FEASIBILITY OF LISTING INDIAN AIRPORTS ON THE STOCK EXCHANGE: A COMPARATIVE ANALYSIS OF LISTED AND UNLISTED AIRPORTS

Arindam Mallik (corresponding author)

Senior Executive - Revenue Analyst, TATA – SIA Airlines Ltd.,

Gurgaon, Haryana, India.

ABSTRACT

The global air traffic touched a whopping 3.8 billion in 2016 (IATA 2017), forecasted to grow at a CAGR (Compounded Annual Growth Rate) of 3.7% annually by 2035, with India displaying the highest growth rate of 23%, beating China and US who retained the second and third position respectively. IATA (International Air Transport Association) forecasted the flown passengers to be nearly double at 7.2 billion by 2035 and the top driver of this demand would be the developing economies of the Asia-Pacific region. The expected growth in air traffic is bound to put commendable pressure on airports' infrastructure, which is already approaching bottlenecks. ACI benchmarked the top twenty airports listed on stock exchange in Asia-Pacific, Europe and United States, according to their passenger volumes in 2016, among which eight were situated in Asia. Considering ACI's benchmark as a reference point, this paper enables us to grasp the financial health of the private Indian airports. Besides answering the critical questions about a tradeoff between investment towards expansion and economic feasibility, this paper analyzes the unaudited financial reports over a span of five years to study the feasibility of listing these Indian airports on the Indian stock exchange. Thereby, the paper explores stock listing of airports as an alternative mode to finance airport expansion to cater to the exponential growth forecasted in the coming future.

KEYWORDS

IATA, ACI, CAGR, Infrastructure, Bottlenecks, Stock exchange.

Arindam Mallik, is an MBA in Aviation Management from University of Petroleum and Energy Studies, Dehradun, India. He has garnered a diverse industry exposure from his experience during internship (Munich Airport), in customer service and ground handling (Air India – SATS), as Route analyst (Air Costa – a regional startup carrier), as Revenue analyst (Go Air India Pvt. Ltd. - LCC) and currently working as a Senior Revenue analyst (Air Vistara, TATA-SIA Airlines Ltd. - FSC). Email: arindammallik26@gmail.com

1. INTRODUCTION

The current airport capacity in Asia Pacific is 0.2 airports per 1 million of population, 1 airport per 1 million of population in Europe and about 2.5 airports per 1 million of population in North America (Leahy, 2016). This exponential growth trend would eventually put commendable pressure on the infrastructure of airports, many of which are operating beyond their planned capacity. Airports are capital-intensive businesses, which are financed in a range of ways like the airport's retained earnings, bank loans (government/private), institutional investments, equity financing and third-party investments. The risks faced by airport investors are political uncertainty involving regulation of charges, demand uncertainty, dependence on air carriers, environment regulations, currency instability, economic uncertainty and high lock-in periods for the invested capital. The food for thought about this study of airport financing came from the initiative taken by the Indian government in 2014 for listing AAI (Airport Authority of India) on the National Stock Exchange, which operates 145 airports all over India. The reason behind that attempt was firstly, to use the funds to bridge the fiscal deficit of the then financial year and secondly, to improve transparency in operations. However, this endeavor is still in the pipeline. AAI comprise of a diverse portfolio of airports including 11 international, 45 domestic and the remaining civil enclaves. Out of the airports operated by AAI that were being evaluated to be privatized earlier, fifteen airports are profitable (Mishra, 2018). It also has joint ventures with four partially privatized international airports in Delhi, Mumbai, Hyderabad and Bangalore that covered almost 58% (APAO India) of the total air traffic in 2015-16. In order to accommodate the compounding traffic additional funding is required to capacitate these major airports. Considering the fact that the major volume of traffic is generated through these five private airports and secondary airports have been proposed to be built in Delhi (where DIAL is located) and Mumbai (where MIAL is located) which has reached saturation, our focus would be narrowed down on them. This paper would explore airport listing in the stock exchange as an alternative funding option and study the feasibility of listing the five private airports DIAL, MIAL, BIAL, HIAL and CIAL on Indian stock exchange.

2. LITERATURE REVIEW

The two major private airport operators in India are the GMR group operating Delhi International Airport Limited (DIAL) and Hyderabad International Airport Limited (HIAL) and GVK Power and Infrastructure Limited operating Mumbai International Airport Limited (MIAL) and Bangalore International Airport Limited (BIAL). The fifth private airport drawn into comparison is Cochin International Airport Limited (CIAL) that is majorly financed by the

Foreign Institutional Investors. Both these companies are publicly listed as conglomerates, but not as specific airports. That is the reason it was tedious to gather the financial data for the purpose of this analysis. However, the analysis is based on unaudited financial reports submitted by the respective private airports with the Ministry of Corporate Affairs in India till 2015-16. Since, the airports that are being analyzed are not listed companies their audited financial reports could not be attained. Hence, all the data that have been used to analyze is gathered from the unaudited financial results of these airports between 2011-12 and 2015-16, submitted with the Ministry of Corporate affairs in India.

The cost structure of the airports that we are analyzing in this paper is slightly different from other infrastructure companies due to the regulatory environment they are operating in. DIAL and MIAL is regulated through hybrid till approach with 30% non-aeronautical revenue to be used to cross-subsidize the aeronautical. Due to the expansion projects on cards, AERA agreed to adopt the hybrid-till approach for all other major airports in India, revising BIAL's non-aeronautical contribution to 40% to offset the aeronautical charges (AERA 2017). The established literature reflects an interesting debate on the treatment of non-aeronautical revenue through single till, dual till or hybrid till. While airlines and regulators generally support the single till to keep the airport charges lower by cross-subsidizing the aeronautical cost entirely through non-aeronautical revenue, airports inclines towards dual till under which aeronautical and non-aeronautical cost and revenues are treated separately incentivizing the airport operators. Hans-Martin Niemeier argues that non-aeronautical revenue is created by the passenger's propensity to spend and not the airlines. (Niemeier, 2009). David Starkie seconds him arguing that under dual till the charges would remain low as airports would garner higher revenue through increase in unregulated non-aeronautical revenue (Starkie, 2001). However, determining the best regulatory approach is a different ball game altogether. For the purpose of this paper, we would focus on conceptualizing the airport cost base.

3. RESEARCH METHODOLOGY

The first set of comparison has been drawn among the debt structure of the five private airports. The second stage would comprise of a comparative analysis of the performance and profitability of these airports. Finally, a risk analysis would be done in terms of the asset beta in respect of these private airports in comparison to the listed airports shortlisted by ACI. This analysis enables us to grasp the financial health of the Indian airports. The paper would be concluded by a feasibility study, considering the already listed airports in Asia-Pacific, Europe and United States that has been benchmarked by ACI according to the passenger

throughput, the feasibility to list the Indian airports in the stock exchange would be evaluated, taking into account the listing parameters and industry benchmarks.

The quantitative analysis has been done through a ratio analysis of the five years' financial statements categorized as follows:

3.1   Financial Leverage Analysis

- Debt / Equity = Total Debt / Total Equity – *Explains the proportion of debt utilized to finance the company in respect to its equity capital.*
- Asset / Equity = Total Asset / Shareholder's fund – *Explains the assets owned by company compared to the assets owned by shareholders.*
- Interest Coverage = EBIT (Earning Before Interese and Tax) / Interest expenses – *Explains how easily the interest on outstanding debt can be repaid.*

3.2.   Performance and Profitability Analysis

- Net Margin = (Net profit / sales) * 100 – *Explains the percentage sales that can actually be translated into profit.*
- Return on Fixed Assets = (Net income / Fixed assets) * 100 – *Explains the net income that can be produced utilizing the fixed assets.*
- Return on Equity (ROE) = (Net income / Shareholder's equity) * 100 – *Explains the net income that can be produced utilizing the shareholder's equity.*
- Return on Capital Employed (ROCE) = (EBIT / Capital Employed) * 100 – *Explains how much profit the company can generate utilizing its capital employed by comparing its net operating profit to capital employed.*
- PBT (Profit Before Tax) / Net Sales – *Explains the amount of profit generated from net sales after deducting the operating expenses but before paying income tax.*
- PBT (Profit Before Tax) / Passengers – *Explains the amount of profit generated from handling each passenger after deducting the operating expenses but before paying income tax.*

3.3.   Liquidity Analysis

- Current Ratio = Current Asset / Current Liability – *Measures the ability of the company to repay its short-term and long-term debts by liquidating it's current assets.*

- Quick Ratio = (Current Asset − Inventories) / Current Liability − *Further refines the above ratio to measure the ability of the company to repay its short-term and long-term debts by liquidating its most current assets excluding its stocks.*

4. CONTRIBUTION AND FOCUS

This paper draws our attention towards a very niche mode of airport financing which have been so far explored only by a counted number of airports across the world. Considering a sample size of 678 airports, ACI (Airport Council International) observed in 2014 that only 14% of global airports had private stakeholders, whereas 44% of CAPEX (Capital Expenditure) was undertaken through private participation (ACI 2017). Simultaneously, the industry average of 2014, suggests that fully privatized airports earned a maximum net profit of 16.5% on total revenue, followed by the fully public airports at 15.1%. But, the ROCE (Return On Capital Employed) was the highest for the airports operating under PPP (Public Private Partnership) at 7.4%, closely followed by the fully privatized airports at 6.5%. Interestingly, with 12% higher investment per passenger than the government owned airports, the private airports accounted for 1.4% higher net profit and 1% higher ROCE.

This paper answers some critical questions like, "Is 12% higher investment in airports worthy of 1.4% higher profit?" "Considering the capacity expansion forecasted, would this margin be sufficient for future financing or additional capital infusion would be necessary?" It would start with a qualitative analysis of the different modes of airport financing practiced in the industry and then delve deep to explain the nuances of economic regulatory framework of airports. This aspect would enable us to understand how the airport business is affected by the regulatory framework it operates in. Empirically, it would explore stock listing as an alternate mode of capital infusion to expand airport capacity. The criticality of this analysis rests solely on the aggressive capacity deployment by airlines, which has resulted in capacity bottlenecks across the globe. The sample for this paper is drawn from the private unlisted Indian airports, which have been benchmarked against the already listed international airports. A similar feasibility study can be extended to other unlisted airports that are craving for additional financing for capacity expansion.

The focus of the paper has been listed as below:

- Explore stock listing as an alternate mode of airport financing.
- Gaining insight on the privatization and regulatory structure of Indian airports.

- Ratio analysis to study the financial health and feasibility to list the private Indian airports on stock exchange.

Before proceeding with the analysis, it is important to briefly understand the regulatory environment in which these airports operate. In India the airport charges of sixteen major airports with an annual passenger throughput of more than 1.5 million are regulated by AERA (Airport Economic Regulatory Authority). In such analysis it is commendable to understand the fundamentals of calculating the RAB (Regulatory Asset Base), which is a vital element of an airport business model. Evaluating the RAB would provide the platform on which the financial leverage of an airport would function. Since, the airports dealt with in the paper are regulated airports, first it would be necessary to conceptualize their cost base.

5. AIRPORT FUNDING & REGULATORY FRAMEWORK

5.1. Types of Airport Financing (Tretheway, 2001)

- *Financing under operation by government department or agency* – This type puts airport under the Department/Ministry of Transport and financed via regular budget process. It creates sufficient burden on the government and taxpayers as the priority of such investments are compared with other developmental prospects. This is particularly challenging as the passengers grow at a rate double or triple, airports require substantial amount of investment.

- *Financing under not-for-profit airport authority* – This can be further explained in two categories:

    1. If the authority is established without any initial equity infusion by the government, then further investment becomes a problem due to lack of funding. It is difficult to gain the trust of lenders without creating an equity base. Precluding the raising of equity capital by the issue of shares, the only source for financing is through retained earnings. But to assemble retained earnings is paradoxical. Due to the absence of initial capital, the airport can only be built through profitable operations, which by definition fall contrary to not-for-profit organization. Ironically, new investment is required to generate new revenue and financing of investments is limited by the lack of equity capital. One way to deal with the problem is to increase the user charges, but globally established principles does not allow aeronautical charges to be a source of equity capital.

    2. On the other hand, if the government provides some equity infusion, the airport is in a favorable position to accumulate further investment at least in comparatively

lesser time.

- *Financing under Government Corporation* – Even this option has the constraint of initial equity infusion based on the willingness of the government. But a government corporation generally has the liberty to provide government guarantee of its debt, which comforts the lenders to provide higher amount of debt.

- *Financing under private-government corporations* – The key advantage of a mixed enterprise is that the private sector can provide the initial equity required to start up the process in return of a reasonable incentive on investment in the airport. The only disadvantage is the degree of risk to the private enterprise due to the government pursuit of non-commercial objectives.

- *Financing under Private Corporation* – Such an enterprise can raise equity at any time. As they can support financing endeavors with their balance sheet, it has been observed that on transferring to private corporations, financing of new projects could be enhanced efficiently. But the principle risk lies in price regulation. In the absence of an appropriate regulation the private corporation would fail to earn sufficient return on investment to create retained earnings and attract fresh equity capital.

The above can be categorized as domestic avenues to any particular country by which the cost can be met through home currency while the below mentioned are the possible sources of foreign funding.

- *Financing through Foreign Sources* - Project costs to be met in foreign funds constitute a demand of the state's reserves for foreign exchanges. While the fluctuations in the value of these funds can add to the cost of an airport development project, hedging of funds can be established in order to avoid the volatility and risk associated to the funding through foreign funds.

- *Bilateral Institutions* - foreign financing can also be arranged from particular agencies of the government that has been established to promote the nations' export trade. In case of developing countries, such assistance may be provided through special aid programs, established by the government to promote economic and social development in other parts of the world.

- *Development Banks and funds* - Possibly the most important among foreign sources of financing are the specially established for the purpose to promote national economic development. Such projects have wide range of economic activities, of which airport is but one. Most popular among these is the International Banks of Reconstruction and Development and its affiliates.

- *UNDP (United Nations Development Program)* - The various kinds of expertise required for the consideration, planning and execution of airport development projects, which will be needed for the necessary feasibility of the cost-benefit study, for preparing master-plans in the construction phase itself, may be requested for the state's program of UNDP – funded technical assistance (ICAO 2006).

Irrespective of the type of regulation and the mode of financing, a critical element of airport financing would be the treatment of non-aeronautical revenue. Whether or not those revenues, or at least the profit from those revenues, should be considered to offset the aeronautical costs often remain a debatable decision.

Under Single Till, the total airport cost is reduced from the net-earnings from revenues of non-aeronautical services, before computing the regulated aeronautical charges. Any gain made from the non-aeronautical services is transferred in full towards the aeronautical costs benefitting the aeronautical users, while the airport operator is not allowed to earn anything greater than, what is deemed as "reasonable" by the regulator. *Under Dual Till*, the aeronautical and non-aeronautical cost and revenue are mutually exclusive and no proportion of non-aeronautical revenue is used to cross-subsidize the aeronautical costs. *Under Hybrid Till*, which is a customized form of dual till, only a certain proportion of non-aeronautical revenue is used to cross-subsidize the aeronautical costs.

The different methods for asset valuation for regulated firms that have been practiced are based on the following components:

- *The historic cost* – Total accumulated cost of the assets. The approach of CAA (Civil Aviation Authority) of the United Kingdom is such an example. In other cases, the historical cost might be indexed by a general or industry-specific inflation index (CAA, 2016).
- *Replacement cost* – the cost incurred currently to replace the airport assets with similar assets that are currently available offering similar capacity and levels of service.
- *Depreciated Replacement Costs* – this recognizes aging of assets.
- *Optimized Depreciated Replacement Cost* – this differs from the above as it realizes the inefficiencies that may be part of the current assets, though it do not consider the sunk cost valuation. In case the terminal in question might be built with old and more costly technology, whereas while replacing it, more efficient and less costly technology would be used. This form of valuation has not been used for airports, but,

has been used in the regulation of electricity utilities in Australia (Johnstone, 2003).

- *Fair market value*
- *Net Present Value*

Traditionally, regulators recognized only historical costs of land acquisitions and improvements, which might undervalue the land asset. With privatization of some airports, the privatization transaction might establish a current value for airport assets, for example, if the land and its improvements are sold or leased outright; however, in other cases, there is ambiguity. A privatization transaction may be for an enterprise that already owns or leases the land, and separating out land from other values in the enterprise (e.g., goodwill) can be problematic. Regulators in many sectors have recognized that there can be circularity in land valuations, especially when using certain discounted cash flow approaches to valuation – a higher land valuation creates a higher return required which in turn could potentially be recognized in higher cash flows and hence, land valuations. Many regulators dealt with this ambiguity either by resorting to bring forward use of historical values of land after an airport sale, or by establishing "deemed values" for the land for regulatory purposes prior to soliciting bids for the shares of the airport operating enterprise. Allowing increases in the RAB due to rising land values has been criticized, as this provides a "windfall gain" for the airport without providing any additional value to its users (Poole, 1994).

5.2. Regulatory Asset Base (RAB)

The Regulatory Asset Base (RAB) can be defined as the current capitalization supporting regulated activities, which will vary according to different forms of regulatory approaches. In some cases, it may include new forecasted future capital stock (infrastructure investment). It represents the investment base upon which the airport is permitted to earn a reasonable return. Clearly, the larger the RAB, the larger the absolute return the airport can achieve. However, the relative return (or an investor's margin) will be dictated by the allowed cost of capital, which is the key driver of investment considerations. In measuring the intrinsic value of any asset, the preferred economic technique is to measure the opportunity cost of that asset. In its simplest form,

$$RAB = CAPEX^1 + OPEX^2 + Cost\ of\ Capital - Depreciation$$

Apart from the challenge of valuing the existing asset base, the inclusion of new investments into the RAB often requires detailed analysis by the regulator. In order to avoid the Averch-

---

[1] Capital Expenditure
[2] Operating Expenditure

Johnson effect [3], regulators have to determine whether the airport's proposed capital expenditures are necessary or in proportion with requirements.

- *Cost of Capital*

The regulator also needs to determine the allowable rate of return (or cost of capital) on the RAB of the airport. This rate of return needs to be sufficient to maintain adequate investment in the airport over the life expectancy of the assets, and results in airport charges, which enhance users' interests reasonably.[4]

One common approach is to estimate the *Weighted Average Cost of Capital (WACC)*, which involves weighting together the cost of debt and cost of equity:

$$(Pre\text{-}tax)\ WACC = g \times r_d + (1 - g) \times r_e$$

Where,

g = gearing ratio (net debt/total value)

r_d = return required on debt

r_e = return required on equity.

The required return on debt is generally assessed based on the airport's credit rating (i.e., the typical interest rate charged to companies with similar credit ratings and debt levels).

The return on equity is calculated by using the *Capital Asset Pricing Model (CAPM)*:

$$r_e = rf + \beta \times (rm - rf)$$

Where,

rf = risk free rate

rm = market rate as a whole

β = risk parameter (the beta)[5]

The beta in this equation is a measure of the riskiness of the firm in question relative to some asset benchmark (e.g., the stock market). Firms that exhibit a beta of more than 1 can be considered riskier than the asset benchmark, while a beta of less than 1 are less risky than

---

[3] The Averch-Johnson effect is a theoretical argument that firms regulated to a specific rate of return on capital have an incentive to overinvest in order to earn the highest possible dollar value of return to the shareholders.

[4] The rate of return also has to reflect the actual debt servicing costs the airports is paying on historical debt.

[5] An alternative approach to CAPM is the Dividend Growth Model, although this is rarely used in economic regulation.

the asset benchmark. The riskier the asset, higher the return investors will require on their investment. In the case of airports, the beta involves considerations not only of how risky the airport industry is relative to other industries, but also how risky a particular airport is relative to its peers, based on the volatility of traffic at the individual airport. The decision of the regulator on the appropriate beta for a particular airport can significantly affect the return charged on capital investments, and the ability of the airport to raise capital.

Given their importance, the calculation of the WACC and its constituent parts can require considerable analysis and research. A permitted WACC set too low can result in delayed or inadequate investment, as investors seek higher returns elsewhere, while a WACC set too high can result in customers paying prices higher than would occur in a competitive market. The values are normally set at the start of the regulatory period based on market conditions at the time and remain fixed throughout. This can result in the airport achieving returns above or below the WACC (for example if market interest rates decline or increase after the regulatory decision). Airports can also potentially attempt to achieve higher return by selecting a gearing ratio different to the regulator's, which provides a lower cost of capital. To avoid perceived "windfall" gains from such activities, some regulators have sought to address this by selecting a projected or optimal gearing ratio rather than relying on historical values.

6. COMPARATIVE ANALYSIS

In order to perceive the feasibility of listing these airports it is vital to understand their financial health and performance parameters. This has been conducted in three segments, namely leverage, performance and profitability analysis. These analyses are based on the data gathered from the unaudited financial results submitted by the respective airports with the Ministry of Corporate Affairs for the financial year 2011-12 to 2015-16.

6.1. Financial Leverage

The first stage analyses the debt structure of the airports through the following ratios:

- Debt/Equity = Total Debt / Total Equity
- Asset/Equity = Total Asset / Shareholder's fund
- Interest Coverage = EBIT (Earnings Before Interest and Tax) / Interest expenses

Figure 1 – Financial leverage ratios of Mumbai International Airport Ltd (MIAL)
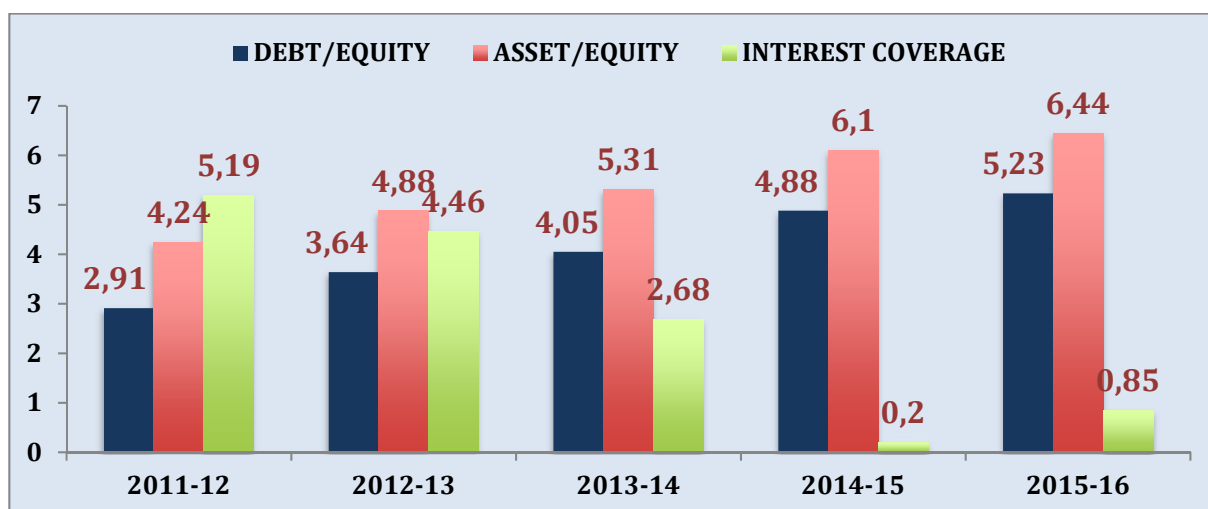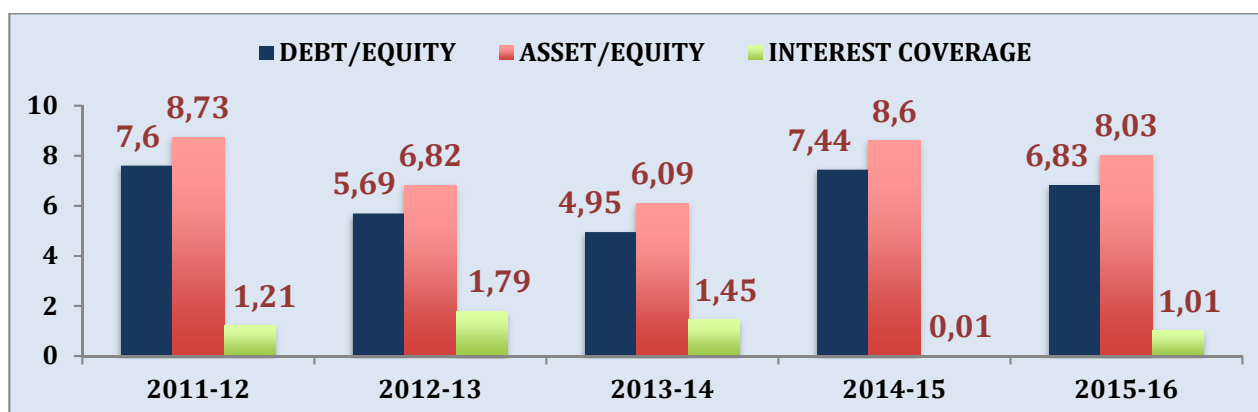

Source: Ministry of Corporate Affairs

Inference: It can be observed in Figure 1 above that the debt-equity ratio has consistently increased over the years due to the continued expansion attempts resulting from capacity bottlenecks. MIAL operates with crosswind runways, majorly operating a single runway at any given point of time. The increase in debt margins has been a result of the new international terminal, T2, which started operating in this duration. Considering an ideal debt-equity ratio of 2:1 for capital-intensive industries like infrastructure and construction companies (Desai, 2015), it almost doubled in case of MIAL in five years. This has been due to an increase in proportion of their long-term debt, which more than doubled in this phase against a decline in the short-term debts. This in turn caused a spike in their financing costs. The sharp decline in the interest coverage needs to be worked on immediately. The reserve and surplus also deteriorated slightly reflecting a lower potential to pay-off the shareholders. The decline in interest coverage might reduce the probability of acquiring further capital for future expansion through long-term borrowings. Hence, the other alternative to be sought after could be disinvestments or stake sale. The gradual increase in asset-equity ratio reflects a remarkable increase in the total asset against a decline in the shareholder's fund.

Figure 2 - Financial leverage ratios of Delhi International Airport Ltd (DIAL)
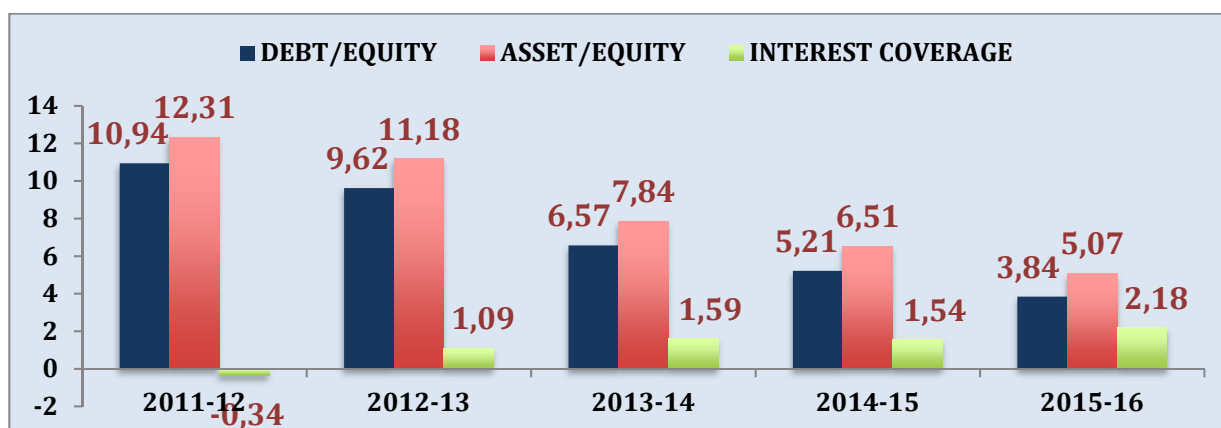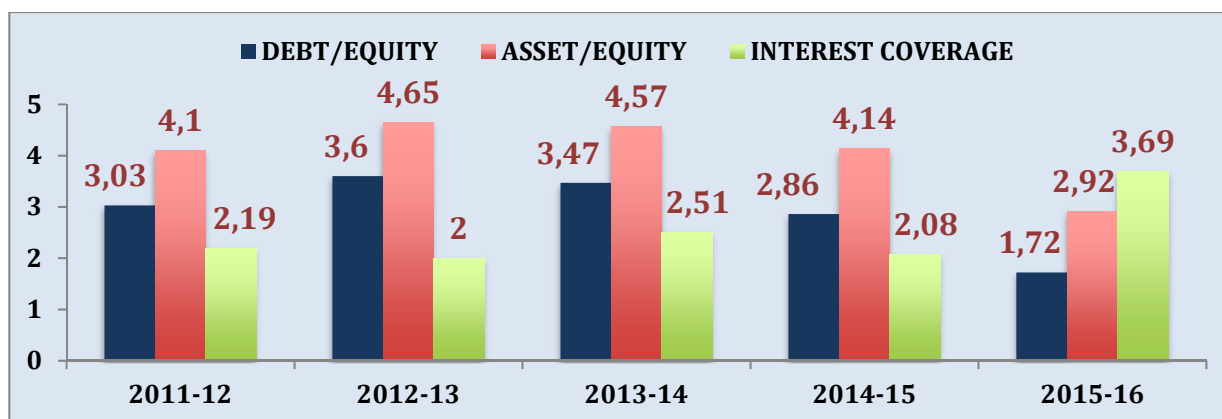

Source: Ministry of Corporate Affairs

Inference: Over the years DIAL's financial health shows a steady improvement in Figure 2. They almost stagnated their long-term debts and considerably decreased their short-term borrowings resulting in a five-times plunge in the debt-equity ratio bringing it close to the industry average. In contrast to MIAL their current investments depict a sharp increase of 1782% over a period of 5 years. This aspect enabled them to keep the interest expenses in control, thereby, doubling their interest coverage. It's interesting to notice that their total assets have undergone a marginal decrease over time which suggests their increased deployment towards offsetting the liabilities, whereas MIAL's almost doubled. However, the declining asset-equity ratio is a result of decrease in shareholder's funds. Although, the balance sheet reflects an accumulated loss of more than INR 23000crore, the losses have declined 84% over the period.

Figure 3 - Financial leverage ratios of Hyderabad International Airport Ltd (HIAL)

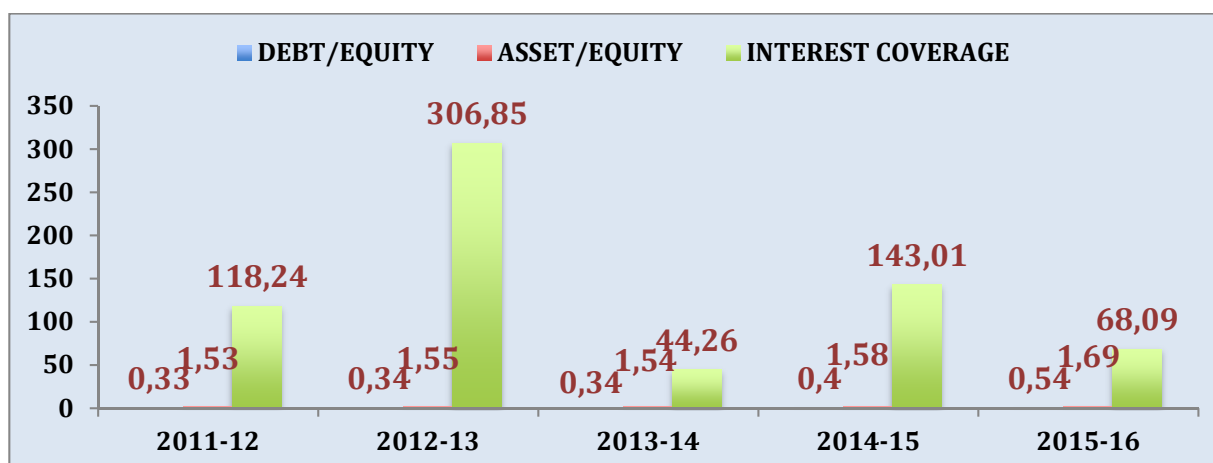*Source: Ministry of Corporate Affairs*

Inference: All the three ratios in Figure 3 shows a marginal decrease depicting an overall stability in five years. The decline in debt-equity ratio is due to a marginal drop in their long-term borrowings and negating their short-term debt. Like DIAL, they have succeeded in reducing their accumulated losses more than 45% keeping their share capital stagnant. Though the current investments spiked by almost 1074%, the effect could not be felt due to the fivefold increase in their non-current liabilities. Their asset-equity ratio shows a marginal decrease keeping their assets almost the same as before. Their interest coverage potential needs to be worked upon in order to meet the industry standards, as it marginally decreased due to a fall in EBIT margins.

Figure 4 - Financial leverage ratios of Bangalore International Airport Ltd (BIAL)

Source: Ministry of Corporate Affairs

Inference: Unlike MIAL, also operated by the GVK consortium along with AAI, BIAL seem to be in a healthier financial condition as depicted in Figure 4.   In spite of a marginal increase in their long-term debts and other liabilities, they have managed to increase their reserve and surplus, which quadrupled. This is reflected positively in the debt-equity ratio and positioned them strategically to cover their interest expenses in a better way. Their increase in total assets was negated by the increase in shareholder's funds that is reflected above. The increase in the tangible asset also reflects their better position to raise liquidity in the future.

Figure 5 - Financial leverage ratios of Cochin International Airport Ltd (CIAL)


Source: Ministry of Corporate Affairs

Inference: Among the private airports, CIAL has a slightly different operating economics as seen in Figure 5 due to its ownership structure comprising of multiple foreign institutional investors instead of a private consortium. CIAL is the only private airport whose share capital and reserve and surplus has grown in tandem ensuring increasing returns to the investors. Their reserve and surplus remarkably increased by 107% in 2015-16. Unusually, their debt-equity has remained way below the industry average of 2-2.5. The major reason behind it is their lack of long-term and short-term borrowings till 2014. Due to the similar reason the interest expenses were minimized that is reflected in the interest coverage ratio. The dip in interest coverage in 2015-16 is due to the hike in long-term debts by 494%.

Before we proceed to analyze the performance and profitability of the respective private airports, it is critical to introspect the trend in air traffic at these airports, which majorly impact their performance and profitability.

Figure 6 summarizes the annual passenger growth (in millions) at the private airports that we are analyzing in this paper. The displayed figures highlight the numbers in 2011-12 and 2015-16 to signify the range categorically. These five PPP airports catered to 58% of the annual traffic across India in 2015-16. With a slight dip in 2008, the total annual traffic in India has witnessed a 105% growth till 2014-15. Among the five airports in question, DIAL and MIAL upgraded to the category of greater than 40 million passengers per annum by the end of 2015. In the last two years accounted above HIAL, BIAL and CIAL witnessed an average of 20% growth. These trends pretty much justify a positive outgrowth towards the future. However, when we consider the proportion of international passengers it can be

observed that it ranges from 10-30%, leaving substantial scope for improvement. Only CIAL's contribution of international traffic increased the highest by almost 80% in this duration owing to the higher concentration of NRIs (Non-Resident Indians) generated from this region.

Figure 6 - Growth Trend in Domestic & International Traffic depicted by the five PPP airports
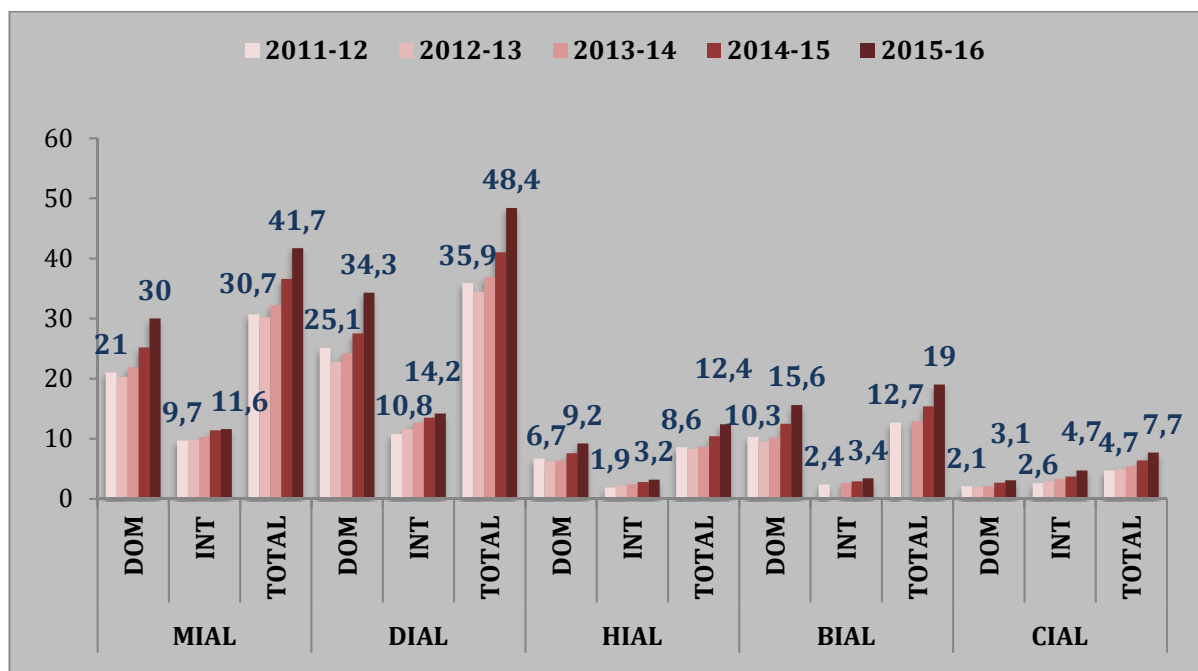
Source: (APAO India)

Here, it must be noted that among the top two airports in India, i.e. DIAL and MIAL, the former operates with three parallel runways accounting for 48 million passengers in 2015 against the latter which operates with a pair of cross-wind runways (generally a single runway operational) accounting for 42 million passengers. This surely highlights the optimal use of resources by MIAL. Now let us see how this growth in air traffic has been reflected in profitability and performance.

6.2   Performance & Profitability Analysis

The performance of an airport is commonly analyzed as per the KPIs (Key Performance Indicators) listed by ACI. This is benchmarked in different categories like safety/security, service quality, productivity/ efficiency, financial /commercial and environmental. For the purpose of this paper, the financial / commercial aspect has been focused upon which can

be easily quantified. The below ratios have been used to analyze the performance and profitability respectively.

Performance & Profitability in terms of:

- Net Margin = (Net profit/sales)*100
- Return on Fixed Assets (ROFA) = (Net income/Fixed assets)*100
- Return on Equity (ROE) = (Net income/Shareholder's equity)*100
- Return on Capital Employed (ROCE) = (EBIT/Capital Employed)*100
- PBT/Net Sales
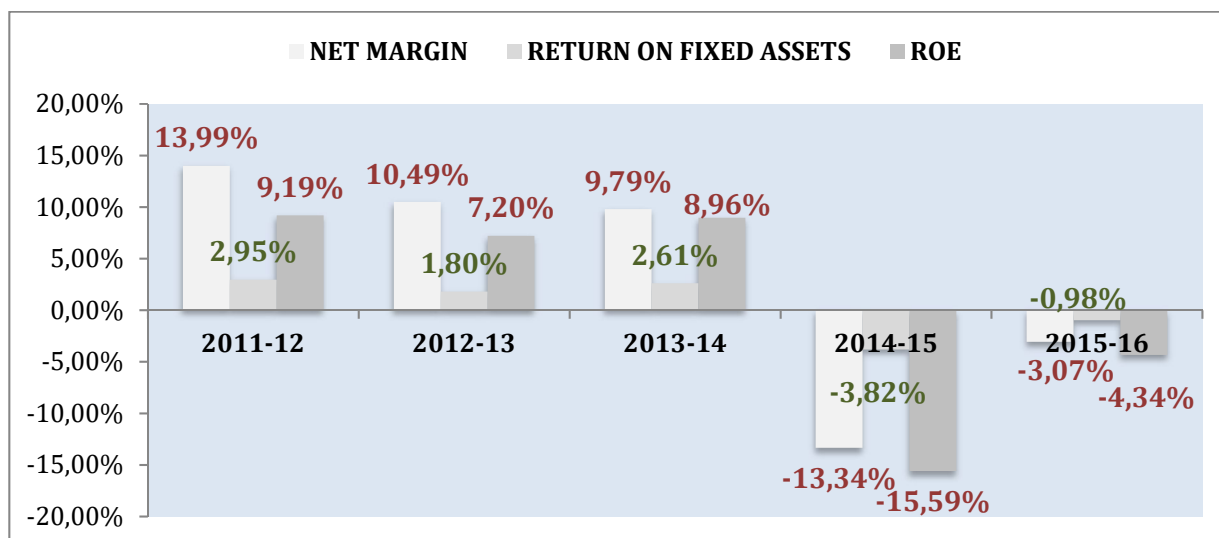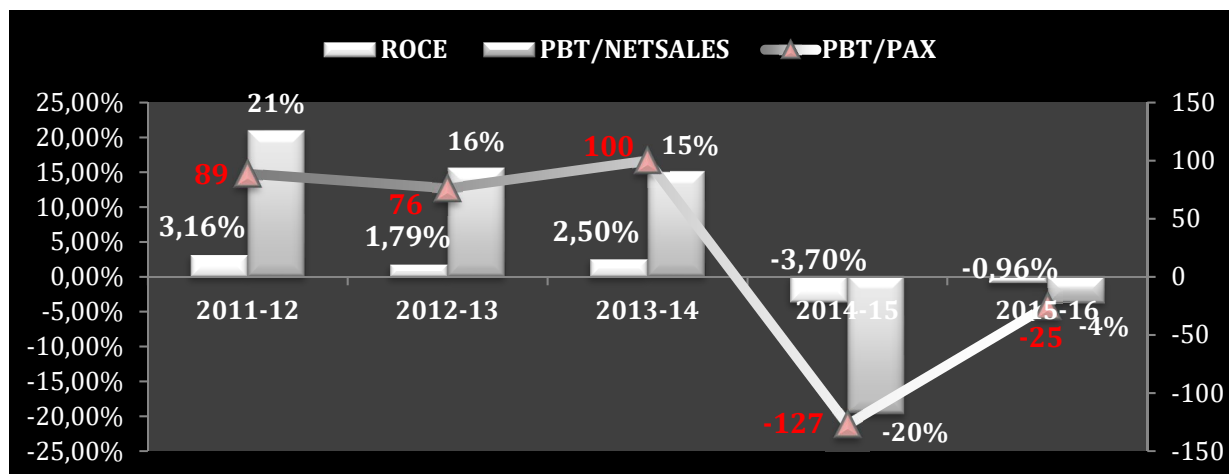- PBT/Passengers

Figure 7a – Performance ratios of Mumbai International Airport Ltd (MIAL)

Figure 7b – Profitability ratios of Mumbai International Airport Ltd (MIAL)

Source: Ministry of Corporate Affairs

Inference: With rising debt margins and lowering potential to cover the interest expenses, MIAL's profit dropped drastically in 2014-15, which prevented them from transforming the 14% annual passenger growth into profit. Their net margin kept decreasing until they landed into operating losses in 2014-15 despite the continuous growth in annual passenger numbers and overall net sales depicting diseconomies of scale. Though their net income increased, their fixed assets kept on decreasing due to the incremental investment towards the new terminal. However, they succeeded in bridging the gap to a great extent by 2015-16. The similar trend can be observed in Figures 7a and 7b with respect to ROE and ROCE. The major component resulting in the lower earnings is the finance cost, which increased by a staggering 940% over five years. However, the asset allocation can be regarded somewhat efficient as the turnover ratios reflect an upward trend. Nevertheless, the negative ROCE raises concerns over garnering further investment, as it is way below the industry average. Expecting a similar growth in passenger throughput and net sales, MIAL need to reduce their operating losses over 75% to breakeven.

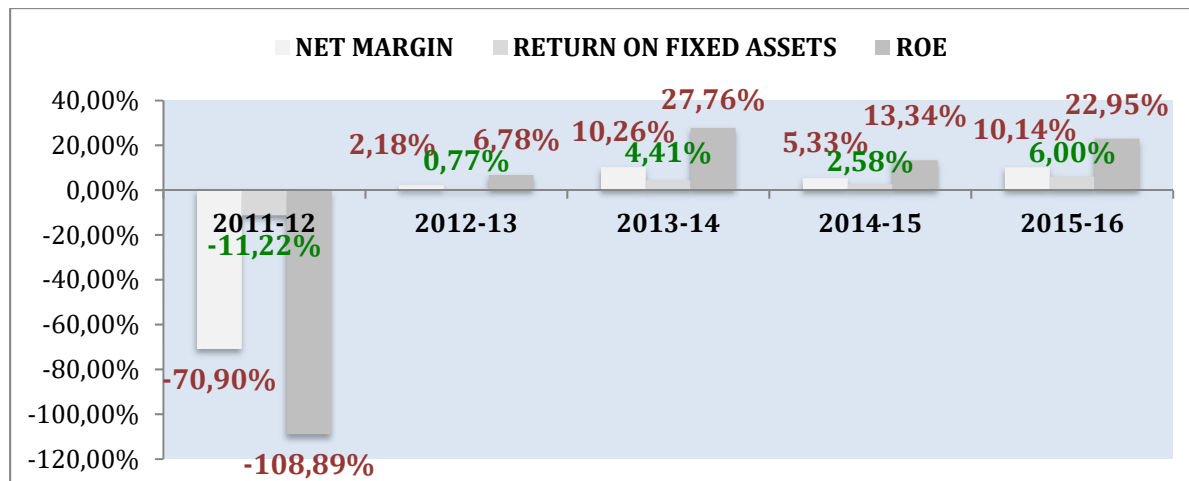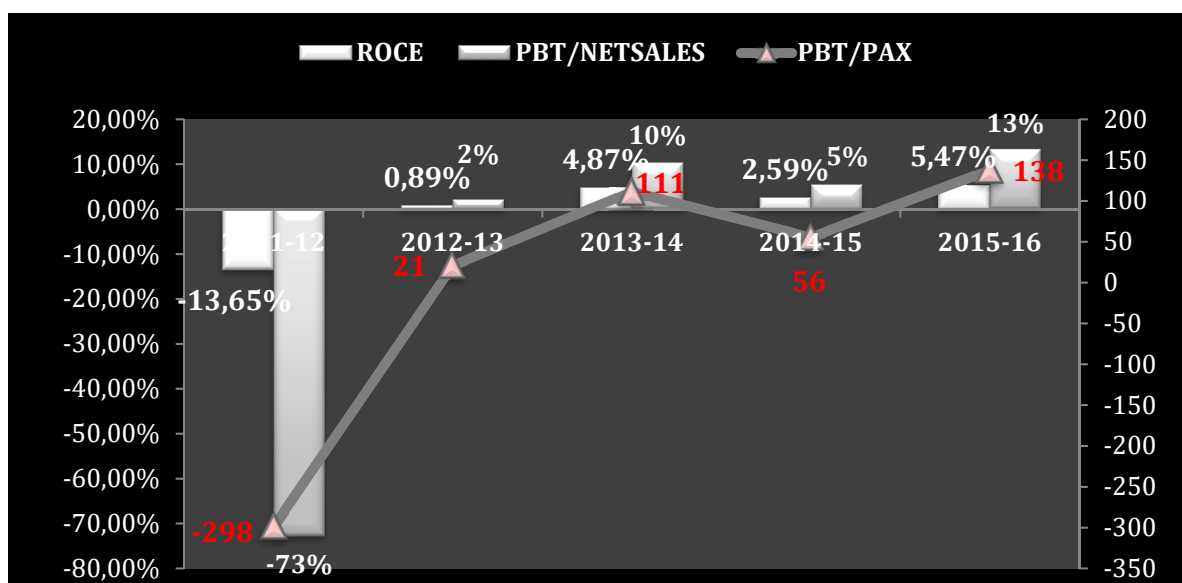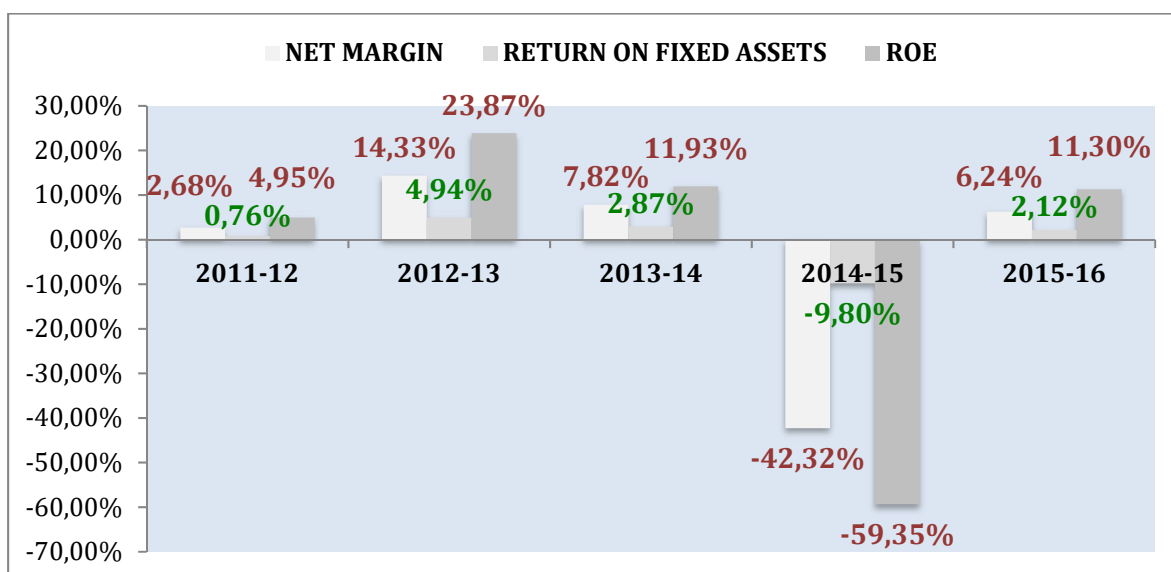**Figure 8a - Performance ratios of Delhi International Airport Ltd (DIAL)**

Figure 8b - Profitability ratios of Delhi International Airport Ltd (DIAL)

Source: Ministry of Corporate Affairs

Inference: DIAL on the other hand pulled a profitable picture altogether as displayed in *Figures* 8a and 8b Their PBT margins increased the most in 2013-14 and 2015-16 by 467% and 193% respectively. Their performance seems to be quite in sync with their financial leverage. In their books only depreciation expenses showed the highest growth of over 50% in five years. Apart from this, DIAL managed to keep all cost and expenses under control. Their efficiency in asset allocation and capital deployment can be observed from the improving ROE and ROCE shown above. They managed to stagnate their capital deployment on fixed and current assets while increasing their current investments by a staggering 1782%. This reflects a matured business model, where they managed not to block their investment for a long-term in a capital-intensive business. The higher PBT margins have been complemented by a two-fold increase in net sales from the growing passenger numbers in five years. These figures positions DIAL in the 3rd rank among the five private airports in India.

Figure 9a - Performance ratios of Hyderabad International Airport Ltd (HIAL)

Figure 9b - Profitability ratios of Hyderabad International Airport Ltd (HIAL)
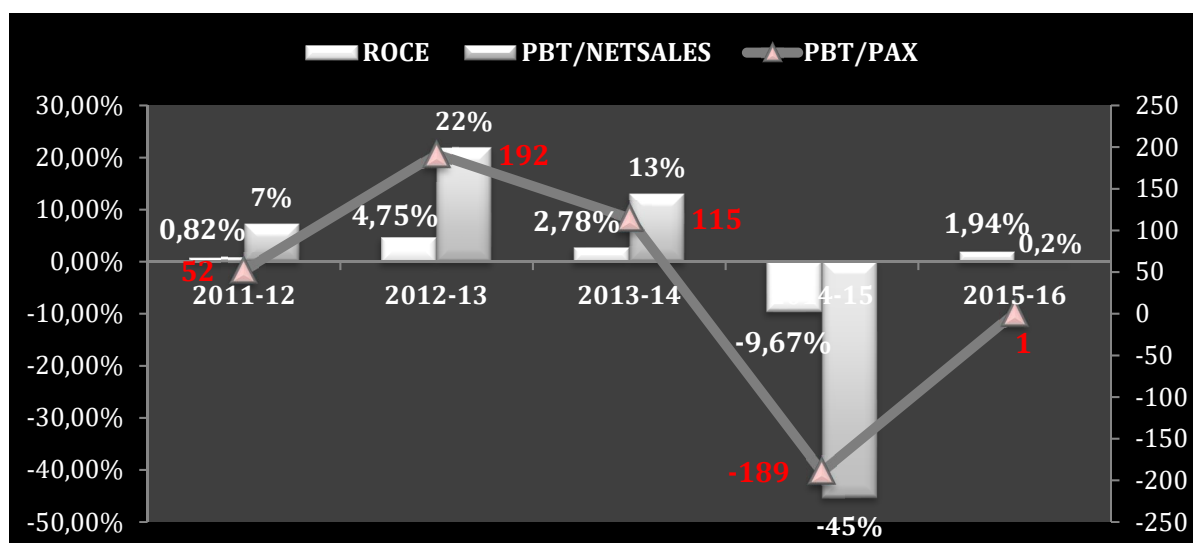
Source: Ministry of Corporate Affairs

Inference: HIAL is the second private airport operated by GMR in the 5-15 million passengers' category. Overall it reflects a positive outlook in Figures 9a and 9b, besides 2014-15. The negative PBT margin is due to decreasing revenue growth caused by a 43% fall in net sales. However, this deficit was bridged in the following year. Like DIAL, except their depreciation expenses which increased over 70%, rest of the costs have been well managed. Through a similar approach like they maintained a lower finance cost by not blocking their capital on long-term assets, while their current investments spiked up by 1074%. Their asset turnover ratios also increased confirming their optimal asset allocation.

Although, the overall performance remained positive, the PBT margins have dropped by 97% in five years. This raises some alarms on focusing on a better turnaround. After the downfall in 2014-15, they managed to turnaround by an extremely thin margin the following year. Though the ROE remains standard, there is further scope to improve the ROCE, in order to keep the shareholders interested.

Figure 10a - Performance ratios of Bangalore International Airport Ltd (BIAL)
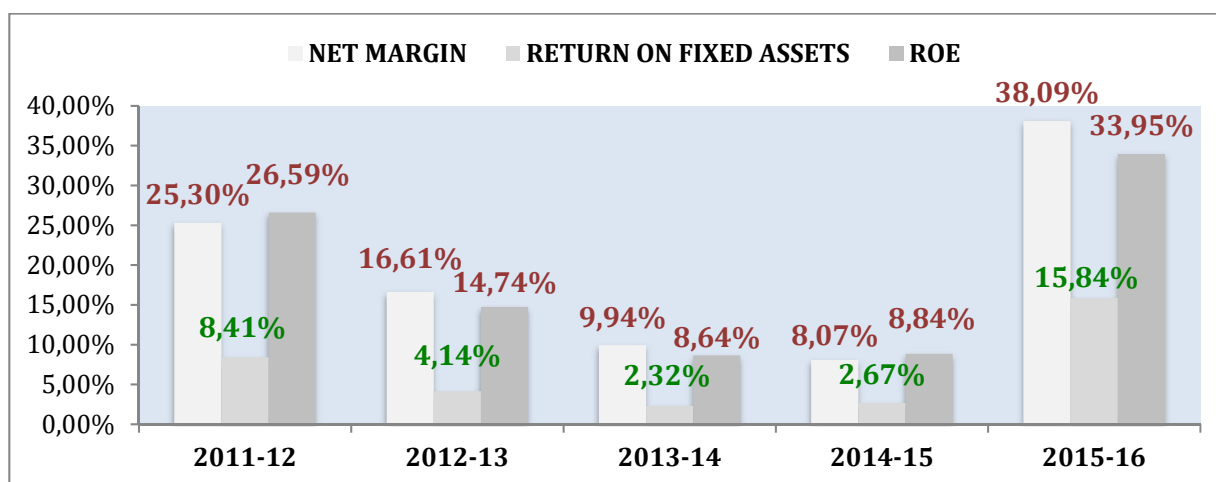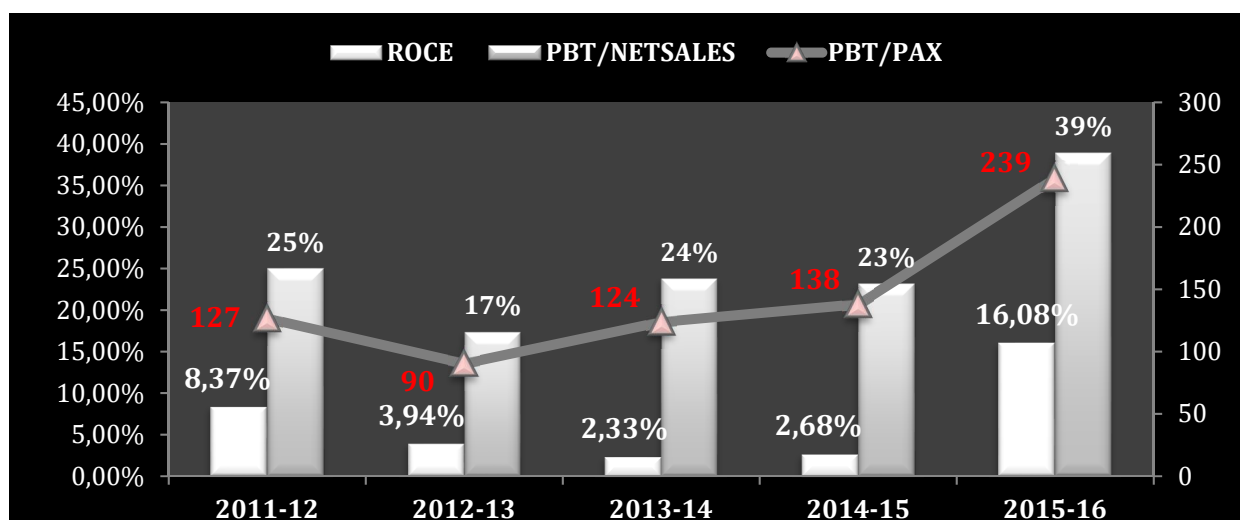

Figure 10b - Profitability ratios of Bangalore International Airport Ltd (BIAL)

Source: Ministry of Corporate Affairs

Inference: BIAL is the 2nd airport operated by GVK in India. In spite of some intermediary downturns, they managed to retain overall positive margins as seen in Figures 10a and 10b. Their PBT margins more than doubled in the last accountable year owing to their aggressive expansion plans, which in turn increased their working capital by 85%. Unlike the GMR run

airports, BIAL focuses on maximizing their working capital instead of the current investments, whereas their non-current investments increased by an enormous 734%. Among the PPP airports, BIAL ranked 2nd in 2015-16 in terms of PBT/passenger, close behind CIAL. The remarkable increase in ROE in 2015-16 is due to their reduced dependency on borrowed capital with a 71% decrease in their short-term borrowings. They experienced the highest growth in PBT in 2013-14 and 2015-16, which grew by 47% and 114% respectively. In the last two years with the net sales growing by 36% and 27%, the high profit margins even indicates growth in non-aeronautical revenue due to catering passengers having higher propensity to spend.

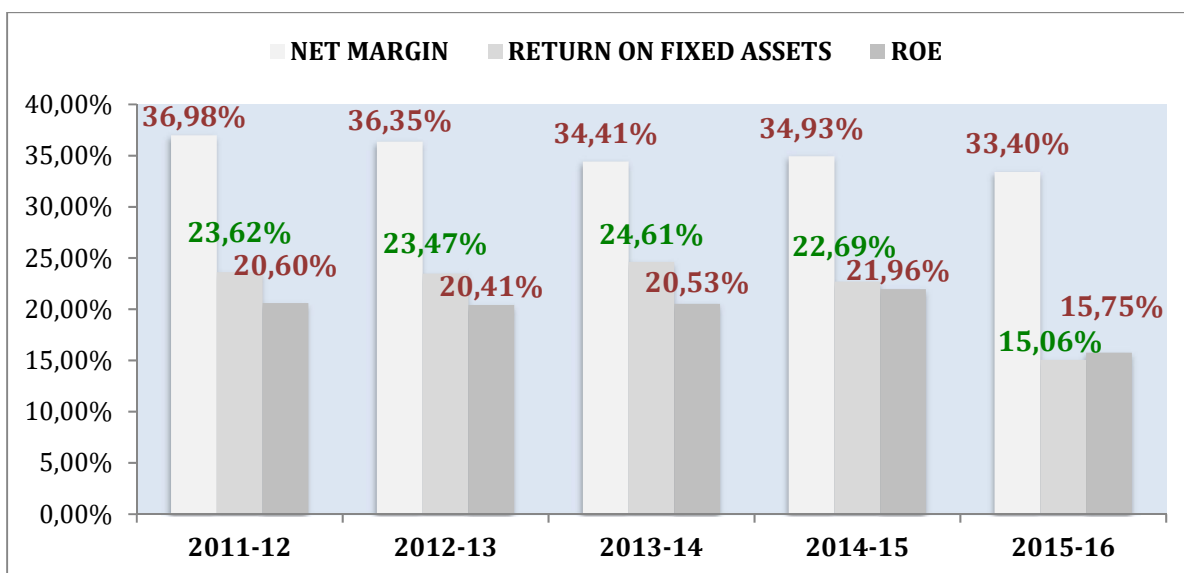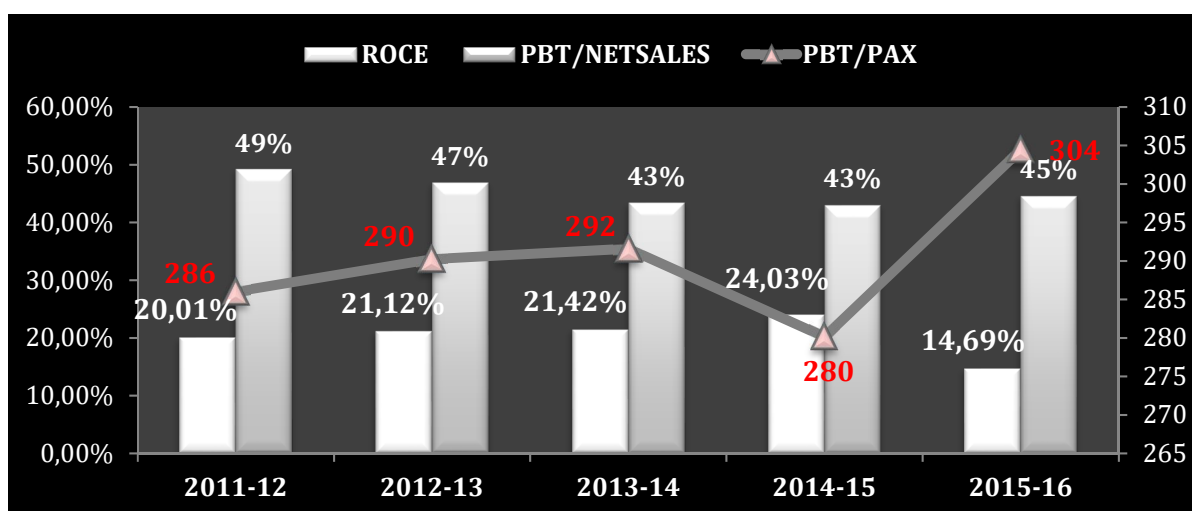**Figure 11a - Performance ratios of Cochin International Airport Ltd (CIAL)**

Figure 11b - Profitability ratios of Cochin International Airport Ltd (CIAL)

Source: Ministry of Corporate Affairs

Inference: CIAL can be regarded as the most profitable PPP airport in India in the 5-15 million passenger category as reflected in *6.3.5*. As described earlier foreign investors instead of a consortium fund them. They succeeded in maintaining a consistent growth of over 30% in their net margins. Though their operating revenue increased by 26% in 2015-16, the 80% increase in fixed assets slowed down their ROFA. This explains the growth in long-term debt by 494% in the same year. However, this investment turned in their favor owing to the 20% increase in total traffic. They managed to retain a PBT margin and net sales higher by 31% and 26% respectively as displayed above, which was the highest in five years. The dip in ROCE is due to the same reason of spiked up long-term debts. Nevertheless, the highest PBT per passenger of 304 in the industry reflects an optimum utilization of resources.

7. FEASIBILITY STUDY

7.1. Advantages & disadvantages of Airports Listed in stock exchange

	Advantages	**Disadvantages**
1.	Significant improvement in governing potential.	Loss of overall control and ownership of business (personal touch may be lost).
2.	Rules that require regular reporting and continuous disclosure can expose poorly performing managers and pressures from shareholders and external analysts can spur the timely rectification of such problems.	More people to share profits with (less income).
3.	Subject to strong, ongoing pressure of scrutiny for improvement in efficiency.	Business may become over exposed to market fluctuations that are beyond one's control.
4.	Independence from government.	Floatation costs may be substantial and there are high costs of professional fees.
5.	Easier to get international funding.	Shareholders interest while running the company may differ from the company.
6.	Having own trade shares gives better potential to acquire new businesses, as shares and cash can be offered.	Giving up a part of management control and opening of a chance to be taken over.

7.2. Risk Assessment and Feasibility

From a sample size of 678 airports ACI analyzed the contribution of private sector to be 14% (ACI 2017) in 2014, while they undertook 44% of the capital expenditure. It has been observed that investment in an airport is directly proportional to the market size they cater to. ACI had shortlisted 20 in terms of passenger traffic that are listed on the respective stock exchanges either as individual airports or as part of an airport group. In terms of listed companies, the risk of investment in a company's shares can be assessed from their estimated beta values, which is a component of the CAPM model described earlier. In 2010, Air New Zealand conducted a comprehensive survey to estimate the airport betas of 31 airports (Strategic Financial Group, 2010). The 20 airports shortlisted by ACI are included in this sample. The standard error of these airports being up to 0.3 except two Infratil Ltd., New Zealand and Multiplus S.A., Brazil with 0.5 justifies the relevancy of the study.

With reference to this study AERA had reckoned NIPFP[6] in 2011, to determine the cost of equity of the five private airports that have been analyzed above based on the CAPM model. The study estimated the risk-free rate to be 7.35% considering an annual yield from government bonds over last ten years, i.e. from 2001-2010. Due to restricted access to data of a short time series of 10 years that was then available for Indian market, benchmarking the matured market in United States at 4.31% and adding a default risk premium of India at 2.4% derived the equity risk premium of 6.71%. As mentioned earlier, the Indian airports not being listed in stock exchange not only prevented their beta value to be derived from Indian market, but also, other Indian infrastructure companies as they are quite diversified. Hence, the study conducted by ACI and Strategic Finance Group substantiated the mean asset beta of the private Indian airports to be 0.51 and an equity beta of 1.57-1.7. Furthermore, the Indian airport policy of not allowing a second airport to be constructed within a radius of 150 km. of existing airport and the liberty to charge UDF[7] to bridge the deficit in projected revenues curtailed the estimated beta to 0.4 (NIPFP, 2011). However, as per inputs and discussion with established consultancies and industry bodies like KPMG, Leigh Fisher, CRISIL and SBI Capital markets AERA ascertained the rates for the second control period as mentioned in table below.

---

[6] National Institute of Public Finance and Policy
[7] User Development Fee

Table 1 – Cost of Debt and Equity

RATES	MIAL	DIAL	HIAL	BIAL	CIAL
Cost Of Debt	11.17%	9.99%	9.38%	10.25%	9.63%
Cost Of Equity	16%	16%	16%	16%	14%
5 year Forecasted CAGR for Passenger traffic	7.44%	7.01%	11.67%	13.63%	

Source: (MYTP/MIAL AERA 2016-17)*,* (MYTP/DIAL AERA 2015-16)*,* (MYTP/BIAL AERA 2018-19)*,* (MYTP/HIAL AERA 2017-18)*,* (MYTP/CIAL AERA 2017-18)

From the analysis of the debt structure, performance and profitability of the private airports it can be perceived that DIAL and BIAL has a robust debt management practice compared to the rest. The profitability catapults CIAL to the top closely followed by BIAL and DIAL. From the perspective of an individual investor in these respective stocks, there would be more value for money buying shares of DIAL in the large airport category due to their optimized financial management and BIAL in the small airport category owing to their profit margin and exponentially growing market size. The ROCE and Net profit margins further complements our decision. MIAL would not be preferable because they have reached saturation point, which would soon trigger diseconomies of scale. CIAL and HIAL cannot be disregarded. However, CIAL's ownership structure of foreign investors is in my opinion sufficient to provide additional funding and unlikely to make it public. Though, HIAL is also reflecting a robust financial structure, the growth rate seems to be comparatively slow. Hence, it could be considered a third choice. Nevertheless, all these airports meet the eligibility criteria of SEBI[8] both in terms of market capitalization and duration of operation. Another rationale for my choice of DIAL and BIAL is in terms of share capitalization. MIAL's authorized share capital is equal to the paid-up capital suggesting little or no room for improvement in their cash flows without fresh equity. Similar is the case of HIAL, and CIAL, whereas such scope of improvements exists in DIAL and BIAL. However, taking into consideration the risk mitigating factors mentioned above, listing these airports on the stock exchange would be feasible.

## 8.   CONCLUSIONS AND FURTHER RESEARCH

The forecasted traffic by the authority and the liquidity depicted below further substantiate our claim for the choice of airports to be DIAL, BIAL and HIAL. The current / quick ratios of MIAL and BIAL show some stagnation due to MIAL's new terminal and BIAL's technological up-gradations. However, GVK has sold a major stake in BIAL to Fairfax in the recent year, which has strengthened their liquidity.

---

[8] Stock Exchange Board of India

Though one of the busiest airports in India, MIAL is over saturated to accommodate further growth. Whereas DIAL, HIAL and BIAL not only reflects a positive forecasted growth, but also, a robust liquidity position for future expansion. The annual passenger traffic in India have been growing above 20% out of which around 56% have been contributed from the PPP airports. Simultaneously, the airports that have been shortlisted in this paper have positioned themselves quite strategically in terms of liquidity, which complements the capacity enhancements soon. However, the investment trajectory must remain consistent as reflected before in order to meet the capacity enhancements necessary.

Thus, it can be concluded that DIAL and BIAL would be the primary choice among the 5 private airports, to be listed from an investor's perspective. This claim can be supported by their robust debt structure, profitability, market capitalization and duration of operation, which is better than the rest. Moreover, the spree of airport operating permits being acquired GMR, which operates DIAL, like Goa, Maldives, Nagpur, Bulgaria and more, further complements their expertise in the airport business.

Figure 12 – Evolution of Quick and Current Ratios in Key Indian Airports
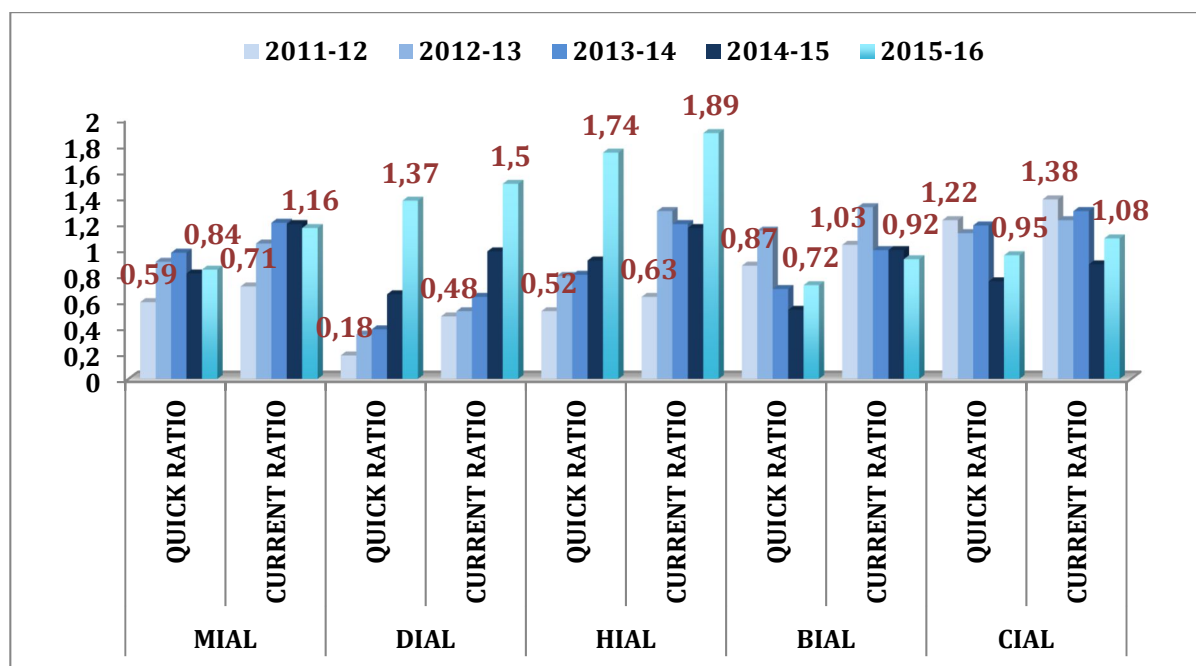
Source: Ministry of Corporate Affairs

On the other hand, BIAL is pioneering in the front of the most technological advancements in India like end-to-end biometrics and facial recognition technology ensures its increased efficiency in the coming future. When we map the investments of these airports with their

profit margins it brings some more positivity into perspective. Over the five-year period DIAL's current investments grew to the tune of 1782% while the PBT margin touched its peak in 2013-14 and 2015-16 at 467% and 193% respectively, in-spite of not blocking their investments for the long-term. This is clarified by the exponential passenger growth and the ROCE that sprung from -13.65% to 5.47% in this duration. Although BIAL do not reflect any such investments as such, but their reserve and surplus increased by almost 400% in this timespan, directing their profitability northwards. Unlike DIAL, it channeled its investments towards work-in-progress owing to its aggressive expansion plans. Nevertheless, their ROE reflected a remarkable growth in 2015-16 due to a 74% decrease in their borrowed capital resulting in a 114% increase in PBT margins. In terms of liquidity as shown in *Figure 8*, DIAL and BIAL have managed to increase their cash equivalents by 56% and 39% respectively in five years, which is quite commendable. Finally, the existence of a room for improvement in both their share capitals further supports our claim for listing them.

In this analysis AAI could not be considered comparable as the airports under its portfolio reflected a diverse cost structure which needs to be further streamlined and restructured before it could be factored in. In this paper the risk factor for investments in airports have been benchmarked with the already listed international counterparts, highlighted in Risk assessment and feasibility section. However, there's room still for drawing a comparison of their financials with the Indian airports, which could not be included due to data and time constraints. The below mentioned adjoining areas holds potential for future research.

- Optimizing the RAB structure.
- Activity based pricing.
- Quantifying the points of value addition in an airport supply chain.

REFERENCES

- AERA. (2017). *F. No. AERA/20010/Civil Aviation Policy/2014-15/Vol-I. Order No. 14/2016-17.* AERA.
- AERA. (2016). *MYTP/MIAL/CP-II/2016-17/Vol-VI Order No. 13/2016-17.* AERA.
- AERA. (2015). *MYTP/DIAL/CP-II/2013-14/Vol. - III Order No. 40/2015-16.* AERA.
- AERA. (2018). *MYTP/BIAL/CP-II/2016-17/Vol-III Consultation Paper No.05/2018-19.* AERA.
- AERA. (2017). *MYTP/HIAL/CP-II/2016-17/Vol-IV] Consultation Paper No. 30/2017-18.* AERA.
- AERA. (2017). *MYTP/CIAL/CP-II/2016-17/Vol-V Order No. 07/2017-18.* AERA.

- Airport Council International (2012) Guide to Airport Performance Measures, available from: *http://www.aci.aero/News/Releases/Most-Recent/2012/02/27/ACI-Launches-a-Guide-to-Airport-Performance-Measures*

- Airport Council International. (2017). *Policy Brief.* Montreal: Airport Council International.

- Boeing (2016) Current market Outlook 2016-2035, Chicago: Boeing.

- Civil Aviation Authority (2016). *ORR Consultation on the charging framework for the Heathrow spur,* London: Civil Aviation Authority.

- IATA. (2017). *World Air Transport Statistics.* Montreal: IATA.

- Johnstone, D. (2003). *Replacement Cost Asset Valuation of Regulation of Energy.* Abacus 39.1.

- Leahy, J. (. (2016). *Airbus Global Market Forecast 2016-2035.*

- Mishra, M. (2018, April 22). AAI-managed 15 profit-making airports likely to be privatised. *AAI-managed 15 profit-making airports likely to be privatised* .

- National Institute of Public Finance and Policy (2011). *Estimating Cost of Equity for Private Airports in India, New Delhi: National Institute of Public Finance and Policy.*

- Niemeier, H. M. (2009). *https://www.itf-oecd.org/sites/default/files/docs/dp200910.pdf.* Retrieved from Joint Transport Research Centre, International Transport Forum.

- Operators, A. o. (n.d.). *http://www.apaoindia.com/?page_id=1021*. Retrieved from www.apaoindia.com: http://www.apaoindia.com/?page_id=1021

- Poole, R. W. (1994). *Guidelines for Airport Privatization.*

- Starkie., D. (2001). Reforming UK Airport Regulation. *Journal of Transport Economic and Policy* .

- Strategic Financial Group. (2010). *Airport Beta Estimates.* Chicago: Strategic Financial Group.

- Tretheway, M. (2001). *Airport Ownership, Management and Price Regulation.* InterVISTAS Consulting Inc.