic	52.2	67.7	65	63.5	63.6	63.2	63.9	65.7	65.2
	Total	57.8	70.5	69.5	68.7	69.1	70.3	72	72.8	73

Airports in %										

Due to a combination of increased consumer traffic, greater aeronautical investment opportunity, and the development of non-aeronautical revenue potential, private airports are seeing excellent revenue growth.

1.8.2. Current Issues in the Indian aviation sector

Even after having a massive demand for Air travel, Airports in India are still less in number (compared to the demand forecast). The current Private operator finds pressure in handling the airport due to the regulatory burden.India's airport CAPEX pipeline of around $4.9 billion is completely inadequate to meet the kind of expansion required. Emerging markets such as China plan to invest $130 billion in airports over the next 10-15 years, while the UAE has airport CAPEX plans of $46 billion (CAPA2016)

Regulatory Uncertainty:

- Recently GMR airport refused to cut tariffs, AERA proposed GMR to reduce tariffs by 96%(daily pioneer, 2017).
- DIAL's gross revenue 3244 cores, revenue share of 1533 crores, the total expenditure of 660 crores, profit after tax is 82 crores (DIAL balance sheet, 2015).
- MIAL's gross revenue 890 crore revenue share 560 crores, total expenditure is 440 crores, net profit after tax 16 crores (Balance sheet 2015).
- Till regulation is still a debatable issue (daily pioneer, 2017).
- Global aviation agencies have termed Indian airports as one of the most expensive airports in the world (Business Standards 2013).
- The holding company (GVK) has a debt of around Rs 6,000 crore, while MIAL's liabilities are around Rs 8,000 crore. Almost the entire 50.5 per cent stake of the GVK group was pledged with the lenders (Hindu Business line, 2020).

Other issues

- The concessionaire led by Reliance Infrastructure has withdrawn from the Delhi Metro's Airport Express Line.
- GMR and GVK have walked away from recently acquired mega-highway projects; the Gurgaon Expressway is in jeopardy, and the Delhi Airport has been demanding a re-start. Changes in input costs are causing Adani Power and Tata Power to struggle to turn their imported coal-based projects into profitable operations.
- For long term, PPP agreement renegotiation is a problem

1.8.3. Industry Opinion about the PPP

- "The problem lies in an ostrich-like belief that once negotiated, ground conditions will continue to hold forever; that the terms of the agreement between the private party and the state are cast in stone; and that any changes required can only attract charges of crony capitalism," (Vinayak Chatterjee, Chairman of Feedback Infrastructure Services)
- PPP project would never have to face problems leading to contract renegotiation is the root of the problem with PPP in India (Vinayak Chatterjee, Chairman of Feedback Infrastructure Services)
- The country has now entered an inflexion point in PPP where it is moving from asset creation to operation of projects. The shift is leading to problems in the absence of an institutional mechanism, like those present in other countries, dealing with renegotiations (Hindustan Times, 2017b)
- In its report, the Kelkar Committee coined a term called 'bargaining obsolescence', which means after you put your money in, for the next 30 years, the state has locked in the entrepreneur in a PPP contract. Once your money is in, you have lost your bargaining power, and the state can do what it wants to do (Kelkor, 2015).
- According to a source from GMR Infra, specific issues are constraining the airport sector -greenfield and brownfield - including the adoption of single

till, low returns (granting 16 per cent return on equity compared to around 18.5 per cent to 20.5 per cent recommended by consultant SBI CAPS appointed by the Ministry of Company Affairs), sub-optimal remuneration on capital employed and restrictions that dampen the financial growth (e.g., restrictions on land usage at Brownfield PPP airports)

- GVK Power and Infrastructure Ltd have sought the removal of the government-nominated chairman of Bangalore airport, who, it claims, is coming in the way of the private firm's functioning (Mint, 2016). The PPP agreement has a clause that says the chairman of BIAL will be a nominee of the state government)
- In 2014 government invites fresh applications from private players for Chennai, Kolkata, Jaipur and Ahmedabad airports; the deadline for applying extended several times due to lack of bidders (business-standard, 2016)

1.9. BUSINESS PROBLEM STATEMENT

The current public-private partnership model leads to a decrease in attraction for private operators to share risk, improve efficiency and reduce cost, leading to a decrease in participation and conflict of interest among stakeholders.

With the above business problem in mind, the researcher is motivated to conduct this study. The above study will be focusing on Public Private Partnership, contract issues in the airport, the incentive for the stakeholders and how long term PPP can be sustainable. These issues are relevant not only for airports but for all infrastructure areas wherever PPP is applied. The study is one of the first research in the area of long-term PPP in India.

1.10. TOPIC & PURPOSE

A review of current thinking on contract concepts, price regulation Airport-Airline relationship, till regulation and other contract-related concepts, are detailed in the literature review section. Airports generally are considered a monopoly (D. Starkie, 2001), long term nature of contracts in airports are studied minimally across the

literature(Biygautane et al., 2019). The literature related to airports generally discusses ownership structure(Gillen, 2011a; Tae H. Oum et al., 2006; Yang et al., 2008), Operational issues(Bråthen et al., 2000; Chang et al., 2013; Dobruszkes et al., 2017), type of contracts(Bush & Starkie, 2014), airport-airline relationship (Y. Zhang & Round, 2008). Some of the authors have studied the effect of economic regulation in airport settings (Adler & Gellman, 2012; Assaf et al., 2014; Maskin & Tirole, 2008). Many of the research has focused on Tariff regulation in the economic regulation setting which are price cap(A. M. E. Beesley & Littlechild, 2016a; J. I. Bernstein & Sappington, 1998; Geddes, 2000; S. C. Littlechild, 2012a), rate of return regulation, single till (Czerny, 2004; Kratzsch & Sieg, 2011) and dual till regulation (Tae Hoon Oum et al., 2004). In the Indian setting these regulations are not studied yet. Literature is silent on the effect of Public Private Partnership on the long term sustainability of the airports and its contract challenges(The detailed literature review is presented in Chapter 2).

1.10.1. PROBLEM STATEMENT

Although in existing Literature, various regulatory models are suggested, their impact on the behaviour of public utility is known. However, existing literature does not answer how contract agreement between principal(government) and agent (Airport Operator) affects the firm's behaviour (public utility) under the regulatory regime.

1.10.2. POTENTIAL SIGNIFICANCE

There is a need to understand the contract issues which often happens in the long term contract setting. With the emergence of new airports, it is imperative to have a better framework for PPP, which can help all stakeholders in the long term. Contracts are binding agreements, and long-term contracts will significantly affect the overall sustainability and efficiency of the project. The Long term contract issues have been studied previously by (O. Hart, 2003; O. D. Hart, 1985; Roger & Hart, 2016) with various factors were considered like project financing issues, stakeholder management, but none of the studies focuses on sector-specific issues

which are more recent like PPP in airports. The issues that arise in sectoral PPP in the longer term needs to be studied, and the outcome has a very significant potential to help policymakers and sectoral business owners better understand the nature of the contract. This research will help create a PPP framework that will provide a better sustainable ecosystem for all PPP stakeholders involved.

The research study will be crucial for both academicians and practitioners. For academicians, this research will help understand the principal-agent relationship in a PPP contract and how incentive mechanism impacts stakeholders and factors that affect PPP. For the Practitioners, this research will help to understand best practices as a regulator or as an airport operator, which will help evaluate the PPP and improve the project's sustainability in the longer term.

1.11. THESIS DISPOSITION

This research work is systematically laid out in the following: Introduction, Literature Review, and Research Design & Research Methodology. The two research objectives follow this analyzed through Game Theory, and the third objective is analyzed through Focus Group Discussion

The present chapter talks about the scenario and Foundation for this research study.

Chapter 2, The chapter discusses the literature on Public Private Partnership , research on price regulation , principle of contracts and the gap which the thesis tried to address.

Chapter 3 discusses the research design and research methodology of this research study. It will include the sections such as research objectives and research questions, overall research approach and rationale.

Chapter 4 discussed tariff regulation in terms of Till regulation of airports and Bidding mechanism in PPP; we applied game theory to understand the incentive mechanism of single till and dual till under different regulatory circumstances. The outcome guides practitioners and regulators to decide on the type of tariff regulation adopted under different regulatory conditions.

Chapter 5 discusses the framework for a better PPP contract by conducting a focus group discussion with the sector's key experts. The chapters include the participants' details, focus group method description, and key themes and dialogue.

Chapter 6 summarises the finding and provides a conclusion to the research. In this section, the implication and result of each research solution is discussed with its importance in the contract theory as well as in the aviation sector

CHAPTER 2

LITERATURE REVIEW

2.1. OVERVIEW

In recent times, privatization and public-private partnership have been critical to developing infrastructure throughout the world. Policies favouring privatization of the infrastructure sector have been studied by experts worldwide (Basso, 2008; M. Beesley, 2005; Hanke & Review, 1987; Hoppe & Schmitz, 2010; Lee et al., 2018; Littlechild, 2018). When privatization increased in the public utility, regulatory agency monitoring became essential, giving rise to economic regulation. Economic regulation is common in large public utilities in the UK and USA (A. M. E. Beesley & Littlechild, 2016). However, it is equally essential for public-private partnerships because it is involved in public projects (Jensen & Policy, 2017). The advocate of PPP argues that by going through the public, private partnership mode, the project gets more diversified skillsets and better services at an affordable cost(Kwak et al., 2009). Even after having an advantage in PPP, long term projects are less in number, and it is not yet a preferred way of project development. One of the critical factors is the economic Regulation of PPPs. Regulating PPP becomes essential when a large public project is involved (Maskin & Tirole, 2008).

To complete the literature review following keywords were used :

PPP airports, Airport-Airline, TILL regulation, Airport-Regulator or Airport Regulator, Price cap-Airport, Airport Regulation, Airport PPP model, Airport agreements.

The search database used are EBSCO (Business Source Premier & Business Source Elite+), Emerald, Elsevier's Business Management & Accounting, Collection (Science Direct). A summary of the theme-based literature review is presented in Table. 2.1.

Table. 2.1. Summary of Theme based Literature Review

Themes	Sub theme	Author	Inferences	Gaps
Airport	Airport-airline relationship	Zhang, Anming & Czerny, Achim I; Saraswati, Batari & Hanaoka, Shinya	Regulation effects treatment of commercial revenue specially when airport are under private ownership/decrease of airport charges increases airline traffic	Treatment of commercial revenue (regulatory mechanism) in terms of PPP is absent in literature
	Commercialization	Tovar, Beatriz & MartÄ±, Roberto Rendeiro	Commercialization of airport improves efficiency of airport in terms of quality of service	
	Competition	Yan, Jia & Winston, Clifford	Competition among competing airports impact airport charges	
	Efficiency	Rolim, Paula S.W.; Bettini, Humberto F.A.J. & Oliveira, Alessandro V.M.;Oum, Tae H.; Adler, Nicole & Yu, Chunyan	Commercial revenue is more efficiently managed under Private Airports	
	Governance	Usami, Munekatsu & Akai, Nobuo	Dual till is better for market and single till improves social marginal cost.	
	Incentive regulation	Starkie, David;Zhang, Anmin	Commercial revenue will motivate Private airports to reduce cost	

Economic Regulation	Competition	Beesley, Author M E & Littlechild, S C	Competition and no regulation is better then price cap	The relationship of Economic Regulation and competition with respect to contracts are not known
	Incentive	Littlechild, Stephen C.	Monopoly can only be efficient if incentive on efficiency is provided (RPI-X)	
	Social welfare	Maffii, Silvia; Parolin, Riccardo & Ponti, Marco	PPP may not provide social marginal cost benefit	
	Type of regulation	Goodliffe, Mike	Service quality aspect if not defined in incentive may create efficiency by lowering the cost.	
	Pricing	Forsyth, P;Georges Assaf, A. & Gillen, David	Form of economic regulation effects pricing more than type of governance	
	Investment	von Hirschhausen, Christian; Beckers, Thorsten & Brenck, Andreas	Investment incentive should be present in the regulation	
PPP	Project phase	Willoughby, Christopher	Bundling of projects contracts is better for efficiency	Type of regulation and its effect on long term ppp is not known
	Competition	Link, Albert N. & Scott, John T.	Competition in PPP increases service quality	
	Concession	Auriol, Emmanuelle & Picard, Pierre M.	With increase in duration of concession period uncertainity in inflation rate, traffic flow and operation cost increases	

	Value for money	Martimort, David & Pouyet, Jerome	Value for money in PPP is debatable ,	
	Infrastructure regulation	Haskel, J; Iozzi, A & Valletti, T;Rouhani, Omid M.; Oliver Gao, H. & Richard Geddes, R.	Regulation should be favourable to develop PPP	
	Critical Success Factor	Zou, Weiwu; Kumaraswamy, Mohan; Chung, Jacky & Wong, James;Chou, Jui-Sheng & Pramudawardhani, Dinar, Byoun, Soku & Xu, Zhaoxia, Devapriya, K. a K;Jerzy Henisz, Witold (Vit)	Incentive based contracts improves project performance	
	Incentive scheme	Byoun, Soku & Xu, Zhaoxia		
	Risk	Nasirzadeh, Farnad; Khanzadi, Mostafa & Rezaie, Mahdi		
	Stakeholder analysis	Dementiev, Andrei		
		Tsamboulas, D.; Verma, a. & Moraiti, P.	Ownership structure impacts the performance of PPP project	
		Sawyer, Malcolm		
		In, Soh Young & Kim, Julie		
		Ismail, Suhaiza & Harris, Fatimah Azzahra	Long term concession agreement cannot forecast future challenges of implementation.	

2.1.1. Public-Private Partnership

Pagdadis et al. (2008) pointed out that the conditions and environment considered vital for successful implementation of Public-Private Partnership (PPP) in airports are generally classified into two factors: Project-related factors and macro factors. The authors explained the importance of the factors usually considered under the PPP policy designed for operations across different nations and regions where all parties are bonded by a contractual agreement and signed by all members associated with the project (Graham, 2009).

The critical success factors for PPP in airports are broadly classified into different categories. They include the existing environment, financial needs, Institutional and regulatory framework, Risk allocation, procurement process, availability of grant consortium and Technical application and solutions(world bank, 2019). The critical factors that contribute to the success of PPP related projects in India include recovery of costs, Contractual needs of all parties and their integration, Private sector consortium (Gleave 2012; World Bank, 2015), Supportive and regulatory policy of government, Competitive procedural appointment of consultants and contractors y (Duffy, 2010; Pagdadis, 2012; World Bank, 2015), Commitment of all parties associated with the project and involvement of consultants (Monsalve, 2009; Transportation Research Board, 2011; Pagdadis, 2012). All these factors are found to contribute to the success of PPP and are classified under internal and external success factors. Internal success factors represent partners based on control and manipulation and whereas external success factors represent partners from outside and are not controlled and influenced by internal factors (Wang, 2006; Lees, 2008; Monsalve, 2009 Hussain, 2010).

The successful implementation of PPP depends on the structure and financial model associated with the agreement. The role of government is to consider financial, institutional and legal frameworks in one place that could facilitate Public-Private partnership(Rossi & Civitillo, 2014). The procurement and funding process will enable success and ensure value for money (Duffy, 2010; Gleave, 2012).

However, the procedure should remain transparent and competitive, and policies need to be implemented regarding PPP. It is critical to allocate risks between the concessionaire and the government to sustain and fetch incentives. The involvement of the private sector in the development of airports is most often related to four different forms: contracts, Greenfields, divestitures, and concessions (Pagdadis, 2012; Gleave, 2012; World Bank, 2015).

Two different models accompany PPP, the Contractual regime and Institutional based PPP, both the regime comprised of arrangements associated with concession (Leon-Razvan et al., 2014). The participation of private enterprises and the public is currently growing for the management and development of airports, increasing further in the coming years (Marques & Berg, 2009). Moreover, there are several issues like works related to refurbishment debt during contractual agreements with the private sector to maintain the quality of airports to meet the global standards (Chi et al.,2011).

Governments in different countries supported the development of the airport through PPP mainly because of a lack of investment resources(Yinglin Wang & Liu, 2015). The objective is to improve efficiency by offering better services that meet global standards. Any shortfalls will be met using extra charges made available by the government in development fees (Marques & Brochado, 2008). Furthermore, due to the wave of liberalization in the airline's industry, most airports across the globe gradually shifted from public to private enterprises, which refers to privatization, which forms a partnership with the public sector. It is referred to as Public-Private Partnership (PPP) (Gleave, 2012).

Several studies indicated it is not possible not to get contractual based agreements through PPP, and it also includes compensation or negotiations offered by the government.

Contractual agreements disseminated to stakeholders are considered a risk to share the information and challenging to evaluate concerning the benefits of PPP for the development of airports (Marques, 2010b). There is a lack of private and public

sectors concerning project information considered risk-sharing (Rockart, 1982). It is considered a critical factor for the success of several Projects linked with PPP to develop airports (Jefferies et al., 2002; Li et al., 2005; Ogunsanmi, 2013). However, both private and public enterprises are expected to exist together to manage and develop the airport through proper financing and conducting operations (Meda, 2007). Research is also going on to make Public-Private partnerships a global governance framework (Korab-Karpowicz, 2020).

Research studies indicated several reasons that lead to an increase in the PPPs across airports in India. Some include price reduction, financial transfer for airport infrastructure development, airport operation efficiency improvement, high expectations of quality services, and political controversies about airport developments (Wang, 2006; Lees, 2008; Monsalve, 2009 Hussain, 2010). In addition, a good PPP contract provides an adequate incentive for private players and an optimal partnership opportunity for public agencies (Pagdadis et al., 2008). As discussed above, it is essential to note that not all projects fit PPP (Lam & Yang, 2020). Research studies also indicated the critical drivers of PPP in airports mainly include fiscal and budget pressure on the government, economic policies, diversification of funding for expansion, development, and progress of airport, investment, operation and maintenance of airports (Leon- Razvan et al., 2014; Pagdadis, 2012; Gleave, 2012; World Bank, 2015). Gates & Parker, 2010; Maseko, 2010; Famakin et al. 2014; Alinaitwe & Ayesiga, 2013; Emmanuel, 2013 earlier conducted research studies on contractual design concerning the improvement of airports by the influence of Public-Private Partnership. All the studies indicated a need to improve planning procedures, contractual designing, and project approval time. Most of the research is case-specific(Ballart & Güell, 2015; Carpintero, n.d.; Cruz & Marques, 2011; Fischer et al., 2006; Jones & Pisa, 2000; Macário et al., 2015; Spackman, 2002; Yin Wang, 2015), as per country, sector and other local factors the PPP success factors changes. Overall, the literature in PPP suggests that many factors influence PPP, like contractual design , political factors, and project management, but it’s a case by case situation in

which factors influence its operation and sustenance.

Further exploration in the chapter

To explore the challenges and issues in the public-private partnership, we dive into selective studies on Regulation, the importance of incentives, price regulation and relating with incentives, economic Regulation as a theoretical study, theory of regulation, understanding natural monopoly. The reason behind selecting these themes is the relationship of PPP with the public utility. In Public Utility systems like railways, airports etc., private entities are generally not given complete autonomy(Bel & Fageda, 2009). The government will monitor the project by economic regulation to make the project a win-win for both private enterprises and customers. This monitoring is done through strict price regulation.

The fundamental insight of regulation is to monitor the system for effective efficiency when the market itself cannot regulate it (D. Starkie, 2001a). Sometimes, two or more players may not compete in the market (Bilotkach, 2011). In progressive monetary terms, it means that two players can survive a market where one player cannot. In the 1950s, John Nash proposed two agents who have a unique situation. His answer, known as the Nash bargaining arrangement, depends on the instinct that all else being equivalent, the agent will divide the surplus the same way most of the time(Bracaglia et al., 2014).

On the other hand, a few agents have preferred outside choices over others; at that point, the net surplus will be equal. Since Nash's outcome, different financial analysts and researchers have stretched out this arrangement idea to an enterprise setting and characterized new ideas(Ordover et al., 1994). In these settings, every operator has a lot of potential agreements made by the system. The "outside choices" of the Nash bargaining arrangement are presently endogenous to the model and created by the system structure itself.

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2.2. PRICE REGULATION AND THE EMERGENCE OF INCENTIVES.

The fundamental reason for incentive guideline is that it gives the regulated firm an incentive to keep costs, at any rate, however accomplishing productive efficiency (A. M. E. Beesley & Littlechild, 2016). This helps the organization to improve its long term cost and to keep price nominal.After the basic formula used to determine price caps, price cap regulation is sometimes referred to as "CPI - X" (in the United Kingdom, "RPI-X"). Price Cap regulation subtracts predicted efficiency savings X from inflation as calculated by the Consumer Price Index (UK Retail Prices Index,

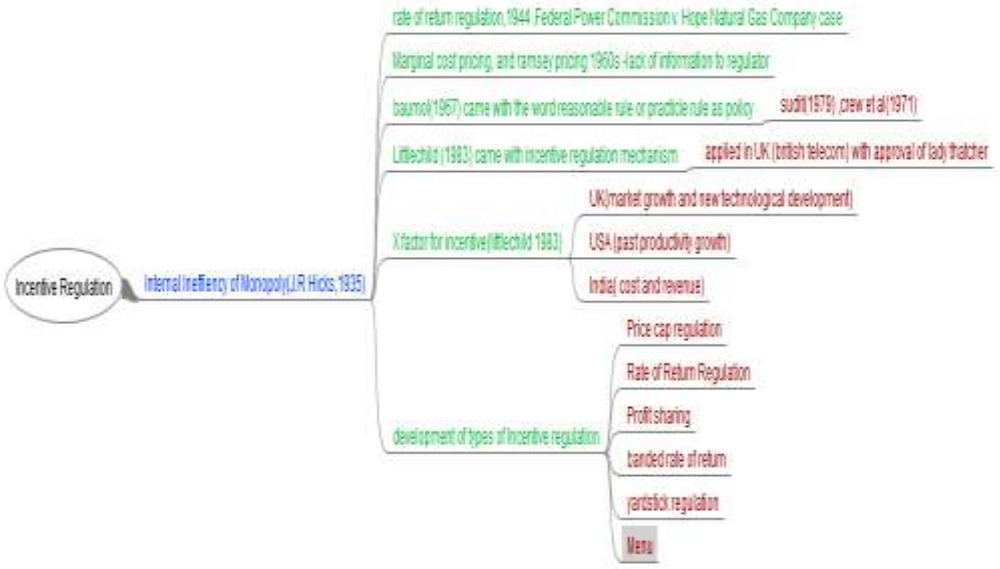


Fig. 2.1. Incentive Regulation History

RPI) (S. Littlechild, 2003). Many Australian airports depended upon incentive guidelines known as CPI-X guidelines (Bernstein & Sappington, 1998). Strangely, for a very considerable period, the audits never tested whether CPI-X could achieve the goals (Iossa & Stroffolini, 2005). The ACCC (Australian Competition & Consumer Commission) agreed with price caps; it did not prove their functioning regarding productive efficiency. For a considerable period, researchers and policymakers wishing to improve price-caps, by observing, analyzed the effects that the guideline had on productive efficiency (Schuster, 2009).

The way the price caps worked on account of the Australian airports created some remarkable improvement in productive efficiency. Price caps were set on the airport's expenses for about five years (until it was balanced in light of the September 2001 emergency). During this period, the airports had been encountering low benefits primarily because of too high expectations; the price-caps that had been set were presumably unreasonably low for long haul feasibility. They may have expected cost-based resets of the price caps toward the end of the multi-year periods (Australian regulators, particularly the ACCC, tend towards cost-based resets of price caps). The price cap helped the airports to bring the cost down to a stable situation. A stable environment price cap will help the entity a special incentive to limit costs under the regulatory period.

As actualized, price-caps for airports in Australia have established a type of incentive guideline. Under incentive guidelines, prices are set without reference to the company’s expenses. It gives the firm a solid incentive to limit costs since it can keep the benefits it wins. However, it also has its demerits.

The price of substantial incentives has negative issues as well. The firm heavily influences a portion of the factors which affect the cost and benefit (Schuster, 2009). However, many times it is not possible for the firm. When the outer environment sways on cost and demand, it is not feasible for the firm to fluctuate the price; it must assimilate them in changes to benefit(Oum et al., 2004). The firm

may do out of the blue well, and it might have the option to win and keep high benefits. External components might also be antagonistic, and the firm may gain a not exactly foreseen advantage or acquire a loss. Inside the typical price cap, there is no instrument for outside events to be considered (Fageda & Fernández-Villadangos, 2009). To a degree, this is perceived in actual administrative structures; in Britain and Australia, cost-based resets of the price cap act to diminish the instability of profits (see Mayer and Vickers, 1996), and in the US, income sharing formalizes this by setting up the reasonable price keeping the end objective in mind. That benefits are shared between the firm and its Public Entity (Sappington and Weisman, 1996). When this is done, the firm may be dependent upon significant dangers, such as unforeseen events like the financial crisis of 2008, Covid 19 in 2020. There are two main reasons why a productivity offset to inflation is required. For starters, regulated enterprises have seen some productivity benefits even under cost-based regulation(Laffont & Tirole, 1996). - The firm's preservation of previous "normal" productivity increases under price level regulation provides no further cost-cutting incentives and may instead increase costs. Extra gains that are "effortless" enhance the political situation. Second, by sharing additional productivity gains, consumers will be compensated for any perceived or actual additional risks associated with an untested regulatory framework, improving political acceptability(Appold & Kasarda, 2011). The challenge with the productivity adjustment is deciding on a sufficiently higher rate than previous productivity improvements to give consumers a portion of the additional gains while leaving enough room to reward the firm for its efforts(Ramón-Rodríguez et al., 2011). This decision necessitates predicting future productivity improvements under a price level regime in which previous productivity experience under profit level control is of low use. It is vital to assess the firm's current productivity before estimating future increased productivity under price-level regulation. This is not very easy in and of itself. It will most likely be impracticable to quantify the productivity experience of a single firm due to expense and inconclusiveness. First, even if there is no competition inside the

market, there may be competition for the market in the form of an exclusive franchise auction. Excess earnings would be bid away in such a market, and a company would be motivated to reduce manufacturing costs. The franchise auction, on the other hand, has come under fire.

An outcome is a contract between a franchisor (a government agency) and a franchisee (the company that won the competitive bidding)(Rossi & Civitillo, 2014). As a result, many of the issues raised in connection with contract design and enforcement are inevitably raised. If the market is "contestable," competition might occur without holding a formal auction. Due to the mobility of all factors of production, a contestable market is one in which entry and exit are both costless and frictionless(Zhang & Czerny, 2012b).

A company can enter a market and compete at any price. It can recoup the entire worth of its assets by selling or transferring them to another market if it departs the market. In other words, entering a market has no "sunk costs."

Suppose several firms with similar technology consider entering a contestable natural monopoly market. In that case, the surviving firm will get normal (but not extra-normal) returns on investment, much like a franchise auction(Ramón-Rodríguez et al., 2011). The so-called "monopolistic competition" is another type of conceivable competition. This entails competition between products that are comparable but distinct. If the rivalry is intense enough, it may encourage enterprises to produce effectively and prevent extraordinary profits from being made.

If benefits are unstable, then there is a risk for the firm, which can be expensive. If the firm does not bear this risk-normally, the government will not want to manage the profits of the project. It will always want the private entity to manage its return. The government will probably have much more trouble if the firm brings about losses, mainly if its sustainability is risk (Crew, 2001). Governments are liable for income and loss brought about by directing firms if the project belongs to the public; when there is no certified probability of the firm coming up short, then the

contract runs as it is, but sometimes the firm will show to the government that it might come up short to get good treatment from the government or regulator. Governments cannot afford the project to get to hold due to supply shortage, so they might consider accepting the request of the private entity (A. M. E. Beesley & Littlechild, 2016a)

With airports, a sunk cost is a significant extent of all expenses (David Starkie, 2012). Furthermore, regardless of whether the firm that possesses the Airport comes up short, the Airport itself will probably remain feasible under another operator (can be government or private). The long-term conclusion is far-fetched; if the new operator fails to reboot the airport, the operator may sell the stakes or assets to recover the losses. The result could be exceptionally harmful and would add up to a political emergency for the government. The government's mind towards benefit uncertainty and firm losses are likewise reflected in regulators' monitoring. Regulators are risk-averse. A regulator will be questioned if the firm's monitoring procures high benefits that are not reasonable. The regulator will be in much more considerable trouble if the firm cannot manage the airport and activity stops. It is not surprising that regulator tends to focus towards cost monitoring. Frequently, when a policy is first set up, it adds solid incentive factors, yet after some time, regulators give more consideration to the association’s actual costs while resetting reasonable prices. Regulators will be progressively practical and avoid risk.

2.3. ECONOMIC REGULATION AS A THEORY.

Economic regulation is a powerful instrument of government approach in improving the economy. Economic regulation gives the government control to manage the private entity without actually controlling it (Maskin & Tirole, 2008). The economics of regulation has become progressively significant lately as immediate state control on projects has declined globally (Willoughby, 2013). The possibility that the state's arrangement of specific, limited yet essential administrative capacities is vital for economic development is a foundation of traditional liberal economic and political hypothesis (Crew, 2001). Regulation

cannot be defined only with one definition. A few types of regulation are worried about setting rules for individuals to follow in their dealings. In this sense, the law of agreement or property would contain some portion of the economy's administrative intentions. For instance, a finance-related regulation means that all organizations must unveil sensitive price data to the market by predefined financial methods. This type of contract sets the rule for the enterprise. The regulation applies to all market members, with some degree of freedom given to players to choose to play in the market to prepare for uncertainty (Alkaf & Karim, 2011). Even though the market regulation cannot observe micro-level assets and their utilization, it guides the market to work progressively towards the long-term future, keeping the firm and nation objective in mind(David E M Sappington et al., 1996). Differential regulation is progressively prescriptive in structure. They teach individuals to accomplish specific objectives guidance on asset utilization. A good model would guide a firm to introduce specific strategies to incentivize the firm to reduce inefficiency or improve security (S. C. Littlechild, 2012). Regulation of this sort not only sets up the guidelines overseeing market activity, but they also endeavour to decide the outcomes of the activity in a long-term. Regulation that restricts prices to be at a certain amount reduces freedom of exploring business for operators. Also, this kind of contracts creates non-productive situations in the market (Halpern, 2010).

The difference between regulation as a long term national objective-driven tool and regulation for controlling the market activities is significant. The national objective-driven regulation has more long term usability and provides much more freedom to the players; Regulation controls market activity often gets misinformed as the years pass. On the other hand, regulation with information asymmetry will have long-term issues, like keeping only specific group interest in mind, efficient monitoring, etc. (Carter & Simkins, 2004). By and large, the applied differentiation is at the core of vast numbers of debates concerning the state's job in a market economy. For instance, Nee (2002), Polanyi’s (1944, p. 140) postulates that a market economy expects the regulator to be continually on the watch to guarantee

the free activities of the regulatory policy and framework'. He contends that there is a causal connection between the rise of a 'lawful sound administration' (Weber, 1947) and the help of market foundations. Others are increasingly suspicious about the bureaucratic expert job since they respect them not as unique policy implemented but as immediate leaders with a high potential to rule instead of helping the portion of assets be more efficient.

The public interest hypothesis of Regulation one of the most significant outcomes of the 'minor unrest' of the 1870s was the improvement of undeniably increasingly thorough and formal welfare economics than the first classic examination of economic policy(R. R. Geddes & Wagner, 2013). For example, the new hypothesis was related to scholars, for example, Walras, Pareto and Pigou (for example, 1938). At its heart was an examination of the properties of general equilibrium. One of the noted definitions is Walrasian equilibrium (Arrow & Debreu, 1954); every economic agent picked a substantially smaller product than the total product in the market. Consequently, their trades have no impact on the price of the products in the market.

To show the presence of general competitive equilibrium was an extraordinary scholarly accomplishment; it is the foundation of the present day's economic Regulation (Armstrong et al., 2005).

It should be noted that the ideal regulation is the one in which all goods and services are freely moving in the market without challenges, and private sector advantage is directly convert into a social advantage (direct customer benefit). However, it is an ideal situation challenging in reality. One of the more aggressive kinds of equilibrium theory is Pareto optimality (Stiglitz, 1981). Nobody could be improved off without making another person worse off. In other words, the resource allocation is said to be Pareto optimal if there is no other alternative possible resource allocation that can make one person better off without making somebody worse off. A market can achieve Pareto optimal conditions only when the market is perfectly competitive under general equilibrium condition. It also means that in

a competitive environment, the price of goods reflects the actual economic value (Niu & Zhang, 2013)

Equilibrium prices explain minimal advantages to purchasers and peripheral expenses to the makers. The ‘First Theorem of Welfare Economics’ had complex repercussions for public strategy(Czerny, 2004). It was equipped for driving in two altogether different bearings depending on how it was translated. One reaction to the ‘first theorem’ was to contend that since the immaculate challenge had such an attractive proposition, the public arrangement should reduce competition obstacles. The challenge may bring about extremely inconsistent dissemination of pay for the demonstration(H. Wang et al., 2018). A ‘Second Theorem of Welfare Economics’ was utilized to show that any ideal distributional result could be accomplished through proper single amount charges(Adler & Liebert, 2014). The prescribed strategy bundle achieved productivity through focused marketing and value through ‘non-discriminatory charges. This is where economic regulation comes into the picture. Regardless of how much the control on a contract has been kept the longer the contract period, uncertainties keep mounting with time (world bank, 2019).

For instance, price capping promptly contradicts the formal necessity that all contractual stakeholders are ‘price takers. The new rules or regulation provides relief for a brief period (A. M. E. Beesley & Littlechild, 2016b). Only providing a guideline for regulation may not serve a whole purpose. The market is imperfect; assuming that players will not have any information advantage or outside support is incorrect. Seen from this subsequent viewpoint, the job of economic regulation was conceivably comprehensive(Zou et al., 2014). Markets did not have the attributes of the flawlessly focused model and, in this way, could not be relied upon to accomplish economic effectiveness. This is why stakeholders are generally disappointed with long term contracts.

Businesses subject to declining costs required an endowment since the negligible expense of additional yield would be underneath the make back the initial

investment price. The regulatory exercise is ongoing. Cost optimization is a must in the PPP contract, which the government always intends. Social welfare and market sentiment have to be met (Iossa & Stroffolini, 2005). To meet both requirements, regulators see a balancing agent trying to balance the market with better policy to maintain the market demand and social welfare (Willoughby, 2013). It was undoubtedly accepted that the regulator had the data on which to act and the government's proper motivation and support. This thought of the professional regulatory agency was also necessary for the macroeconomic regulation that left the 'Keynesian principle' of the 1940s and 1950s(Perkins, 2013). The economy was comprehended as an arrangement of conditions. Regulator worked on creating shared (goals that should improve firms' performance and the overall market for consumers) and applying specialized tools to control the estimations of many policy instruments to realize the best conceivable outcome, social welfare maximization (David Starkie, 2006). Regulators were in the Platonic convention of logician lords. Whether dependent on the general equilibrium hypothesis or Keynesian macroeconomics, the regulator's job is better explained as Hobbesian (Gibbons, 2000). The sovereign authority is utilized to force an answer where the social result would somehow be disadvantageous since people cannot come to enforceable understandings(Palmer, 2013). The law is organized to 'limit the damage brought players individual players' self interest and consumers' limited understanding(Ma Jamison, 2007).

2.4. THEORY OF REGULATION

From the 1960s onwards, the players' unethical business tactics to deal with economic regulation were exposed to further analysis. Some of the cases in the past 40 years partially clarified these issues(Laffont & Tirole, 1996). Keynesian macroeconomic regulation had not created steadiness, even though an economic decline in the post-world war era was not experienced, although developed countries' economy was expanding(Basso, 2008). However, at the same time, joblessness in the general public also increasingly turned into the day's issue. Correspondingly the microeconomic regulation of business sectors in the United

States and the work of those businesses nationalized by the post-war Labor government in the UK did not appear to bring about any noticeable proficiency gains (Grout, 1997). For instance, Stigler and Friedland (1962) could discover no proof that energy prices contrasted after the world war between those states with regulation and those without, while as indicated by Stigler (1964), the Securities and Exchange Commission had also been incapable of creating quantifiable outcomes. The regulation of rents, for instance, prompted examinations of its production costs as opposed to its advantages (Olsen, 1972). Regulations were used to keep prices beneath minimal expenses for specific sectors and keeping price above the expense level for certain groups along these lines; regulators utilised the price framework as a redistributive device contrary to the second theorem of welfare economics (Posner, 1971). Unbiased public official and to display the conduct of regulators and lawmakers utilizing a similar kind of examination as may be utilized in the private division. On the off chance that directors of public constrained organizations could be seen not as conventional profit maximizers however, as augmenting firm size or revenue, it was a little extra venture to accept that civil servants were spending maximizers (Niskanen, 1968, 1971) or on the other hand that government officials voted maximizers (Downs, 1957; Buchanan and Tullock, 1962; Breton, 1974).

In general, scenario business visionaries in consumer theory were considered profit seekers. They would be relied upon to campaign for a good administrative condition once they understand that regulators and government officials were available to create a good ecosystem (Sappington et al. The group of producers in a market needs to be under since they were in a superior position than were buyers to defeat the ‘aggregate activity’ or ‘free rider’ issue (Olson, 1965). Stigler (1971) utilized this system to propel the so-called ‘capture theory’ of regulation with its surprising decision that the administrative framework is working in light of a legitimate concern for the controlled firms instead of the more overall population intrigue. This theory was reprimanded by Peltzman (1976) for not considering the impetus for different gatherings to stand up to as they encountered expanding minor

expenses of regulation. The speculation of assets in endeavours to redirect salary from others through the political and administrative procedure was known as ‘rent chasing’, a term begged by Krueger (1974). Rents emerge when dealers get more than the least they are set up to acknowledge, or purchasers pay not precisely the greatest they are set up to offer. It is a component of an impeccably focused equilibrium that the aggregate of such rents is augmented and that subsequently, there is no rent on the negligible exchange. The greatest that a purchaser is set up to offer for extra yield (its negligible advantage) is equivalent in a focused equilibrium to the base a provider is set up to acknowledge (its negligible expense). An intentional exchanging action that outcomes in shared addition are a type of rent chasing that makes rents and expands proficiency. The increases to exchange appear as extra rents gathering to the different exchanging parties. The political weight that brings about the redistribution of rents through the political and administrative framework, in any case, is a type of rent looking for that is inefficient. It speaks to a procedure of rent dissemination instead of rent creation because the total assets put resources into making a case for rents may rise to or even surpass the rents accessible (Tullock, 1980). Buchanan et al. (1980) have examined rent chasing as a noteworthy part of public choice theory.

This public choice point of view of the administrative framework prompted a reappraisal of the historical backdrop of organizational development, particularly in the United States. Indeed, even significant authentic occasions, for example, the Foundation of the Interstate Commerce Commission (ICC) in 1887, since quite a while ago observed as a method for controlling the restraining infrastructure, power of the railroad organizations, could be reinterpreted as a method by which these same organizations could dodge progressively merciless competition on extended periods (for example Kolko, 1965). The Bell Telephone Company, during the first decade of the twentieth century, upheld regulation to limit the new passage after the expiry of licenses had made it increasingly defenceless. Aircraft interests were conspicuous in supporting the Foundation of the Civil Aeronautics Board (CAB) in

1938. Somewhere in the range of 1950 and 1974, no application to begin another between state aircraft was allowed by the CAB.

From the perspective of positive economics and as a method for clarifying administrative results, the public choice theory had preferences over the public interest theory of regulation. From a regularizing perspective, the impact was to move consideration away from the ID of perfect ‘closes’ to a talk about what institutional systems would be generally acceptable in accomplishing them. The public intrigue theory of regulation was a part of Demsetz (1969) named ‘nirvana economics’. Genuine foundations should not be contrasted, and the nirvana of an ideal administrative framework is accomplishing a Pareto productive designation of assets. They ought to be contrasted and reachable choices that did not rely upon unexplained changes in human inspiration (the ‘individuals could be different’ false notion) or unexplained and costless changes in the accessibility of data (the ‘error of the free lunch’). Consideration was along these lines diverted towards the comparative investigation of organizations or elective administration game plans. What rules of the game will probably create the best outcomes over time that can be accomplished by and by? This is the essential issue of administrative economics and powers us to consider ‘protected’ issues about the impacts of property rights, procedural principles and individual motivating forces in administrative forms.

2.5. NATURAL MONOPOLY

Only one provider can exist, and the only one can provide the product at a reasonable cost and still exist with a reasonable profit. In other words, two players will only increase the cost of their existence(R. Geddes, 2000). Hypothetically, characteristic syndication conditions are that cost and capacity are ‘subadditive. Empirically, this implies regular syndication is related to businesses that require the contribution of enormous unbreakable measures of fixed (and normally sunk) capital. Verifiable, the divisions generally subject to characteristic restraining infrastructure have been the ‘public utilities, for example, gas, power, water, and media communications just as different types of transport(Tretheway, 2001). These

businesses' centres are ‘indissoluble’ resources, such as pipes, links, wires, satellites, rail, street connections, conduits, etc. Indeed, even old-style liberal market analysts such as Smith, Mill and (in later occasions) Baumol and Buchanan perceived the appealing quality of some government regulation within sight of regular imposing business model or ‘extraordinary joints efficiencies’ (see Baumol, 1965 and Buchanan, 1975, p. 97). Smith contended for the Regulation of the cost streets, and Mill talked about the instance of trenches.

In railways' regulation started in the United States in the nineteenth century and was stretched out in the twentieth century to media communications, broadcasting, and power(Delaplace & Dobruszkes, 2015). On later occasions, more major consideration has been given to organize economies in utilization contrasted and the more seasoned spotlight on straightforward economies of scale in creation. The more client correspondence arrangements he draws in, the more critical it administrations become and, up to some limit, the lower the expenses per unit of administration conveyed(Merkert & Cowie, 2012). Economies of degree are likewise often related to current public utilities. These exist where it is less exorbitant to produce different items together instead of in independent firms. These will come again at last get from some joint info that can be utilized while generating a few different items(Sambrani, 2014; Socorro & Viecens, 2013). For instance, there are economies in metering and charging at the retail level if purchasers manage a solitary organization for gas, power, and water. Economies of extension subsequently support the development of differentiated as opposed to particular firms.

From a Coasian perspective, the issue of a characteristic imposing business model is the unfeasibility of assembling the agreements required for effective arrangement. A characteristic monopolist who could haggle causelessly and separately with all clients for administrations to be rendered in all future timeframes would not require regulation on legal effectiveness grounds. A monopolist must reduce significant measures of capital for the future and has limited capacity to expand, and the price is regulated. In such cases, the monopolist will boost profit

by showing unproductive expenses charging a price in an overabundance of minor expenses. A few types of regulated procedures are required to defeat this issue. The advancement of helpful plans in which purchasers become ‘proprietors’ of the characteristic restraining infrastructure endeavour, for instance, can happen suddenly (Hansmann, 1996). If customers hold control rights to the advantages they can, subject to the unavoidable expenses and wasteful aspects of aggregate choice procedures, guarantee that the imposing business model works to serve their inclinations(Forsyth, 2007). It does not need to appear as ‘the state’; however, over a significant part of the twentieth century, the nationalization of standard restraining infrastructures was regular by and by. In the UK, for instance, the gas, power, water, rail and broadcast communications ventures were all under state control by the 1950s. This spoke to a definitive Hobbesian arrangement. Leaders delegated by the state would fix disappointments in personal understandings. Administrators were explicitly required ‘to advance the public enthusiasm for all respects’. Specialized counsel refined this reasonably ambiguous directive after incorporating setting prices identified with negligible social expenses and undertaking speculative ventures with positive net present qualities determined utilizing a test markdown rate(Yan & Winston, 2014). Two-section taxes, including overhead charges, were recommended if productive valuing would prompt budgetary misfortunes(Engel et al., 2011).

Effectively, the directors received information about the productive results in the regular restraining infrastructure segments that an ideal market may adroitly accomplish for different segments. The reactions levelled during the 1960s and 1970s at the US's administrative organizations, referenced above, were reflected in the UK by a primary comparative reaction to the nationalized businesses' exhibition. By the late 1970s, official reports and scholarly investigations scrutinized the exhibition of UK public endeavours (for example, NEDO, 1976; Pryke, 1981). Regardless of their lawful status as 'public corporations'14 free of Government, administrators of the nationalized enterprises were dependent upon experts' political weight just as from worker's guilds and other weight gatherings.

Prices, cross-sponsorships, work levels and venture plans were often strongly disputable.

Where money related misfortunes happened, it was difficult to tell whether these were a consequence of proficient valuing or wasteful tasks. Because of this issue, explicitly budgetary, the late 1970s presented profitability targets(Bilotkach & Mueller, 2012). In any case, this sort's advancements just served to toss into more honed help the contracting issues looked at by government officials and chiefs. What incentive did legislators need to decide fitting focuses, make them express, and stick to them after some time? What incentive did leaders need to give target setters fitting data or accomplish the objectives once set? Where a portion of the significant targets inherently non-certain and, in this way, not contractible?

Furthermore, these inquiries concerned the best reaction to organizational issues and raised the likelihood that public venture was inherently prone to be less gainfully productive than different types of enterprise. Specifically, if the administration wished to buy certain products and enterprises in the public's interest, it was hazy why contracting with directors of exclusive resources ought to be any more troublesome than contracting with chiefs of publicly claimed assets. The non-attendance of secretly interchangeable control rights in the public division obliged the kind of incentives that could be organized(Macário et al., 2015). They assumed control over risk, the insolvency limitation, the immediate intercession of investors with a critical individual stake, and the conceding of investment opportunities were altogether precluded by state possession. Numerous examinations during the 1970s and mid-1980s endeavoured to research the overall execution of public contrasted and private undertaking from this property rights perspective(AERA, 2010). In situations where public and private concerns could be seen in competition with one another, the last were usually found to have the edge of factor efficiency. It has been affirmed by work in the post-privatization time that examines the general execution of public and private undertaking over an entire scope of nations and industries(Ramón-Rodríguez et al., 2011).

General decisions about the association of normal syndications, notwithstanding, were progressively hard to draw because the option in contrast to the monopolistic public endeavour was a monopolistic private undertaking(de Brux, 2010). Any favourable circumstances of the last as for cost-effectiveness may not be incredible without competition and maybe balanced the more prominent abuse of restraining infrastructure power(Q. Wang et al., 2015). Any upgrades in specialized and cost-effectiveness from privatization were perfect, with a general crumbling in allocative efficiency(Tirole, 2014). The significant inquiry was whether the favourable circumstances logical from interchangeable control rights and the worth boosting incentives that went with them could be joined with some security against limitations in yield. This insurance would need to originate from an administrative framework as a substitute for a public-private partnership. In this way, in the characteristic restraining infrastructure businesses, the case for privatization was worried as much with the incentives looked at by politicians, regulators, and other interests (and henceforth about public choice) as it was about administrative incentives. If politicians and industry chiefs had neglected to accomplish 'public intrigue' goals under nationalization, what reasons were there for anticipating politicians?

What are the scope for regulators to improve with regards to privatization? Politicians would probably still seek after votes and still depend on political weight. At the same time, regulators could be 'caught' and would have their very own just as the public enthusiasm to consider(Schweitzer & Lyons, 2008).

The distinction among nationalized and privatized utilities from a public choice perspective, in any case, is in the principles that oversee conceivable political intercession. Under state proprietorship, political weight on directors could be immediate; however, it avoided public view. Under privatization, directors have guardian obligations to investors, the price of the organization's stock goes about as a proceeding signal concerning money related execution, accounts must be attracted up to satisfy specific bookkeeping guidelines, price-delicate data must be uncovered to the market, and administrative intercession must include itself accord

with procedural rules. These elements may be foreseen to expand the cost and diminish politicians' average advantage from impacting the board choices. Along these lines, privatisation will be related to 'de-politicization (Boycko et al., 1996).

2.6. ECONOMIC REGULATION AND ITS RELATION WITH COMPETITION

One important quality of the governmental framework that went with privatization in the UK was the regulator's obligation to support competition. This mirrored the judgment that privatization would give far more critical Social advantages if it were joined by a move towards focused markets than if restraining infrastructure power stayed flawless. It likewise had significant general outcomes for the idea of the administrative system. The regulator could be seen not as the master of specific results yet as the 'administration' supplier for an advertising process(Maskin & Tirole, 2008). This is nearer to the Coasian way to deal with 'advertise disappointment' than the Hobbesian one. Instead, the regulator allows the most extensive conceivable degree to strike new private understandings by empowering or encouraging competition. When in doubt, the possibility of the regulator for showcase forms is reflected in the ongoing merger of the offices for gas and power regulation into a solitary office, the Office of Gas and Electricity Markets (OFGEM)(Sobhiyah et al., 2009). Although regulators can be depicted as market facilitators, the more straightforwardly interventionist components are never a long way from the surface. The issue is the strain between two unmistakable perspectives on the competition. One underlines a transformative experimentation procedure of revelation in which contractual workers consistently scan for an unequivocal bit of leeway over their rivals(Assaf et al., 2014).

The regulation theory started with Hayek (1949, 1978) and Schumpeter (1936, 1943). If regulation is restricted to the excellent prerequisites of forestalling power or misrepresentation, the result is an 'aggressive regime'(Hicks, 1935). The other view sees competition more in the wording of an athletic challenge where firmly coordinated individuals attempt to accomplish indistinguishable finishes in similar conditions compelled by exceptionally formal and often broad sets of rules (D.

Sappington, 2016). Regulation is required to forestall cheating, and it helps create a framework for a stable competitive market (A. M. E. Beesley & Littlechild, 2016c).

Mediation in the competitive scenario sets the regulator in a place comparable to that of the supervisor of a game who screens the specific group and sees if anyone is getting more powerful(Palmer, 2013). if the regulator finds any group, then it tries to stabilise the game by reducing the power of the dominant player by the rules. The regulator may also look at the game from a macro level where the regulator may allow players to play but will not allow anyone to cross the boundary. These are relatively different originations of the administrative procedure. Regulator manages the competition of predator versus prey and often 'play God' for the market, meaning it tries to decide the market's future course of action (D. E M Sappington & Weisman, 1996). The other is attempting to create a perfect procedural 'reasonableness'. Considering the standard imposing business model, the entire thought of empowering competition appears to be confusing since a competitor with more resources will show up to disrupt the market to create a clear competitive advantage (Czerny, 2004). There are, in any case, a few manners by which the point can be deciphered. The first and most minor complex is for the regulator to ensure that if innovation advances and market size develops, exercises change from being 'characteristic' imposing business models to getting possibly aggressive market-based business models. This would speak to a Coasian policy of expelling obstacles to the exchange. Regardless of whether characteristic imposing business model conditions proceed to exist, the expulsion of passage hindrances can make the market more 'contestable', accepting that the issue of sunk capital is not excessively genuine. Where there are potential participants ready to take the market from an occupant as soon as the last attempts to abuse a restraining infrastructure position by raising prices, the market is contestable.

Administrative changes in the transport enterprises in the late 1970s and 1980s depended on the thought that the market works only by big players(Baumol et al., 1982). The second way competition has been encouraged in the regular imposing

business models is by a vertical integration policy. As effectively noticed, most public utilities' regular working business model component lies in system resources (by definition government resources)' arrangement. In power, for instance, it is transmitted and appropriation that usually are monopolistic. Also, in Telecommunications, the arrangement of wires from the nearby phone exchange to residential and business premises might be a characteristic indication of resources. However, this absolutely would not have any significant bearing on hardware production or the conveyance of different telephone utilities utilizing the wires (Georges Assaf & Gillen, 2012).

The obligation to empower competition can, along these lines, be deciphered as a policy of confining the regular restraining infrastructure component from the encompassing possibly aggressive exercises. Regulation would then be limited, on a basic level, in the centre of regular restraining infrastructure resources, which typically involves attempting to guarantee to get to on equivalent terms to all contending clients. The 'regular transporter' is required to post controlled prices to allow access to the system. This detachment between the arrangement of system resources and their utilization in conveying administrations to customers may be affected without separating the business into its parts and running them as isolated concerns. Directing a standard-bearer is progressively clear, be that as it may, if the transporter is not associated with utilizing its possess arrange. The doubt that vertically incorporated utilities will support they possess 'inner' clients over outer clients is exorbitant to defeat by administrative methods. This would be particularly valid if real degree economies related to system administrators and system clients' combination.

Given the enormous sunk costs related to most public utilities, aggressive procedures to undermine restraining infrastructure, power through advancement, the new passage has customarily been viewed as unreasonable in these segments. Competition, as has been seen above, has must be falsely imagined. The advantages of this ordered competition are broadly observed as exceeding any unfriendly consequences for value-based proficiency. In a couple of zones, in any case, value-

based issues have highlighted noticeably. For instance, in the rail business, the partition of track and flagging framework from the train working organizations in the UK have been dubious, chiefly on account of well-being concerns and the apparent trouble of guaranteeing appropriate track support by utilising the agreement. This case is intriguing because the partition of track and train organizations has not come about in much direct competition between train administrators over similar courses. The goal is that the traditional avocation for useful breaking down does not have any significant bearing. The potential significance of value-based contemplations is reflected in the choice in October 2003 to suspend the contracting-out of track support by the track administrator (Network Rail) and move the work to inward units to restore more noteworthy control.

2.7. METHOD OF REGULATION

2.7.1 Principal and agent

Competition alone cannot drive the market; regulation is needed in a general business scenario. There are challenges in the public interest theory of regulation, which abstracts from the data and incentive issues and expect a well-educated and considerate regulator ready to uphold ideal approaches on the directed firm (Hantke-Domas, 2003). An elective methodology sees regulation regarding a head agent relationship and spotlights on the issue of reasonable risk. Here data asymmetry (the way data is not similarly accessible to all invested individuals) is accepted to oblige the regulator's exercises. Data about the controlled firm's conduct, for instance, probably won't be accessible or just accessible at a highly significant expense. The regulator (head) is still thought to be seeking after public interest goals. However, the regulator may not have the slightest idea about its costs, relying upon public sources for data. This is where the contract is essential between the regulator and the firms in the market to share information as per rules (Bernstein & Sappington, 1999).

Firms (agents) are unbiased in terms of opportunity. The exemplary hypothetical response to the 'inconspicuousness' of an agent's exertion is for the agent to get the full extra advantage from additional exertion. There is a remote possibility a player if sees gold in the project he is going to do he may bear the risk associated with it, even initially he may agree to take care of the uncertainty, but a mere incentive cannot be a trust bond between regulator and agent, so a contract makes it more sensible for the market to function. In this situation, once the agreement is signed, the government will get rent, which will be automatic as per the contract (Perkins, 2013). In specific conditions, in this manner, the imperceptibility of exertion does not make a difference. An agreement like a lighter 'establishment' course of action, whereby the agent pays an establishment expense to the head and afterwards keeps the net outcome, this can provide 'powerful' exertion incentives (A. M. E. Beesley & Littlechild, 2016b). On account of a regulator (head) wishing to accomplish allocative effectiveness also, haggling with a syndication provider (agent), the identical arrangement is for the firm to get the total social estimation of its yield while paying a fixed charge to the administration for the privilege given to the agent to do the business (Loeb and Magat, 1979; Aristocrat and Myerson, 1982). If the firm wishes to amplify its profit, it will work in a cost proficient manner without being firmly checked. It will likewise set the production yield because accepting that a wonder such as this can be devised, its minimal income will rise to negligible social advantage, and profit maximization requires this is set equivalent to the company's nominal cost. This plan adjusts the company's nominal income with the peripheral social benefit of yield. It keeps away from hazard bearing costs because it is thought to be a hazardous, unbiased group (Arrow & Debreu, 1954).

The firm along these lines acts like a consummately separating monopolist, and its average profit-boosting choices will be socially proficient. The challenges with this plan are not hard to see. First, it streamlines the requirement for data about the company's costs of creation and exertion. Second, however, it requires the regulator to pay the firm entireties to the buyers' overflow produced on its yield. If the firm gets income from its deals to purchasers, it will act like a typical monopolist. On

the off chance that it is to carry on ideally, its peripheral income must mirror its yield total minor social estimation (Laffont, 2015). This necessitates that sponsorships be paid equivalent to the customers' surplus created. In this way, the regulator is accepted to know a lot about the minor social worth timetable for the company's item (Laffont, 2015).

The entire methodology is still in the convention of the 'public intrigue' theory of regulation. The plan, moreover, requires the regulator and the firm to deal over the fixed charge(Iossa & Stroffolini, 2005). The regulator might attempt to orchestrate the charge with the end goal that the firm, in the end, accomplishes a focused return on its advantages. However, the data to ascertain this will probably not be accessible. An aggressive honour of the establishment to the most noteworthy bidder would be one method for continuing. However, this includes transaction costs (discussed further underneath) and suggests that every one of the bidders has a similar comprehension of the peripheral social advantage of yield as the regulator (James L . Price, 2014). The fixed expense size will decide the company's inevitable profit, but not the productivity of its activities under this conspire. A remote possibility distributional network arrangement is critical to the regulator and not just productivity; Because both factors will define the charges (D. E M Sappington & Weisman, 1996).

2.7.2. Rate of Return Regulation

Fundamental regulatory frameworks have developed in the 1970s and were impacted by the hypothetical objectives and political dreams(Mobley et al., 1978). Since the early work of Averch and Johnson (A J), the focus of regulatory economics study has been on the types of economic inefficiencies produced by regulation. According to the economic literature, traditional regulatory restraints cause profit-maximizing businesses to misallocate resources, counter to the core regulatory purpose of reproducing competitiveness. In the literature, the term "rate of return regulation" has been used to refer to a variety of regulations. The Averch and Johnson model looks at how a profit-maximizing monopolist behaves when

faced with a rate of return on investment constraint(M. Beesley, 2005). The authorized rate of return exceeds the real cost of capital is a critical assumption in the research. The first model for regulating public utilities was built up in the United States, and the method used was the return rate on capital regulation or Rate of Return Regulation(Joskow et al., 1986)(Mark Jamison, 2000). In the literature, the term "rate of return regulation" has been used to refer to a variety of different types of regulations. The Averch and Johnson model looks at how a profit-maximizing monopolist behaves while facing a rate of return on investment limitation. The study assumes that the authorized rate of return is greater than the actual cost of capital. The regulator avoids data about costs; this framework's detriments are a lack of incentive for cost efficiency. It is not like the principal-agent model, which made the company's return subordinate all alone activities; rate of return regulation offers the firm the chance to gain a 'worthy' return and, in this manner, undermines the incentive to operate cost-effectively (S. Littlechild, 2003). Specifically, an unsuitable return rate can be effectively made satisfactory by expanding capital utilization. The entity can charge more price for the cost incurred in development sometimes; this leads to an artificial increase of prices called Gold Plating (Spann, 1974). The cost and the rate of return regulation make these incentives that bring down cost economy. The inclination of managed organizations to embrace exceptionally capital-serious creation techniques and, for the most part, to 'blow up the rate base' is known as the Averch–Johnson impact (Spann, 1974).

2.7.3 RPI-X Regulation

The post-privatization technique for a regulation presented in the UK took the structure of a price cap instead of a rate of return top. The framework became popular out of Littlechild (1983) official report into British Telecom regulation (BT). A directed price is set for a predefined regulatory period or weighted regular regulation slot in a given time frame (usually five years) (S. Littlechild, 2018). At that point, the controlled firm is allowed to build this price by incrementing the retail price index (RPI) subtracting with an arranged factor X to cover the foreseen profitability upgrades in overabundance of the national average (GDP) in other

words adjusting the inflation (M. Beesley, 2005). Occasionally, as for the energy sector situation, the equation would be stretched out to consider changes in the prices of determining sources (global gas prices) that cover an overall external influence of the directed company's costs beyond its ability to do anything about it. As a type of agreement, the RPI less X framework is like a fixed price game plan in which the purchaser has guaranteed the outcome(D. Starkie, 2001a). At the same time, the provider takes the hazard and gets the compensations from extra exertion or the disclosure of cost diminishing advancements. In this manner, it is closer in its incentive properties to the head agent contract examined before and keeps away from the wasteful Averch Johnson impacts related to the return regulation rate. It would not be relied upon to accomplish a completely productive outcome, in any condition.

Furthermore, Magat (1979) case, the firm gets the directed price for its yield and not (aside from by accident) a total equivalent to the negligible social worth. Littlechild (1983) initially considered the RPI less X framework to keep the privatized utilities from abusing their imposing business model positions in the short to medium term. The competition was empowered in the longer term. As a long haul method for controlling standard syndication, notwithstanding, there is a peril that the incentive properties of RPI less X are debilitated(Alexander et al., 2003). When issues arise in the price cap and renegotiation chances, a new control period starts(Oum et al., 2004). If the new price cap and the new estimation of X are identified with existing profits and to rates of efficiency improvement accomplished before, incentives are undermined. This is the central issue that was unanimously raised by private entities (Grout, 1997). As the administrative period's end draws near, firms will want to postpone efficiency upgrades that may unfavourably influence the coming administrative bargain. 25 More, by and large, they will utilize their data advantage over the regulator to exaggerate their costs. Changes like the item or the substance of the managed 'container' of administrations infer that a focal arranging issue will characterize the 'yield' to which the price top applies.

Beesley and Littlechild (1988) contend that due to the fixed regulatory period and how each deal is forward-looking instead of simply changing following past occasions, RPI - X regulation gives a more prominent degree for haggling (bargain) than the rates of return regulation. In this haggling condition, capital interest in extensive and explicit resources turns into a specific issue if price audits are as often possible. Firms may stress that, after the ventures have been made, future prices will be set at levels that do not yield an adequate return –it is like a catch 22 situation. Political weight on regulators to keep prices low or scrutinize past profits makes the firm powerless. This can prompt firms financing speculation utilizing more significant levels of obligation than the value since regulators cannot overlook commitments to shareholders at any rate (as in the UK) where they are required to allow the directed firms to back their legitimate exercises. The regulator may vow not to carry on in a deft route towards investors; however, governments' powerlessness soundly to submit far into what is to come is generally perceived as a critical issue. Indeed, it is not sure that renegotiating or interfering with private entities work on the project under the regulatory period is beneficial.

2.7.4 Profit-Sharing Regulation

RPI-X regulation is on a fundamental level intended to give powerful incentives to support profit-chasing conduct. By and large, profits in the abundance of some cutoff depend upon substantial well-known analysis, which has prompted recommendations for joining an express component of profit-sharing into a regulatory transaction with some imposing business model profits to the legislature(Alexander et al., 2003). However, It would not improve any change in evaluating and yield choices—progressively making profit-sharing more and more complex. The expense rate falls as the monopolist yield rises, which can be contrived to initiate firms to bring down prices and increment output(A. M. E. Beesley & Littlechild, 2016c). Alternatively, an arrangement of price regulation may be changed to incorporate profit offering to customers through programmed price modifications. Such plans are in the custom of 'public interest' regulation as effective and overall market goals are being sought after by the government to add

investors' interest in the regulation; however, as it is crafted by public choice and institutional financial experts, it is perceived by the presentation of political and other limitations on the policy procedure.

2.8. PRIVATIZATION, REGULATION AND COMPETITION

The idea of the national policy system produced for privatized utilities in creating nations has been affected by a nation's ability to actualize an arrangement of regulation and business sectors in which ventures have worked (Leontief, 1946). The procedures of regulation that have created have varied broadly in both structure and degree. Some administrative frameworks have set up price caps that restrict the price charged for a specific need (M. Beesley, 2005). This type of regulation is expected to give incentives to decrease costs since reserve funds can be accomplished to expand profitability for the private entity of the utilities. Different types of regulation have ordinarily comprised of profit regulation, which forces roofs on the allowed rate of return, or cost of administration regulation, which affirms profit markup on a concurred cost of giving a help (Martin and Parker, 1997). An ongoing report uncovers that some type of the price-cap arrangement of regulation has been generally embraced in creating nations despite having various drawbacks given the setting where it is applied(Kirkpatrick et al., 2004). Under price-cap regulation, a price ceiling is set up, and the profitability of the venture at that point relies upon the degree to which it can keep its costs beneath the decided most extreme income under the cap. The cost that goes through may likewise be allowed for any expansion in creation costs outside the regulatory cost control(D. Starkie, 2001a). It has been seen that this may display issues in many producer nations, where inflation rates will, in general, be high also vary more than in developing economies (Kirkpatrick et al., 2004). For example, in a few businesses, the business's sustainability depends on oil as a significant contributor to energy production. Costs are sensitive to changes with the global price of oil, and power cost may affect the residential level of swelling. In this case, the recipe for incentive regulation under a price top becomes more complex and may wind up giving misshaped signs to the market officeholder.

Additionally, as a feature of making conditions for surrogate competition, the foundation of a price top is often found to reference the most productive presentation(Laffont, 2015). The thought behind this is to lessen the dependence on an endeavour's very own costs and incomes to work in incentives to lessen costs(Alexander et al., 2003). This might be hard to create nations with recently settled regulatory offices since they need information on the effectiveness and have powerless authorization frameworks to gather such information (M. Beesley, 2005). Thus, there have been troubles in the institutional game plans for regulation under producer nations. Following the UK design, it has been very typical to set up a devoted regulatory expert for every fundamental utility area (Grout, 1997). In different cases, regulation of all utilities has fallen under the umbrella of an establishment in silos. Some have achieved a high level of independence, while government specialists have firmly constrained others. The degree of regulation has likewise fluctuated. Now and again, for example, in the media communications area, regulation has commonly been exhaustive. It has comprised of controls on balance sheets, rules for allowable asset base and business income, observing equity, and oversight of venture programs (Sappington, 1994). On the other hand, regulation has been progressively halfway, influencing just some of a venture or segment's exercises. It is also essential for regulators to understand how to provide regular competition and respect the market's competition law.

In most nations, as additionally in a broad scope of developing economies, the presentation of competition law is a moderately late event. Many developing nations had what might establish a robust competition structure, supported by competition law, in the late 1980s (Gray and Davis, 1993). Also, most developing nations have presented or are toward getting ready the new competition enactment (UNCTAD, 2004). The privatization of utilities in developing nations, such as water, energy, and media communications, has implied that competition is typically restricted since these ventures incorporate distinct restraining infrastructure components emerging from economies of scale and degree. Even though innovative change has disintegrated a few of the standard imposing business model attributes

in these utilities, especially in the media communications sector. It has allowed a more extraordinary level of competition in different regulatory regions. Developing nations still have elevated focus levels in these fields (D. Starkie, 2001b). Just as the hazard that is imposing business models will be built up following privatization, there is the extra hazard that occupant restraining infrastructures will abuse their imposing business model force by looking for inordinate profits that can hurt buyers. The hazard is exceptionally high regarding creating nations because, independent of the economic justification for a constrained number of members in the market, privatization as a restraining infrastructure might be necessarily identified with political intentions and the convenience of drawing in rare purchasers. Yarrow (1999) has highlighted the solid financial inspiration to privatize, with many creating nations expecting income to enhance raised through feeble and profoundly slanted monetary frameworks. As such, the financial advantages from changing administration and proprietorship through privatization may supersede thought of the productivity picks up that might be made of competition, is that it powers a legislature to be more express about goals and to be progressively transparent about the costs engaged with meeting these goals (Armstrong, 2003). How truly this is taken can be found in the regulator's terms of reference and powers. In a nation with stable, legitimate conventions and foundations, agreements and licenses can be utilized to constrain the players in the market or an absence of administrative 'responsibility by governments. Be that as it may, in creating nations, these organizations might be feeble and contract implementation poor as of now.

Besides, not all parts of a venture's presentation and the administration's conduct can be composed of different types of licenses(Qiu & Wang, 2011). Accordingly, these fragmented agreements become critical for deciding the result and adequacy of privatization and regulation (Newbery, 2000). In creating nations, a private utility monopolist will control the quality and degree of its administration if these contemplations can only with significant effort be epitomized in a structure of the agreement or if the regulator's agreement puts an excessive amount of accentuation

on cost decreases. Additionally, administrative agreements might be hard to recommend when a government may have raised prices preceding privatization, to guarantee that future financial specialists would have sufficient high returns on their expected speculation, and be looked at with the possibility of pruning them after under public tension(Bentz et al., 2001). By and by, regardless of the legally binding complexities, an enormous number of creating nations have presented new, committed administrative bodies for both their state-owned what is more, their privatized utilities. All in all, these new administrative offices have endeavoured to have a level of autonomy, in any event from the everyday political control. By and by, this has been hard to accomplish (Cook, 1999).by presenting more prominent competition (Shirley and Walsh, 2000).

Public utility self-interest also plays an essential role in the project (Peltzman, 1976). The issues can happen to the start of regulation where utility interests impact the regulation's plan and might be alluded to as 'top level' or 'political' catch. A lower level of a target results from regulations built up to improve the public interest becomes slanted in support of the players' special interests after some time (S. Littlechild, 2003). The regulations become adverse to different interests, especially for customers. The regulatory regime will probably be a specific issue in producer nations since utilities employ impressive political power. An absence of master aptitudes inside government may imply that staffing in administrative organizations must be significantly drawn from the business that is being regulated. The regulatory regime might be an outrageous circumstance, and regulation may essentially not be working as initially considered. Utilities might endeavour to dodge regulation through their control of data (Auriol & Picard, 2013). Data asymmetries that exist among regulators and the managed firms are vital to the regulation issues. Regulatory wastefulness and adequacy may likewise be firmly connected to how much regulators can learn by doing. At first, regulators may think minimal about the administrative condition they involve. New organizations may have been made, with the administrative standards encapsulated using enactment

in the administrative agreement. The agreement may be a vital determinant of the effectiveness with which learning can happen (Parker, 1999).

2.9. CONTRACT AND INFORMATION ASYMMETRY

Until the 1940s or 1950s, just circumstances of a simple exchange of goods. What is more, administrations were agreeable to a formal investigation. Increasingly complicated exchange exercises like the distribution commodities by Arrow (1964) and Debreu (1959) and the plan of a hypothesis of "decision under vulnerability" by von Neumann and Morgenstern (1944) and others have been part of the literature for a long time. The idea of exchanging state-unforeseen commodities gave an exact significance to the exchange and designation of risk. Inclination orderings over lotteries gave a formal portrayal of dispositions toward risk and inclinations for risk-taking. These theoretical developments are the establishments of modem hypotheses of speculation under risk and portfolio decision. In the late 1970s, one more applied leap forward took place with the presentation of "private data" and "concealed activities" in traditional settings. The thoughts of "incentive similarity" and incentives for "truth-telling" gave the essential underpinnings to the hypothesis of incentives and the financial matters of data.

Mainly, a Public-Private Partnership can convey better cash to the public entity; private interest in the undertaking can fathom the government's investment need, yet can likewise make substantial data asymmetries to add the expense to get regulatory support to increase charges. Eventually, acquiring a public utility venture through a PPP should possibly be viewed as when the apparent efficiencies of this technique are more prominent than the extra costs this procurement strategy includes. Guasch found that 30% of PPPs in Latin America are renegotiated with the most elevated rates found in the water and sanitation segment (74.4%) trailed by the sanitation division (54.7%) (Guasch, 2004, p. 81). Generally, it is difficult for the government or private stakeholders to realize the factors affecting the project shortly and the ecosystem surrounding the system changes with time concerning the project. This is the time when a renegotiation is an essential tool for stakeholders

to revise the project. In India, this trend is not visible in the PPP contract. The private stakeholder is locked up in the PPP contract.

Financial renegotiation isn't constantly viewed as a choice when the underlying PPP contract is marked; be that as it may, if a project starts to encounter trouble, usually renegotiation is intended (Ho, 2009, p. 280). For instance, in a regulated market where a private firm isn't allowed to set prices, disintegration in monetary conditions can crash profits, subsequently expected returns can never again be accomplished, for this situation, a renegotiation of the agreement to make the firm gainful is objective (Guasch, 2004, p. 37). However, a problem emerges when there is no common crumbling in financial conditions and renegotiation is being asked. In this circumstance, it must be viewed as to whether the underlying offer was practical and renegotiations expected when the underlying offer was made. On the off chance the previous response is "no," and the last is "yes" at that point, we could be watching a shrewd bidder. Ho, reveals to us that "entrepreneurial bidders, in their proposition, will deliberately downplay the conceivable dangers included or exaggerate the venture gains to beat different bidders" (Ho, 2009, p. 280).

A properly planned and focused closeout should ensure that the most efficient firm receives the bartering returns. In any instance, when bidders consider the possibility of the contract being renegotiated at a later stage of the project, the most efficient firm does not win the contract (Guasch, 2004, p. 35). The processes and offers of the organizations participating in the sale vary when the potential of renegotiation is factored in. When no renegotiation is contemplated, firms base their bids on two factors: how effectively they can provide the requested administration and their knowledge of the project under consideration.

The firms often face a problem in the contract because the contracts are created without considering changes during the operational phase. As renegotiation is not possible in the airport sector, this creates a dilemma for the private stakeholder to find ways to make sure the project runs smoothly, which may not be an efficient way of running the business.

2.10. ECONOMIC REGULATION OF AIRPORTS AND TWO-SIDED MARKET

If two arrangements of agents and an agent from one side of the market may coordinate with an agent from the other side of the market, the market can be considered two-sided (Gale and Shapley, 1962). "Described by the proximity of two particular sides whose exceptional advantage comes from interfacing through a typical stage," two-sided marketplaces say (Rochet and Tirole, 2003: 990)." There are three components to the structure of two-sided markets: the different sides and the stage, enabling them to locate one another and interface. Two-sided stages are classified into market-creators as just depicted, crowd creators that enable sponsors to get to the crowds assembled for many other business reasons, and request facilitators, for example, authority creating guidelines (Evans, 2003a). Two-sided markets are now and again described by "organize economies." The larger the number of members, the more significant the advantage to everyone. Rather than the fundamental instance of system economies, the more significant the number of clients, the more noteworthy the advantage (e.g., phones). Here the market is sensitive to external forces. In two-sided markets, the larger one side's advantage, the greater the other's advantage (e.g., more enormous passenger volumes make more noteworthy open doors for airport retail deals). In specialist terms, two-sided market theory can be described as "a bridge between structured economics and externalities, which weakens externalities" (Rochet and Tirole, 2003: 991). Accordingly, "a market is two-sided if one side can influence the volume of transactions by charging more to the other side of the market and lessening the price paid by the opposite side by an equivalent sum; so one can assume that the price structure matters and both sides must plan it [the price structure] in order to bring the two sides prepared for Market" (Rochet and Tirole, 2006: 665).

Conversely, if that is not the situation, the market is uneven. The charges can incorporate either fixed enlistment charges or use expenses, or both. The critical business knowledge, which also impacts regulation, is when regulators might have

the option to increment the number of members on one side by controlling the other's prices to take an interest in the Market (Maskin & Tirole, 2008).

In the broadest sense, two-sided markets are very regular. For the model, retailers can be viewed as a platform connecting customers and wholesalers. Gillen (2011) and indirectly Starkie (2001) and many others have recommended that the two-sided market structure give airports the executives and public policy experiences. Such statements see the airport as a stage connecting the carrier from one perspective and travellers on the other (Gillen, 2011). Consonant with the writing on two-sided markets, carriers scan for and take advantage of enormous traveller pools. Similarly, travellers looking for an advantage from a vast choice of aircraft and destination routes. For the most part, the accentuation has been on administrative issues. The main issues are that valuing underneath peripheral costs is not really savage and that, appropriately comprehended, market powers may lead airports to limit aeronautical charges so just a light administrative touch is required. As a result, carrier administration, travellers, and the load will generally concentrate at a moderately modest number of airports all around and locally. In light of ongoing ACI information, the busiest 36 airports catch 33% of worldwide traveler traffic**.** For payload, the busiest 12 airports on the planet catch 33% of the traffic. Locally, in those cases wherein different airports serve a metropolitan district, a single airport commands air traffic control except for specific, moderately uncommon conditions.

In examining airports and different transportation types as stages in two-sided markets, the distinctions from the internal strength and different models used for pricing may influence the viability of the two-sided aviation market. First, airports bolster a many (travellers) - few (aircraft) coordinating which might be middle between the many-numerous matches of web entryways and the one-one counterparts for work markets. At centre point airports, a solitary aircraft often catches an enormous part of the traveller population and may disguise many positive externalities (Malavolti, 2009). Thus, an airport estimating policy might be more grounded at busy non-centre point airports. Second, the nature of the

coordinating alongside the costs in question influences each side's capacity to multi-home — and in this manner their choices to take an interest by any stretch of the imagination. It is costly for aircraft to multi-home, in part, clarifying their by and large preservationist strategies, however fundamentally less so for travellers. Third, not at all like in the software industry where the economies of scale are significant; however, the economics insignificant, the nonattendance of economies of huge airports in the type of longer excursions to doors, longer taxi times to runways, and once in a while blocked airspace, is often apparent (e.g., Doganis and Thompson, 1974; Jeong, 2005). According to Rochet and Tirole (2003), organised economies are fundamental to a few significant discoveries. Fourth, unlike the electronic instalment industry, which only supports a few steps, the transportation sector has many stages (airports). Many of them have unfinished geographic imposing commercial models that limit competition among stages.

2.11. AERONAUTICAL REVENUE AND COMMERCIAL/NON-AERONAUTICAL REVENUE

A significant part of the dialogue of airports as stages in two-sided markets focuses on how aeronautical and non-aeronautical incomes could be figured out and how to cross-finance each other to increment the level of traffic and create the total income for airports(Atasoy et al., 2015). The most pertinent bits of non-aeronautical incomes might be due to the liberalization of aircraft regulation. Food and beverages and accessories are now available at both airports and airlines (Malavolti, 2009).

Malls and retail sites for air travellers are too significant. Likewise, air travellers interest in retail buys can improve non-aeronautical incomes (Zhang & Czerny, 2012a). While shopping expenses are often a significant contributor to non-aeronautical income, They are most often a tiny segment of the total travelling population; in other words, the travellers who have spending plans at the airport may shop (in substantial volume) from the airport (Castillo-Manzano, 2010). Most travellers are only observing the products rather than buying them. The focal

element of the two-sided market is that diminishing aeronautical charges for carriers at the end of the day will help the aeronautical side reduce long-run costs but may not improve non-aeronautical revenue(Bogicevic et al., 2013). Better yields on nonaeronautical ventures would regain costs. The plausibility of winning high returns on non-aeronautical ventures, such as airport retail, lodgings, and hotels, the lounge may motivate airports to focus on improving their aeronautical business where the rates are more regulated because the cost in aeronautical revenue is spread across multiple entities like a runway, parking space etc(Sehgal et al., 2017). Because aeronautical incomes are frequently required to spread costs of runways, parking, and the segment of terminals legally associated with aeronautics at dual-tunnel airports, the argument may have far greater validity for single-tunnel airports, where non-aeronautical incomes may finance carrier costs to a greater extent to increase absolute monetary returns. In either case, the ideal airport strategy is to sponsor aircraft tasks to pick up access to a perfect client base. (Following a similar rationale, a few airports likewise limit stopping charges, which often comprise a critical part of non-aeronautical incomes, to expel obstacles to extra travel.) Analysts have long said that terminals are costly shopping centres with runways (Sudjic, 1992). Similarly, as malls give free stopping to pull in clients, Airports can also do the same (Brueckner, 1993. An airport client base can be very well-to-do, it can cater a huge set of populations. Retailers, hotels, luxury stores, and others may pay a premium for preferential access to this first-class consumer base, which may be reflected in terminal retail space rates (Bush & Starkie, 2014).

2.12. SINGLE TILL VS DUAL TILL

With the modernization of airports, more money in private funding started flowing into the airport development. This is partly due to the liberalization of many economies and privatization or partial privatization (Public Private Partnership) of the airport sector(Macário et al., 2015), giving rise to the modernization of airports globally standards. With modernization, airports started investing hugely in developing terminals, runways, non-aeronautical source of revenue etc. (Knieps, 2014). More investments in the airport sector focus on improving retail revenue

because it’s not under regulation(Assaf et al., 2014). Because of the airport's free hand to develop retail revenue and retain its profit, there is a chance to abuse, dominance by the airport (Bush & Starkie, 2014). The abuse is increasing expense (gold plating), and increasing aeronautical charges to the airline is entirely possible.

Airports are generally considered a monopoly due to their location advantage (Czerny, 2004). Only one airport in an area provides no choice for airlines and negotiates with the airport's price (except some exceptions where airport competition exists, but those airports are few). Therefore, economic regulation became a fundamental pillar to regulate airport activities so that the two-sided market is always stable. Furthermore, the regulator realized that the airport-airline relationship is crucial for the sector, so no market should abuse the other. Looking at these aspects, the government globally started creating economic regulation rules based on price cap regulation (RPI-X). This helped regulators monitor the airports' cost part and the efficiency gain they are making with each year after inception. It is also noted that passenger demand has a very high significant relation with ticket price does not have a very significant effect due to concession prices (non-aero products), this is possible because passenger will be aware of the change in ticket prices but may not be aware of concession prices until he reaches the airport (Czerny, 2004).

Many authors have discussed the relationship between non-aeronautical revenue and its impact on passenger demand and airlines (Bush & Starkie, 2014; Czerny, 2004; Malavolti, 2009; Zhang & Czerny, 2012a). The economic regulator needs to keep a balance between the two sides of the market. It can be possible only if the non-aeronautical revenue is also used to subside aeronautical prices' ill effect. The reason discussed till now gave rise to the concept of single till and Dual Till.

The question that gave rise to a single till is whether the concession revenue should cover the airport's infrastructure expenditures. In other words, single till means airport concession revenue is entirely cross-subsidized to calculate the revenue

requirement. Therefore, it reduces pressure on the airlines as more commercial revenue less will be the aeronautical charges(Oum et al., 2004).

In dual Till regulation, the basic assumption is that concession revenue is not directly linked to the airlines, so the only concession cost will be cost subsidized in calculating the total revenue earned. This has two sides(Oum et al., 2004). First, it provides the airport with some benefit in terms of more concession profit, but it provides slightly less incentive to airlines.

After exploring the literature on price regulation, incentive regulation, Economic regulation, Regulation theory, Natural Monopoly, Competition, and two-sided market one, we can agree that underneath all the government player arrangement is the agreement or other words, a contract.

2.13. THEORETICAL UNDERPINNING

- We found out that the theory of incentives, information, and economic institutions/Regulator, is generally referred to in short as contract theory (Bolton, P. & Dewatripont, M., 2005. Contract Theory)
- This study will focus on incomplete contracts: public-private partnerships are typically incomplete contracts (Hart, O., 2003The Economic Journal, 113(March), pp. 69–76). Incomplete contracts are long term contracts that are uncertain or incomplete boundaries that are open for the future.

2.14 CONTRACT THEORY

Evolution of contract theory towards incomplete contract

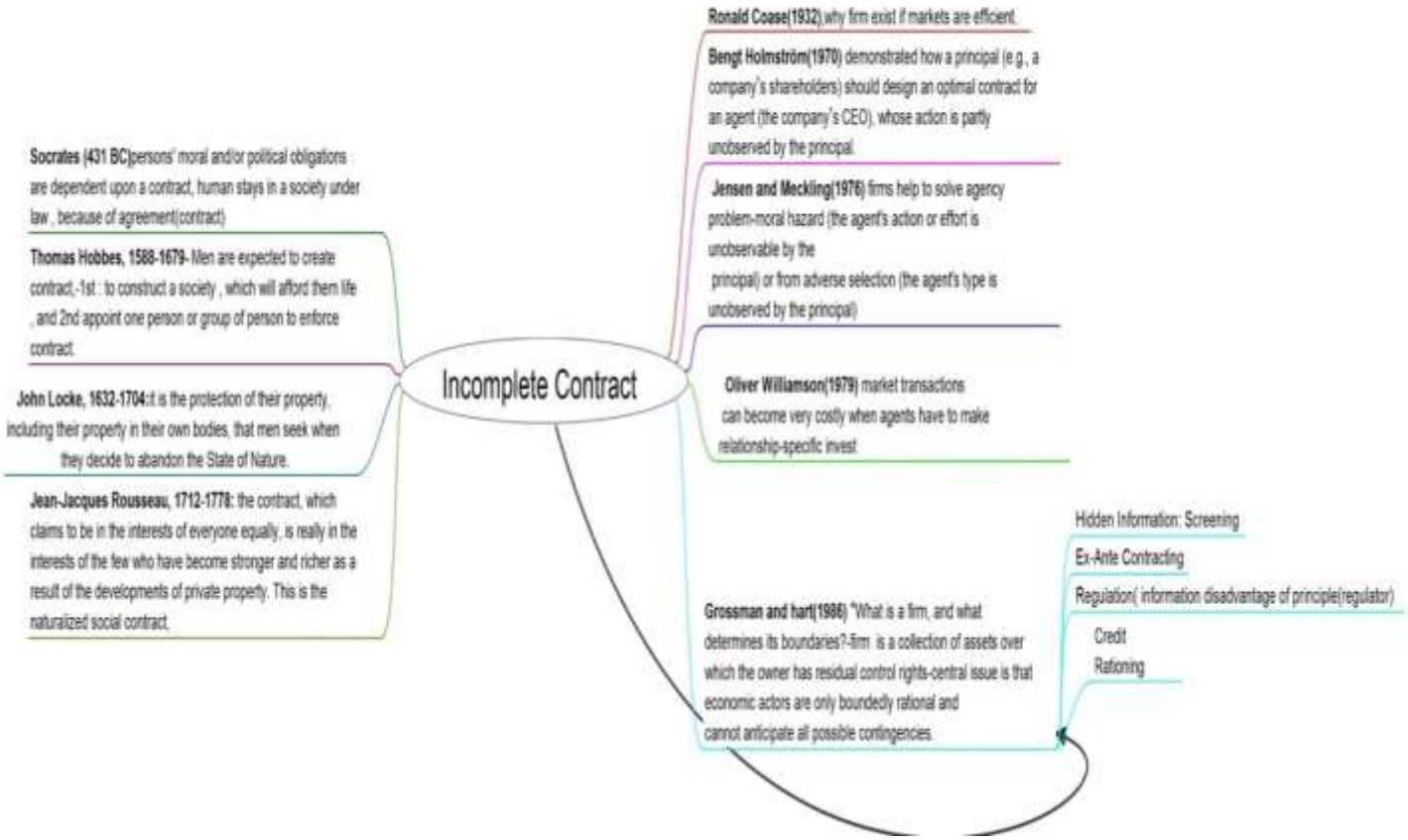


Figure .2.2. Contract theory evolution

Contracts are a necessary part of our general public. It is used to reduce conflict of interest among stakeholders, in other words, among agents and principals. Agents take a shot for the sake of the principal. For instance, think about the agent as a CEO on a fixed salary and the principal shareholder. The more productive the CEO makes the organization, the more the shareholder benefits through stock cost increments (Bolton & Dewatripont, 2005). The CEO must then consume essential assets, for example, time and exertion, to improve benefits. This characterizes one of the contract hypothesis's focal assumption: *the agent's utility*, the principal, will

constantly monitor his performance by measuring the work he does. All factors will be considered through the measure of work. Without a doubt, the more work the CEO does, the less he will profit under a fixed salary, which prompts an irreconcilable situation. For the principal to pick up an incentive from the agent's work, he should give some motivating force that restricts the expense of accomplishing more work.

The contract hypothesis's foundation lies in declaring that the ideal contract boosts the two parties' all-out advantage. Since the agents control their measure of exertion, they limit their work to augment their utility. This prompts problematic principal utility and imperfect complete utility. Without a contract, the agent will relax and diminish the benefit of the principal who utilizes him. Indeed, even with impetus-based pay, we, despite everything, run into the principal-agent problem.

This interaction is the reason why game theory is the very dominant tool in studies of Contract theory.

With contractible choice rights, Dessein (2002) applies the modest talk model of Crawford and Sobel (1982) and asks whether centralization with vital correspondence is preferable or more regrettable after assignment when the agent is secretly educated about a choice critical condition of the world. From that point forward, his methodology has been stretched out to different settings (see, e.g., Agastya et al., 2014; Alonso et al., 2008a,b, 2010; Harris and Raviv, 2005; and Rantakari, 2008). In these examinations, the essential inquiry is the tradeoff between loss of control (due to skewed inclinations) and loss of data (because of vital correspondence). The agent's predisposition is exogenously expected. An exemption is Rantakari (2013), who considers the setting where the principal can set the relative loads on divisional benefits in each divisional supervisor's goal work. Setting one-sided loads might be desirable over the principal since it will build the motivating force to accumulate nearby data. In his model, be that as it may, it stays unexplored why the principal cannot incentivize the agent by robust, however, adjusted contracts. The impacts of the proper choice assignment are

likewise concentrated in the corporate fund field, essentially in their association with inside capital markets in multi-divisional firms. It is just plain obvious, e.g., Brusco and Panunzi (2005), Harris and Raviv (1998, 1996), In-derst and Laux (2005), Marino and Matsusaka (2005), Scharfstein and Stein (2000), and Stein (2002). In terms of organisational design, not many examinations consider the ex-post endeavours and incentives at the execution phase of a dynamic procedure, as this strand of writing normally accepts the agent(s) to be a domain developer, who sees distinctive qualities in the size of his own divisions/ventures. When both the principal and the agent hold private information about a world state on which the agent's ex-post exertion efficiency is reliant, Zábojnk (2002) defines the benefit of an assignment. In his concept, knowing the principal's private data disincentivizes the agent, and appointment allows the principal to avoid discovering such data through her requests.

Bester and Krähmer (2008) may be the nearest to the current investigation in that they investigate the connection between organizational design and ex-post incentives without topsy-turvy data. In their model, centralization can be advantageous as a dedicated gadget.

However, the designation has no non-insignificant advantages, and it may be optimum only when the second-best effort level is zero. The choice of organizational structure boils down to a simple comparison of the principal's and agent's pleasure goals. Similarly, the current study by Bester and Krähmer (2008) shed light on a wide range of topics of the organizational design problem.

2.14.1. Hidden Information And Signaling

The extraordinary case of a flagging problem is the model of instruction as a sign by Spence (1973,1974). Spence's essential arrangement is a critical work advertisement where firms do not know consummately the labourers' efficiency they recruit. Without any data about specialist profitability, the competitive compensation reflects just anticipated efficiency, so low-profitability labourers are overpaid, and high-profitability labourers came up short on. In this circumstance,

the high-efficiency labourers have a motivator to attempt to uncover (or signal) their profitability to the firms. Spence considered that training before entering the work market might go about as a sign of uncertain efficiency. In a nutshell, his thought was that instruction might be less troublesome or exorbitant for high-incentive jobs for workers. They could, in this manner, separate them by getting more training. It is imperative to stress that Spence did not contend that education as such would raise profitability, nor did he contend that instruction would uncover capacity through the grades. His point was that high instruction would flag high profitability since it would be costly for low" 'productivity types to obtain high training. Spence's thought is the primary model of a pre-contractual flagging movement. Contracts often look to create boundaries for the firm, and those boundaries will be the level playing field on which the firm starts creating the business. These boundaries act as rules on which the firm has to play; When it is a government project, the player contract changes. It becomes more project-focused rather than firm focused. The firm will always want maximum benefit because profit maximization is its motive; the government will always want to have consumer welfare as the primary objective. The ideal contract is which provides room for both (Cruz & Marques, 2013). From the above reviews, we can say that the two-sided market of aviation (airport-airline relationship) and treatment of till the incentive regulation all come under the boundary of contract theory. Still, the papers do not directly explain why a contract can impact the project, especially in the partial privatization stage (PPP), how incentive schemes (price cap) impact a contract, and how regulation and contract can impact the future sustainability of the project. To summarise, the studies do not answer incomplete contracts, their impact on PPP projects.

2.15. INITIAL CONCEPTUAL CONSTRUCT

Contract Design	Contract design-related issues , contract boundaries , scope of contract , (Leon-Razvan et al., 2014), Gleave 2012
Stakeholder issues	Stakeholder dynamics (Monsalve, 2009; Transportation Research Board, 2011; Pagdadis, 2012, Sehgal, Dubey, and Tiwari, 2017)
Bidding	Bidding criteria, bidding process
Regulatory issues	Regulatory dynamics ((Tomo, Mangia, Hinna, and Pellegrini, 2020)
Airport Specific issues	Airport Specific (Graham 2009)
Sector Growth	Country and sector growth
Non Aero Revenue	Commercial revenue (Starkie 2003)
Business, Strategy	strategy, business (Bhattacharyya, 2011; Haverila and Haverila, 2019)

Table.2.3. Initial Conceptual Construct

2.16. GAPS IN LITERATURE

- Although Treatment of Commercial is already discussed by various literature, it is unknown until regulation (commercial revenue treatment) will be better for airports under the long-term PPP contract.
- Many of the literature talks about having incentive schemes in PPP, and also the importance of regulation is discussed. However, the Type of regulation of PPP contracts under Revenue share agreement on firms Profit and consumer price is unknown.
- The effect of Economic Regulation is well discussed in the literature, Competition issues under price-cap regulation in the long-term PPP contract is unknown.

CHAPTER 3

RESEARCH METHODOLOGY

3.1. INTRODUCTION

This part describes the research design and strategy for directing the research study. Research design depicts the association between information gathered to the examination's underlying research questions and how these research questions was answered, and what approach was taken (Yin, 2003). It explicitly addresses different research models, research methodologies,research techniques, research systems, information assortment techniques, and information investigation procedures.To develop the path for the research design and research focus, the research questions, research objectives were created. Area 3.3 depicts details about methodology and the reason for choosing game hypothesis procedure and focus group strategy.

3.2.. RESEARCH PROBLEM

- Although in the existing literature, various regulatory models are suggested, and their impact on public utility behavior is known, existing literature does not answer how a PPP contract agreement between government and airport operator affects the behavior of the firm under a long lease period.

3.2.1 RESEARCH OBJECTIVES & RESEARCH QUESTIONS

Research Question

- RQ1: How Contract between the principal(government) and agent(airports) affects agents' incentive to develop commercial revenue when price cap regulation is in place?
- RQ2: How economic regulation affects a firm's behavior under a revenue share contract agreement on Firms Profit and Pricing?
- RQ3: What kind of contract framework can help improve the agent's competitiveness and reduce the opportunity for abuse of dominance under long lease contract agreement (PPP) of public utility (Airports)?

Research Objective

- RO1: To develop an analytical model of Till regulation (economic regulation) of Indian PPP airport with reference to Indian PPP contract and understand the impact on the incentive of agents under different till regulation.
- RO2: To develop analytical model as per revenue share agreement of Indian PPP airport to understand firms' profit maximizing behavior as well as pricing behavior.
- RO3: To create a contract framework for future development of PPP contracts which will improve Competitiveness and reduce abuse of dominance of the agent.
- RO3 : To provide factors which can help to create better PPP contracts which will help operators get incentives as well as reduce the chances of abuse of dominance by the airport operator.

3.3. RESEARCH FOCUS

The research's primary focuses to understand players' behaviour in a contract and how incentives play an essential role in the agreement. Also, what factors will help improve the Contract to make PPP more sustainable in the long run.

In the early literature lot of factors have been studied that may help identify bidding criteria, understanding financing options, strategic execution of PPP, valuation of the project(Aerts et al., 2014; Berg et al., 2014; Cruz & Marques, 2011b; Dementiev, 2014; Givens & Busch, 2013; Hodges & Mellett, 2012; Hoppe et al., 2013; Nasirzadeh et al., 2014; Ng & Loosemore, 2007; Thackway & Olsson, 1999; Vassallo, 2010; Viegas, 2010; Z. A. Zhang & Durango-Cohen, 2012)**.**

But very few studies have attempted a study on the sustainability of long term PPP projects. These few studies discuss relationship management, contract

management, Special purpose vehicle, project management which is required to run the project(Abednego & Ogunlana, 2006; Grimsey & Lewis, 2002; Kajimo-Shakantu et al., 2014; Smyth & Edkins, 2007; Sobhiyah et al., 2009; Thackway & Olsson, 1999; Zheng et al., 2008) but they failed to come out with factors which improve the sustainability of long term PPP projects, basically because most PPP research is focusing on areas where contract period is 3 to 10 years.Also, economic regulation and its impact on long lease PPP are not studied. The PPP lease period is about 60 years in Indian airports and is generally under economic regulation, compared to other public utilities with a shorter PPP period.

To understand the phenomenon, some explanation is essential. It will help build theory and clarify the research methods used. In this research, there is a need to understand the player dynamics in the Indian PPP settings. As PPP factors cannot be generalized, factors such as country, geography, and sector all matter to understand the PPP project (Saussier, 2012).

In Indian Public-Private Partnership airports, the PPP airport is first presented for bidding by the government. The interested companies will present their auction amount in front of the government. The government will provide the contract to the bidder who provides the highest revenue share(share of revenue earned every year). Once the contract is awarded to the airport operator, AERA (economic regulator) will monitor the airport. The airport operator will submit the cost to be incurred for developing or operating the airport every five years(forecast). As per the regulatory regime, the regulator will provide the price to be charged from the customer(Aeronautical charges: revenue coming from the airline through parking rents, airline slots etc.).This relationship between regulator and operator is a part of the airport PPP contract. The regulator has two objectives, the common public should get the best service at a reasonable price, and the airport operator should not exploit its monopoly nature.The regulation used for monitoring the airports in India is known as price cap regulation.In general definition Price, cap regulation adjusts the operator's prices according to the price cap index that reflects the overall rate of inflation in the economy, the ability of the operator to gain efficiencies relative to

the average firm in the economy, and the inflation in the operator's input prices relative to the average firm in the economy.

Airports have two sources of revenue, aeronautical revenue (charges airlines give to the airport) and non-aeronautical revenue (airport shopping or commercial revenue). There are two modes of pricing for the regulator in the aviation sector; the first is single till, and the other is Dual till. Both regimes help decide the price to be charged by the customer(airline). In a single till regime, the price to be charged by the customer is decided by cross-subsidizing total commercial revenue(non-aeronautical revenue)from the total revenue earned by the operator(Aeronautical+non aeronautical). The critical assumption is that commercial revenue is a by-product of the passengers airlines bring into airports. So airlines should be given benefits for the same. The other regime is Dual till regulation which means the regulator will cross subsidize or substract non aeronautical cost(cost incurred for development of commercial revenue) from the total expected revenue from the airport.In dual till case airport gets some incentive as complete commercial revenue is part of airport operator and only non aeronautical cost are substracted but it may add pressure on airlines as single till prices are lower than dual till charges (not always true but in a general case scenario).

Therefore, this research study at first focuses on understanding & describing the Players (Airport Operator) behaviour in the extended lease contract and how incentive plays a role in the relationship between stakeholders. The thesis looks from the economic regulation lens because the active part of the contract does not affect pricing or government rules. The operation of an airport is actually not a complete part of the PPP contract itself.It is also essential to understand what kind of contract framework is suitable for Indian PPP contracts under economic regulation. To build the complete research setup, two methods are chosen. The first method is a game theory that helps understand player behaviour under different contract circumstances. And then the third, the focus group discussion method, was applied to create a framework to improve the contract.

Game theory, by definition, means "the study of how economic agents interact and produce outcomes that affect their preferences (or utilities)". (Stanford University Press, 1997)

A focus group is a research approach in which a small group of people meets to discuss a specific topic or issue to create data. The interaction between the moderator and the group and the interaction amongst group members is the most crucial aspect of a focus group. The goal is for the researcher to have a better grasp of the participants' perspectives on the topic at hand (Wong, 2008)

3.4. RESEARCH METHODOLOGY

The study requires an in-depth understanding of PPP, pricing mechanism, incentive regulation, and economic regulation to justify the Research Objective. It needs a some understanding of Contract theory and Game theory with a base of economic regulation; in this kind of studies, a quantitative methodology will best suited for the first two research questions and for the third research question, which is based on industry perception of experts, qualitative will be best suited.

3.4.1. RESEARCH DESIGN AND METHODOLOGY PROCESS

3.4.1.1 PHILOSOPHICAL ASSUMPTION

Scientific Paradigm: From Research Problem and Research Objective, suggests that there is the requirement of developing (Setup), Contract, Principal and Agent Relationship, so this study will use Analytical Modelling (Quantitative) (if required)

Scientific Approach: This study will be deducted, and inductive both since the research Objective is predominantly looking for answers to principal and agent behaviour and finally through focus group we are trying to create a framework;

Deductive → Theory →Hypothesis → Observation → Confirmation.

Inductive → data collection → development of concept → Concepts are used to the structure theory

3.4.2. APPLICATION OF GAME THEORY

When public and private participants negotiate sharing risks or development potential before forming a PPP, we employ game theoretical modelling. Non-cooperative games, which mimic how agents behave strategically toward each other when negotiating and coordination costs are too high, are used to describe such strategic discussions.

Non-Cooperative Game:

In-game theory, a non-cooperative game is a condition in which only alliance between players or principle-agent possible through a forces condition or Contract. Most of the pricing issues or player incentive issues are studied through game theory because it can capture the player's behaviour in a market much better than other alternative methods.

3.4.3. RESEARCH STRATEGY

The game-theoretical approach has been selected for research questions 1 and 2 because; the form of research deals with the player's behaviour, development of contract situation(Setup), Principal and Agent Relationship. The action of players will be derived from two-player non-cooperative games.

For Research Objective 1:

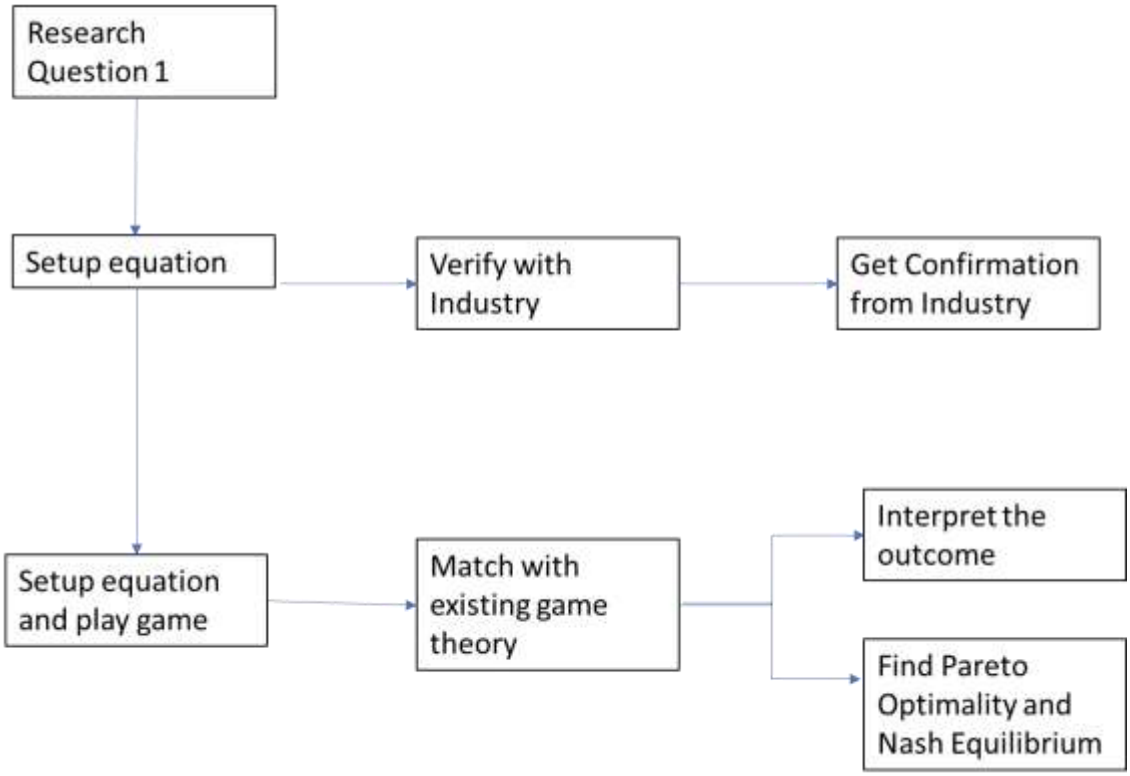


Figure 3.1. Game Strategy for Research Objective 1

The setup will be explained in chapter 5

For Research Objective 2:

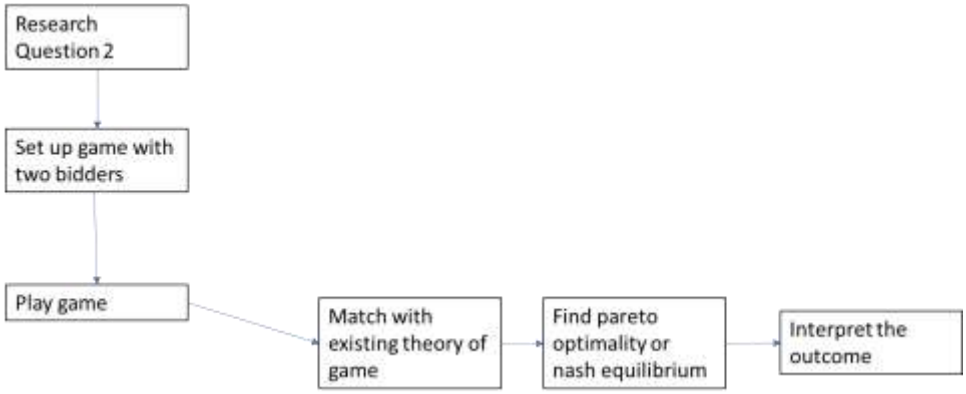


Figure 3.2. Game Strategy for Research Objective 2

The Setup will be explained in chapter 5

The outcome of each game will provide the result of each pricing regulation(economic regulation) and bidding consequences. The payoffs will influence our research, which will help us create guiding questions for research question 3.

For Research Objective 3:

We will use the Focus Group Discussion process to get critical factors influencing PPP contracts related to Regulation and Long lease Agreement.

Process:

- Define the Focus Group Team: Consist of 6- 12 key officials of PPP Airports and Regulator AERA, Competition Commission of India
- Questions will be prepared based on Industry Problems and RO1 and RO2 is relating to till issues, revenue share agreement and competition Issues.
- Three columns on separate paper are created. One column for coding will be used; One column will be for participant number, and One column for feedbacks.

- Look at common entries and categories as per themes. Assign number or letters to each category.
- Then assign the number/letter of the category that best fits each entry on the sheet.
- Sort all the comments as per categories
- Summaries the finding and build a framework for PPP contract as per Indian Settings.
- Match it with the outcomes of RO1 and RO2 for Confirmation,

3.6. PPP AND THE GAME

As discussed earlier Public Private Partnerships (PPPs) are becoming an increasingly popular way for government to undertake public infrastructure projects. In a PPP project, the private sector is expected to participate in the investment, the provision of services and receive significant risks from the government (EPEC, 2012, p. 5).

There are two reasons for establishing relationship between game and PPP. In a PPP , the government and private sector interacts in two levels. First during the bidding stage and the second ones the private entity wins the bid and the regulation to monitor the project begins.In the first case when the bidding is essential to enter the project players will put their best response to get the bid.The best response is always decided here by the government.Here the incentive for the bidder is to get the project and for the government it's the maximum revenue coming from the bid.In the second settings when project is underway the government wants least price to consumer and private stakeholder wants to gain profit, each interaction between regulators action (price regulation) and private entities reaction are best captured in a game theory settings.These conditions are better understood only by game theory because in the game we can observe the interplay between players as well as how players behave in each action.

3.7. GAME THEORY PROCESS

A game has N participants, each with their own set of strategies, and a result quantifies the outcome of each 'play' of the game in terms of the sum that each player wins or loses (Medda, 2007). Every player's strategy can be bewildering because it is a predetermined blueprint that outlines what a player would do in every possible circumstance (Simchi-Levi et al., 2014). There are two different kinds of games: Non-cooperative two-person game and cooperative two-person game. A cooperative game requires two individuals/players with interests that are neither completely dissimilar nor completely similar (Barron, 2007). Players make official agreements with a cooperative game; however, this is not the case in non-cooperative games. An appropriate game methodology will be applied to model and analyze the dynamic relationships between players in the PPP scenario.

Nash Equilibrium is a concept in game theory that describes each player's 'optimal response' to a particular strategic decision made by the other player(s) (Neumann and Morgenstern, 1944).

Table 3.1 indicates a classical game model called 'the Prisoner's Dilemma.'

		Prisoner B stays Silent		Prisoner B Betrays
Prisoner A remain Silent		Each serves 6 months (-0.5, -0.5)		Prisoner A:10 years, Prisoner B goes Free (-10,0)
Prisoner A remains Betrays		Prisoner A Goes Free		
		Prisoner B (10 years(0.-10))		Each Serves 5 years (-5, -5)

Prisoner's dilemma is a classic example of a game in which each player has a set of choices and outcomes are predefined, but they still make the worst strategy because the agents are non-cooperative.

3.8. USE OF FOCUS GROUP DISCUSSION FOR RESEARCH OBJECTIVE 3

A focus group discussion is a kind method of qualitative research that includes discussing a particular arrangement of issues with a pre-decided group of individuals (Manoranjitham & Jacob, 2007). Focus group research varies from other qualitative methods in its reasoning, performance, and information assortment procedures essential motivation behind the focus group research is to recognize the scope of various perspectives around the research point and increase comprehension of the issues from the members themselves' point of view. The group setting is proposed to gather more wide-running data in a solitary meeting than joint meetings. Focus group methodology was officially evolved in the social sciences during the 1940s (David and Sutton 2004). Its actualization was in statistical surveying for a long while to decide shopper perspectives, inclinations, and conduct. The focus group method rise happened with customer interview became critical part of qualitative research, it became an alternative form of standard interview methods, the impact of an interviewer on a respondent's remarks and, the restrictions of pre-decided interrupt addressing on empowering unconstrained reactions or finding new points became difficult in individual interview methods (Hennink and Diamond 1999; Flick 2002). These disadvantages of conventional interviewing prompted the improvement of another methodology of nondirective interviewing. The interviewer assumes a negligible job, and the elements of a group discussion are utilized to accumulate data (Krueger 1988; Flick 2002).

The setting of the Focus group discussion and its environment is a critical part of the overall process. The capacity of unstructured interviewing is to move the priority away from individual opinion and creating a discussion between members on specific issues where are broad meaning can be taken out of the discussion. In addition, the discussion component of the method gives members more noteworthy control of the issues brought up in the exchange, as they are talking about the issues

between themselves instead of straightforwardly with an interviewer (Rabiee, 2004).

Recognizing that this kind of discussion makes a group dynamic motivates participants to be more comfortable, which helps discover new points or opinions of the discussion. The themes coming from the discussion are significant for the overall group. This feature is less inclined to happen in an interview which a designated interviewer coordinates. Ritchie and Lewis (2003: 171) express that,it could be said, the group members assume control over a portion of the "interviewing" job, and the researcher is at times more in the situation of partially guiding the discussion. However, they stress that this circumstance does not diminish the researcher's weight, as focus groups should be deliberately overseen for this to occur. Since the mid-1980s, there has been a resurgence in utilising focus group discussions in the social sciences (Eliot & Associates, 2005). Focus group research has given essential data for a broad scope of research issues in the social sciences, including wellbeing and field research, assessment of social projects, forming open arrangement, creating wellbeing advancement systems and creation evaluation mechanism. Focus group methodology presently stands in the social sciences as one of the focal instruments of qualitative inquiry. During the 1990s, the utilization of Focus group discussion as a tool for discussion gained much more momentum. A few prominent leaders remember the utilization of focus groups for 1997 by the recently chosen Labor Party in the United Kingdom to measure the available impression of new government strategies, specifically the presentation of charges for instruction. Around the same time, focus group discussions were utilized to check general conclusions about the British royal family's job and the perception of the commoners.

3.8.1. Focus Group Research Characteristics

A focus group study is an arrangement of discussions intended to discern a characterised section of questions. Each group is led with six to eight individuals

by an expert interviewer. Group individuals impact each other by reacting to the thoughts and remarks of others. (Krueger and Casey 2000).

Focus group discussions have various attributes that make this method very popular. Focus group discussions are generally close group, pre-chosen people who have comparable qualities or share some understanding of the research subject. Groups regularly comprise six to eight members; however, we can incorporate somewhere in the range of five to ten members relying upon the reason for the examination. The group discussion is focused on a particular subject and, for the most part, investigates just a predetermined number of issues to permit adequate time for members to examine the issues in detail. The point of a focus group isn't reaching an accord on the issues examined; however, it energises a scope of reactions that give a more noteworthy comprehension of the perspectives, conduct, feelings, or view of members on the research issues. The discussion between members is a critical component of focus group discussions, as this circumstance gives a chance for issues to arise that is unexpected by the researchers. The group discussion is guided by a prepared arbitrator who presents each problem and encourages the debate so that point by point data is picked up on each issue. The inquiries utilised by the arbitrator to invigorate the discussion are deliberately intended to seem unconstrained and conversational, yet are evolved through impressive reflection furthermore, guiding. A fundamental fixing to use focus group discussions is improving a lenient, non-compromising condition inside the group. Members feel great to share their perspectives and encounters without the dread of judgment from others. The qualities and restrictions of focus group discussions are abridged in Fig. 3.3

Fig 3.3.Strengths and limitations of focus group (Source: Hennink, M. M. (2013))

Strengths	Limitations
Social setting:	**Skills required:**
Replicates social interaction	Requires skilled moderator
Naturalistic setting	Less controlled environment
Comfortable and enjoyable	Need 'permissive environment'
	Risk of bias in participant selection
Application:	
Variable structure	**Group dynamics:**
Wide range of applications (exploratory, explanatory, evaluative)	Some participants may dominate
	Participants may agree
Suitable for stimulus material	Little discussion
Useful in multi-method research	Influence of social pressure
	Hierarchies may develop
Group environment:	Less confidential
Large volume of information	Few issues discussed
Range of views	
Limited researcher influence	**Data and analysis:**
Participants identify issues	Responses are not independent
Identify new issues	Not suitable for individual data
Spontaneous responses	Not for personal or sensitive topics
Considered responses	Large volume of textual data
Issues debated and justified	Data analysis complex and time consuming
Seek clarifications	Costly
Study group interaction	

Strengths and limitations of focus group discussions

There are numerous points of interest in utilising focus group discussions, which might be categorised under three fundamental headings; the socially situated nature of the research system, the assortment of utilisations of the method, and the group condition of information assortment. Focus group discussions reproduce individuals' joint social cooperation instead of an exploratory setting as in a quantitative overview or, a point-to-point meeting. Consequently, members may discover the focus group condition agreeable and pleasant, which will probably affect their commitment to the discussion.

Second, the degree of structure in a focus group discussion can be changed to suit its application (Breen, 2006). The focus group method's adaptability to fuse into multi-method research plans, for example, quantitative assessment of the outcomes, is a great advantage. The group's discussion can be done in different modes like physical hand note type or online mode. Third, maybe the best bit of leeway of this method originates from the nature of the participants' information. A one-hour focus group can produce an enormous volume of information at a basic level and recognise a more prominent mixture of perspectives, feelings, and encounters than a similar time spent in individual meetings. Greenery (1982) found that a focus group discussion produced around 70% of the critical information recognised in a

lot of individual meetings with a similar number of individuals. A focus group discussion may identify a broad scope of issues, a different study subject later.

The discussion component of the method empowers members to discuss the issues with little effort of guiding questions from the interviewer; members are accordingly ready to expand on the reactions of other group individuals and discuss different segments (Fern, 2011). One member's remark may trigger a progression of responses from others; this can uncover bits of knowledge about an issue compared to that of a single interview. The group discussion empowers members to uncover their perspectives and assessments of the theme discussed, which may reveal perspectives, thoughts, or issues unforeseen by the researchers; the discussion also creates an assorted variety of feelings. These components are significant preferences of this method. Morgan (1998) expresses that 'The sign of focus groups is the unequivocal utilisation of the group connection to produce information and experiences that would be less open without the communication found in a group.'

For our research question for the PPP framework, a focus group is the best-suited method. As stated above regarding the nature of focus group, PPP is a recent phenomenon with long term PPP implication cannot be empirically calculated. As experts can be invited, a focus group suits this problem, and discussion can provide us with the stakeholder's perception of PPP challenges.

3.8.2. Defining The Objectives, Target Population And Outcomes of Research

Similarly, as with all analytical research, the principal undertakings in arranging focus group research include explaining the investigation's motivation, characterising the objective populace and thinking about using the research discoveries (Parker & Tritter, 2006). These issues' clearness is significant in directing everyone to create an atmosphere for discussion with a clear objective. The primary assignment includes characterising the ample research reason and the progressively explicit research goals(Grudens-Schuck et al., 2004). The reason for

the study should be apparent, in any event, for exploratory research. The research will direct the discussion questions' advancement and help the mediator keep the discussion focused on the discussion's essential points. The research might be comprehended (for example, perspectives towards vaccination); notwithstanding, the particular goals should be progressively characterised (for example, inoculation, cost, reactions).

In this research, our primary objective is to understand stakeholder perception regarding challenges in PPP and how those challenges can be minimised to make PPP more sustainable in aviation. The criteria for selecting the target members for the focus group is experienced in aviation and especially in the Airport sector in India, as the discussion will be primarily based on airport PPP.

3.8.3. Focus Group Protocol

- Create a summary of the need of a focus group, the topic for discussion
- A total number of focus group range decided at 4 to 6 with 1 to 1.5 hrs each (in line with Krueger and Casey (2014).) (Also, PPP Contract has a finite boundary repeated focus group is not necessary)
- Identifying the participants as per their experience (10 to 30 years) in aviation, with PPP experience at the airport.
- Invite participants in focus group discussion
- Generate questions to be asked

3.8.4 Detail Of Focus Group Protocol

Question formation

Questions need to be based on RO1 and RO2, but it cannot be a direct question because of two reasons:

a) Direct question related to Ro1, Ro2 may create discomfort for participants as both questions may be difficult to answer for regulator on the record secondly question should provide a path to discussion, not the statement itself.

b) More the discussion more comfortable participants will become and more chance of getting hidden perspective.

Keeping this in mind the questions asked are as follows:

- What is your view on the current PPP Airports and their future?
- What is your view on issues of Till, which till may be beneficial for Indian Airports?
- What is your view on the conflicts between stakeholders which are ongoing in PPP? Specifically, the debates with the specific issue of Contract?
- What do you think needs to be improved in PPP Contracts in India?

Questions To Set The Tone

a) As airports in India has grown exponentially in terms of traffic do you think private sector involvement contributed for the growth.
b) Regulator role is always to monitor the airport performance tell me about your experience.
c) What is your view on the conflicts between stakeholders which are ongoing in PPP? Specifically, the debates with the specific issue of Contract?
d) Why there are recurring conflicts in the Contract?
e) Do you believe Contract helps to preserve consumer interest?

Guiding Questions:

a) Do you believe the Contract needs to be more transparent? (Ro2)
b) Why so many issues by the airport operator?(Ro1,Ro2)
c) Can you all explain the impact of policy formulation since PPP inception in India? (Ro1 , Ro2)
d) Can we relate any recent problem with Airports due to contract issues?(Ro2,Ro1)
e) Why PPP is beneficial for the airports compare to other models(General guiding question)
f) Do you believe single till is better as per world standards? (Ro1)

g) What is your view on the contracts clauses? (Ro2)
h) Do you think non-negotiable is detrimental for the stakeholders? (Ro2)
i) Do you believe the criteria for selection of bidder is complex? (Ro1,Ro2)
j) Do you think Private Operators do the operations efficiently? (Ro1)
k) What can be a better way to evaluate aeronautical costs?(Ro1)
l) Do you believe revenue share contract is a good agreement for stakeholder in longer term? (Ro2)
m) What way regulation can prevent abuse of dominance? (Ro2)
n) Do you think current tax regime can be effective for the PPP projects in Airport? (Ro1)
o) Why private stakeholder keeps coming back to regulators for clarification on the Contract (Ro1,Ro2)
p) Do you believe the risk and responsibilities of each stakeholder are clear in the Contract? (Ro1,Ro2)
q) What is your view on the initial information shared before bidding criteria? (Ro2)
r) Do you feel any need of improvement in the current contract agreement structure? (Ro1,Ro2)
s) Do you believe abuse of dominance is a nature of the airport? (Ro1,Ro2)
t) What should be the incentive for airport operators (Ro1)
u) What improvements you can suggest to improve efficiency of the Contract? (Ro3)
v) What can be probable points which a long term PPP contract should include? (Ro3)

The questions are arranged sequentially and phase-wise; each question will be the step forward for others. The objective is to finally get themes that address the maximum points possible related to the Indian PPP contract.

Phase 1: Development of Script

Part One: The participants were welcomed, and then the detail of the session was explained to them, we also explained to them that all the information shared here is confidential.

Part Two: Few questions were asked to guide the focus group, and frequently follow up questions were introduced to the group so that the group does not get distracted.

Part Three: We closed the focus group once the overall group conversation reached saturation. We stopped recording, thanked all participants and then gave them contact details for any follow-up.

Decision on Location

Two locations were first discussed, Bengaluru and Delhi; finally, Delhi was chosen because it was comfortable for most participants.

The participants who were in Bengaluru joined through Google Meet.

Phase 2: conducting Focus group

- Material: Notebook, mobile recorder, list of participants (name, designation), focus group description
- Introducing the researchers (Akhil Damodaran)
- We are introducing the participants and giving a brief overview of the overall topic.
- Making sure every participant should be a part of the discussion, if somebody is silent, then trying to put questions in Infront of them to get some information
- After the focus group was over, we thanked the participants for their time.

Phase 3: Interpretation of the complete result

Summarizing each meeting: the transcript was created for each focus group. Coding is done in the transcript, pre-transcript codes are made based on the literature. New codes were generated wherever applicable, converting codes into meaningful units

(each code may have a different meaning as per context). Also, we have noted the emotions in each conversation, which is a significant part of finding out the relation of each code with the topic. Looking for themes and trends, interpret the result by highlighting critical statements of significance. show the themes and effects to participants to check for any wrong interpretation

3.8.5 Method of Analysis

Thematic analysis was used to evaluate the data which was compiled. Assists researchers to analyze an exact, consistent and exhaustive way of recording, organizing, and disclosing the techniques for analysis and the investigation results with enough detail to help individuals decide the process's credibility and legitimacy *(Nowell et al. (2017).*

Braun and Clarke's (2006) six-step approach used in our study:

- Familiarization of data through going through the transcript
- Initial reference code are generated
- Going through codes repeatedly to generate themes.
- Each theme are ones again reviewed
- The themes are then defined and named
- Those themes are explained as research output and presented

Reliability Test

Construct Validity

Game theory outputs were verified through case evidence. Focus group discussion provided the factors as well as verification of game theory outputs. External experts then verified themes

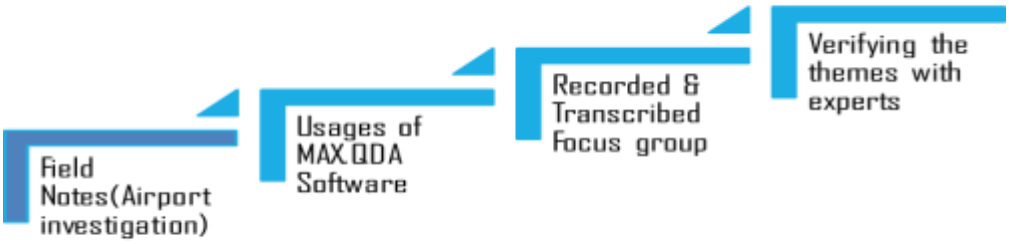


Fig. 3.4 steps for validity (Source: Johnson, R. B. (1997) *)*

INTERNAL VALIDITY

- Game theory to get the contract incentive issues (conceptual)
- Focus group discussion on understanding the contract framework (qualitative data analysis)

EXTERNAL VALIDITY

- Cross case reference
- Themes of focus group verified by experts

3.8.5.1 Initial Conceptual Construct

The initial conceptual construct are the key points created from the literature review and then these initial conceptual constructs helps to develop initial pre decided codes for initiating the focus group discussion. These codes helps to code the transcript created after the interview. To find out common patterns or any new pattern emerged.

Table 3.3. Initial Conceptual Construct

Contract Design	Contract design-related issues , contract boundaries, scope of the Contract, (Leon-Razvan et al., 2014), Gleave 2012

Stakeholder issues	Stakeholder dynamics (Monsalve, 2009; Transportation Research Board, 2011; Pagdadis, 2012, Sehgal, Dubey, and Tiwari, 2017))
Bidding	Bidding criteria, bidding process
Regulatory issues	Regulatory dynamics ((Tomo, Mangia, Hinna, and Pellegrini, 2020)
Airport Specific issues	Airport Specific (Graham 2009)
Sector Growth	Country and sector growth
Non Aero Revenue	Commercial revenue (Starkie 2003)
Business, Strategy	strategy, business (Bhattacharyya, 2011; Haverila and Haverila, 2019)

Table. 3.4 Pre decided codes created from literature

Major Codes	Code Meaning	The broader meaning
CTR	Contract Design	Contract design-related (Leon-Razvan et al., 2014), Gleave 2012
STK	Stakeholder issues	Stakeholder dynamics (Monsalve, 2009; Transportation Research Board, 2011; Pagdadis, 2012, Sehgal, Dubey, and Tiwari, 2017))

BID	Bidding	Bidding criteria, bidding process
RGR	Regulatory issues	Regulatory dynamics ((Tomo, Mangia, Hinna, and Pellegrini, 2020)
APR	Airport Specific issues	Airport Specific
GRT	Sector Growth	Country and sector growth
Non Aero Revenue	Non Aero Revenue	Commercial revenue
STR	Business, Strategy	strategy, business (Bhattacharyya, 2011; Haverila and Haverila, 2019)

Coding guideline: codes created keeping literature in mind, we created broad codes so that its actual meaning can view each sentence of the transcript. Specific codes may create biases.

In this chapter, we have discussed the research methodology, research design, and steps to approach the problem. The solution of the research questions are presented from the next chapter onwards.

CHAPTER 4

PUBLIC PRIVATE PARTNERSHIP:

A GAME THEORY APPROACH

4.1. PPP IN AVIATION AN INCOMPLETE CONTRACT GAME

A public-private partnership has become increasingly an essential way by which the government tries to execute infrastructure projects. It provides a way to deliver services to the consumers by participating private stakeholders as a partner to the project. The private stakeholder works for the investment and the delivery of the services for the government and takes a significant amount of risk with the hope of having a good return on investment. The PPP is a more efficient way to deliver services than the traditional Public procurement method. This is concluded from the assumption that the private sector works more efficiently than the public Sector (Laffont, 2003). In the Indian PPP scenario, especially the aviation sector, the PPP are long-term contracts because they are highly capital-intensive and long-term projects (world bank, 2019).

The issue in Airport PPP is complex because they are non-negotiable incomplete contracts. The pricing of the aeronautical services and the bidding conditions is an essential issue for research. The players always discuss pricing and the non-negotiable issue of the contracts with the regulator.

We seek to address this issue by implementing game theory to an existing PPP contract. The game theory model is created to analyze what happens when the regulator fixes the tariff mechanism and how revenue share bidding affects the PPP operators' project operation. We apply the game theory model to see how players can get a maximum payoff and under what condition the government can get a welfare objective. We will also see whether applying the game theory would have changed the outcome. Lastly, we will summarise our finding, which will be input for our focus group discussion in RO3.

The idea of game theory is not new, but applying game theory in PPP is a recent phenomenon (Gregory Kennedy 2013); we are taking two base model references,

One for price regulation we use (Czarny 2006), and for revenue share, we use modifieds. Ping Ho's literature on PPP.

4.2. THE GAME

This thesis attempts to analyze the finer points that game theory can provide to policymakers on how policy implications impact the Market. We are also taking the example of the Delhi International airport limited understanding of the importance. Practically, we explore the literature first to understand the PPP issues addressed through game theory. Then we derive our model through the rules of the games and the assumptions. This section will explain the research Process to understand the model and create the boundaries for the game.

4.3 FORMATION OF GAME

Initially, the literature has been studied to see the contract knowledge in the literature database, and then we see the area of the problem, which was not studied yet. After going through the existing literature, we have found an opportunity to study the game's theoretical aspect in practical, real-world cases, especially in the PPP Indian context. This has not been studied in the game approach. Then studied the regulatory process of selected airports and created a Game model out of it. After the Game simulation is played, the outcomes are then interpreted. The results were then compared to the Actual Scenario by revisiting the Indian Airport Case. After the literature survey, a chance to add to the writing was perceived; In this chapter, we apply a game theory model to a PPP case. The writing was organized to get the essential information expected to decipher the game theory model investigated in this proposition. After our initial review, we have created a model for pricing formulation which simulates the actual pricing equation, and on it, we created our game to understand how players will eventually react to each situation.

After the game is played, we compare it with the actual case scenario.

4.4. INCENTIVE MECHANISM IN PPP

Any contemporary economy relies on infrastructure; streets, railways, ports, and media channels are all necessary for an economy to function and be productive (Guasch, 2004, p. ix). The accessibility of infrastructure, which affects profitability, cost, and intensity, is the starting point for the transportation of products and ventures (Guasch, 2004, p. ix). The policy decisions are very critical for the development of infrastructure. Then again, the government was the leading investor in infrastructure ventures bound for public use (Grimsey and Lewis, 2004, p. 19). According to Guasch, Laffont, and Straub, pouring resources into open infrastructure is inefficient, and the private sector appears to make more significant efficiencies in any case in terms of profitability(Laffont, et al., 2003, p. 2). Expressed at the end of the day, the private entity (being progressively proficient) makes more money. This has prompted governments to manage spending limitations and strain to contribute public cash more proficiently, progressively to swing to the private sector to give foundation to public use. In a Public Private Partnership with regulated sector, pricing is governed by regulators decision.It is important for the regulator to create a balance between the government's objective and private operators objective.The regulation should be such that it provides incentive for the private operator to invest more on infrastructure as well as should provide opportunity for profit maximization keeping customer welfare in mind.If private enterprise doesn't get any incentive due to monopoly nature of airport , either they will stop investing or can put cost burden on customer by showing increasing rate of cost to regulators.

4.5. GAME THEORY ON PPP CONTRACT

Why game theory is used is a question we are trying to answer in the next paragraph, and we are also trying to provide a small glimpse of game theory points so that it becomes easy for anyone to understand our work.

The study of mathematical models of conflict and cooperation amongst clever, wise, and judicious decision-makers is known as game theory (Myerson, 1991)

In PPPs, clashes and strategic interactions among promoters and governments are normal and part of PPP project execution. Numerous troublesome issues, such as abuse of dominance, exchanges, competitive biddings, and partnership, have tested the PPP members' capabilities. In this manner, game theory is an explanatory system to think about the interaction and elements between the PPP members and propose appropriate methodologies for the two, namely governments and promoters.

Through game theory displaying, a specific issue of concern is abstracted to a level that can be investigated without losing the issue's essential components. Additionally, new insights or theories for the concerned issue are created when the game models are solved.

4.6 STEPS TO PERFORM FOR GAME THEORY ANALYSIS

To assemble theories through game hypothesis demonstrating, a game hypothesis model will be created to abstract the issue of concern appropriately. In this step, proper assumptions must be made to simplify the issue to focus on a couple of essential components. Notwithstanding the information on the game hypothesis, this model setup process needs sufficient space information on the issue. For the most part, an intensive writing audit or case studies will give a more transparent and precise understanding of the problem and its ramifications. The second stage is to find the conditions of all relevant and specific game model equilibriums. The complexity of the equilibrium solutions and the number of alternative equilibriums are determined by the complexity of the game model and the number of variables connected with payoff functions. The final stage is to connect the equilibrium conditions to the problem's difficulties. If the equilibrium solutions are muddled, separating possible context-oriented or possibility variables will narrow the solution space and provide more information about the problem; when the rationale between various variable configurations and possible equilibriums are established, theories concerning the issue can be created.

4.7. MODE OF APPROACH IN GAME THEORY

A few setup and model is available to solve games; Nash equilibrium, Pareto Optimality, Best response, Strategic predominance and Maximin, Minimax (Crandall, 2008, pp. 2-5). Choosing the suitable model depends on the individual solving it and the intent behind the solution. Some methods centre around limiting your misfortune, while others centre around augmenting your gain. Furthermore, a significant number of these methods are not without their imperfections, so usually practice to work out a game by utilizing a few arrangement methods to supplement one another; along these lines, the individual solving the game can choose the best technique to seek after. In any case, Ho optimistically points out that the Nash equilibrium is a standout amongst the essential concepts in game theory (Ho, 2009, p. 270).

4.7.1 NASH EQUILIBRIUM

According to Gibbons, a Nash Equilibrium is reached when each player's predicted strategy is the optimum response to the other players' plans, and no player has a motive to depart from this equilibrium solution. Such predictions are said to be "strategically stable" or "self-enforcing" because no player wants to stray (Gibbons, 1992, p. 8). This means a Nash Equilibrium possibly exists when no player can profit by changing their strategy.

4.7.2 PROBLEM STATEMENT AND RESEARCH QUESTION

Research Question 1:

To develop an analytical model of till regulation of Indian PPP airport through Contract agreements, to derive the impact on the incentive of agents.

The Till regulation is an integral part of Indian Airport PPP. Ones Airport is under PPP , the economic regulation governs the airports pricing.Two pricing modes are Single Till and Dual Till (Under Price Cap Regulation).

4.8. BASELINE MODEL

To understand the model we need to first understand how to airport business

works. Airport has two source of revenue,one is aeronautical revenue (parking charges , waiting charges etc) , the other is non aeronautical revenue or commercial revenue (shopping , retail etc). Both the revenue are coming from passenger who are either coming to airport to going out of airport. Airlines are directly responsible for substantial part of aeronautical revenue. Airlines provides fees for the parking and taxiing/waiting to the airport. Airport charges the revenue in two modes Single Till or Dual till depends on what pricing policy regulator has prescribed for the year. In Single Till complete non aeronautical revenue (expected) is cross subsidized(a treatment given by regulation in which to reduce burden of finance on airline certain portion of the expected revenue to be charged from airline is reduced as incentive) from total revenue expected.In a Dual Till mechanism Cost involved in developing commercial revenue is cross subsidized from expected total revenue.

We are taking the equations given by Czerny (2006) as the base model:

ST= Single Till Regulation, DT = Dual Till Regulation.

ST = min τ:τ=(F-S)/(q(τ))

• DT = min τ: τ=F/(q (τ))

• S= (non-aero revenue expected in a year by the airport)

• F= Expected Cost incurred by the airport During a year

• q= Quantity of Passengers.

=τ= Passenger Function depending on the growth of passenger

4.9. CREATION OF GAME SETUP

Airports and airlines want more profit, and to create more profit, airports need to focus on their revenue streams, and airlines need to focus on their revenue streams. airport's revenue streams are Non-Aero Revenue (shopping, hotels, etc.) and Aeronautical Revenue (airport charges, etc.).

Airlines need to get revenue basically from passengers travelling from their aircraft. As per literature, airports have a monopoly nature because they have locations benefit, giving them a slightly upper edge in pricing the airlines. That is the reason aeronautical charges are priced charges.

Let's take a scenario where airports want to improve their revenue and airlines want more profit.

The airport employs capital, which will be submitted to the regulator for audit, and after that, the return is calculated. Let us suppose its Single Till regime; the airport is submitting its cost for year Y (Next Year), The cost approved by the regulator is F. This with a small percentage of the rate of return is what the airport operator can take back in return (under single till). The projected revenue from commercials by Airport operator is S.

Under Single Till: Airports need to earn an F (cost incurred on the airport, which includes aeronautical cost, as well as commercial cost) from price to be paid by the Airlines (As part of Aeronautical revenue, which includes parking Charges, landing Charges etc.)

= F-S (all non-aero revenue will be Cross-Subsidized).

(Let us Assume that projected commercial revenue = actual commercial revenue both were S)

Airlines' profit depends on the price paid by the passenger for traveling in the Aircraft.

= p.q-C

= p is the price paid by a passenger, q is the number of passengers, C total cost incurred by Airlines.

The whole Aeronautical Revenue F-S is a cost for Airlines.

So, C= c1+ (F-S)

c1 is the Airlines cost (incurred for running the business), F-S is the cost to be paid to Airports. So, we can write the new profit equation for the Airlines as p. q-c1-(F-S) = p. q-c1-F+S

Here q depends on p (The higher the price airlines charge to the passenger, the lower will be airline passenger traffic).

Let us suppose two conditions F>S (airports are focusing more on Aeronautical cost) such that capital employed is ϕS unit more than commercial revenue generated (assuming commercial revenue projected and generated were same).

F=S+ δS : $F = (1 + \delta)S$

So you can write.. $F = (1 + \delta)S$ and it becomes relative to S

p.q – c1 – F + S, substituting the value $(1 + \delta)S$ in place of F, (and not S).. we can write

$p.q - c1 - [(1 + \delta)S - S]$ or $p.q - c1 - (1 + \delta)S + S = p.q - c1 - (\delta)S$

F<S

In the reverse case, use $(1 - \delta)S$ as the fraction by which the amount is lower than the S

F=S- δS

$= p.q - c1 - [(1-\delta)S - S] = p.q - c1 - [(1-\delta)S -$

$S] = p.q - c1 + (\delta)S$

4.9.1. Under Dual-Till Regulation

Commercial Revenue is a separate accounting for airport operators; no cross-subsidization will be done. So, Airport Cost to be approved by the regulator becomes F-A (that is, Airport total cost subtracted from Commercial cost); this will be charged by the airlines, as commercial revenue and cost both have to be taken care of by the operator. A= commercial Cost

Airlines' profit depends on the price paid by the passenger for travelling in the Aircraft.

= p.q-C

= p is the price paid by a passenger, Q is the number of passengers, C total cost incurred by Airlines.

The whole Aeronautical Revenue F-A is a cost for Airlines.

So, C=C1+ (F-A)

S is directly proportional to A (more investment in commercials more revenue generation by commercial sources).

=p.q-c1+(F-A).

Use the same logic as above

Under the Dual till Scenario:

If airport focuses on more aeronautical revenue, then he needs to focus on more Aeronautical costs which are F

S is revenue generated from commercials when A amount of capital was invested in Airport commercial development.

So let us assume F>A by $(\delta)A$ unit.

As per Theory, greater the investment in commercial greater the return.

So More S means more investment on nonaeronautical

F= A+ $(\delta)A$:

Airline Charge: F-A: (F-A) = A+ $(\delta)A$ -A= $(\delta)A$

Airline-Profit = p. q-c1-δA

F<A (Capital employed is $(\delta)A$ unit less that commercial cost employed)
F=A- $(\delta)A$

F=A-1 = F-A = A- $(\delta)A$- A= $-(\delta)A$

Airline-profit:

=p.q-c1-(F-A))

=p.q-c1+ $(\delta)A$

4.9.2. The Game

Airlines have to pay in Single till- F-S, and in Dual Till its F-A

Putting values of both above:

There are two actions for both airport and airlines , for airport either they can focus on aeronautical revenue (F) or commercial revenue(S) , for airlines either they can increase the price of ticket or decrease price of ticket. In every box left variable is airports payoff and right variable is airlines payoff , as per equations above. (Payoff is the return which player makes) ,Airlines has two actions low price of tickets or charge high price on tickets. Airport has two options completely focus on aeronautical revenue (F) , or completely focus on commercial revenue (S)

Table. 4.1. Single till model

Airport/Airline	Low price	High Price
F	+ $(\delta)S$, p(l).q(l)-c1- $(\delta)S$	+ $(\delta)S$, p(h).q(h)-c1- $(\delta)S$
S	- $(\delta)S$, p(l).q(l)- c1+ $(\delta)S$	- $(\delta)S$, p(h).q(h)- c1+ $(\delta)S$

Under Dual Till;

Table. 4.2 Dual Till Model

Airport/Airline	Low price	High Price
F	+ $(\delta)A$+S ,p(l).q(l)-c1- $(\delta)A$	+ $(\delta)A$+S ,p(h).q(h)-c1- $(\delta)A$
A	- $(\delta)A$+S ,p(l).q(l)- c1+ $(\delta)A$	- $(\delta)A$+S ,p(h).q(h)- c1+ $(\delta)A$

In Dual Till, the payoff of the Airport is + (δ)A+S because in dual till all non-aero revenue which airport creates(S) the airport can retain it, no cross-subsidy. Under Single Till only (δ)S because S is subtracted from cost to be recovered, so the airport can only retain a slight return above the cost incurred ($(\delta)S$)

Another assumption: (A) directly proportional to S, more investment A more S is generated. Moreover, S depends on the number of passengers (p) entering the airport.

4.9.3. Under Single Till

Let us suppose the total cost of development in the airport was 100, commercial revenue was 110(when S>F) and 90 when (S<F), and per passenger, flight charge was 10, and quantity of passenger was 100.

The airport has a two-strategy price high, price low: so P=10, high price p (h) =15, assuming the quantity of passenger is the same as aircraft size cannot change.

Table. 4.3 Single Till with variable added

Airport/Airline	Low Price	High price
F	+ 10 , 10*100-100-10	+ 10 , 15*100-100-15
S	- 10 , 10*100-100-10	- 10 , 15*100-100+ 15

Under Single Till game

Table. 4.4 Single till outcome

Airport/Airline	Low Price	High price
F	+ 10 , 810	**+ 10, 1385 (Nash)**
S	- 10 , 910	- 10 , 1415

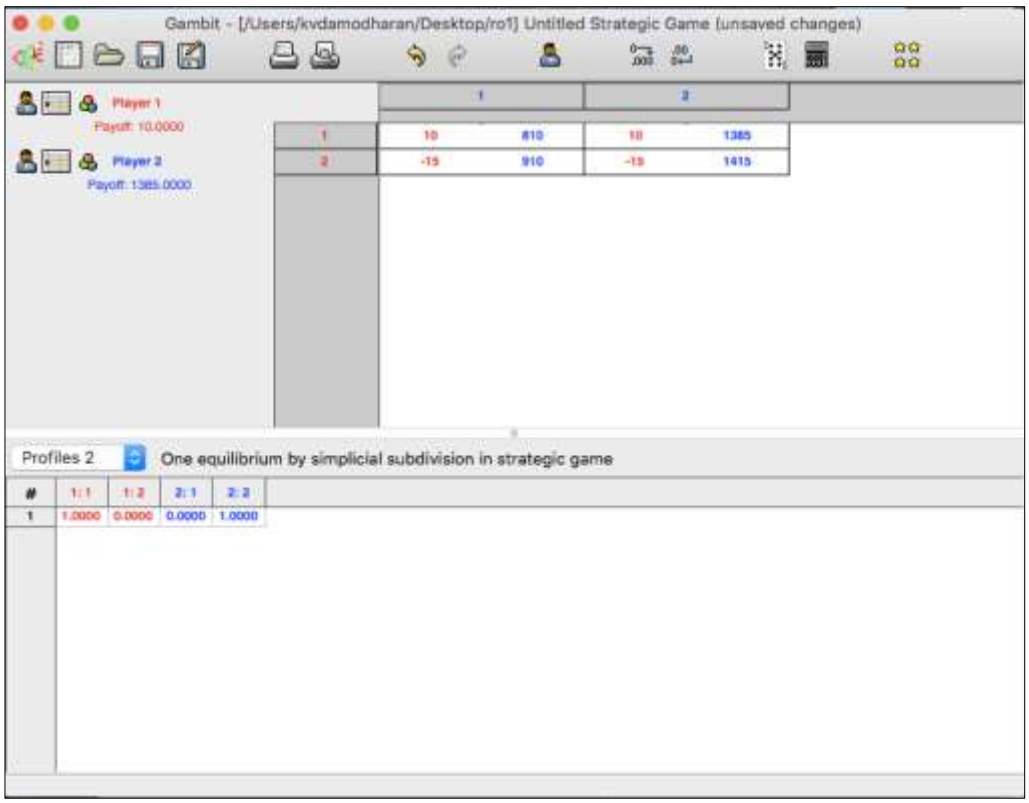


Figure. 4.1. Gambit software playing game.

The above clearly shows that airport will increase charges in single till because that's the best strategy for it, and airlines may increase passenger charges to compensate if they don't do it, let say, because of hyper-competition on the airlines.

4.9.4. Under Dual Till

Table 4.5. under Dual Till

Airport/Airline	Low price	High Price
F	+ $(\delta)A$+S ,p(l).q(l)-c1- $(\delta)A$	+ $(\delta)A$+S ,p(h).q(h)-c1- $(\delta)A$
A	- $(\delta)A$+S ,p(l).q(l)-c1+ $(\delta)A$	- $(\delta)A$+S ,p(h).q(h)-c1+ $(\delta)A$

Let us suppose the total cost of development in the airport was 1000, commercial revenue was 7000 (when S>F), and when (S<F), and per passenger flight charge was 10. Quantity of passenger was 100.cost of service to the passenger by airlines is 6/passenger Cost of developing commercial revenue is 7 per unit so for 100 units its 700 unit cost.

Price per product = 10 times the cost incurred

When S<F Cost of developing commercial revenue is 4 per unit, so for 100 units its 400 unit cost

Table. 4.6. Dual Till with variable added

Airport/Airline	low price	high price
F	400+4000,10*100-600-400	400+4000,15*100-600-400
A	7000-700,10*100-600+700	7000-700,15*100-600+700

Airport/Airline	low price	high price
F	4400, 0	4400 , 500
A	6300, 1100	6300 , 1300

(both Nash equilibrium and Pareto optimal)

When commercial investment increases, the price of the airline to be paid to the airport decreases. The airport operator keeps the surplus coming out of commercial revenue. The point 6300,1100 is Pareto optimal as the airport gets more revenue as commercial revenue needs to be high. There no absolute Nash equilibrium here as a Pareto optimal solution is also making both of them better off

4.9.5. Implication

Dual till provides an incentive for commercial revenue, provided the investment is high, that means airports needs to be bigger.So for large airport contracts Dual till

is best , it provides better incentive for commercial revenue.For smaller airports, a single till is fine.

Contract with Dual till provide better return on investment for airport operators then single till.

So for a bigget airport , the contract should provide Dual till regulation , bigger airports will have higher investment opportunity and due to high return on commercial revenue under Dual till , airports will have motivation to develop commercial revenue streams.

A larger airport with a single till or modified single till may increase charges by the airport operator.

Case 1 (Under Single Till: Delhi Airport)

In August 2012, the government permitted the GMR-run Delhi Airport to climb user charges (aeronautical expenses) by an astounding 346 percent after the Airports Economic Regulatory Authority (AERA) rejected GMR interest for a 774 percent climb in something similar.In March 2014, the Mumbai airport steeply climbed the aeronautical charges by more than 300%, and in June 2014, AERA permitted a more than 100% climb in client charges at the Bangalore airport (monetary occasions, 2015)

Case 2 (Under Hybrid Till Or Modified Single Till)

Worldwide aviation body IATA communicated 'worry' over the hybrid model for fixing charges at airports which were under PPP model, saying it would make Indian airports more costly (dailypioneer, 2017)

4.9.6 Winning A PPP Bid: A Game Theory Approach

4.9.6.1 Research Objective 2

RO2: To develop an analytical model as per the revenue share agreement of Indian PPP airport to understand firms profit maximization behaviour and pricing behaviour.

Setup

Let us suppose two players are bidding for a project "V" the government's valuation of the project is "X", which is not disclosed to any player; it closes envelope bidding. The condition for bidding is the person giving the highest revenue share is going to win the project.

So let us assume the revenue share to be given is R.S, p1 revenue share to be quoted in RS1, p2 revenue share is R.S2

Using Ho, 2009 model of renegotiation and applying the logic of prisoner's dilemma, the game is as follows:

If P1 wants to win the bid, then the bid amount should be more than p2, which is RS1>RS2.

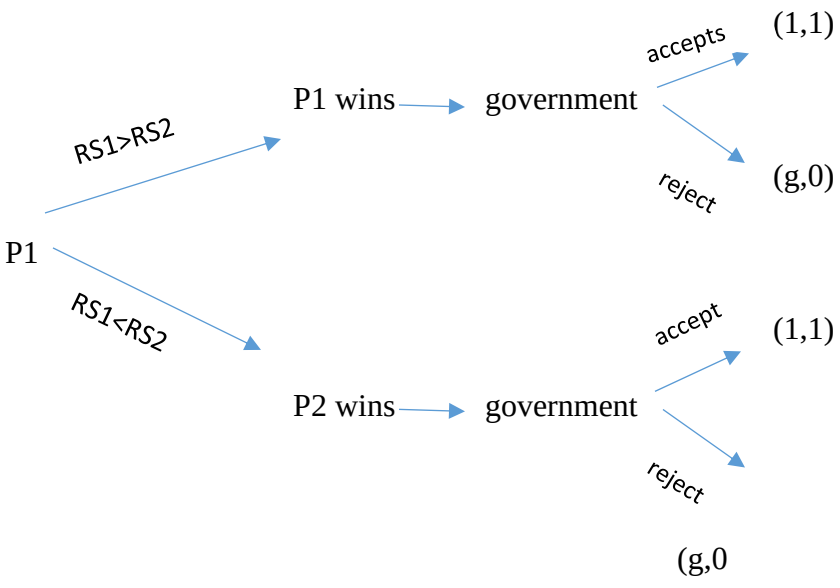


Figure. 4.2 Network Model Bidding game

There is no choice for the government, but to accept the highest revenue share given by any of the two. But the government has benefited, if the project is of the good return value for the future and true value is not known, the players will bid higher to get the project. Not accepting any project or not able to start the project is a political risk (g).The player will eventually bid higher to win the project this is similar to a prisoner's dilemma

Table.4.7.Bidding game payoff

p1/p2	high bid	low bid
high bid	(1,0) (0,1)	1,0
low bid	0,1	(0,0)

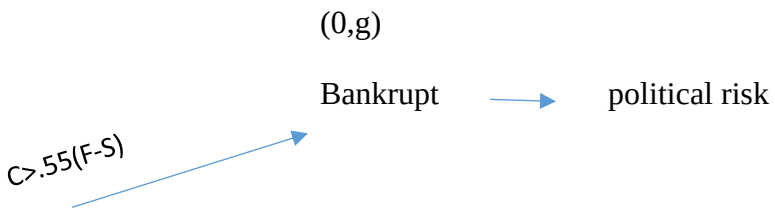
As you can see both players will go for the highest bid because that provides the maximum payoff (Nash) if both bid low can provide the Pareto optimal situation, but it has less payoff so the player will go for the Nash equilibrium that means both will bid higher.

So from above, it is understood that the player who wins will have a very high revenue share, their risk will increase.

Let us suppose the revenue share p1 quoted is 45 percent and p1 wins so under pricing system the game will be played like below

Revenue under a single till is, with a 45 % revenue share, revenue to be given to the government will be .45(F-S), net remaining revenue will .55(F-S) for airport operator

Revenue under Dual Till is A+ (δ)S, under revenue share agreement .45(A+(δ)S), Net revenue remaining for airport operator .55(A+(δ)S).



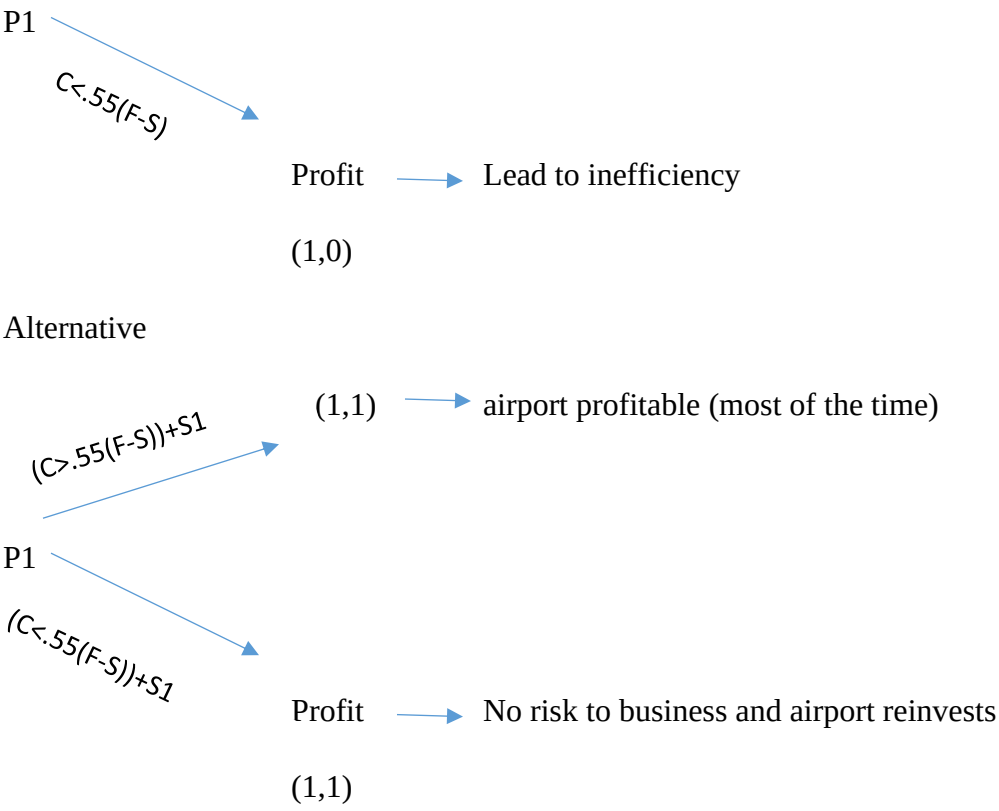
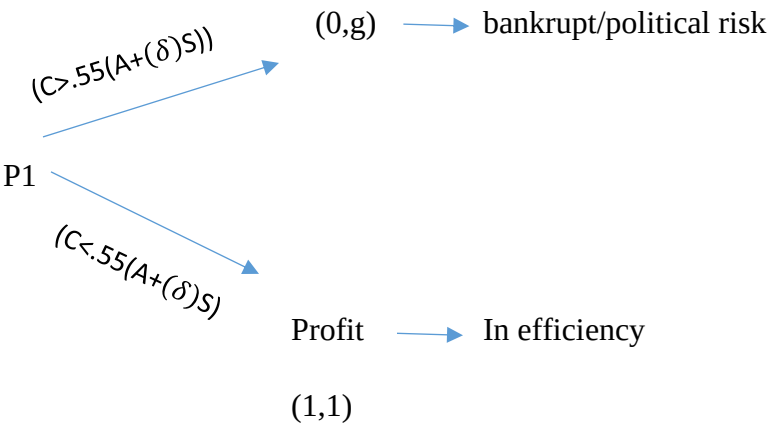


Fig 4.3 Bidding game payoff structure under Single Till

Under Dual Till



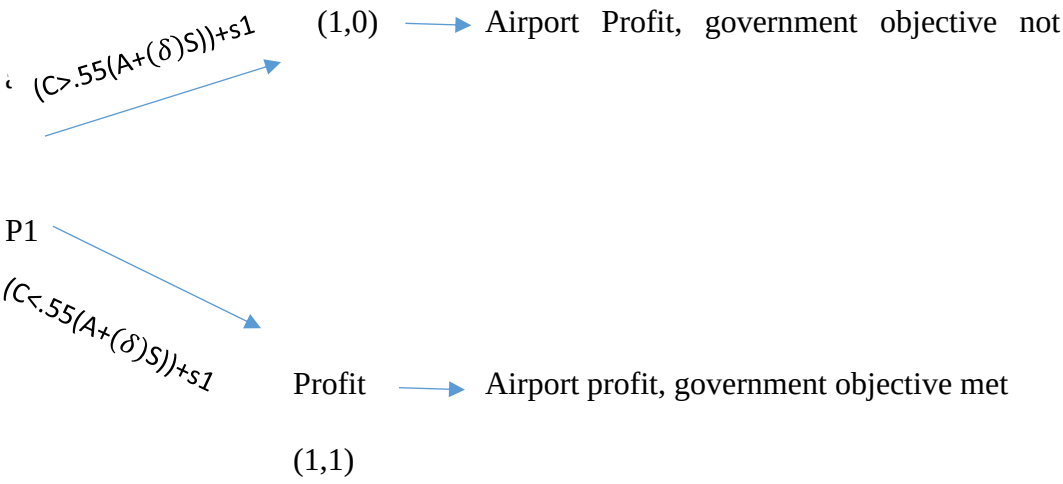


Fig 4.4 Bidding game payoff structure under Dual Till

From the above, we get the findings as below

a) Higher the revenue share, the higher the risk for both private parties as well as the government of default.
b) Under Dual Till and Single Till cost has to be kept below net revenue (when non aeronautical revenue is not generated), which may lead to inefficiency of asset utilization.
c) The alternative will be to have non-regulated income (s1) as one of the major sources of income for the airport so that it is not part of the total regulated income on which revenue share is created.

Non-regulated income source generation means revenue, which on paper does not come under the regulated income so they do not come under the airport regulated income account so it will not be under revenue share.

Why the operator may do this, it's because he is taking a risk of giving a high revenue share and he knows contract is not renegotiable. So the operator will try to change the channel of revenue.

Why the government may allow it because the government always fear the risk of project failure.

4.9.7. Implication

Higher the revenue share more it leads to the winner's curse. The operator still bids the higher value, which increases its risk. The diversification of revenue is very much possible because it incentivizes the operator to sustain the business. The operator may not show all revenue in the regulated revenue bracket so that less revenue will be shared.

4.9.8. Illustration

According to existing airport business activities, Single Till and Dual Till are two frameworks designed to ensure the safety of aeronautical and non-aeronautical charges.Non-aeronautical services need less capital and have a better profit margin in general. According to OMDA regulations, Delhi International Airport Limited has outsourced the majority of non-aeronautical services through joint ventures. In its order No. 13 dated January 12, 2011, AERA, decided to implement the Single Till design, ensuring a fair return on value and at the same time, all these were done to keep end user welfare. The regulator also informed that any single saving will benefit the passenger. It was noted that through different Joint ventures the Delhi International Airport might have transferred many of the revenue of non aeronautical revenue into different Joint venture entity, which has created undue charges on consumer.

DIAL has farmed out various activities at the airport to 11 subsidiaries and JVs through separate agreements with no AAI role. In the letter CAG pointed as a result of different Joint ventures Airport Authority of India’s revenue is considerably diluted.

Article 2.1.2 (iv) of OMDA recognized the exclusive right of Delhi International Airport to outsource or subcontract work to different Entities.It was also pointed out that many of the facilities which was suppose to be provided by Delhi International Airport has been outsources to different Joint venture entities. Delhi

airport owns a stake in these companies that ranges from 26% to 50%. The revenue share of Delhi International Airport in these businesses ranges from 10% to 61%. The security deposits received by these ventures totalled 503 crores, which are not included in the revenue shared by Delhi International Airport with the Airport Authority of India in the financial statements of Delhi International Airport as unsecured loans.

Aera Comment

"DIAL acknowledges that under Section 2(a)(v) of the AERA Act 2008, services provided for cargo facilities (including X-Ray screening) at airports are considered aeronautical services. However, they have asserted that cargo handling and services (including X-ray) constitute non-aeronautical activities and have asked for compliance with the concession contract.

CHAPTER 5

CONCEPTUAL FRAMEWORK FOR AIRPORT PPP

5.1. PUBLIC-PRIVATE PARTNERSHIP

Due to a decrease in the country's infrastructure deficit in the country, many efforts are taken towards improving the flow of investments in physical infrastructure (NITI, 2019); especially since 2004, several steps were taken to promote private investments in the country. From 2007-12 private sector contributed almost 36.6% of the overall infrastructure investment, which increased the contribution of infrastructure investment in GDP from 5% to 7 per cent by 2012 (*PPP for Growth*, 2019). But this growth was not sustained. As private sector investments decreased, the GDP contribution reduced to 5.6% in 2013-17 (*Infra Development through PPP to Spur Growth, Create Job; Projects Worth Rs 27,514 Cr in FY20 till Date - The Economic Times*, 2020). It is estimated that to have good infrastructure growth in the country the spending on infrastructure needs to increase to almost Rs. 50 lakh crore. This required the government to create a better policy framework to motivate the private sector for investments. In this context, a good PPP framework is something which government needs which can facilitate private players to invest in government megaprojects where both government and private sector share the risk, develop the Project together, and the private player can get a share of profit for the work done by them Aayog (2019).In this regard, PPP has been applied to some public utility sectors like roads, airports, etc. The airport is one of the long-run PPP projects with a PPP contract timeline of 30 to 60 years CAG (, 2009).With the advent of new PPP airports like GMR Delhi airport, GVK MAIL, BAIL, and HAIL.PPP has become a very popular way of project administration in the Indian aviation sector. As per the Ministry of finance data, overall, 1539 PPP is awarded till now, on which the transport sector has 58 per cent PPP projects (*Public-Private Partnerships*, 2020). Despite the improvement in the latest infrastructure and growth in traffic, and the development of world-class airports, the investment in airports is still limited.

One of the key reasons is the challenges, which private players come across as the contract progresses.

5.2 DESCRIPTION OF STEPS

We are using qualitative focus group discussion by inviting participants working in different areas of Indian Airports. The reason for using a Focus group has various advantages compared to many other qualitative tools. Generally, it's not a fast-paced process of purposely put discussions and replies (a social occasion meeting). However, a genuine gathering discussion where every individual can put forward their perspectives depending on the moderator's inquiries has many possibilities to (re) direct the discussion whenever required. This draws in them to raise and work through conversations, need, and discernments rely on the combined data of the group, beyond what any individual member of the moderator would have thought of (Kitzinger, 1995, 1994). Individuals can incorporate, reject or question each other's data; furthermore, together come to new importance or experience and comprehension. This is important for our examination, right off the bat, due to our enthusiasm for the interaction between the individuals who have a direct working knowledge of the sector and those who have research experience in the area. Be that as it may, Wiklund et al. (2014) pointed, this opportunity has an expense as a focus group is not a theme-based test. Participation regularly includes some degree of business (members are interested in the subject or not) and is intervened by a blend of deliberate examination on the coordinator's side. The study was conducted in New Delhi. This study concludes on original data from 5 semi-structured focus groups with 12 members across Indian Airports (list of participants in table 1). On average, the groups completed each session between 1.5 hrs which is in line with Krueger and Casey (2014). After the 5th round of discussion, data saturation occurred. Toward the beginning, the panelists got a summarized detail about the session, continued by one more round of short explanation of Indian Airports and about the PPP contract. After the focus group session, the recording was transcribed, and the names of the participants were converted into P1, P2.....P12.The researcher then followed a deductive process of analyzing the

transcribed and started observing pattern, which then linked to a set of codes to connect it to our questions. A total of 767 codes was generated, of which 50 were unique codes. 4 broad themes were generated in the process: The viability of the Project, the Bidding process, Risk allocation, Price Regulation.

Table. 5.1. List of focus group participants

Number of Participants	Sector	Rank
2	Public sector	Chief Financial Officer
2	Regulator	Board Member
4	PPP Airport	Airport Operation Manager
3	Aviation Consultant	Management Consultant
1	Entrepreneur	Owner

5.3 ANALYSIS

Table.5.2. Selected code table

Meaningful sentences related to the questions asked.	**Occurrences**	**Meaning Unit**
The airport authority of India is a facilitator	46	Stakeholder roles and responsibility
96% are yet to take the air travel	32	Need of Development
I think the focus of the govt is short term	67	Viability of Project
Airport negotiation is only on the bidding stage	56	Negotiation
Airports are moving towards PPP	46	Private stakeholder's role
The airport authority of India and govt roles are not very clear	30	Conflict between stakeholders
Airport authority of India is a facilitator, not a competition	62	Stakeholder roles and responsibility
To invest in an airport needs huge cash	28	Private stakeholder's role

The severe tax regime of government is not	26	Viability of Project
The Goa airport and airport authority of India, AAI made a bid	32	Stakeholder roles and responsibility
Was the govt model Contract not up to the mark? Is it clear one Project has gone through a couple of years?	20	Viability of Project
Renegotiation needs to be periodically	33	Negotiation
The contract is long term, and bidding criteria is not covering the long term workarounds	32	Bidding Criteria
Many are yet to take the air travel today	23	Need of Development
There will be no consistency in the contract rules and tariff regime	26	change in a business environment
The Pvt entity enters now in the PPP	20	Private stakeholder's role
The contract has limited options during the bid	28	Negotiation
Meaningful sentences related to questions asked.	Occurrences	Meaning Unit
The large Concession fee is something we feel forced on us	32	Tax Regime
Airport Authority of India is a facilitator, he is also a bidder	31	Stakeholder roles and responsibility
The risk expectation keeps changing	31	sovereign immunity
High capital is involved investors needs some protection from the government	29	sovereign immunity
Long lease period is unpredictable	28	unpredictable environment

Commercial revenue is essential for us to	18	Commercial revenue
The regulatory regime is unpredictable	24	Commercial revenue
No-till regulation is permanent	29	Till regulation
long lease period needs renegotiation opportunity	33	Negotiation
Ten years or 15 years, the environment changes	24	unpredictable environment
Till regulation should be need-based	18	Till regulation
The government does not clearly state how much security is provided to investors	22	sovereign immunity
Government PPP risk in the contract not defined	28	Risk
The bidding becomes Pressure	29	Bidding Criteria
Dual Till better for improving non-aero revenue	10	Till regulation
Regulatory regime slightly unpredictable	22	Till regulation
The role of the Airport Authority of India needs to be defined	20	Stakeholder roles and responsibility
Forecasting does not predict the aviation demand accurately	21	change in a business environment
The contract needs negotiation periodically	50	Negotiation
Stakeholders need to know their roles in the contract	45	stakeholder
Change in the environment is inevitable; we need a scope of inclusion in the contract, time to time	31	Long Lease

Viability of the airport depends on investors contract needs to calculate viability conditions before bidding	22	viability
The payback period is less than the lease period of the airport	31	Viability of airports
Airport Specific Regulation is required	37	regulation
The obligation of stakeholders needs clarity	26	risk
Contract renegotiation scope is important	22	contract
Lack of long term guidance in the contract	33	Viability of airports
Non-aero development needs investors' money	38	price regulation
Dual Till better for improving non-aero revenue	18	price regulation
Single till was good when airports, initially set up	12	Price regulation

The focus group transcripts are coded, and meaningful units were extracted, which will help us to form broad themes.

Coding

The codes and it's connected meaningful units tells us about hey how these sentences connect this. Then we converted into themes which then became our focus group results

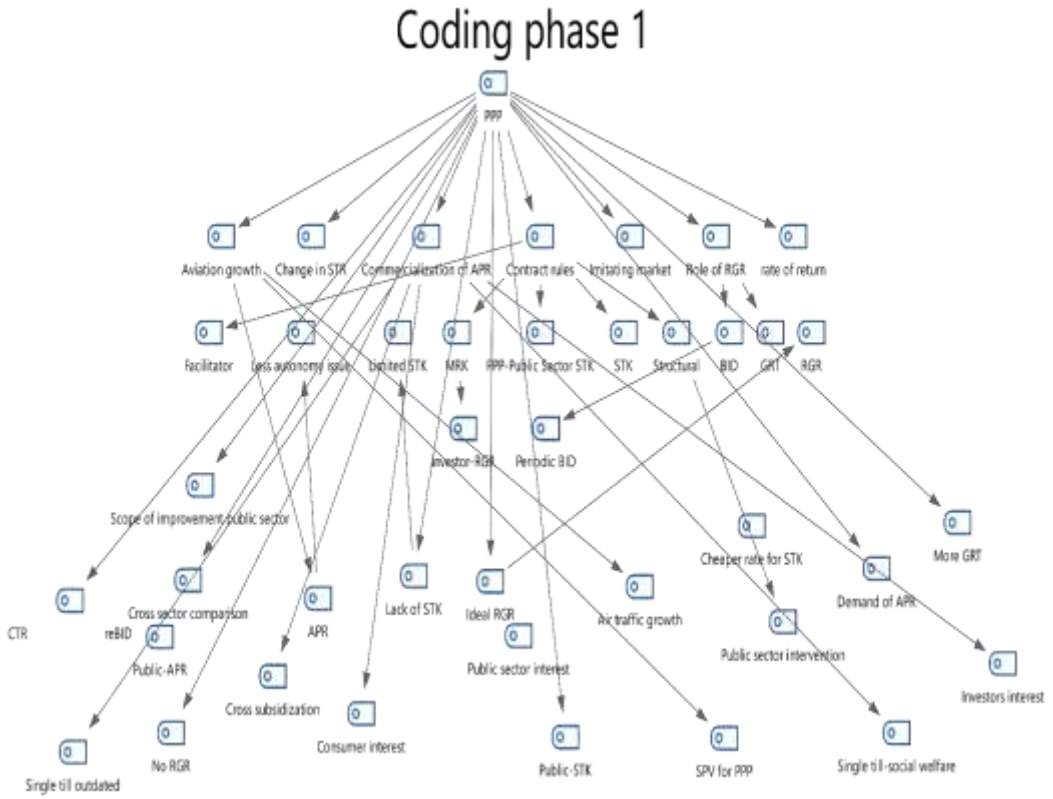


Figure 5.1 coding phase 1

Creation of Groups for Themes (citation shows the codes were similar to literature)

Table.5.3. Group creation for themes

Group A	Group B	Group C	Group D
Rate of Return (Czerny 2004)	Sovereign Function	Bidding Criteria	Single till and Dual Till (Czerny 2004)
Private Interest (starkie 2002)	Investment Climate , Growth of Sector	Revenue share	Investors interest (starkie 2002)
Periodical review of airport	Government intention (U. Kratzsch and G. Sieg 2011)		Development of non aero (Graham 2009)

Long Term Evaluation		Investors sentiments	Social welfare objective (Czerny 2004)
Renegotiable Clause	bidding information	Concession fee	Airport-Airline Relationship (starkie 2002)
		Government rule	
		Revenue of airport	
		Obligation of Each Stakeholder	
		Risk profiling	
		Transparency in bidding	
		protection of investors	
		Uncertain Environment	
		Long term strategy in contract	
		Change in risk parameter	
		Long lease	
		Change in government	

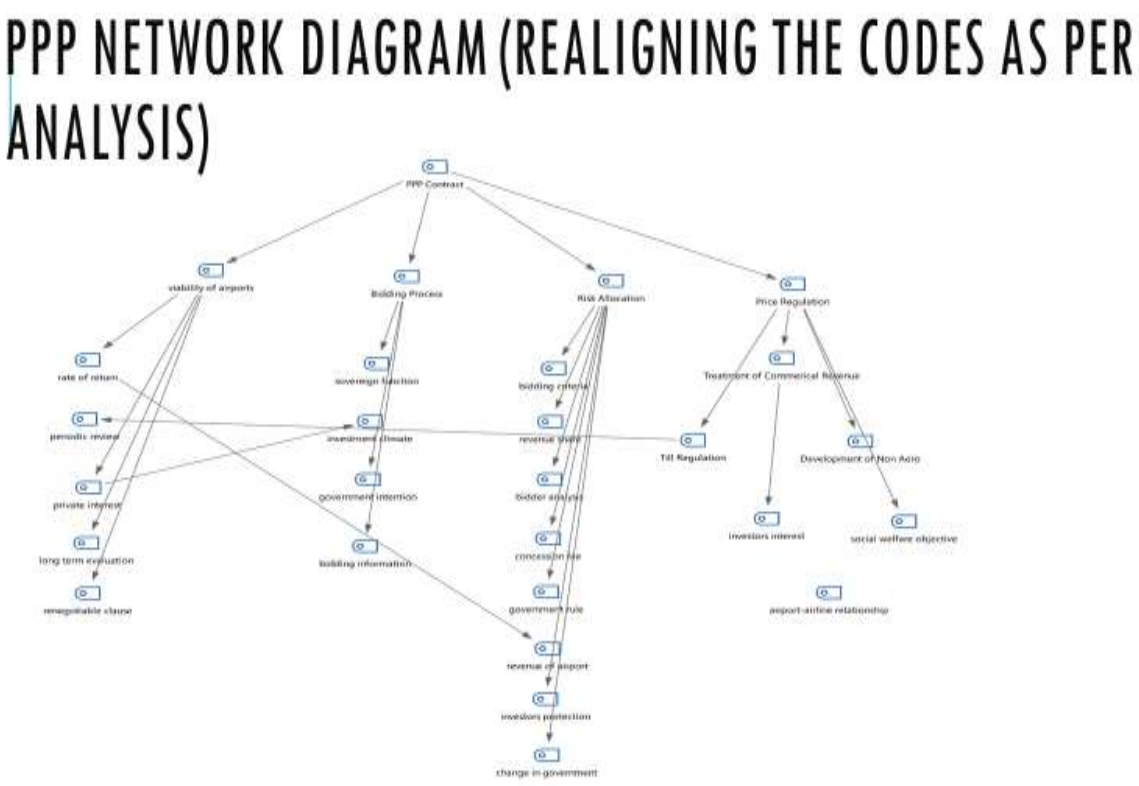


Figure. 5.2. PPP network diagram for themes

Themes From Focus Group Discussion

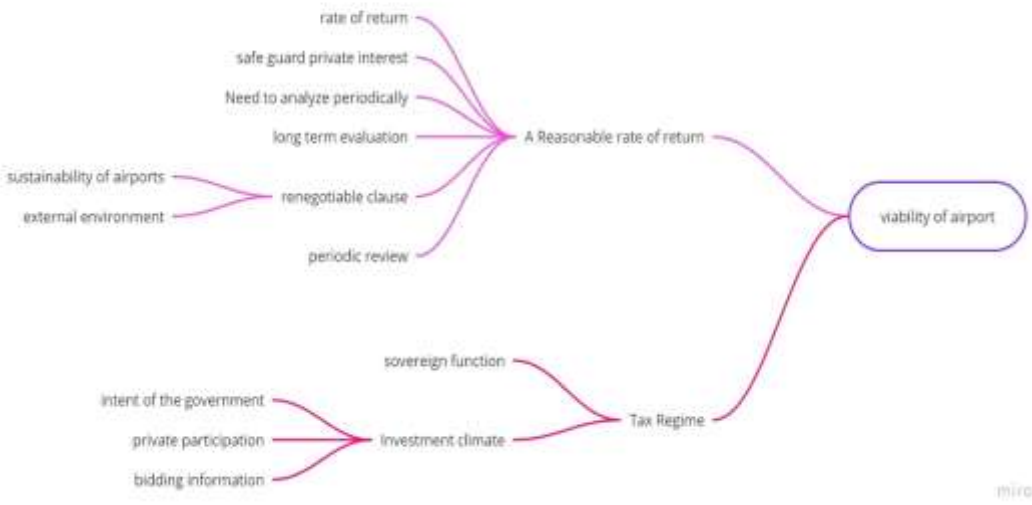


Figure.5.3. Focus group thematic diagram 1

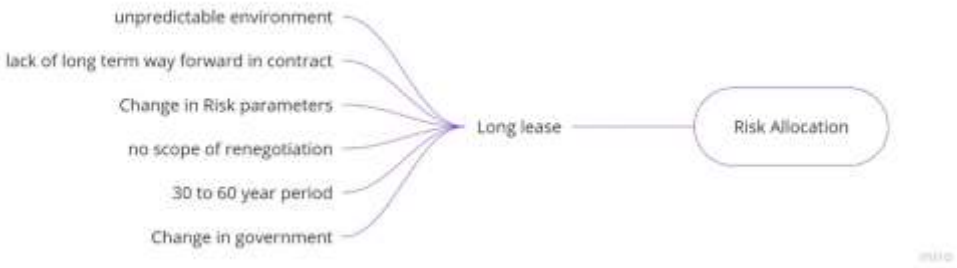


Figure.5.4. Focus group thematic diagram 2

Figure.5.5. Focus group thematic diagram 3

Figure.5.6. Focus group thematic diagram 4

5.4. RESULTS

PPP Framework

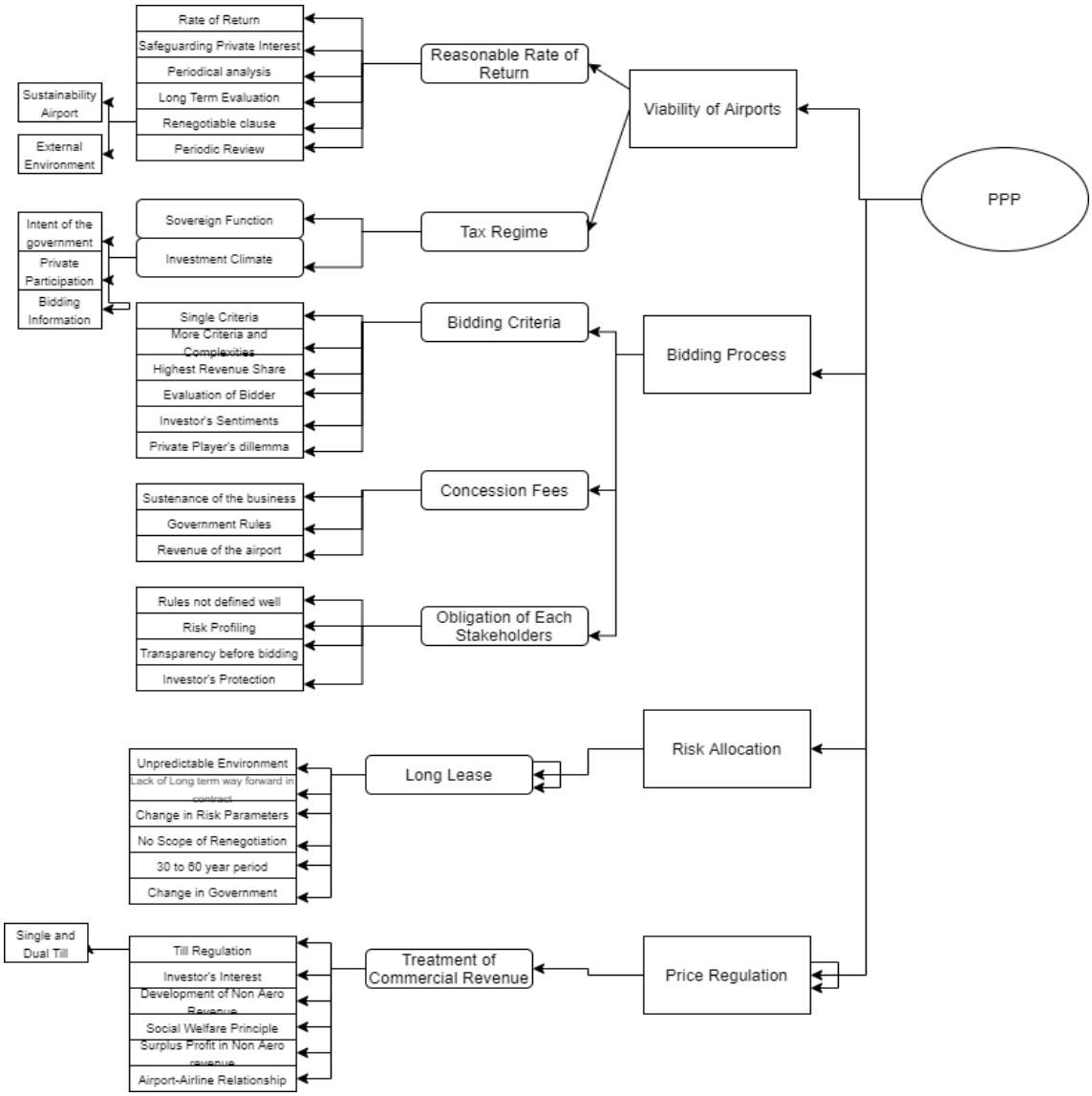


Figure. 5.7. Final Thematic Framework

A variety of perceived challenges were mentioned in the focus group. During the discussion, four broad themes emerged, which are discussed as a general line of focus group discussion.

Theme 1: Viability of the airport

1.1) **A reasonable rate of return**: The policymakers need to realize that investors will get attracted if they find a reasonable return on their investments. P1 suggested that " Policymakers need to realise that a reasonable rate of return should be fixed during the contract negotiation, which provides breathing to the investors to take more risk by making more investment." P2 also agreed with the point and said that " because of no reasonable rate of return, some of the airports during the long run are incurring huge losses". The group supported the fact that a reasonable return rate is a must for having a good contract design.

1.2) **Tax Regime**: P4 and P3 highlighted the tax issue by conveying that " the tax regime of PPP contracts needs to change, even sovereign functions of the private airports are under huge tax which creates pressure on the investors." The Focus group also said that this kind of regime creates a less attractive investment climate. They emphasized having a liberal tax policy. P5 noted that "government needs to realize that its development of airports is more important than the operator's profit. Having more and better investment climate is good for the growth of airports".

Themes 2: Bidding process

2.1) **Bidding criteria**: the group was very critical regarding the bidding criteria .p3 said that " the bidding should be based on a single criterion, multiple criteria create confusion, in the long run, the bidder needs to be competitive, but here more than competitive it is the highest revenue share and cost of the project both are put on as the criteria which are not favourable for the investors."

2.2) **Concession fees**: The group said concession fees are sometimes a bottleneck for the operator. P6 said that " the concession fees are levied on the operator

by the government without looking into the fact that whether the revenue can sustain it. Without looking into account when concession fees are levied, it creates pressure on the operator".

2.3) **The obligation of each stakeholder**: During the focus group, the experts also emphasized the stakeholders' roles and responsibilities not predefined during the bidding stage. P2 said that " during bidding time, generally it is observed that obligation of each stakeholder is never clear. The obligation of concessionaire and the authorities should be specified in advance which helps the bidder evaluate the Project better". P4 also supported the argument and added," the responsibility and obligation keep changing as per change in government this creates a lot of uncertainty for the operator".

2.4) **Sovereign immunity and risk allocation**: During the continuation of the discussion, one crucial point came out. The Experts suggested that most of the time, the government's protection is not clear in the contract, and the same goes for risk, which the operator has to take into account. These risk and protection expectation keeps changing as the project progress. This creates conflict between the government and operator most of the time to clear out issues of responsibility. P5 said, " the contract should mention the boundary of risk that the operator is accountable for and protection that government will provide as a guarantee. It will create a positive momentum among investors. It will help them to evaluate the Project, and investment will increase."

Theme 3: Risk Allocation

Risk is high on the operator side when dealing with airports; This risk is closely defined with the airport project scenario. P4 said that " the risk issues keep changing over time as the project progresses. This creates a kind of dissatisfaction among investors ". P5 said that " this non-clarity of risk motivates the investor to sell the project before the lease period is over".

The group also emphasized that risk and clarity during the contract design are integral to the PPP. Every airport has a different market; even state agreement is unique for each airport. The risk measurement and its impact are not present during the contract. If your policy is created that may impact the airport, the operator doesn't have the scope to renegotiate the agreement.

3.1) **Long Lease Period**: The group thought a more extended lease period creates a more significant amount of uncertainty. " P3 said that " Long lease period means once the airport is ready and has completed two to three years the initial projection and estimates done during contract changes due to changes in the external environment, demand, etc. The problem is this uncertainty is never taken into account in the PPP Agreement. It puts pressure on the operator once the Project progresses ". P7 said that " it is important for the government also to consider the uncertainty associated with the long lease period ".

Theme 4: Price Regulation

One of the points that the group supported unanimously was regarding price regulatory mechanism. The group said that the regulatory mechanism in terms of price regulation needs some fine-tuning. P5 noted that " As per airport requirement and its future scope price regulation rules to be decided". P7 said, " there is no clear mandate of what price regulation is best for each airport. There should be a mechanism to evaluate the same".

4.1) **Treatment of Commercial Revenue**: Commercial revenue is an attractive proposition for airport operators. As per the group, the treatment of Commercial gain is the main highlight of the Price regulation. For single till the Entire commercial revenue will be cross-subsidized, and for dual till the only commercial cost will be cross-subsidized. P5 believes that " Airport operator will like to have scope for more commercial revenue in airports. Due to cross-subsidise the motivation to expand commercial revenue declines". P8 said that the current government's decision to go to hybrid till regulation is a

short-term measure; it will not solve future commercial revenue issues. p9 said that " In future government needs to focus on framing a policy on till regulation based on the specification of each airport."

5.5. KEY POINTS FROM THE CONVERSATION

1) **The viability of the airport**: Group has emphasized that the government needs to see how to make the airport viable. Its growth should be an essential factor to consider while creating the contract. The group said that a reasonable return rate to the new operator must sustain the airport in the long run. The agreement needs to take this as a factor. The group also said that undue tax in the PPP model demotivates players to participate in PPP Bid.

2) **Bidding Process**: The group also suggested that the bidding process needs to be streamlined, the too many criteria create complexity, single criteria bidding can make better- simplified Contract management; before the bidding process, the government should clarify in the matter of concession fee, and how much will be charged. Defining the obligation of each stakeholder is crucial.

3**) Risk Allocation**: Group suggested that clarity on risk assessment and mitigation is a must. Generally, the risk is not clearly defined in the contract, creating problems once the project progresses. The threat keeps changing with time, putting undue pressure on the operator.

4) **Price Regulation**: Group suggested that price regulatory mechanism cannot be a universal mandate. It should be designed as per the requirement of each airport. Treatment of till is an important issue to be considered while creating price regulation.

5.6. RELATION TO THEORY

In the exploration of research for contracts, we went from principal-agent problem to contract theory. There is a clear linkage between the framework

we have proposed and the theoretical underpinning we studied in our research outcome. The leading theory we have used is the incomplete contract theory given by Oliver hart. The study proposes a framework that addresses the issues of incomplete contract theory in the Indian airport settings. The factors which came out of our study are as follows :

The factor airport-airline relationship(Zhang, Anming & Czerny, Achim I; Saraswati, Batari & Hanaoka, Shinya) from literature suggested that Airport-Airline relationship matters in an airport setting same was also noted in the PPP settings in our framework, the outcome of this thesis also supports the literature and it further says that both airport and airlines are part of the same business (airlines are not part of the contract legally) which makes it essential for the airports to have good relationship with airlines and this is also been noted in the discussion on treatment of commercial revenue in the framework : The study also noted that commercial revenue improves airports revenue but it needs good airport-airline relationship, another factor from literature was Commercialization (Tovar, Beatriz & MartÄ, Roberto Rendeiro) the literature notes that commercialization is a good scope for the airport revenue , in our study the framework clearly supports commercialization as one of the important factor but it goes one step ahead and relates its relation to contract (specific to Indian settings) and the framework suggest that contract should periodically allow review of the airports performance and should allow airport operator to negotiate if external conditions are becoming unfaviourable, also it says that treatment of commercial revenue should be studied and implemented as airport specific matter not as a pan India policy. Another vital factor which literature suggested was Governance(Usami, Munekatsu & Akai, Nobuo), in which literature suggested that ownership patterns influence the airport's efficiency; in our study, we have supported this argument, and the framework goes one step further it also connects governance issues to the obligation of each stakeholder as well as the bidding process, the study

suggests that not only ownership pattern but the contract should also clearly define all the roles and risk involved. The roles of each stakeholder should be clearly defined, and they should be communicated before the bidding process so that the bidders can evaluate the project better. The literature talks significantly about Incentive Regulation (Starkie, David; Zhang, Anmin). It says that incentivizing the agents for their work is crucial if they are not given incentive, the agent will find ways to gain profit which may not be part of the rules given by the regulator and agent will not work for efficiency gain; This study has supported this argument and also gained insight on incentive regulation in the airport settings. The framework suggests that the treatment of Till is crucial, and it should be airport specific because commercial revenue is a crucial incentive for big airports; it also suggests that Dual till or single till should not be the Country specific rule, but it should be analyzed and explicitly decided to the airport in the discussion. Another essential part of the theory we studied was Pricing(Forsyth, P; Georges Assaf, A. & Gillen, David),the literature says that pricing in a public utility is decided as price-cap, rate of return or light touch in recent times, in this study the framework as it is studied keeping Indian airport settings in mind. Hence, it went further, the research suggests that airport prices may reduce if treatment is implemented airport-specific, and investors can invest more in commercial revenue. Another crucial point suggested by the literature is contract design(Niu & Zhang, 2013; Verweij et al., 2020); literature suggests that contract design needs to be created keeping project work and stakeholders in mind, and it also suggests that an unpredictable environment also should be considered in the contract design our framework supports this argument, and the framework in this study also suggests the same, however, it also goes slightly further and connects price regulation with contract design. It suggests that in a public utility, the price regulatory settings should be defined in the contract. There should be a renegotiable clause in the contract which will take care of the unpredictable

environment; our study is unique because it is one of the first to connect price regulation to PPP contracts in an airport setting.

CHAPTER 6

CONCLUSION AND DISCUSSION

6.1. CONCLUSION

Three scenarios are explained in this thesis. Chapter 4 discussed how a contract between principal and agent affects the agent's incentive to develop commercial revenue. This issue has been addressed by creating a regulatory model in different regulatory scenarios: Single Till, Dual Till. The game setting has been made to understand player behaviour under each circumstance. These circumstances simulate actual environmental settings. Dual till provides better incentives to develop commercial revenue after playing the game than the single till when the airport has a more extensive area and investment is high. For smaller airports, Single Till provides a better return for both Government and private players. Single Till shows an adverse effect on large airports and shows adverse effects on investments. The overall understanding is that each airport is different, and its way forward will depend on the environment in which it is running its business. The environment will be different for each airport. It is suggested from the analysis that the Government should try to implement Till based on the Airport that will be best suited for current circumstances.

Chapter 4 also discusses research question 2, a unique issue in PPP by public and private stakeholders. The question focuses on whether having no knowledge of PPP project value and bidding for the project like an airport will provide the best incentive for players or a win for the Government. We assumed that two players want to bid for a PPP airport project. The main bidding criteria are that the person giving the highest revenue share will win the project (per conditions in Indian PPP contract). A bidding model was created, and a game was played between two players and the Government. Our analysis suggests that the higher the revenue share, the higher the risk for private parties and the chance of default of the project. The cost must be kept below net revenue, leading to inefficiency of asset utilization(For the winner). The game is safe for the private player when

non-aeronautical revenue is substantially higher as income. The alternative suggested in the game is to have unregulated income or income by showing a separate company not part of the Airport. This can give rise to more complicated problems in the future. The above suggests that to have a better sustainable airport under PPP best way is to allow private operators to enhance non-aeronautical revenue.

The games in both questions have shown that to have a better PPP Airport, which is more sustainable and profitable and keeps all airport stakeholders well off, we need to give private stakeholders more freedom to improve non-aeronautical revenue until regulation be Airport specific.

To understand further, it was essential to verify the above suggestions and better understand the stakeholder's views on PPP Airports in India. For this purpose, chapter 7 discussed stakeholders' perception of the development of PPP Airports in India, which develops into the PPP framework, which will benefit all stakeholders.

The themes that emerged out of the focus group are the following:

a) The Viability of airports

b) Bidding Process

c) Risk Allocation

d) Price Regulation.

These themes can be helpful for further research for the development of future PPP contracts. For the Airport's Viability, the stakeholders have suggested that having a reasonable return rate on the project will be beneficial. Policymakers need to keep this in mind while creating the contract. They also emphasized a liberal tax policy to relieve undue pressure on the airport operator. The group suggested that PPP bidding should be based on single criteria. The group also believes that concession fees should be levied on the Airport only if the revenue can sustain it. The group was also emphasizing that risk in a long-term PPP contract is a critical component. The only way out is to have a renegotiable contract from time to time to improve the agreement on the change in

environment. For price regulation, the stakeholder believed that each Airport is different, and the price regulation should be implemented by looking at each Airport differently. A single criterion of price regulation may not be suitable for all airports.

6.2. OBJECTIVE-WISE FINDINGS

Research Objective 1:

Findings:

1) Single Till showed better results in smaller airports, providing invective to operators.
2) Dual Till led better results in larger airports, providing a better incentive for airport operators.
3) Airport regulation cannot be generalized it should be case-specific. Each Airport has a different specification.
4) When Non-aero Revenue is less, it is better to have a single till regulation.
5) Investors incentive is less in high infrastructure single till regulation.

Research Objective 2:

1) Revenue sharing agreement has a de-incentivizing effect on operators
2) Revenue share with more freedom for commercial profit is better for investors
3) The winners curse is observed: The player wins the bid, but the overall objective of social welfare is not achieved; the player tries to make a profit from non-regulated sources.
4) Long term sustenance is not achieved under winners curse (learnt from case references)

Research Objective 3

Contract themes are created, the below are the factors which emerged for a fair, sustainable contract for PPP in Airport

a) **Viability of the Airport**: Group has emphasized that the Government needs to see how to make the airport viable. Its growth should be an essential factor to consider while creating the contract.

a.1) Reasonable rate of return :The group said that a reasonable return rate to the new operator is necessary to sustain the airport in the end. The agreement needs to take this as a factor. The group also said that the high tax regime in the PPP model demotivates players to participate in Airport PPP. The subthemes that emerged from the discussion are the Reasonable rate of return and Tax return. Every project under bid needs to have a good reasonable rate of return, that we depend on factors like how Government will safeguard the private interest, periodical review of the project contract, keeping in mind the external environment is uncertain in the long run, the contract needs to have renegotiation clause which makes it easy for all stakeholders to revisit the contract whenever the need arises for amendments.

a.2) Tax Regime: One of the crucial subthemes were the tax regime. In the tax regime, the critical point which came out of the discussion was government's intent for the PPP, and the participants pointed out that to have a healthy PPP model, the tax structure needs to be very reasonable. Undue pressure due to a high tax structure can be detrimental to project sustainability. The tax structure should be declared in advance before the bidding so that players bidding for the project will be able to calculate the actual risk involved.

b) **Bidding Process**: The group also suggested that the bidding process needs to be streamlined.

b.1**) Bidding Criteria:** Too many criteria create complexity. Single criteria bidding can create better- simplified Contract management. A simplified single criteria structure works well for the bidding. Becouse of complex criteria the bidding stakeholders(who eventually wins) confusion increases after the projects starts.The highest Revenue share clause is not a good criteria for bidding. Highest revenue is accepted by the private stakeholders only because of non availability of choice but it

is detrimental for the project in the longer term as well as for the sustenance of the project. Higher the revenue shares riskier the project becomes in the longer run, the bidding should have a calculated revenue share clause; otherwise, it can create winner's curse situation. The bidder's evaluation should be transparent and should have minimum criteria for eligibility, creating complex evaluations makes bidding more complex. As per the group the government needs to take care of the investors sentiment as they are the one investing for a longer-term growth. The complex criteria's as well as high revenue share clause creates a winner's curse situation for the operator in the longer run of the project.

b.2) **Concession Fees**: Before the bidding process, the Government should clarify the concession fee and how much will be charged. Obligations required by each stakeholder should be clearly defined in the contract. Higher the concession fee is riskier for the sustenance of the airport business. The group said the concession fee should be calculated based on airports existing business and environment in which they are working. The research also shows that the roles and responsibility of each stakeholder should be defined before the bidding starts. Strict government rules are essential but it should not be put as mandate in the contract, the rules should be defined as per the circumstance's airports are currently working. The government also need to see that concession fee should not impact adversely to revenue of the airport. All these are only possible if there is periodic negotiable clause in the contract.

b.3) Obligation of each stakeholder : The group also emphasized that the contract before the bidding should clearly define the roles and responsibility of each stakeholder.Becouse of no clarity in the contract it becomes difficult for the operator in the longer run of the project. The group also emphasized that risk profiling should be clear regarding which stakeholders will take the responsibility , at least in the broader sense of the project. The contract should be completely transparent and presented to bidders before the bidding so that they can evaluate the project well. The contract when created should also keep in mind that investors money

needs to be protected because its their funds which are running the project and they are taking risk. The government needs to ensure that contract should be encouraging for the investors.

c**) Risk Allocation**: Group suggested that clarity on risk assessment and mitigation is necessary. Generally, the risk is not clearly defined in the contract, which creates a problem, ones the project progress. The threat keeps changing with time, putting undue pressure on the operator.

c.1) **Long Lease:** The research shows that risk increases as the project tenure increases (long lease period). The risk increases with time, it can be due to change in government so the rules may change or it can be because of change in external environment which can change the risk profile of the stakeholders. The overall recommendation is to have a *renegotiation clause* in the contract, which can take care of the unforeseen future issues. The clause should not have any effect on change in government. This can be detrimental to the project. The projects which are 30 to 60 years in nature need to have renegotiable mandatory clause.

d) **Price Regulation**: Group suggested that a price regulatory mechanism cannot be a universal mandate. It should be designed as per each airport's requirement, and the type of price regulation should be mentioned upfront in the contract.

d.1) **Treatment of the till:** It is a critical issue to be considered while creating price regulation. Till needs to be calculated with the interest of airport development in mind, the government needs to accomplish *social welfare objective*. The objective cannot be achieved by determining tariff to decrease charges but to have a long term view of the development of the airport, which will bring more non aeronautical revenue to the airport. Keeping stakeholders in mind will also improve the airport-airline relationship, which will help airline bring more passengers to airport, and they will, in turn, get more commercial revenue sources.

6.3. COMPARISON OF RESULTS FROM RO1, RO2, RO3.

1) The comparison among the Research Objectives provides us with the following:
2) Participants agreed that a universal mandate on price regulation not possible. It is an airport-specific matter.
3) The contract needs to be transparent, policy and regulatory criteria should be defined in advance before bidding.
4) Contract clauses should be renegotiable periodically

6.4. PROPOSITIONS

Research Objective 1:

P1: Dual till may not increase Aeronautical Charges

P2: Increase in Non-Aero Revenue can increase countervailing power of airlines

P3: Single Till is better regulation for smaller airports

Research Objective 2:

P4: Transparency in contract conditions before bidding improves investor confidence

P5: Highest revenue share in the contract may not be a sustainable model for the long term growth of airports

P6: Commercial revenue positively influences long term incentive for airport operators.

P7: Winners curse situation will likely influence the airport operator to diversify the revenue more towards non-regulated sources to sustain the business.

Research Objective 3:

P8: A reasonable rate of return positively influences the long term sustainability of PPP Airport

P9: Periodic negotiable tax structure positively influences the growth of PPP Airports

P10: Simplified Single criteria bidding parameter is likely to improve contract management

P11: Transparency on concession fee during the bidding phase will positively improve investor confidence.

P12:Periodic review of risk assessment will likely improve the long term sustainability of PPP Airport.

P13: Type of price regulation, when clearly defined in the contract bidding phase, positively influences investor confidence

P14: Airport specific price regulation improves the long term sustainability of PPP Airports.

P15: Long term payback period in Airport PPP will positively influence the sustainability of the PPP Airport.

The Framework for the Public-Private Partnership has been proposed in this research (model below shows the framework connecting all propositions). The model is shown in Figure. 6.1 .

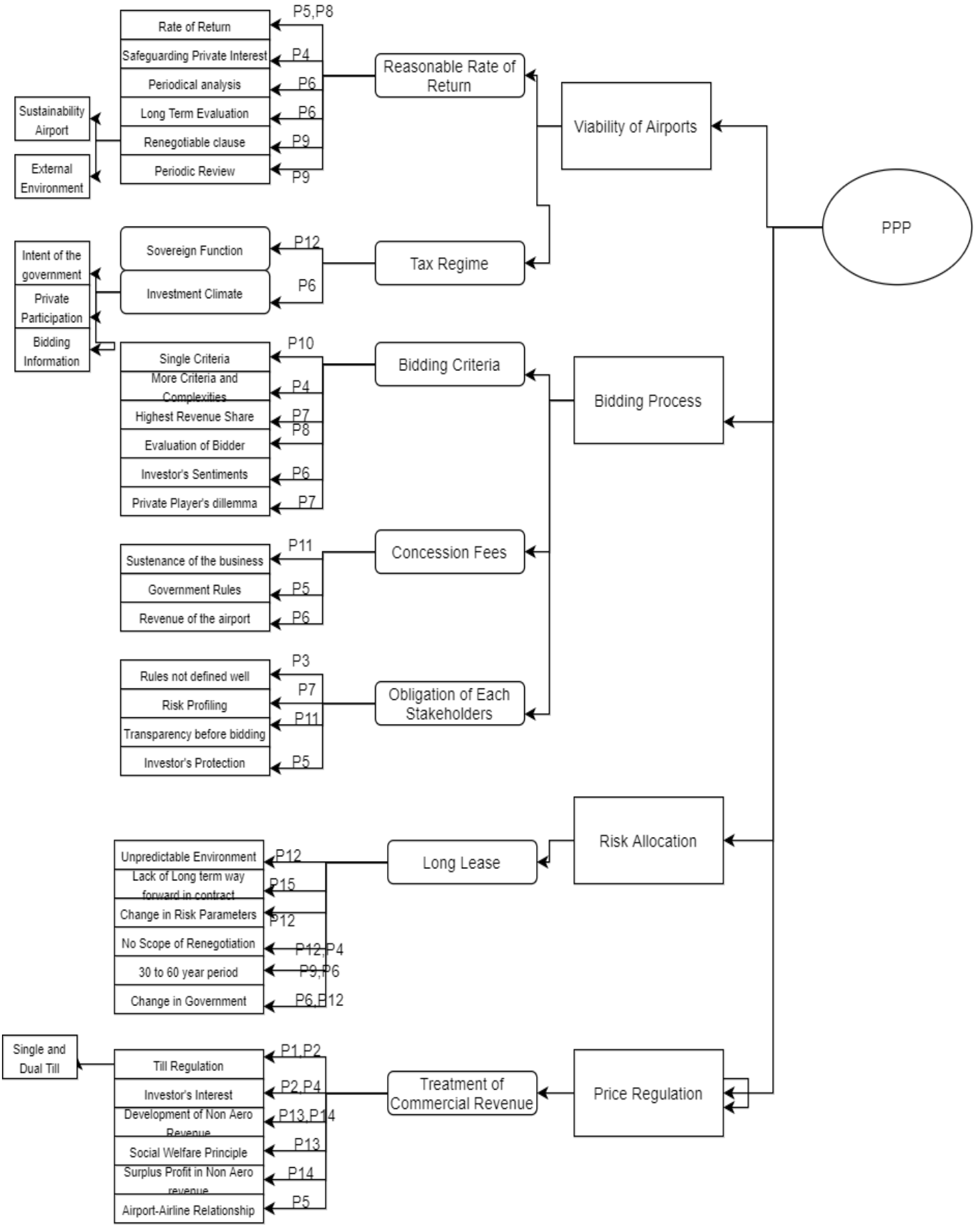

PPP
Viability of Airports
Reasonable Rate of Return
Rate of Return
P5,P8
Safeguarding Private Interest
P4
Periodical analysis
P6
Long Term Evaluation
P6
Renegotiable clause
P9
Periodic Review
P9
Sustainability Airport
External Environment
Tax Regime
Sovereign Function
P12
Investment Climate
P6
Intent of the government
Private Participation
Bidding Information
Bidding Process
Bidding Criteria
Single Criteria
P10
More Criteria and Complexities
P4
Highest Revenue Share
P7
Evaluation of Bidder
P8
Investor's Sentiments
P6
Private Player's dillemma
P7
Concession Fees
Sustenance of the business
P11
Government Rules
P5
Revenue of the airport
P6
Obligation of Each Stakeholders
Rules not defined well
P3
Risk Profiling
P7
Transparency before bidding
P11
Investor's Protection
P5
Risk Allocation
Long Lease
Unpredictable Environment
P12
Lack of Long term way forward in contract
P15
Change in Risk Parameters
P12
No Scope of Renegotiation
P12,P4
30 to 60 year period
P9,P6
Change in Government
P6,P12
Price Regulation
Treatment of Commercial Revenue
Till Regulation
P1,P2
Investor's Interest
P2,P4
Development of Non Aero Revenue
P13,P14
Social Welfare Principle
P13
Surplus Profit in Non Aero revenue
P14
Airport-Airline Relationship
P5
Single and Dual Till

figure 6.1

6.5. THE RESPONSE TOWARDS RESEARCH PROBLEM

Research Problem: Although in existing literature, various regulatory models are suggested, and their impact on the behaviour of public utility is known, but existing literature does not provide an answer to understand how the contract agreement between principal and agent affects the behaviour of firms (public utility) under the regulatory regime.

Response: The study explores contract issues, regulatory models are tested, and how it impacts the airport operator's incentives. The study explored the issues between agent and principal in this case, airport and Government in detail. The outcome of the study, the new contractual framework, is created out of the factors studied.

6.6. THEORETICAL CONTRIBUTION

The current study contributes as follows :

- The study provides factors which will enhance PPP contract in Indian Aviation sector. (This is the first study on the PPP contract in aviation in India)
- The main theoretical underpinning was the Incomplete Contract theory. This study attempts to explain Incomplete contracts and their impact on an agent under regulatory conditions through game theory, which is in line with (Hart 2003).
- The factors necessary for PPP contracts are the following: Viability of airports, bidding process, Risk allocation, Price Regulation.
- Some factors like risk allocation and each stakeholder's obligation (sub-theme) align with previous research works (Chou et al., 2012). The suggestion for scope for renegotiation as an essential part of the contract is in line with (Macário 2010).

- The study addresses the contract once the contract has reached at least ten years of its operation. Thus, it makes this study unique in terms of its contribution to PPP studies.

6.7. CONTRIBUTION FOR THE SECTOR: IMPLICATION FOR AIRPORTS

1) The research output of this study will help policymakers create a much better PPP environment in the country by designing the contract keeping factors in the review.
2) The components referenced in the investigation ought to be considered as an essential component for making a framework of the long-term PPP contract in Indian airports
3) This study also highlights the importance of incentives for the airport operator in the contract, which will help policymakers create contracts that will be fruitful for the airport operator and long-term government relationship.

6.8. DISCUSSION

Airports are complex and multi-product enterprises. It is a system that caters to a wide range of requirements relating to the global movement of people and things.A nation cannot ignore the nature of airports as one of the significant contributors to economic development. Throughout the world, airports are continuing to upgrade their infrastructure to meet air travels ever-growing demand. This infrastructure development is increasingly funded through Airport privatization, attracting many airport operators and investors. From the year 1980's onwards, a range of different ownership models has emerged based on Govt policies for the ownership and operation control of the Airports. Due to the Airport's inherent nature of being highly capital intensive, it becomes difficult for the Government to bring the required investment for large-scale

modernization and airport infrastructure expansion. [1]In India, airport privatization initially started as a significant Government policy by deciding to modernize Delhi and Mumbai Airports and set up new Greenfield Airports in Cochin, Bangalore, and Hyderabad. AAI has transferred the operation and management of Delhi and Mumbai Airports for a long time lease of 30 years with an option to extend for another 30 years. OMDA and SSA are the mother documents under which the AAI/ he right to operate, maintain, develop, design, construct, renovate, modernize, finance, and manage airports. It also prescribed objective and subjective service quality standards mandatorily required to achieve and maintain by the Airports[2].

The Airport sector has witnessed a shift from a completely Government-owned sector to a PPP framework. Opening up of Airport infrastructure to private participation fuelled the growth of their traffic in India. The five major PPP Airports have shown the world that PPP is a successful model to develop airport infrastructure in the country. These 5 PPP Major Airports have created a world-class infrastructure in the country, but most of them are adjudged as one of the world's best airports in their respective categories. We are witnessing the impact of new, improved Airports on our country's perception, GDP, and business growth. The civil aviation sector has seen unprecedented traffic growth in the past few years because of rapid economic growth and the entry of low-cost carriers in the private sector. Several studies forecast that India can be an aviation leader by 2025, reaching within the top three positions globally in air passenger transport[3].

Under their control, state-owned public sector undertakings have been protected from competition. By implementing current methodologies, new management, and marketing abilities and practices, such businesses will not compete in a

competitive business environment. Indian experience shows that the privatization of airports enhanced the entire sector's efficiency, given more comfort and convenience to passengers, generated more revenue to AAI, and contributed immensely to its GDP. Today not more than 5% of our population had ever experienced air travel. PPP Airports in India have demonstrated that these airports can play an efficient enterprise that gives more economic benefit to the country, pushing the Indian company's competitiveness in the global arena. These airports have proved the best examples of efficient enterprises using the most modern techniques and methods and have the best consumer-oriented approach with excellent operating efficiency and boost revenue to attract the much-sought investment.

The airport sector will continue to provide a wide range of opportunities to all the stakeholders, particularly the private sector-run airports. Given the nature of the aviation industry and the potential growth, it can be concluded that privatization is the only answer to improve the aviation sector in the country. While air transportation is relatively expensive than Rail or Road, it is the most practical way of covering long distances within a reasonable time frame.

The impact of civil aviation on the economy has several dimensions. The sector requires various inputs and skilled labour for its operations, which can generate more employment. It helps build new industries. It also helps those products which require air transportation urgently, such as the shipment of perishable and high-value goods Communities and economies all across the world benefit greatly from the aviation industry. It provides connectivity and market access, making it a critical enabler of economic growth, social development, and tourism. It is an essential contributor to economic development and growth. The aviation sector of the economy benefits directly or indirectly from the expansion of this industry. Building new airports, upgrading existing airports, or enhancing airport operations necessitates massive amounts of raw material, typically sourced from various other economic sectors. The aviation industry produces a significant multiplier effect.

The research has dived deep into all the perspectives that would explore the interrelationship between efficient PPP Contracts and the airport sector

development and answer the pertinent question regarding the optimal way to make the long term PPP contract more sustainable, suitable for the Indian airport sector. The research also deeply examined the interplay between the regulatory regime and the efficiency improvement in PPP Airport, business, attracting investment and guaranteeing that the regulation should confirm the Airport's viable activity. The research examined the effect of long-term contracts for public and private entities in the Airports sector. The thesis suggests the solutions that would enable policymakers and other airport stakeholders to frame better PPP policies which will help the sustainability of the Airport PPP project in the long term.

The contractual framework given in the thesis will improve the sustainability of PPP projects in India. The thesis will also help policymakers and managers understand the PPP issues and how these issues can be reduced by having an approach that will benefit all stakeholders.

6.9. KEY POINTS FOR BETTER PPP SPECIFIC TO AIRPORT

All contracts under PPP, which is long term in nature, needs periodic review, and there should be a clause for renegotiation in the contract. Uncertainties for the future cannot be assessed or calculated all the time, and the contract should have the clause for uncertainties so that both parties can discuss a way through. Bidding criteria should be simplified and transparent so that bidding parties can measure the project's real opportunity. There should be a PPP project commitment by the government to measure the performance of the project periodically. Till regulation being an airport-specific matter should be implemented as per the airport development phase, the goals of having the till regulation airport-specific and state in which it belongs. All airports under the same till regulation may not serve well in the long term.

6.10. FURTHER SUGGESTIONS FOR INDIAN PPP

India offers today the world's biggest market for PPPs. It has aggregated an abundance of involvement with getting to this chief position. As the PPP market in India's infrastructure development, new difficulties and openings have arisen and will continue. Periodic audit of PPPs is an absolute necessity

to help address issues before they become endemic and improve PPP contract matters by cultivating new ways to improve PPP successful implementation. This must be a powerful interaction. Such audits ought to be done often in a perfect world, maybe once in 3 years, and all the more frequently if the PPP is much larger in nature and complex. India's success in deploying PPPs as a critical tool for building infrastructure will be contingent on a shift in mindset and outlook among all professionals involved in PPPs, including public organizations that collaborate with the private sector and government divisions regulating inspecting and authoritative bodies that oversee PPPs. This shift in attitude necessitates (1) shifting from a narrow focus on PPP financial transactions to a focus on relationships and service delivery to citizens, (2) developing an incentive methodology among private and public sector partners, and (3) developing a tool for managing vulnerabilities inherent in long-term contracts. It should be remembered that given market and innovative vulnerabilities, both public and private administrators of long lease PPPs take choices dependent on insufficient data(PPP ar long term data availability and accuracy depends on the age of the project). All stakeholders should encourage trust among the private and public sector when they actualize PPPs. All tasks and responsibilities under PPP frameworks should be transparent and fair between various stakeholders and all should be responsible for making customers happy. The framework developed in this study will help stakeholders and policymakers to improve the sustainability of the long term PPP. Apart from the above, there is a need to reinforce further the three essential mainstays of PPP frameworks, specifically Governance, Institutions, and Capacity, to expand on the setup establishment for the next flood of usage. Typically, infrastructure PPP projects length more than 20-30 years and private operator regularly loses bargaining power identified with taxes and different issues if there are sudden changes in the financial or strategy climate outside his ability to control. In such circumstances, the private sector should be ensured against what has been called an "Obsolescing Bargain"- the deficiency of bargaining control when the project is of a long period in the PPP through the suitable mechanisms, including the setting up of Independent Sector Regulators.

6.11. LIMITATION OF THE STUDY

The study is based on game theory and focus group discussion by airport stakeholders; because of the airport-specific content, the generalized recommendation to overall PPP is possible but may need further validity in its applicability in other sectors. Secondly, despite having a good number of stakeholders involved in the focus group discussion, there is always a little chance of having biases in their viewpoint, which we tried to minimize by showing it to professionals and academicians who were not part of the focus group from the area of Airport PPP.

6.12. SCOPE OF FURTHER RESEARCH

There is substantial scope for further research in PPP creation, formulation, and final execution of the project and its impact on the airport. A multi-sector approach can be taken to get contract design parameters to improve overall infrastructure PPP contracts applicable to all infrastructure sectors. The public-private partnership is considered to be an area with multiple complexities and these complexities. The improved Public-Private Partnership in-depth research needs to be done regarding project financing, project formulation, and project execution phases. The current research focuses on the overall framework of the PPP, especially from the angle of the regulatory challenges. Future research should focus on customer inclusion in the Public-Private Partnership model that can improve the effectiveness of Public-Private Partnership.

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Appendix A

Focus Group Discussion Transcript

Focus Group

Moderator: Let me start today's discussion. Before starting the discussion, let me tell you the rules of the focus group.

First rule: it is purely a discussion. That means that whatever the views you will put up as a participant will be taken as a general view and not a particular individual's view, on the topic

Before talking, let me tell you my topic, it is "Infrastructure utilities". My area of research is Airports. My Area of research is "contract mechanism in airports" especially is PPP areas, because nowadays PPP has become a big buzzword in infrastructure sector and in that my research is focusing on "role of economic regulations in PPP area." And outcome of research will be applicable in almost all the utility sectors. Having said that let me start it out.

Let me start by saying that, what do you think is the role of regulation in airport development now? As govt participation in development is slightly decreasing and private parties are coming up well. There is utmost importance that regulations will be framed right, for infrastructure setup like airport. So what is your view?

Speaker2: So there will be no consistency in the contract rules and tariff regime Airport, as an infrastructure is still considered as a monopoly. Competition is very limited. When a customer travels somewhere, he has no choice to choose between one airport to another. So it is a monopoly.

Pricing, in a monopoly sector, definitely should be regulated. Particularly when govt parties and private parties are participating, it is a must that there must be a regulator, who controls the pricing. Otherwise there is always a fear that the airport will misuse its monopoly character.

Second thing is, many of the airlines, find it that the airport charges in India are very high. So once a regulator puts the costing angles and pricing etc. it will satisfy all the stake holders, not only the airport, the airlines and even the general public, they will understand that there is a regulator who controls the pricing mechanism.

Third thing is, the investors. An investor will look into a sector where the regulator mechanism is already enforced, because they want a certainty in their investment. A sector which does not have a regulator, it depends on political party or ruling party of the country, and it will be governed by their policies. In another year, a different political party will be the ruling party, and policies will be given by them. So there will be no consistency in the approach in the business model that they follow. So an investor will always look into a sector where a regulator mechanism is there, which is independent of political parties and the government. So an independent party, an expert body, who is also transparently dealing with all the matters, in a transparent way, consistent way, is a must for the airport. 96% are yet to take the air travel.

My view is that, in India particularly, regulator is a must for the development of the airport sector.

Speaker 3: I agree with Mr Damodaran. In a PPP, it a must that there must be a regulator because the interest of the investor can only be ensured with the regulatory mechanism. Unless you have a regulator, the investors will not consider their investments safe. They will require the regulator there, to ensure the investments are safe there. This will also ensure the success of the PPP projects. Contract needs negotiation periodically

Speaker 1: Having said that, I want to ask you one more thing. As the private participation is increasing, before that public agencies were doing all this. Do you think, once pvt participation Is included, public agencies role should be slightly lesser? I'm talking bout the public operator, and not the regulator. Because that is also the part of the contract, which also sometimes have a impact on the total project execution. What I'm trying to say is, before the pvt participation came in, there was a public operator who did all the work. As soon as the pvt party enters now, in the PPP sector, the airport sector, the role pf public operator is blurred. We don't know what is the role of the public operator.

I'll give you an example before getting into anything. Recently there was a bid for the Goa airport and airport authority of India has also made a bid with GMR and GVK. Now if you say the Honda agreement of 2007-08, the agreement before Delhi airport, because it was under Airport authority of India, the revenue share of whatever agreement was made is based on the assumption that the airport authority of India is a facilitator of PPP. The same facilitator is the competitor when another segment comes in. so theres a blurred way of looking at the situation. So what is your view on that?

Speaker 2: The airport authority of India, wants to retain all airports of India for private participation to play.lot more people are yet to travel its important to have growth. And the policy maker is the govt. and the airport authority of India is also a govt. org. so there is always a conflict of interest. So the govt. will have some special interest in airport authority of India. In that situation also, if there is no regulator, consumer interest will not be protected. They will be investing, budget after budget, they will put some money and there will always be specific interest by the govt, as it is a govt org. Contract needs negotiation periodically so that way commercial orientation will be there, business orientation will not be there, efficiency orientation will not be there, all these things are missing.

Even if it is inefficient also, it will be okay, because there is no compulsion of govt. to settle them right.

Secondly, the airport authority of India, as you're asking Goa airport, the airport authority of India is a facilitator, no doubt. They also now want to develop, commercial oriented, business oriented entity. They have to compete with the PPP airports. So in a way we will feel that it is now govt owned company etc. but they are given little autonomy, second thing is, they are also just imitating market with the PPP airport. So how will they do? They will have to take up assignments in competition with GMR airport. So there is no harm in ensuring such public setting, in taking up new airports and showcasing their talents. Public sector people are by virtue talented. Only thing they have structured way, they have bureaucrat style etc. they don't have opportunities to showcase their talent. For once they'll get opportunity, for eg. Some airport they got PPP model, and they have opportunity to show, what our govt is showing is much less, so definitely they can outshine the PPP airport. Moreover we want competition. Also, only private will be entitled to the competition, that is, again we are restricting the competition. So the govt should also step in and show their talent. It is no harm in doing that.

Speaker 3: My view is that PPP is intended to put together the resources of both govt as well as the pvt parties. But I think the SPV of the current govt org and participation of pvt parties in large investment areas, I think it is a welcome step. In any case they will be a party and they will also be the competitor, will give the stability. The govt being the partner in PPP, would give stability to the project.

Speaker 1: Now coming on to the next question. I will come to the airport authority of India again, that will guide me to the next question, that is, How do you assess the current economic regulation? Till now we were discussing the

role of economic regulation in PPP projects. Now lets come to the realistic view. What is the current economic regulation of the Indian airport sector?

Speaker 2: This economic regulation, all started after the establishment, that is 2009. Till then the airport authority of India and govt of India, the ministry of civil aviation industry, was the policy maker and operator. So they don't have the regulatory expertise to guide. That was the govt model that they were following. They set up a regulatory philosophy that was open for consultation. All the stake holders of airline, airport, public etc. they have modulated. But that was challenged by many in the project. Because, they worked for a model which is not flexible for the airport. Airport is the main stake holder. They were propagating the UK model. UK model or singleton model is going out of regulation, in almost all over the country, except UK. In India as well, the regulator want to implement the singleton model, where, the main point is that, whatever non- aeronautical revenue they generate, that all will be distributed to the public. The social welfare mechanism is in order, but there is incentive for the operator to earn revenue or invest in non- aeronautical revenue etc. so it is a hit for the development. The investors are not coming, the airport authority of India is not interested. So, it's a dilemma in everybody's mind. Regarding whatever happened now, the stake holders, the ministry of civil aviation, govts etc.

Then ministry of civil aviation, under Section 15, they issue direction to the era, now in the interest of the development of the sector, and attracting the investors, to change the model in a hybrid model. The hybrid model is, 30% of the non-aeronautical revenue can be shared with the public, and the rest can be retained by the airport. It will satisfy everybody. And the regulator will also accept and modify the model.

But even today, the airports are demanding that they must have lighter regulation. The airlines are demanding a singleton regulation.

My opinion is, the in India, what is our requirement today? India wants more airports. 5% or 3% only travel today. So 96% are yet to take the air travel today. We've got that much potential for airports today. We need 500-600 airports today. Who will invest? The govt does not have that much money to invest. The pvt investors need to come in to the industry. So for the pvt investors, they need to get good return. For good return, is non- aeronautical revenue. Like in Kochi airport, 70% revenue comes from non-aero. That can be retained by the operator. That will make everyone happy. The situation will come to as, they will allow the airlines to come free, and go free.

So such a regulation should be ideal in India. It will attract investment, more airlines, airports, public will also get cheaper rate, airlines will also get cheaper rate. Therefore, ideal would be, the regulation should be upgraded to doubleton.

Speaker 3: I can give the example of the railways, where, much more investment is needed and the main obstacle seems to be the confidence of the investors, in getting the appropriate returns. As of now, since regulatory mechanism has not been put in place, in railways, which is a big infrastructure area for economy, likewise in airlines, regulatory mechanism can only bring a pvt finances, which is necessary, as Mr Damodaran has spoken I detail, as much more investments are required and can brought only when regulators are placed and the interest of the pvt investor is taken care of.

Speaker 1: Does abuse of dominance by a monopoly, as in the railways sector or airport sector, the reason, theoretically, is given to public sector is because these are national interest assets, so if a pvt party governs it, it will be the abuse of a monopoly. That means the pvt parties will abuse the interest, if public assets are given for their operations, for their return. How much is it valid today?

Speaker 2: Abuse of monopoly is not as such a case in the monopoly, because in that ministry is ensuring that the consumer interest is protected. So, in my view, there is no specific case of total abuse of monopoly is intervened or

stopped by the govt. in that way, abuse of monopoly case is not established in airport sector so far. But there are few cases, where airport stake holders complain that airport charges are high, they argue that it is abuse of monopoly, but that is not proved anywhere.

Speaker 1: So the next point is, what do you feel the economic regulation should be so that the abuse of dominance should be minimised or become irrelevant?

Speaker 2: When the regulation is there, what are the roles of regulation? that means they oversee operations, that means all the aspects of regulation are protected. Tariff are genuine. Tariff calculated is not public. Tariff implementation is there, and airport operators finances are checked by them, the undue profit is not there. They check everything, so people are satisfied. So therefore, there is no chance of abuse of operations by the pvt sector.

Speaker 1: So you are saying that it is an incentive, and that if he will go for the right thing then he will not go for the wrong thing. That's a good thing. Lets got to the next point that, what is your view on the contacts which are made in the PPP sector, especially nowadays, now Goa airport has also come up, so what is your view?

Speaker 2: PPP is a very long run contract. It runs for 30 years or 60 years contract. In all the PPP contracts there is a model construction agreement, in dividing the PPP agreements. These agreements are not taken into account. The eventuality that happens in 10 years or 15 years, even today there are some cases where changes in conditions are required. But it is not negotiable. No condition is negotiable. Once the change is there, the contract is invalid. So , it is difficult for the operator to continue with his contract. There are many cases where revenue has gone down etc. so there is renegotiation chances in between. And this is a long term contract and in particular PPP contract will always have this problem. They are renegotiating and taking the matter to the govt , to settle some issues. But now the planning commission has come out with a moral concession

agreement. They have been meeting with so many issues for a simple Tariff. So once the investor comes and puts his money, the regulator may decide sone tariff, it may not be accepted, thus he's under high risk. So problem is that, the planning commission thought, instead of that, before bidding you should know what is the tariff (eg, under this contract, XYZ is the revenue share and ABC is the tariff.) presently there is no such guarantee, presently the revenue share has no relation with tariff that they're getting. Tariff will be decided by the regulator who is going to be set up tomorrow. So that is what they're facing today. So planning commission has come out with modal concession agreement. Goa, Navi Mumbai etc. have implemented this today, they now what is the tariff today. Even the Airport Authority of India is bidding for 6 airports, they also know the revenue share.

So the investor should know what is the tariff and what will he get. The inflation and price cap is taken care of, then and inefficiency they can transfer to public.

Speaker 1: In that perspective I want to ask you one more thing, generally in airport sector, the contracts are for 30-60 years, so one story is that when a pvt operator bids for an airport there are 2 conditions, one is, values of the contract, that is how much you're gonna pay, and second is, how much is revenue share. These are 2 things that they look for. Now for Delhi airport it is 45% you have to pay, as the revenue share which goes to airport authority of India. Same way for Mumbai airport, the revenue share is 36%. That revenue share 45%, when Delhi airport was developed in 2008, the revenue share was 300 Cr, and now it is 3000 Cr. If you look at 60 year period, you can imagine the kind of revenue share it is going to pay to other operators. When you are saying that airport authority of India is going to compete, you should also understand the bid amount it is gong to put for goa airport, if you see the balance sheet, 60% revenue share is coming from these 2 competitors.

GMR is Delhi airport and GVK is Mumbai airport, they both ae providing 45% revenue share to AIRPORT AUTHORITY OF INDIA. AIRPORT AUTHORITY OF INDIA is bidding for goa airport against GMR and GVK. So these two have to put the capital to get the airport. If you see the balance sheet, most of the revenue this was getting was from these 2 competitors. How's this eco system good? Secondly, this bidding process itself has a term called "winner's curse", that is if you win the bid, you're still at loss, because you're giving the revenue share which is not mathematically or by finance, practical. I mean, if GMR gets into loss, still it will say that the revenue share lets say 5000 Cr, still you have to pay 45% to govt agent. So what is your view.

Speaker2: That is different altogether. Bidding process is under a tender process. It is an open tender, they know what are the criteria which they should bid. And the highest revenue share gets the bid. So, knowingly they risk their profit. So 45% is their own, 36% is of somebody else, so the highest quarter, they got the airport revenue. And now asking the question whether they should bid for goa airport, again coming back to the same thing that airport authority of India, is now a modern commercial entity.

Speaker 1: My question was, that the capital infusing is coming from these 2 airports. So what is your view on that?

Speaker 2: That does not matter. Delhi airport is a separate entity altogether. They are using the revenue for the development of other small airports across the country also. So they are assuming that goa airport will generate sufficient revenue.

Speaker1: So reframing the question, my point is that this revenue share is fixed for 60 years, how much this non- flexibility of the contract is appropriate? Because we must understand one thing that contracts made by planning commission or the airport authority of India, in 2006, is based in the forecast of maximum 5-10 years. But the way the dynamics of the industry is changing in

every 4 years, that contract may be advantageous in certain years, and after sometime it becomes a weight for the operator, whether it will work or not.

The estimation of the airport capacity and the traffic, were all went wrong by all steps. The traffic that was estimated for 2020, we have reached that traffic in 2016 itself. That much growth has happened. The projection investment doubled. So in that perspective, do you think renegotiation should be open in all the PPP airports?

Speaker 2: The PPP contracts are long term contracts. There is always a risk, as many conditions that come eventually, cannot be foreseen during signing the contract. So any ideal contract should be renegotiable. That is why the planning commission said that in new model commission there is scope of renegotiation. After every 7 years they will verify. Plus-minus whatever the revenue is there, the offer will be renegotiable. So that should be available.

Speaker 3: I think PPP, as far as India is concerned, it is still in the evolving stage. And at evolving stage it is necessary that all precautions are taken for all the problems that are faced.

Speaker 1: Now lets go to the next point, the airport ownership. What I'm trying to say is that airport ownership, when you say Banglore, Delhi, Kochi airports are all PPP airports, when you see the ownership of al these airports, especially if you see the comparative ownership of Kochi airport and Delhi airport, it is entirely drastically different. Kochi airport is managed by govt operator. CM is the chairman of it. It is called PPP airport but managed by govt operator. Delhi airport is managed by a single private operator but is negotiated with the govt. in Kochi airport, you have 10000 NRIs who have put money in developing the airport. So the pvt concentration is lee. What is your view on that? How do you asses these two different ownership patterns?

Speaker 2: Kochi airport as compared to other airports is a low cost model, and that was the first PPP model that emerged in India. And it is operated and governed by and IAS officer, so the point is that it's a govt sponsored org. Govt support is always there, but the working is totally professional. It is manged by the CM, whereas that cannot be replicated in other places. 300 or 400 Cr is not sufficient to make Delhi airport. It takes 20000 Cr, so govt won't be able to fund that much amount of money. So that's why it's a different model altogether. Larger airport, pvt airport, pvt funding is required to manage it.

Speaker 1: So can I say that for a larger airport, you need more capital, and so you need more private investments? An added view being that Kochi airport is also an international airport, as people come from Dubai and all. So can I say that leadership is important in this?

Speaker 2: Yes definitely. All the airports are under capable leaders, so that is why Delhi and Hyderabad, they are at a high rank in ACA ranking, No.1 in the world. Expert managers are managing the airports.

Speaker 1: My last question is, that what on your view, will be the best contract mechanism adopted by the airport sector, which includes the regulator itself, so that social welfare is achieved, that is the passenger is happy, prices are less, and secondly, you reduce the dominance nature of the airport, and then you also make the pvt investors balanced and happy. So what is your view on that?

Speaker 2: Any contract is an agreement written between two different parties. One is govt, and one is private party. The interest of the govt should be protected and the interest of the pvt party should also be protected. The best way is that it should be a long term contract. The contract must ensure that they can operate the airport for minimum 30-40 years. So long term is required. At the same time, scope of renegotiation, at least every 5-10 years, so that they can review and find out any real issue that comes up, and so renegotiation chance should be there. And if both parties don't agree, then there must be a third party, an

arbitrator mechanism, they will intervene an take the matter with them and negotiate their opinion. Therefore, renegotiation should be available.

Speaker 3: Like I said that it is a evolving, so long term contract is must subject to review in between.

Speaker 1: Do you think competition commission role anywhere comes in between?

Speaker2: Competition commission oversees all the sectors, and not only airport. So any issue that comes up, they can always intervene. And they have intervened in issues like, In parking charges, ground handling issues, all these issues, they have examined and given verdict as well. So they have power to intervene any sector. The regulator will only look at tariff matter. All the other issues will go to competition commission.

Speaker 1: I'm giving you options, dual ton which airports and singleton which airports and light touch for which kind of airport, in terms of scale.

Speaker2: By experience, there is no best fit for regulation in any airport. Means for all airports, regulation is there. Singleton airports, can be verified in some cases. When non-aero revenue is high, it will be disastrous for singleton and It will go to dual ton or lighter. So when an airport is just starting, you ideally should use singleton, then move to hybrid and then to dual ton. That is the way it should move to lighter. This is the revolution path.

Speaker 1: Thanks to all participants and all points were taken well.

P1: There are debates among stakeholders in the systems when the tariff is involved . There are times when Airport Authority also wants to compete in spite of the fact that they are PPP facilitators and their focus should be more towards regional airports. Competitive neutrality is still an issue in the regulatory aspects.

p2:Uneven level playing field still an issue .Lack of level playing field between private and public operator is something the contracts does not provide clarity on.

Mod:The bigger question is how to take a wider role of competition. What is the role of CCI in going and investigating abuse of dominance?

P2 In Australia there is Productivity Commission .There is complaint cell . The private operator can pass a complaint.They will do the market study and it will go to the Treasury . The Treasury needs to take action if not they need to justify. In India, structural issues in regulation are difficult to address.

P4The rules need to be equal to the public and private sector.

P6:The commission came late and the sectoral regulator came early. That is why the functions overlap. The roles and responsibility are better clear in abroad compare to India where the regulatory system is still developing. P7:The regulator's job is to make sure to regulate the market until the sector is better to regulate themselves.

P1:The Airport Authority taking revenue share is to make sure they develop the underdeveloped airports where private is not investing. This is like universal service obligation where the effectiveness of the money utilized has to be measured. P3 In commercial revenue we need more competitiveness. We need more player to come. Most of the bigger airports in India will come near to saturation in the coming years. I think regulator needs to think more about developing the Commercial Revenue. Regulators need to re-assess on why we need large airports. If it is for development then commercial revenue should be allowed into fully profit-driven business. The dilemma is when Regulator thinks of development of the airport and social welfare together. It may not be true that consumer will have exploitation from the airline's prices as the airline industry has reached hyper-competition level .p4 Airlines don't have the choice

toncrease prices anymore.60 year contract is a long time . Provision for negotiation within the contract should be there. The threshold should be set and after which there should be room for negotiation.

P1 Prioritizing the regulatory goals is a cause of concern especially to find out what is important for the sector. P4In theory of economic regulation, airports are still considered as a monopoly. Pricing in monopoly sector needs to be regulated so it is true that regulator is important and one important reason is that a consumer does not have a choice for airports within a specified location.p3 Many of the airlines find that airports charges are very high. I think the regulators need to be more transparent in terms of tariff calculation and the type of pricing and its methodology should be precisely given in the contract before bidding starts. Investors will look into a sector where a regulatory mechanism is already in force but with more transparency and predictability Otherwise the political climate becomes more powerful and policy will get influenced. P6 The government needs to have consistency in the business policy any investor who is putting his money needs consistency. My view is that in India regulatory mechanism is a must. P7 The interest of the investors needs to be kept in mind. Stability in the sector is important.

The public operator is a facilitator of PPP and other time he is a competitor. P4There is always a special interest of government on the government operator. It creates a problem as business and commercial efficiency become less in public operated airports.p4 The public operator also wants to develop into commercial oriented operator .This is a good step to have a competitive approach.p5 But public operator also needs to make sure that small airports are well developed. They are also imitating the market. It is only possible if they take bigger airports. Public operators are also good operator.Its structure of the

airport which creates the issue. They also can develop into good airport operator.p6It is a good step of current government organization with a private party is a welcome step. Government being a partner will give stability to the project.

Economic regulation started only after formation of AERA in India.Under its supervision economic regulatory philosophy was created. It was challenged in court as they were going for single till regulation which was not for the interest of the private operator. P6 In single till non-aero revenue is cross-subsidized and that has created operator issue. So government and operators consulted and went for hybrid till and the operator was ok with it. India wants more airports. P7 96% of our population is yet to taste airline travel In order to attract private investors they need to be given free hand at-least in terms of non-aero revenue.p1If they can allow nonaero revenue to be retained by the airport operator they will be happy to invest more and in order to attract more consumers.They will give discount to airlines or will have contract agreements with airlines for more passengers. P5 Such regulation is ideal for India. Today's regulation should move to dual till or light touch.

P7 In railways also the confidence of the investors was an issuelikewise airports also much more investment is required and this will be possible if private investors interest is taken care of.

P3 Abuse of monopoly as such is not proven in the airport sector.There are few cases where stakeholders complained that airport charges are high that is the reason why Airports are presumed to have monopoly nature.

P4 The regulators need to make sure that all its goals are achieved.All interest is protected. Transparency of tariff will reduce abuse of dominance issue.p3 PPP is a long term contract, there is a model concession agreement already there.Even today after 10 years requirement of change is there but the contract is non-negotiable. P1 So for airport operator it's difficult.So long term contracts

have this problem. The planning commission has come out with MCA. Before bidding you should know the tariff. P3 In Goa PPP bid it was known. If investors know what they are going to get then it ís comfortable for investors as they know what they will get. P3 The revenue share is on revenue .So even if the operator is in lose still he has to pay a revenue share. P4 Growth has happened more than what was projected.PPP contract is long term.There is always a risk for the operator. P5 There are things, which cannot be foreseen.So contract should have renegotiation possible. Airport ownership is also important and that influence very highly. P7 Cochin airport is slightly low-cost model and its first PPP airport in India and itís a government-sponsored organization but working is totally professional .p6 Whereas it is not possible to replicate that for a high-cost airport. For a larger airport, you need large-scale investment and expertise. Leadership is a very important part .Airports are under capable leaders thatís why Indian PPP airports are reaching great heights. P6 Any contract is an agreement between private and public.It should be a long term contract which creates a minimum guarantee of return.p5 There should be the scope of regulation. Renegotiation should be possible. If the government and private are not in agreement then there should be a tribunal to look into the matter. Commission oversee all sectors.p7 They can intervene whenever they feel there is a need. Specially tariff matter they have a say. There is no best fit regulation for all airports. Single till can be good for starting up fewer commercials. For high commercial revenue dual till should be the best.

P4 Contracts need to transparent and that's really important I feel. I agree with the other speaker on this contracts needs to be transparent for the private investor. P5 If they feel risk uncertain the problem they will not like to invest on PPP. P3 The government needs to ensure that before bidding transparency should be there on what investors are going for.

Contracts have to mention the kind of rules and regulation the private participant will go through. P7 I have the example of many such incidents happened in railways where small service contracts are given to private participants and after a year or so private participants were following up with the railway for renegotiation. P2 The stable contract is a must.

P3Every contract which is long term in nature are incomplete contracts. The externalities will change with time The contract should have provision for it.This provides relief for investors They know that the long term growth of project is risky but still they know where they are putting their money into.

P5 Tariff calculation is another important areawithin the contract . It has to be precisely given how the calculation will be done and private participants should be able to see it beforehand so that they can evaluate their bids.

P7 The Revenue share bidding is not itself a problem .The problem lies in the fact that revenue share bid is decided in the bid and then the private investor is able to see the contract which sometimes misguides the calculation of their expectation. P1 For the regulator , the dilemma lies in the fact that social welfare and infrastructure both objective needs to be achieved together. I think regulator needs to take decision looking at the priority of the sector. The cooperation with airport pubic operator and private operator is a must .p3 Contract needs negotiation periodically The revenue share is being used for the development of regional airports which is good but at the same time both public operator and private operator needs to understand each other's strength and weakness and appreciate each other's cooperation especially for airports where OMDA is prevailing. I guess the bottom line is to take care of the investor's sentiments in

the contracts and make the contracts negotiable. P6 I agree with the point that contract negotiability is important especially 30 to 60 years is a very long time . p5This creates a lot of factors which will impact badly to the investors as well as the airport development.

P4Contract negotiation needs to be framed well by the regulator/government.p2 Not only that the concession fee should be levied only when sustainable revenue is present but also generally the problem in contract to discuss the concession fee in advance and revenue sustainability is not taken into account.p2 The concessionaire should be given the flexibility to create its own masterplan . Having said that it is important to have good communication transparency between government and the concessionaire.p3 I agree in this matter that communication between investors and government should be transparent. P4 so there will be no consistency in the contract rules and tariff regime Another important point is that Risk allocation between the concessionaire and Government and how the risk mitigation plan will be executed this specification in the contract is critical for private investment and must be specified in clear terms in advance. P3Most of the times it is being noted that if a private investor is putting money it is assumed that the whole risk belongs to him . This creates uncertainty of the private inventors' is important for a contract to have a clear specification for this. P5One important issue we have generally found is that user fee revisions are not specified in advance . This creates confusion for the operator. It will be better for having provision in the contract to specify the user fee revision in advance which helps investors to plan the operations accordingly.

P1 I think the overall mechanism should be driven by a board representation which should have both public and private stakeholders rather than multiple public authorities. This will take care of both public and private interest as well as they are better prepared to tackle the issues. P2 I agree on this aspect with Mr. X there is a need to have a separate unit which should consist of both public

and Private Stakeholders to provide better governance. Even they should be representing the PPP in front of the government. P5 One more point I think we had discussed in the previous meeting also is Till uncertainty has to be removed. The government should provide a full declaration in the contract stating under what condition they will put single till, Dual till, light touch, or hybrid. This provides a better understanding for investors to plan and manage their operations accordingly.

P3 so there will be no consistency in the contract rules and tariff regime I Think we have boiled down the question into what kind of model of framework required for the effective contract management in airport development under PPP.

What really matters is that the contracts need provisions for renegotiation and there should be government approval given in the contract itself.

P6 There should be clear guidelines in the contract which clearly defines the duty of each stakeholder, tariff calculation should be transparent, the investors need to know what is their benefit if they go for the project. Provision for renegotiation should be present.
The contract award, financial close, and contract signing, Service delivery management,Contract compliance,Relationship management, Renegotiation (when needed),Government approval of renegotiation terms (Special body, cabinet, etc.)

I thanks to all participants for the valuable discussion we will compile the transcript and get back to you if any further clarification required.

List of Publication

- Damodaran, A., Dhingra, T., & Dwivedi, P. (2021). Regulatory Dilemma: A changing dynamics of Cochin International Airport. Emerald Emerging Markets Case Studies. Accepted (SCOPUS)
- Damodaran, A., Dhingra,Tarun,(2020).Factors affecting non-aeronautic revenue in Indian airports: A focus group study of Indian PPP Airports. International Journal of Business Excellence (SCOPUS) (2020)
- Damodaran, A.,Dhingra,Tarun,Dwivedi,Prasoom,(2020).Stakeholder Perception on the challenges in long term PPP Contracts: A focus group study of Indian PPP Airports. International Journal of Business Excellence (SCOPUS) (2020)
- Akhil Damodaran, Tarun Dhingra : Analysis of Till Regulation: A decision dilemma for PPP Airport. The Management accountant Journal (vol 53 , no:4)

List of Conferences

- Economic Regulation of Indian Airports (Background note) 5th International Conference on Management of Infrastructure in Dehradun UPES, 2017
- Regulatory dilemma: the changing dynamics of cochin international airport International case conference Fortune Institute of International Business, 2020

Brief Background

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