

Opinion

**On the Asset Beta of
Christchurch International
Airport**

ANZ Investment Bank
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1. Executive Summary

ANZ Investment Bank ('ANZIB') has been engaged by Christchurch International Airport Limited ('CIAL'), to provide an expert opinion on a number of issues raised in the New Zealand Commerce Commission's ('the Commission's') recently issued Draft Report on the Price Control Study of Airfield activities at Auckland ('AIAL'), Wellington ('WIAL') and Christchurch international airports. In particular, CIAL are interested in ANZIB's views on the determination of an appropriate asset beta.

Critique of the Commission's Approach

The Commission has accepted the proposal of its expert, Dr Martin Lally, who has adopted rate of return regulated US electricity companies as the benchmark for CIAL's and AIAL's airfield charges asset beta. Dr. Lally has taken the US electricity asset beta of .36 and added half of the estimated beta effect of regulation (.20 based on the differential between US and UK regulatory frameworks estimated by Alexander et al (1996)). He then arrives at an estimate of .46, which is rounded down to .45. This asset beta estimate is applied equally to CIAL and AIAL.

ANZIB disagrees with Dr. Lally's choice of the US electricity industry as the sole benchmark for airfield charges

Dr. Lally notes that operating risks are likely to be higher for airfield charges than for electricity. He also notes that there may be a case for airfield charges on domestic passengers to have a higher systematic risk than for international passengers, since the effects of economic shocks would be spread across a number of countries. Indeed, in an earlier publication Lally (2000, p.27) indicated that a US study had found statistically significant differences in the operating risk characteristics of different industries and that "telephone services and energy suppliers have particularly low betas while travel and recreation are particularly high."

Despite this knowledge and evidence, Dr. Lally ignores industry-specific and customer-specific risk characteristics and decides not to estimate them on the grounds of a judgement that "any increase in beta [accounting for such factors] would be modest." This is done without any attempt to empirically analyse the operating risk differentials between air travel and electricity on the one hand, and between domestic and international traffic on the other. Adopting Dr. Lally's approach, rate of return regulators in the US would not differentiate between different industries despite obvious differences in fundamental business risks. This is not the current practice in any of the Anglo-American regulatory frameworks.

It is instructive to note that when the airline industry in the US was regulated very tightly on a rate of return basis prior to 1978, the average asset beta of airlines was significantly higher than for similarly regulated electricity companies (Cunningham et al (1988)). This is due to the wide swings in passenger numbers that characterise the airline (and therefore, the airport) business. Rate of return regulation has an asset beta increasing effect in this industry because regulators will control prices, and the regulatory process will lag behind the market.

ANZIB disagrees with the Commission’s position on not differentiating the asset betas of CIAL and AIAL that are due to the mix of international passengers

ANZIB does not accept the Commission’s position at paragraph 77 of the Executive Summary of its Draft Report, where it is stated that the Commission is ignoring the differential risk characteristics of domestic and international traffic because it “it is limited to using the domestic CAPM.” This view does not appear to have any basis in finance theory, and does not accord with practice in unregulated industries.

In regulatory cases in the US and in Australia, the composition of the customers is taken into account when considering asset betas. For example, in the US electricity industry those companies which have a higher proportion of domestic customers who have lower sensitivity to GDP shocks, and therefore a lower asset beta.

ANZIB believes that the regulatory risk exposure of CIAL and AIAL has been underestimated by the Commission

The regulatory risk differential ascribed by Dr. Lally is set at .20 and it is judged that the regulatory framework facing CIAL and AIAL deserves a weighting of 50% when compared with the two extremes of US style rate of return regulation and UK style CPI-X regulation. ANZIB believes that these risks have been understated, as set out in the table below.

Relative characteristics of the New Zealand and UK regulatory regimes

New Zealand vs United Kingdom	Dr. Lally’s argument	ANZIB Comment
3 year vs 5 year regulatory period	Lowers risk for NZ airports	This argument deserves low weight, as most shocks last less than 3 years
Consultation vs decree by a regulator (as in UK)	Lowers risk for NZ airports as they can covertly recoup revenues	This argument deserves low weight. Consultation process subject to the threat of Commission approval (except for WIAL Deed). There is no evidence of this happening.
Power to vary prices within the period vs CPI link in UK	Lowers risk for NZ airports, but low weight, since this has not happened in the past	No weight should be given to this argument as CIAL is specifically committing not to vary prices within the period. In practical terms the consultation period precludes it.
Inflation risk borne by Company vs consumer in UK	Raises risk for NZ airports, but low weight in a low inflation environment	Agreed

ANZIB’s Approach

ANZIB’s approach may be distinguished by the following:

a) ANZIB rejects using the following potential comparators for airport landing charges:

- ***Listed airports*** – different regulatory frameworks and aggregate too many cash flow streams with diverse risk characteristics (eg long term property leases vs. revenue-based concession income);
- ***ACCC determinations*** – ACCC determinations on the asset betas of Australian airports could be employed, but only after appropriate adjustments are made for regulatory structure and the traffic composition of each airport vs. traffic at CIAL and AIAL;
- ***Listed ports*** - while ports are closer comparators to airports than electricity companies, like airports their revenue stream is composed of wharfage, property rentals and

stevedoring operations which have different risk characteristics, as does the nature of the cargo.

b) ANZIB employs the electricity and airline industries as lower bound and upper bound benchmarks for airfield operations

ANZIB considers that an appropriate upper-bound benchmark of the operating risk facing airports is provided by airlines. Airlines handle the same passengers as airports and are also subject to high operating leverage. However, there are differences in regulatory framework that must be taken into consideration.

On their own, US electricity generation/distribution companies are the least useful benchmark, since the operating risk environment of electricity companies in the US is not similar to that of airports. This industry can only be considered as a lower bound to the operating risk faced by airfield charges.

c) ANZIB estimates the risk differential between international and domestic passengers by reference to the airline industry

ANZIB's analysis indicates that it is important to distinguish the international and domestic passenger operations of the airports, since these revenue streams are associated with markedly different systematic risk profiles.

d) ANZIB employs the empirical regulatory risk differential that was evidenced during airline deregulation in the US as a benchmark

In the US, deregulation of the airline industry reduced asset betas by 30 points on average. ANZIB has adopted a range of 20 to 30 points to indicate the differential between an airline's asset beta under rate of return regulation (price control) and deregulation (full price flexibility).

e) ANZIB aggregates the operating risk and regulatory risk components of international and domestic traffic respectively

ANZIB takes US electricity companies as the lower bound of airfield charges risk, and deregulated airline industry betas, adding back the effect of rate of return regulation, as the upper bound. An estimate of the asset beta for airfield charges, broken down by domestic and international market is derived in the table below by taking the mid-point between the US electricity industry and the (adjusted) airline industry betas. Then 10 to 15 points are added to reflect the additional impact of price rigidity resulting from the regulatory frameworks faced by CIAL and AIAL.

Estimated airfield charge asset betas

	International market	Domestic market	Total market
A. Lower boundary:			
US Electricity companies (ROR regulated)	.35	.35	.35
B. Upper boundary:			
Domestic and international airlines (deregulated)	.25	.65	.55
Plus, adjustment for ROR regulation (Cunningham et al)	.20 - .30	.20 - .30	.20 - .30
Adjusted (ROR regulated) airline beta	.50 - .55	.90 - .95	.80 - .85
Imputed airfield beta under ROR regulation (half way between A and B)	.40 - .45	.60 - .65	.55 - .60
Plus, Price rigidity effect (Alexander et al)	.10 - .15	.10 - .15	.10 - .15
Beta estimate – airfield charges at CIAL and AIAL	.50 - .60	.70 - .80	.65 - .75

f) For comparative purposes ANZIB estimates the whole of airport betas for CIAL and AIAL

Relative airport asset beta estimates

	CIAL			AIAL		
	Asset beta	Weight	Weighted Beta	Asset beta	Weight	Weighted Beta
Airport charges (International)	.50 - .60	9.5%	.05 - .06	.50 - .60	30.0%	.15 - .18
Airport charges (domestic)	.70 - .80	25.8%	.18 - .21	.70 - .80	20.0%	.14 - .16
International Departure Charge	.55	16.0%	.09 - .09			
Concessions	1.05	20.4%	.21	1.05	30.0%	.32
Lease rentals	.28	19.7%	.06	.28	10.0%	.03
Vehicle parking	.50	5.7%	.03	.50	7.0%	.04
Other	.50	2.8%	.01	.40	3.0%	.01
Airport asset beta			.63 - .68			.68 - .74

Source: CIAL and AIAL accounts, ANZIB analysis

The result shows that while CIAL is estimated to have a higher asset beta than AIAL for airfield charges due to its greater proportion of “domestic economy” travellers, it has a lower overall weighted asset beta. AIAL’s overall airport asset beta is estimated at between .68 and .74, compared with CIAL’s .63 to .68. The main driver of this swapping of relativities is the fact that AIAL’s Concessions revenue, and in particular its duty free revenue, is much greater than at CIAL.

g) ANZIB reviews and tests the estimates obtained for reasonableness

Having made the estimates of relative systematic risks associated with domestic vs international traffic, and the other components of airport revenues, ANZIB tests the relativities by undertaking an analysis of how these components have responded to economic shocks in the past. The tests are particularly instructive when viewing the sensitivity of revenue streams to the recession of 1991-92 and subsequent recovery. In particular, it is apparent that the ordering of income elasticity is from electricity (the lowest systematic risk) to international revenue (intermediate systematic risk) to domestic passenger revenue (highest systematic risk).

Income Elasticity of Demand – CIAL revenues vs electricity

Year on year change in:	Recession: 1990-91	Recovery: 1991-92
GDP	-1.3%	1.1%
Electricity consumption	1.9%	2.8%
International pax revenue	-0.8%	2.3%
Domestic pax revenue	-5.4%	8.1%

Finally, the overall estimated asset betas for CIAL and AIAL are compared with empirical evidence on whole-of-airport asset betas.

Conclusion

Given the fact that there are no direct listed company comparators for airfield charges, any analysis will have to rely on comparators that are not ideal. However, ANZIB's view is that the Commission's proposal to use US electricity companies as the sole comparator is bound to yield an asset beta that significantly under-estimates the true asset beta for airfield charges. ANZIB believes that its own approach, which uses electricity companies as a lower bound and airlines as an upper bound, yields a result that is found to be defensible and reasonable when the relative income elasticities of demand for electricity, domestic and international travel are analysed.

On public policy grounds, given the tourism, business and regional development spinoffs and externalities associated with air travel, and given the uncertainties associated with estimation of the cost of capital, there is likely to be more damage caused by an under-investment in airport facilities than by over-investment. Hence, the safest approach is to err on the side of over-estimation rather than under-estimation of the cost of capital, and therefore the asset beta, which in the case of airfield charges is the most important and difficult of all WACC parameters to estimate. This, we understand, is the approach that has been taken by the ACCC in relation to Australian airports.

2. Introduction

ANZ Investment Bank ('ANZIB') has been engaged by Christchurch International Airport Limited ('CIAL'), to provide an expert opinion on a number of issues raised in the New Zealand Commerce Commission's ('the Commission's') recently issued Draft Report on the Price Control Study of Airfield activities at Auckland ('AIAL'), Wellington ('WIAL') and Christchurch international airports. In particular, CIAL is interested in ANZIB's views on the determination of an appropriate asset beta for airfield activities.

Of the WACC parameters that are being debated in the current determination of airfield charges at CIAL the Asset Beta is the most important. Increasing the asset beta of CIAL from the .45 employed by the Commerce Commission in its Draft Report to CIAL's .65 would raise the WACC by 180 basis points.

This Opinion provides ANZ Investment Bank's analysis and critique of the Commerce Commission's approach, and then makes its own estimate of the asset beta of CIAL's airfield and terminal services. The discussion in this Opinion will not consider the asset beta of WIAL directly, but will compare CIAL and AIAL due to the fact that the Commission's Draft Report has determined that their asset betas are identical.

Two of the major objectives of any regulatory framework applied to a monopoly industry or activity are to provide:

- efficient pricing signals that will mimic the outcomes of a competitive market; and,
- incentives for reducing costs that will mimic the operation of competitive market forces.

Estimating an appropriate cost of capital ("WACC") to apply to the calculation of airport charges and terminal charges is an important part of the regulatory framework. If the WACC is set too high, customers will be subjected to unnecessarily high charges that will result in allocative inefficiency. If WACC is set too low, in the context of a privatised airport new investment would not be forthcoming. Under public ownership this would again result in allocative inefficiency.

3. Asset beta: critique of Commission's approach

3.1 *Critique of WACC Report submitted by Martin Lally*

3.1.2 Introduction

The Commerce Commission's Draft Report draws on a report submitted by Dr. Martin Lally entitled "The Cost of Capital for the Airfield Activities of New Zealand's International Airports". Dr. Lally begins his discussion of the asset beta of the three international airports by outlining the positions of the airports, which favour values from .40 to .65, compared with the position of the airlines, which propose asset betas in the range of .30 to .35.

The airports and the airlines put forward average asset beta estimates for alternative sets of comparable companies.

The airports favoured estimates for:

- AIAL, three foreign listed airports, port companies in New Zealand and the UK, and other utilities as well as the decisions of the ACCC with respect to terminal developments at several Australian airports.

The airlines favoured estimates for:

- Gas and electricity utilities, Airways Corporation, Transpower and Commerce Commission Ruling 266 on NGC's gas distribution activities.

However, ANZIB notes that the airport landing and terminal charges that are the subject of the Commerce Commission's Draft Report are for a specific sub-set of airport operations, and cannot be reliably estimated by reference to businesses that face alternative operating and regulatory frameworks. This is also true for listed airport companies, whose operations may include regulated and unregulated activities, and activities with a wide range of asset beta risk profiles.

ANZIB agrees with Dr. Lally's proposal that the selection of appropriate comparable companies should begin with "some knowledge of what underlies betas".

3.1.3 Determinants of Betas

Regulatory framework and asset beta

ANZIB does not have any fundamental issues with the list of beta determinants put forward by Dr. Lally. ANZIB agrees that asset beta should be higher under price (ie. CPI-X) regulation, compared with rate of return regulation. We are also in agreement with the proposition that beta will increase with the length of time that a CPI-X price control formula is set. The issue of additional asset beta risk flowing from a CPI-X pricing formula is essentially one of the constraint that is placed on making price adjustments in the face of changing demand and cost conditions. A CPI-X regulatory formula will have this effect, as will a light handed regulatory regime and the practicalities of business faced by CIAL and

AIAL. In practice, CIAL's pricing structure can be considered constrained for three years, in the same way as under a CPI-X regime because:

- The consultative process itself lasts 18 months;
- CIAL has given a commitment to the airlines not to vary prices for three years;
- If there is an upturn in the economy CIAL benefits from higher volumes, while in a downturn it would be strategically inept for CIAL to raise airfield charges at a time when its major airline customers are likely to be experiencing financial difficulties; and
- The experience of the last decade indicates that CIAL's prices remained fixed in nominal terms through both recessions and a boom in economic activity.

The aim of rate of return regulation is not to eliminate risk or reduce the asset beta risks of all regulated industries down to the same asset beta. Rather, it is to provide an appropriate rate of return for the industry that is being regulated. Compared with CPI-X regulation, Rate of Return ("ROR") regulation provides for more flexibility in prices to counter the effects of changing demand and cost conditions. Complete deregulation of price control obviously increases the price flexibility of companies even further. Lally (2001, p.15) cites the evidence presented by Alexander et al. (1996) that utilities subject to a five year CPI-X regime ('high powered') have significantly higher asset betas compared with the strict rate of return regulatory style ('low powered') evidenced in the US.

Table 1. Average asset betas by regulatory regime and sector

Incentives	Electricity	Gas	Energy	Water	Telecoms
UK (High – powered)	0.60	0.84	-	0.67	0.80
US (Low – Powered)	0.30	0.20	0.25	0.29	0.52
Difference High - Low	0.30	0.64	n/a	0.38	0.28

Source: Adapted from Alexander et al. (1996) p.27

Lally (2001) extends the work of Alexander et al (1996) by calculating that part of the differential is due to market leverage differences, but concludes that this "still leaves a substantial residue, apparently attributable to the differences in regulatory regimes".

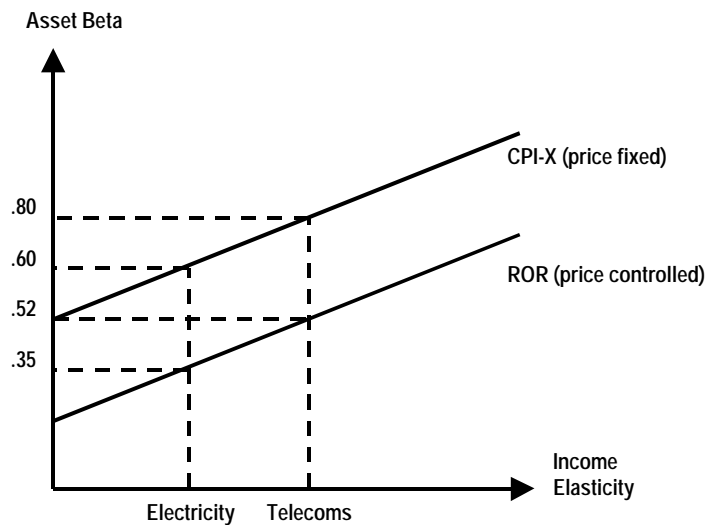
Industry characteristics and asset beta

The other effect, which is ignored by Dr. Lally, is the apparent differences in average asset beta that are observed between regulated industries, after taking account of the regulatory regime. For example, the "low powered" telecoms industry in the US has a much higher asset beta (.52) than the similarly regulated electricity industry (.30). In other words, whilst the regulatory framework has a significant influence on asset beta, the same regulatory environment does not eliminate systematic risk in each industry down to some minimum.

The factors that Dr. Lally lists are still important differentiators of risk faced by companies in rate of return regulated industries in the US. A commonly used proxy for income elasticity is the nature of the customer group in all these industries. For example, in the electricity and gas distribution industries low systematic risk is associated with a relatively large base of domestic consumers, as opposed to industrial consumers. At presentations to business analysts, gas company executives present a high percentage of domestic customers as an advantage indicating lower risk, compared with gas companies having higher industrial loads.

Combined industry and regulatory effect on asset beta

It is important to note that a major component of the asset beta differential between a high and low powered regulatory regime lies in the relative price flexibility that is allowed. In a CPI-X regime prices are fixed under a formula for the period, while in an ROR regime they may be adjusted for economic conditions so that the company may approach its appropriate return on investment. It does not, however, allow for retrospective “clawback” in order to guarantee a rate of return. Another major determinant of asset beta, as noted by Dr. Lally, is the income elasticity of demand. If the income elasticity of demand is high there will be greater swings in demand in response to changes in economic circumstances. Hence, when income elasticity of demand is high the time lags involved in ROR regulation will generate a higher asset beta than where customers have a lower income elasticity of demand. The combined effects of industry (via elasticity of demand) and regulation (via the constraint placed on price flexibility) is illustrated in the following chart, using the results found by Alexander et al (1996).



3.1.4 Arguments Presented

Listed airport companies

Dr. Lally begins by claiming that the estimated asset beta of AIAL is “a useful source of information”, but then proceeds to discard it. Air New Zealand estimates an asset beta of .51, adjusts this down to .40 for “a more normal gearing ratio” and then claims that the non-aeronautical activities of AIAL are higher risk, resulting in another arbitrary reduction to .35. ANZIB does not consider it clear-cut that the non-aeronautical activities of AIAL will be higher risk than aeronautical. It depends on the weights of alternative operations in the revenue structure. Some activities, such as long-term property leases, will have very low beta risk, while retailing will experience relatively higher risk.

Dr. Lally notes that reliance on observed listed airport company betas is flawed since all these airports have substantial non-aeronautical operations. ANZIB concurs with this statement in general, but would not rule out reference to appropriately adjusted airport asset beta calculations for comparative purposes. The comparison, however, would need to be like for like.

Dr. Lally also proposes that whilst CIAL is subject to a three year prices review, and therefore has less exposure to economic shocks compared with the CPI-X regulatory regime experienced in the UK, CIAL takes on inflation risk, and this would have the effect of raising asset beta compared with the UK.

ANZIB also agrees with Dr. Lally's point that an "airport's beta is a weighted average of the betas for aeronautical and contestable activities," however, that distinction must be taken further. In fact, an airport's beta is a weighted average of all of its operations that have significant differences in the attributes discussed in section 3.1.3 above, for example:

- International aeronautical activities
- Domestic aeronautical activities
- Concession income
- Lease rental
- Car parking

Ehrhardt and Bhagwat

ANZIB does not find the analysis of Ehrhardt and Bhagwat (1991) very instructive in the manner in which it is presented by Dr. Lally, since the categories of aeronautical and non-aeronautical are not homogenous between BAA and AIAL. For example, the mix of domestic and international passengers, retail, car parking and property rental revenue streams will differ significantly. A useful application of the technique would require many more variables and equations (airports), and even then it would not overcome the high standard error problem. That is, the estimated beta for each airport is likely to have a relatively large confidence interval around it.

Regulatory regime

Dr. Lally is critical of the airports' reliance on judgements made in Australia by the ACCC in relation to landing charges. Dr. Lally, together with Lovick (2000) and Bowman (2001), concentrates on the relative differences in regulatory regimes, where emphasis is placed on the following:

- the New Zealand review period is shorter (3 years vs. 5 years);
- New Zealand airports are subject to a consultation process rather than a price imposed by a regulator; and,
- New Zealand airports can recoup the effects of adverse shocks since the last review;

On the other hand, Dr. Lally presents two factors countering the presumption that regulatory risk is higher in Australia:

- "there should be significant restraints on" "covertly recouping the effects of past adverse shocks"; and
- "New Zealand prices are set in nominal terms and therefore the airports face inflation risk."

The last point is dismissed by Dr. Lally in a low inflation environment, and it is his judgement that regulatory risk is higher in Australia. This infers that the asset betas derived by the ACCC are not appropriate benchmarks for New Zealand airports. However, this judgement by Dr. Lally, and the implication that flows from it, can be countered by the following:

- there is no evidence that CIAL has in the past, or is in the current review of prices, attempting to recoup the effects of adverse shocks during the recessions of 1991-92 and 1998.

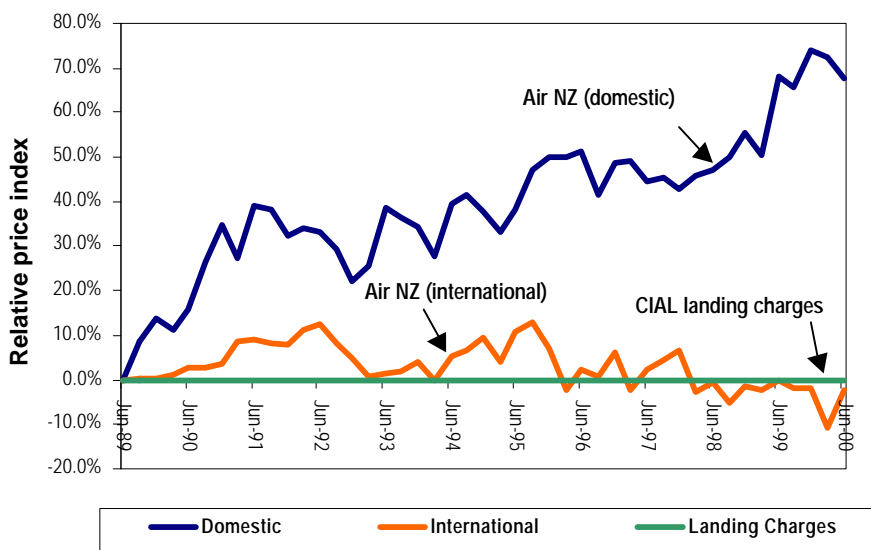
On balance, given the actual constraints upon CIAL’s ability to raise its charges and recoup past income reductions, its exposure to inflation risk and the fact that it has locked-in a price path for three years (compared with 5 years, but CPI-adjusted for the ACCC). It is not unreasonable to conclude that CIAL’s systematic risk flowing from its price inflexibility is closer to that experienced by Australian or UK airports under CPI-X price fixing, than to a rate of return regulatory regime.

It is important to recognise that price inflexibility has the same influence on asset beta whether it is imposed through a regulatory CPI-X formula, or through a system of light-handed regulation combined with practical business constraints such as those faced by CIAL.

Price Flexibility

Air New Zealand and BARNZ claim that AIAL “can reset prices at any time subject to consultation,” and is therefore in a lower risk position than overseas airports. This is countered by Dr. Lally with the statement that it does seem clear “that AIAL and CIAL cannot reset landing charges at will.” Furthermore, Dr. Lally presents the additional anecdotal evidence that “New Zealand airports have not historically exercised this power.” This fact is demonstrated by the graph below, which shows that CIAL’s real landing charges reduced throughout the 1990’s despite two domestic recessions (in 1991-92 and 1998).

Relative pricing flexibility: CIAL vs Air New Zealand



This chart demonstrates that CIAL did not raise prices even when aeronautical revenues suffered during recessions in 1991-92 and 1998. Indeed, to do so would be counter-productive for CIAL, since a rise in aeronautical charges during a domestic downturn would exacerbate the already depressed profits of the major airline users. In the context of the current prices inquiry, it is important to note that CIAL has committed to the airlines that it will keep prices fixed in nominal terms during the three year period. Furthermore, it is apparent that the full effects of a domestic recession can impact within a three year period.

In stark contrast to CIAL's price stability, which is the hallmark of CPI-X regulation, Air New Zealand has exercised considerably more pricing flexibility over the decade of the 1990s. A pattern emerges in that Air New Zealand's prices have risen particularly rapidly during the period of the 1991-92 recession. Thus, during this period and during the smaller recession in 1998, Air New Zealand has been able to react to demand shocks with rapid movements in prices, while CAIL has maintained its prices throughout.

Listed port companies

Dr. Lally criticises CIAL's (2001) submission in its reliance on estimated port company asset betas to derive an asset beta estimate for CIAL's aeronautical activities. ANZIB agrees with Dr. Lally that while ports are in the transport sector there are significant differences between port operations and an airport's airfield activities. But these differences are in many instances less than the difference between electricity and airfield activities.

With regard to port companies, there is also a break up of activities into:

- Infrastructure charges
- Lease rental
- Stevedoring operations

Ports will vary in these characteristics and also in relation to the nature of cargo that crosses the wharf. Ports are subjected to a derived demand that is related to the income elasticity of the cargo. Thus, in the New Zealand context, it is intuitively correct that the asset beta of Auckland port should be considerably higher than for the Port of Tauranga. Lease rental operations are relatively lower risk than wharf infrastructure and stevedoring revenues that are based on ship visits. The cargo at Auckland is weighted much more towards containers holding elaborately transformed manufactures (ETMs) and other luxury goods such as cars, whose demand is highly dependent on the economic cycle. Hence, a high asset beta is to be expected. By contrast, Tauranga has a lower asset beta because its cargo is basic raw materials (logs, woodchips) with markets in Asia.

3.1.5 Estimating the Asset Beta

Dr. Lally begins by noting two benchmarks:

- US firms engaged in electricity generation and/or distribution subject to rate of return regulation (converted to a New Zealand equivalent of .36); and,
- The average asset beta of the market (estimated at .81).

Lally's assertion that a beta of .36, which is adjusted from the ROR regulated US electricity industry must represent a "lower bound on any asset beta of any New Zealand industry" is flawed because regulators in the US electricity industry are often slow to react to cost and demand shocks, as argued by Joskow and MacAvoy (1975) in the context of the US

electricity industry. Furthermore, there may be industries such as property trusts, which have long contract periods and rental price reviews, can more readily withstand such shocks and will therefore have a lower asset beta. The Australian Property Trust industry is such an industry (see Table 9 below).

Lally holds that of the eight factors listed earlier, the “de-facto regulation by the airports is crucial” and sets up two further “comparators”:

- Electricity companies subject to UK style (CPI-X) regulation; and
- Electricity companies subject to US style (ROR) regulation.

ANZIB agrees with Dr. Lally (as well as Bowman (2001) and Lovick (2000)) that, on balance, under its regulatory regime CIAL would face less regulatory risk (ie price inflexibility) than similar companies in the UK (and Australia), but ANZIB’s view is that this differential is likely to be low. The major regulatory risk in the UK, which has driven equity away from the water industry for example, is the risk of “regulatory expropriation”. This is not a systematic risk. Therefore, ANZIB disagrees with Dr. Lally’s logic in pronouncing that in the absence of “any formula to quantify this, I [Lally] treat them as lying midway. This is a matter of judgement, and making the judgment that regulatory risk at CIAL lies half way does not accord with the factors analysed in Table 2 below.

Table 2. Relative characteristics of the New Zealand and UK regulatory regimes

New Zealand vs United Kingdom	Dr. Lally’s argument	ANZIB Comment
3 year vs 5 year regulatory period	Lowers risk for NZ airports	This argument deserves low weight, as most shocks last less than 3 years
Consultation vs decree by a regulator (as in UK)	Lowers risk for NZ airports as they can covertly recoup revenues	This argument deserves low weight. Consultation process subject to the threat of Commission approval (except for WIAL Deed). There is no evidence of this happening.
Power to vary prices within the period vs CPI link in UK	Lowers risk for NZ airports, but low weight, since this has not happened in the past	No weight should be given to this argument as CIAL is specifically committing not to vary prices within the period. In practical terms the consultation period precludes it.
Inflation risk borne by Company vs consumer in UK	Raises risk for NZ airports, but low weight in a low inflation environment	Agreed

To quantify the difference between US-style (“low powered”) and UK-style (“high powered”) regulation, Dr. Lally takes the differential in asset betas for electricity distributors/generators estimated by Alexander et al. in 1996, of .30 and .60 respectively, ie .30, and adjusts for market leverage to produce a figure of .20. At this point Dr. Lally’s analysis takes a course that is highly unexpected, and in ANZIB’s view, flawed. He takes the market leverage adjusted US-regulated electricity generator/distributor asset beta of .36, adds .10 for regulatory risk differential (ie. half of .20) and rounds down to produce an asset beta estimate of .45 for the landing charges of both CIAL and AIAL.

On the one hand, Dr. Lally recognises that his estimate should be adjusted to reflect operating and financial factors other than regulation. Indeed, in an earlier publication Lally (2000, p.27) noted that in a US study,

“Rosenberg and Guy (1976 table 2) document statistically significant differences in industry betas after allowing for various firm-specific characteristics and these differences accord with intuition about the income elasticity of demand. For example, telephone services and energy suppliers have particularly low betas *while travel and recreation are particularly high.*” (emphasis added)

On the other hand, Dr. Lally makes an unsubstantiated judgement that “any increase in beta [accounting for such factors] would be modest” and is “disinclined to attempt subjective judgements.” Once again, Dr. Lally makes his own subjective judgement, without presenting any real evidence. Neither data, nor analysis of the differences in risk characteristics of domestic and international traffic, or between electricity and airport charges are provided by Dr. Lally. Instead, a very general discussion of the “remaining seven factors” is put forward to analyse the “differences between aeronautical activities and electricity distribution other than regulation”, as summarised in the table below. While this is a flawed comparison in the first place, again no real data are provided or analysis undertaken.

Table 3: Differences between Aeronautical activities and Electricity distribution

Risk Factor	Dr. Lally's argument	ANZIB's comment
Nature of the product	Air travel has greater exposure to real GNP shocks, implying higher asset beta. Mitigated by: <ul style="list-style-type: none"> • Landing charges based on seats, not passengers • Foreign tourist demand depends on GNP in other countries 	Agreed, but there needs to be analysis of these differentials, and not only for air travel vs. electricity, but between the domestic and international traffic categories. This has not been done by Dr. Lally. Hence, Dr. Lally's assertions that the differences are 'modest' have not been substantiated.
Customer type	Neither AIAL nor CIAL have significant sales to Government	Agreed
Contract duration	Subsumed in the regulatory regime	Agreed
Monopoly power	Industries are similar as airport charges are a small percentage of consumer's total travel cost Regulatory regime obstructs exercise of monopoly power	This may have been the case, but proposed rises in landing charges are vigorously challenged by airlines.
Real options	Modest exposure in both	Agreed
Market weight effects	Small market weights	Agreed

After reviewing these factors Dr. Lally announces that “the only significant point is that demand shocks between successive price reset may be greater for aeronautical activities,” but then proceeds to ignore this significant point since he is “unable to quantify this effect.” Despite being unable to quantify the effect, he believes on the basis of no hard evidence of any kind, that the “increase in beta would be modest.” Finally, he recognises that due to the differential exposures of AIAL and CIAL to domestic traffic, the latter's asset beta should be higher, but recommends no adjustment on the grounds that this is “too difficult to estimate and modest.”

Implications of Dr. Lally's approach

Adopting Dr. Lally's approach, regulators would ignore the fact that different industries and even cash flow streams within industries have different risk characteristics and base all of

their estimates on the benchmark of a US electricity industry asset beta, with a modification for the nature of the regulatory regime. This is not the approach of rate of regulators in the US, who assign higher asset betas to a higher risk industry such as telecommunications networks compared with say, gas and electricity distribution networks. Furthermore, there are arguments presented within the same industry group for why the allowed rate of return should be higher/lower based on specific characteristics of firms that generally reflect the nature of the product/service and the nature of the customer base.

Adopting Dr. Lally's approach, regulators would make arbitrary judgements rather than analyse the risk characteristics of the regulated company and appropriate comparators in greater detail. The consequences of making judgements about asset beta based on inadequate analysis are severe with respect to valuations of infrastructure assets by private investors. In the case of community owned infrastructure they are no less serious in view of the mispricing of services and, consequently allocative inefficiency that result

Finally, it should be noted that in the US during the period of airline regulation, airlines were regulated on a rate of return basis and were closely controlled on a number of aspects of management. Furthermore, during the period of heavy regulation the asset betas of airlines were substantially higher than the asset betas of similarly regulated electricity companies (see Cunningham et al (1988)). ANZIB would argue that the airline industry is a more relevant comparator to airfield charges than are electricity companies.

3.2 Critique of Commerce Commission Draft Report

With respect to asset beta, the Commission's Draft Report follows closely the logic applied by Dr. Lally in the paper that is examined in section 3.1 above. However, paragraph 77 of the Executive Summary of the Commission's Draft Report makes an extension that ANZIB believes is without foundation. Following Dr. Lally, it is stated that "CIAL's beta may in fact be higher than AIAL's, but it has been unable to estimate accurately the difference." The Commission goes on to state that CIAL's asset beta is likely to be higher because it has a higher proportion of domestic traffic than Auckland, and therefore its sensitivity to shocks from changes in the domestic economy will be greater. At this point there is a divergence between Dr. Lally and the Commission.

Dr. Lally has decided not to make an adjustment for traffic type because:

- It is consistent with Dr. Lally's decision not to adjust the base beta risk for the airports above the proxy of US electricity companies even though he knows that airports are subject to higher real GNP shocks; and
- It is considered "too difficult to estimate and modest".

On the other hand, the Commission's reason for ignoring the differential risk characteristics of domestic and international traffic is as follows:

- "The Commission is limited to using a domestic CAPM and, therefore, this factor has not been able to be taken into account."

ANZIB does not accept that this is a valid reason for ignoring the differential risk characteristics of domestic and international traffic. The fact that the Commission is using a domestic CAPM has nothing to do with the analysis of the covariance of returns earned on domestic and international traffic revenue streams with returns on the New Zealand market portfolio. Any company in New Zealand that earns the bulk of its profits from exports to a diverse range of foreign countries will still have an asset beta measured against the New Zealand market, and that beta may be low because of low covariance of returns with the New Zealand market.

ANZIB agrees with Dr. Lally and the Commission that the differential proportions of domestic and international travellers at CIAL and AIAL indicate a higher asset beta should be applied to the former. ANZIB further believes that this is a significant factor, and that a reasonable estimate of the differential risks associated with domestic and international traffic can and should be made, and will do so in section 4 below.

4. Asset Beta: ANZ Investment Bank's approach

4.1 ANZIB's approach

It is important to note from the outset that there are no directly comparable listed companies whose revenues are limited to landing charges only and are subject to the same regulatory framework as the three airports under consideration. Therefore, estimation of asset beta will require an analysis of appropriate comparators, together with a more than normal degree of estimation based on a combination of judgement and supplementary analysis of the fundamentals of beta risk.

ANZIB's approach is to split the revenue stream of the airport into a number of components facing similar levels of risk. The revenue categories are as follows:

- Airport charges – international
- Airport charges – domestic
- Retail/Concessions
- Lease rentals
- Vehicle parking
- Utilities recharge
- Other (maintenance/flight centre)

For both CIAL and AIAL, ANZIB's methodology will be to:

- Examine the relative risk characteristics for each component;
- Derive appropriate comparators for each component;
- Estimate asset betas for each component;
- Calculate a weighted asset beta for CIAL and AIAL as a whole;
- Test the reasonableness of the estimates by reference to the relativities between:
 - Asset beta estimates for each component
 - CIAL and AIAL
 - CIAL, AIAL and listed airport company betas

4.2 Landing charges

4.2.1 Appropriate comparators

Consideration of comparators

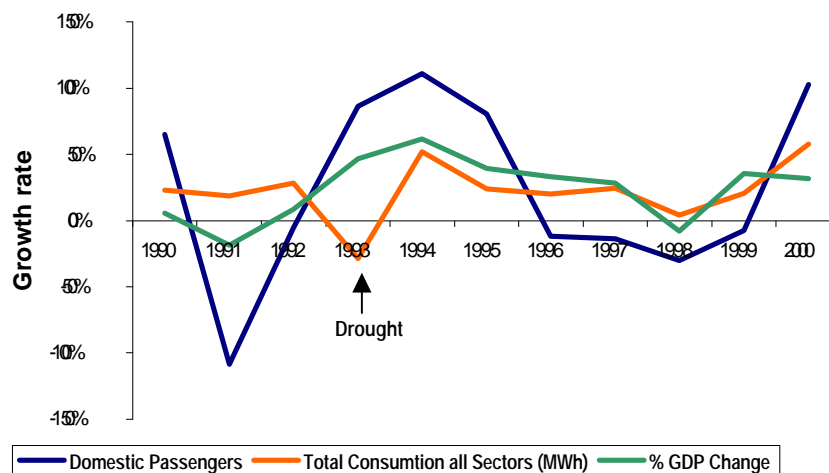
ANZIB considers that several of the indicators that have been used as proxies to establish beta estimates for *airfield charges* are inappropriate, as they reflect operational and regulatory environments that do not reflect the situation faced by CIAL and AIAL. In particular, we reject the following potential comparators:

- **Listed airports** – different regulatory frameworks and aggregate too many cash flow streams with diverse risk characteristics (eg long term property leases vs. revenue-based concession income);
- **ACCC determinations** – ACCC determinations on the asset betas of Australian airports could be employed, but there is no guarantee that they are appropriate. If accepted, they could only be used after appropriate adjustments were made for regulatory structure and the traffic composition of each airport vs. traffic at CIAL and AIAL;
- **Listed ports** - while on their own ports are closer comparators to airports than electricity companies, like airports their revenue stream is composed of wharfage, property rentals and stevedoring operations which have different risk characteristics, as does the nature of the cargo.

Lower bound comparator - US electricity generation/distribution companies

US electricity companies are the least useful benchmark on its own, since the operating risk environment of electricity companies in the US is considerably to that of airports. However, this comparator could be employed as a lower bound on the asset beta for airfield charges. In effect, this is what Dr. Lally had done in his advice to the Commission.

Relative risk profiles: NZ Electricity Consumption vs Passenger Numbers (CAIL)



The chart above shows the relative risk profile of domestic passenger movements at CIAL compared with electricity consumption over the 1990's period. In particular, it will be noticed that domestic passenger numbers react more than proportionately with the change in GDP. The significant dip in 1991 and subsequent recovery of domestic passenger numbers indicates that this component of the aviation industry has a relatively high degree of systematic risk. It is also worth noting that fluctuations in the consumption of electricity are less than proportionate to the change in economic growth. This is reflective of the fundamental low systematic risk nature of electricity demand, and supports the use of electricity companies as a lower bound indicator of airfield asset beta.

Upper bound comparator – airline companies

ANZIB considers that an appropriate upper bound comparator of the operating risk facing airports is provided by airlines. Airlines handle the same passengers as airports and are also subject to high operating leverage. Airports may be expected to face less systematic risk than airlines to the extent that landing charges are based on aircraft takeoff weight, rather than the number of passengers on board. Under such a charging regime a reduction in passenger loads during a recession would not affect the airport's landing charge revenues if airlines maintained their schedules and their fleet mix. This effect is mitigated by the ability of airlines to change their fleet mix in order to minimise the reduction in passenger loads. Airline funding structures in recent years have become more flexible in order to accommodate such movements.

A major advantage that airlines have over airports, that reduces their asset beta relative to airports is their pricing flexibility within a deregulated environment. Other advantages of airlines include:

- a large and widely dispersed customer base (compared with the small number of organised airline "customer/advocates" faced by airports);
- extensive customer loyalty programs;
- ability to change prices and product quality rapidly;
- ability to change route structures and fleet mixes;
- ability to change their cost structure;
- ability to form alliances; and,
- ability to exit markets quickly (vs. a lower ability to enter).

In a heavily regulated airline industry most of these flexibilities would disappear and asset beta would rise. In a study of the effects of deregulation on the systematic risk of US airlines, Cunningham et al (1988) found that for trunk route airlines there was a 50 points decline in beta (capital structure was found to remain relatively constant), while for all airlines, including regionals, there was a 30 points decline. They concluded that in the US airline industry, "a free market environment significantly lowered systematic risk relative to the period of regulation." (p.351)

ANZIB believes that it is important to distinguish the beta risk characteristics of domestic vs. international traffic, since this is a major differentiating factor in the relative risks faced by CIAL and AIAL. Here we are distinguishing "domestic" traffic as traffic which is generated primarily by a country's air travellers, and is therefore driven by the state of the economy in that country. We should expect the asset beta of such a passenger mix to be relatively high, as it is determined by reference to income in a single economy. The income elasticity of demand for air travel in general is expected to be high. On the other hand, airlines with an internationally diversified mix of passengers are expected to have low asset betas relative to

their home economy. This is because the demand for their services will be a function of economic conditions in a number of economies that are not perfectly correlated.

The US airline industry provides a number of observations of purely domestic airlines, and the asset betas of these companies may be compared to those of airlines with highly internationally diversified customer bases and a number of airlines that have a mix of domestic and internationally diversified clientele. This comparison is shown in the Table 4 below.

Table 4. Airline Asset Betas (February 2000)

Sector	Company	Asset Beta
Domestic economy	Alaska Air	.38
	Midwest Express	.35
	Northwest Airlines	.38
	Southwest Airlines	1.10
	US Airways Group	.67
	Japan Airlines	1.09
	Average – Domestic economy	.66
Combined domestic economy & international	Air New Zealand	.40
	Continental Air	.53
	Delta Airlines	.44
	UAL Corporation	.35
	British Airways	.53
	KLM	.25
	Average – International/domestic economy	.42
	Average – All airlines	.54

Source: Datastream, ANZIB analysis adjusts US and UK comparators for market leverage

The average asset beta for airlines that depend purely on domestic customers is found to be .66, although there is a wide divergence. The combined domestic/international airlines average asset beta is found to be .42. With an assumed weighting of 35% of combined airlines business being based on international economy passengers, ANZIB estimates the “pure” deregulated international passenger asset beta at .25.

4.2.2 Asset Beta estimates

Taking a base asset beta of .25 for “international economy” airlines and .65 for “domestic economy” airlines and adding a range of .20 -.30 yields the estimates shown in Table 5 below. Cunningham et al (1988) estimated a .30 differential to reflect the asset beta effect of deregulation (movement from ROR price control to price flexibility). ANZIB has applied a lower range on grounds of conservatism. This procedure generates estimates of .45 to .55 for international ROR regulated airlines and .85 to .95 for domestic ROR regulated airlines.

Table 5. Estimated airline asset betas: regulated vs deregulated

	International market	Domestic market
Base beta estimate (deregulated)	.25	.65
Airline ROR regulation effect – ie price control (Cunningham et al (1988))	.20 - .30	.20 - .30
Beta estimate – regulated airlines	.45 - .55	.85 - .95

ANZIB considers that the asset beta for ROR regulated airfield activities will lie midway between the ROR regulated airlines and ROR regulated electricity companies. This provides base estimates of .65 and .45 for domestic and international passenger airfield operations respectively. ANZIB considers that it is likely that New Zealand airports actually face more than half of the price rigidity risk faced by UK or Australian airports because:

- Prices are effectively fixed for 3 years as opposed to 5 years for UK airports (supporting a risk differential of 60% at least);
- Prices in New Zealand are fixed in nominal terms while they are CPI-adjusted in the UK airports (supporting a risk differential of more than 60%) and;
- Most exceptional economic booms or recessions last less than 3 years.

Therefore, ANZIB adds a range of .10 to .15 to the base numbers calculated above. This range reflects ANZIB's view that price rigidity resulting from the situation of CIAL and AIAL is most likely to lie between half and three quarters of the CPI-X regulatory regimes in Australia and the UK.

Combining the estimated ROR regulated airfield betas and adding a margin of .10 to .15 to reflect additional price rigidity due to the regulatory regime faced by CIAL and AIAL yields asset beta estimates of .50 to .60 for international passengers and .70 to .80 for domestic passengers. In Table 6 we also display the results based on a single market view of airfield charges under which the estimated asset beta ranges from .65 to .75.

Table 6. Estimated airport landing charge asset betas

	International market	Domestic market	Total market
A. Lower boundary:			
US Electricity companies (ROR regulated)	.35	.35	.35
B. Upper boundary:			
Domestic and international airlines (deregulated)	.25	.65	.55
Plus, adjustment for ROR regulation (Cunningham et al)	<u>.20 - .30</u>	<u>.20 - .30</u>	<u>.20 - .30</u>
Adjusted (ROR regulated) airline beta	.50 - .55	.90 - .95	.80 - .85
Imputed airfield beta under ROR regulation (half way between A and B)	.40 - .45	.60 - .65	.55 - .60
Plus, Price rigidity effect (Alexander et al)	.10 - .15	.10 - .15	.10 - .15
Beta estimate – airfield charges at CIAL and AIAL	.50 - .60	.70 - .80	.65 - .75

Source: ANZIB analysis

In the next table, these asset beta estimates for airport traffic components are applied to CIAL and AIAL. Ideally, the weights applied to each asset beta component should be the assets employed in each activity. Since a major component of the airport assets used for international and domestic traffic are jointly provided (ie RTAs), we have applied relative revenues to approximate the weights. The results show that CIAL, which has a lower proportion of revenues derived from international traffic, has an estimated asset beta range of .65 to .75, with an average of .70. On the other hand, AIAL's estimated asset beta for airfield charges is lower, with a range of .58 to .68 and an average of .63, due to its larger proportion of international traffic.

Table 7. Estimated airport landing charge asset betas for CIAL and AIAL

	CIAL			AIAL		
	Asset beta	Weight	Weighted Beta	Asset beta	Weight	Weighted Beta
International	.50 - .60	26.8%	.13 - .16	.45 - .55	60%	.30 - .36
Domestic	.70 - .80	73.2%	.51 - .59	.65 - .75	40%	.28 - .32
Asset Beta			.65 - .75			.58 - .68

Source: ANZIB analysis, AIAL weights are estimated from relative passenger numbers

4.3 Other revenue components

4.3.1 Appropriate comparators

The asset beta risk of the airfield charges component of airport revenues should also be set within the context of the risks faced by airports with respect to other components. The other major components are concession income, rental income and car park income. These are considered in turn.

Concession revenue – Concession income is essentially retail-based income derived from duty free stores, food, clothing and other retail establishments operating within the airport. There are no direct, listed comparators for this category. A useful benchmark, however, would include components of the listed US “specialty retail” industry and “fast food” industries. This provides an estimate of 1.05 for the concession component.

Table 8. Concession revenue: US specialty retail and fast food

Company	Asset Beta
Abercrombie	1.44
American Eagle	1.29
Barnes & Noble	.59
Best Buy	1.55
Borders Group	.53
Buckle	1.34
Circuit City	1.04
Enesco Group	.5
Footstar	.86
The Gap Inc.	1.46
The Good Guys	.42
The Limited Inc.	1.02
PC Connection	1.98
Pier 1 Imports	1.03
Quicksilver	1.15
Talbots Inc	1.25
Tiffany & Co	1.61
Toys R Us	.73
Venator Group	.69
Lone Star Steakhouse	.90
McDonald's Corp	1.05
Papa John's International	.76
Wendy's International	.83
Average	1.05

Source: value Line and ANZIB analysis, adjusted for market gearing

The concessions at CIAL and AIAL are based on contracts under which the airport obtains a percentage of revenue earned by the concessionaire, subject to a minimum revenue amount. Thus, the airport obtains “up-side” from a strong growth in retail sales, but is protected if retail sales fall significantly during a recession. This indicates that the airport has a lower asset beta what could be expected on the basis of the US retail and food industries. On the other hand, the concessionaires at an airport (and therefore the airport itself) already face a “volume risk” effect in the passenger numbers. For example, during a recession the passenger number effect will reduce the number of shoppers at the airport, while it will have another independent effect in reducing the shopping that is done at the airport. On this basis, one could expect airport retailers (and therefore, airports) to be subject to higher systematic risk than the broad comparator chosen. On balance, ANZIB has chosen to retain the estimated asset beta of 1.05 for this component.

Rental revenue – This stream of income is derived from long term contracts for land and buildings that are owned by the airport. Contracts are for a number of years and price reviews are undertaken regularly. In this case the income stream for the airport will not vary significantly through economic booms or recessions since it is based on a long term contract. As long as the businesses paying the rental do not go out of business, a steady stream of income should be earned by the airport. The best benchmark for such a business is the listed property trust sector. Australia has a large listed property trust sector that can be employed as a comparator. The results, shown in the table below, indicate an asset beta of around .28 can be employed.

Table 9. Rental revenue: Australian listed property trusts

Company	Asset Beta
Westfield Property Trust	.42
General Property Trust	.55
Stockland Trust Group	.34
Gandel Retail Trust	.36
BT Office Trust	.15
AMP Diversified Property Trust	.29
AMP Shopping Centre Trust	.28
Centro Properties Group	.27
AMP Office Trust	.35
Macquarie Office Trust	.18
Macquarie Countrywide Trust	.29
AMP Industrial Trust	.26
Tyndall Meridian Trust	.11
Bunnings Warehouse Property	.06
Australian Commercial Property Trust	.33
Average	.28

Source: AGSM Beta Book and ANZIB analysis

Passenger departure charges – The passenger departure charges is a terminal charge based on international traffic, and is highly correlated with the risk structure of international airlines. Whilst this component is not subject to light-handed regulation, the airport does not have pricing flexibility in the same way that airlines have. Therefore, ANZIB estimates an asset beta of .55.

Car park revenue – Car parking revenue is expected to be highly correlated with “domestic economy” generated traffic. However, this source is not impacted by the constraints of regulation that affect the “domestic economy” landing charges. Therefore, ANZIB considers that the unregulated “domestic economy” asset beta of .50 provides a reasonable estimate.

Other revenue – Other revenue is relatively small and comprised of maintenance, utilities recharge and in the case of CIAL, an In Flight service. In the case of AIAL the asset beta estimate is .40, while for CIAL it is estimated at .50 to reflect the greater risk associated with the In Flight service.

4.4 Airport Asset Beta estimate

4.4.1 Airport Asset Betas for CIAL and AIAL

Combining the asset beta estimates for all the components of airport revenue provides the following estimate of asset beta for CIAL and AIAL.

Table 10. Relative airport asset beta estimates

	CIAL			AIAL		
	Asset beta	Weight	Weighted Beta	Asset beta	Weight	Weighted Beta
Airport charges (International)	.50 - .60	9.5%	.05 - .06	.50 - .60	30.0%	.15 - .18
Airport charges (domestic)	.70 - .80	25.8%	.18 - .21	.70 - .80	20.0%	.14 - .16
International Departure Charge	.55	16.0%	.09 - .09			
Concessions	1.05	20.4%	.21	1.05	30.0%	.32
Lease rentals	.28	19.7%	.06	.28	10.0%	.03
Vehicle parking	.50	5.7%	.03	.50	7.0%	.04
Other	.50	2.8%	.01	.40	3.0%	.01
Airport asset beta			.63 - .68			.68 - .74

Source: CIAL and AIAL accounts, ANZIB analysis

The result shows that while CIAL is estimated to have a higher asset beta than AIAL for airfield charges due to its greater proportion of “domestic economy” travellers, it has a lower overall weighted asset beta. AIAL’s overall airport asset beta is estimated at between .68 and .74, compared with CIAL’s .63 to .68. The main driver of this swapping of relativities is the fact that AIAL’s Concessions revenue, and in particular its duty free revenue, is much greater than at CIAL.

4.4.2 Airport Asset Beta comparisons

Having generated estimates of CIAL’s and AIAL’s total asset betas, ANZIB has placed these estimates among the listed airport asset betas that are available. The estimates show the percentage of revenues that are derived from each of the three major sources that can be ordered into low, medium and high asset betas.

Table 11. Airport Asset Betas – market vs calculated estimates (February 2000)

	Property rentals (%)	Landing charges and vehicle parking (%)	Concessions (%)	Regulatory Regime	Asset Beta Estimate
Asset Beta effect	low	Medium	High		
Auckland (est.)	10.0	57.0	30.0	Medium	.68 - .74
BAA	18.5	48.9	28.3	High	.67
Auckland (market)	10.0	57.0	30.0	Medium	.66
Christchurch (est.)	19.7	57.0	20.4	Medium	.63 - .68
Vienna	N/A	71.5	N/A	Medium	.56
Copenhagen	9.5	60.4	27.2	Medium	.46

Sources: Datastream, annual reports, Bloomberg and ANZIB analysis, only BAA adjusted for market leverage

It is difficult to draw firm conclusions based on so few independent estimates of airport betas. However, there are several points worth noting. First, Vienna airport has an asset beta of .56,

its regulatory framework can be described as “medium powered” (Alexander, et al (1999)), and its revenues are dominated by landing charges. Second, the estimated asset beta for Auckland based on asset beta estimates of its components is slightly higher than the market estimate of .66, while substitution of the Commission’s .45 estimated asset beta for landing charges would reduce the components estimate to between .62 and .63. Not much should be read into these alignments given the high standard error associated with a single observation of CIAL’s asset beta. Taking account of the orders of error, it may be noted that the components estimates lie in the range of .60 to .70, which appears to be a broad range for airport asset betas. Alexander et al (1999, p.14) provide estimates of .56 for medium power regulated airports and .69 for high power regulated airports. Finally, given the make-up of Copenhagen’s revenue base, its estimated asset beta of .46 appears relatively low.

4.4.3 Other relativity and reasonableness tests

In order to test the reasonableness of these estimates of asset betas for landing charges at CIAL and AIAL, ANZIB has reviewed the relative income elasticity of demand for international and domestic traffic. These indicators are also compared with the relative income elasticity of demand for electricity consumption in New Zealand.

The chart below demonstrates the implied income elasticities of CIAL’s passenger base compared with AIAL’s. Of particular interest is the sensitivity of domestic and international passengers to the recession of 1991-92 and the subsequent return to GDP growth of around 5% per annum in 1993-94. The chart shows that the percentage change in CIAL’s passenger numbers have indeed been more sensitive to GDP shocks, both during the recession and in the subsequent recovery. Furthermore, in accordance with expectations, the sensitivity of CIAL’s domestic passenger numbers to GDP shocks has been much more pronounced than for its international passengers.

Sensitivity to GDP shocks: domestic vs international passengers

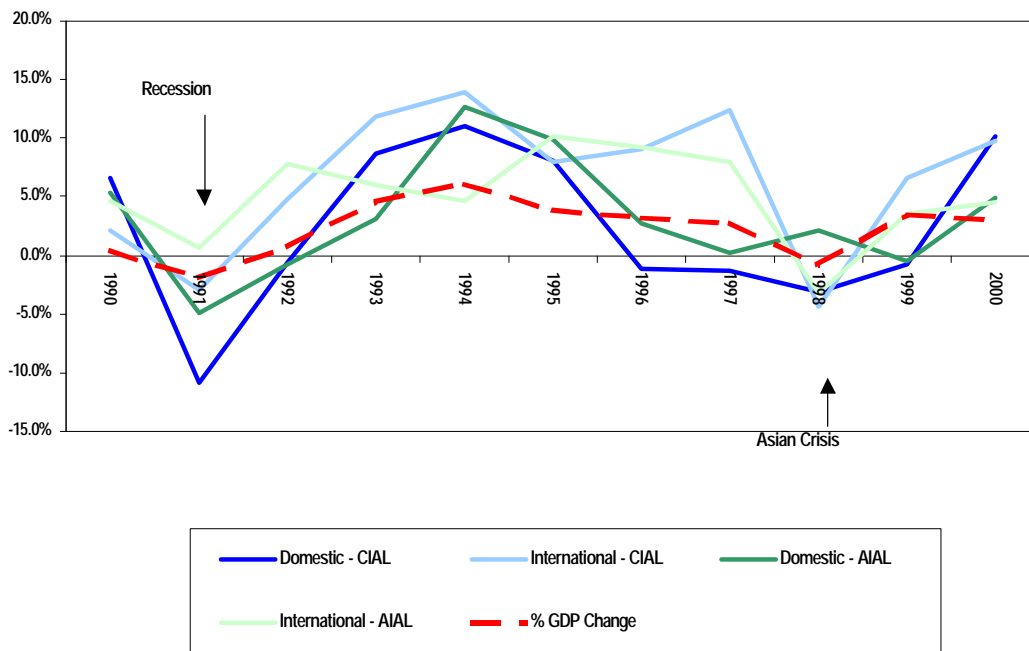


Table shows the relative sensitivity of the revenue components at CIAL, compared with electricity consumption, in response to the major domestic economic shocks which occurred during the early 1990s. In particular, it is apparent that the ordering of income elasticity is from electricity (the lowest systematic risk) to international revenue (intermediate systematic risk) to domestic passenger revenue (highest systematic risk).

Table 12. Income Elasticity of Demand – CIAL revenues vs electricity

Year on year change in:	Recession: 1990-91	Recovery: 1991-92
GDP	-1.3%	1.1%
Electricity consumption	1.9%	2.8%
International pax revenue	-0.8%	2.3%
Domestic pax revenue	-5.4%	8.1%

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Authorship of this Opinion

This Opinion has been prepared by Dr. Michael Lawriwsky, Director – Corporate Finance, ANZ Investment Bank. Michael has 12 years experience in investment banking and was formerly a Professor of Commerce at LaTrobe University. He is co-author, with James Van Horne (Stanford) and Kevin Davis (Melbourne) of *Financial Management and Policy in Australia* (Prentice Hall, 1994) and has a number of publications dealing with corporatisation and privatisation issues and the valuation of utility stocks. Michael's experience in industry policy/regulation includes:

- ♦ Appointed in 1996 as a member of the Review of Business Programs (Mortimer Report).
- ♦ Appointed in 1997 (reappointed 2000) as a part-time Commissioner of the International Air Services Commission, which regulates Australia's international airlines with respect to entry and access to international routes under Australia's Air Service Agreements.

Dr Lawriwsky has been involved in numerous corporate advisory assignments including company valuations and recapitalisations, equity raisings, mergers and acquisitions and experts reports (fairness opinions). In the infrastructure industries his experience includes assignments in valuation, asset beta estimation and regulatory assessment during several bids for distribution and generation companies during the privatisation of electricity in Victoria and South Australia.

Dr. Lawriwsky has had extensive experience in the assessment of asset betas for airport companies. During 1993 he undertook a 7 month assignment for the Department of Transport and Federal Airports Corporation (FAC). In the course of this assignment he undertook asset beta calculations and valuations of all 22 FAC airports. During 1996-7 he was financial adviser to the Port of Brisbane in the successful bid by the Schiphol/CBA/POBC consortium for Brisbane International Airport. In the airline industry he has had experience in the privatisation of Qantas, a capital raising for Compass Airlines and an advisory assignment to the Australian Department of Transport on the takeover of Ansett Airlines by Air New Zealand.

Dr. Lawriwsky spent most of 1996 in New Zealand advising several companies in the electricity industry regarding mergers and acquisitions. This advice also included several valuations of electricity generation, transmission and distribution assets within the context of New Zealand's light-handed regulatory framework. Other New Zealand assignments have included advisory services to TVNZ, to the Auckland City Council on the Corporatisation of its water and waste-water assets, and on the valuation of the Port of Napier.