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Assessing market power in aeronautical services

A report for the Australian Airports Association

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Executive Summary

This report examines the extent to which the pricing of aeronautical services by the four airports – Sydney, Melbourne, Brisbane and Perth (the airports) – the subject of the airports price monitoring regime administered by the Australian Competition and Consumer Commission (ACCC) can be said to reflect the exercise of any market power.

The significance of this question arises in the context of the further detailed review of the performance of the regulatory regime for airports, to be undertaken by the Productivity Commission over the twelve months commencing late June 2018.¹ A finding that aeronautical services are being provided in accordance with outcomes that would be expected under a workably competitive market would imply that the current monitoring regime and its associated arrangements are functioning effectively as a means for curbing the intrinsic market power of the four monitored airports.

Since the structural likelihood that the airports hold a degree of market power is taken as a given, the examination as to the exercise of that market power principally involves an assessment of whether prices or profits have been significantly above the workably competitive level over a sustained period. Our review of the literature shows that there are number of potential pitfalls to which careful attention needs to be given in any profitability analysis directed at the assessment of market power. The most important are that:

- the estimation of an appropriate, contemporaneous WACC for comparison with the achieved rates of return earned by the four price monitored airports can be a significant task;
- returns can be expected to vary in accordance with the stage of the capital life cycle, since the prevalence of periodic, large investment outlays is a prominent feature of airport capital investment programs;
- the absence of excessive profits is not itself sufficient to imply there has been no exercise of market power if service quality has fallen or the rate of innovation is poor; and
- there is a need for any finding of rates of profit above normal rates of return to be both significant and sustained for an inference as to the exercise of market power to be available.

In previous reviews of the airports regulatory regime, the Productivity Commission was also guided by the principle that an analysis of the risk adjusted return on investment is an appropriate basis for assessing the prices charged by airports. The Australian Competition and Consumer Commission (ACCC) and Board of Airline Representatives Australia (BARA) have both also made submissions to the Productivity Commission in support of this form of test.

Notwithstanding, the Productivity Commission noted in its 2006 and 2011 reviews that drawing conclusions about the exercise of market power from rates of return data, either for a single period or over time, was difficult.² It identified fluctuations in the benchmark rate of return over the investment cycle and the dependency of the rate of return on asset values ascribed under accounting standards as practical problems to be overcome.³ These cautionary considerations appear to form the principal reason that the Productivity Commission has not undertaken comprehensive analyses of rates of return in its previous reviews.

The airports price monitoring regime has now been in place since 2002, and the fixing of aeronautical asset values on a line-in-the-sand basis as at 30 June 2005. The four airports have now each experienced at least one round of significant capital investment, so that the rate of return fluctuations that might be expected

¹ Morrison, S, *Inquiry into the economic regulation of airport services*, Terms of reference, 22 June 2018

² Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, p 20; Productivity Commission, *Economic regulation of airport services*, 14 December 2011, p 111

³ Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, p 20; Productivity Commission, *Economic regulation of airport services*, 14 December 2011, p 111

within such a cycle will tend now to have allowed a more meaningful average return measure to develop. For these reasons, it is now more appropriate than ever before to consider the totality of evidence as to achieved rates of return on aeronautical assets over the 15-year life of the current regulatory regime.

Our report presents the results of our empirical assessment of market power by reference to the price cost relationship for aeronautical services, and so the economic returns to airports, over the period since the price monitoring regime has been in place.

The essence of our profitability analysis is the derivation of an annual comparison of:

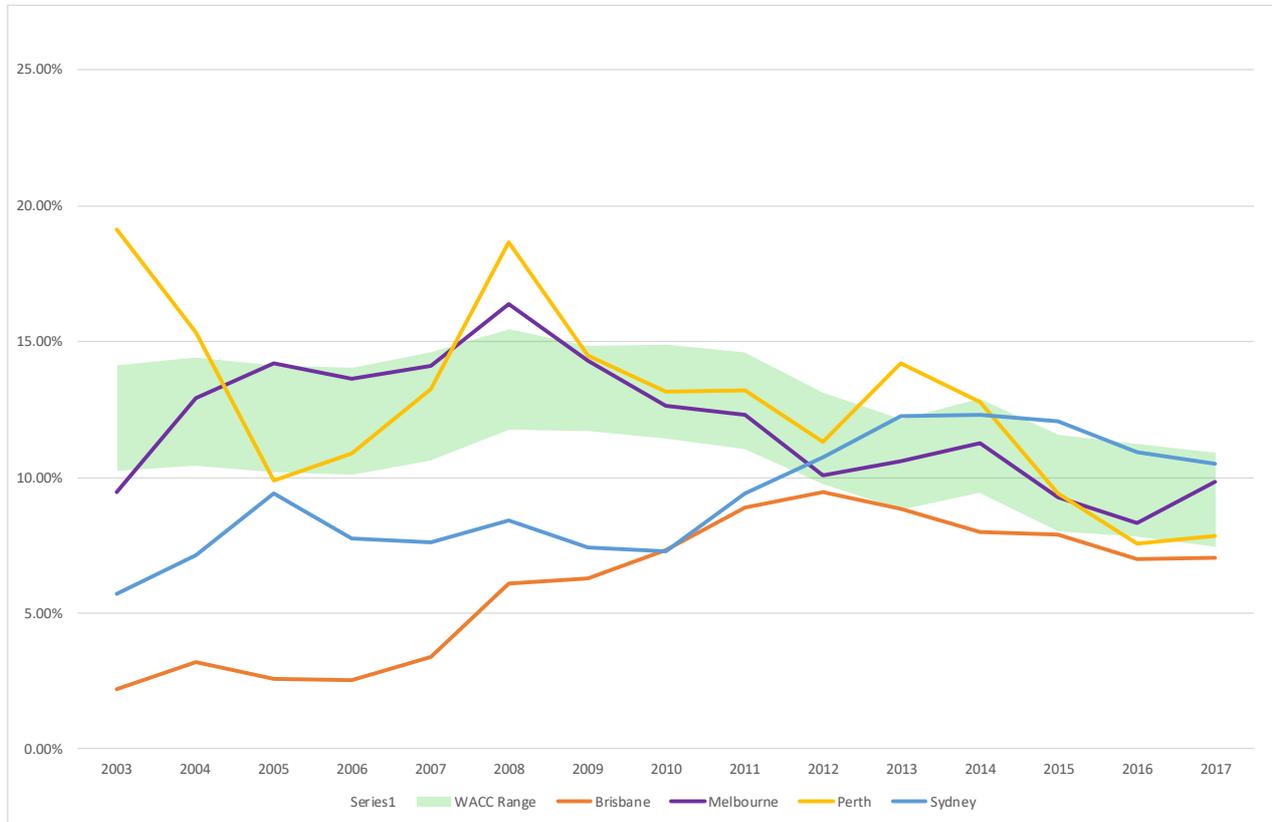
- the rate of earnings before interest and tax (EBIT) as a percentage of the aeronautical asset base for each of the four airports, in each year since 2003 through to 2017, using data disclosed by the ACCC in its annual airport price monitoring reports; and
- an estimated range for the pre-tax nominal, weighted average cost of capital (WACC) for a benchmark Australian airport, derived using readily available upper and lower bounds for each WACC parameter, as drawn from either airport or other infrastructure service provider decisions made by the ACCC – noting that, as far as the value of beta is concerned, the range established by earlier ACCC airports' decisions remains consistent with more recent studies.

The purpose of the estimated WACC that we adopt for this comparison is not to provide an opinion on the likely cost of capital for any particular airport, but rather to identify the range of estimates that is reasonably able to be drawn from material readily available in the context of established regulatory decisions on infrastructure pricing.

We present the results of our analysis for Brisbane, Melbourne, Perth and Sydney airports, respectively, in section four of our report.

Figure 1 below sets out for each airport the return on aeronautical assets in each year during the period 2002/03 to 2016/17, along with our year-by-year lower and upper bound estimates of the WACC for a benchmark Australian airport.

Figure 1: Returns on aeronautical assets for price monitored airport and WACC range



Our results show that:

- for Brisbane airport, the return on aeronautical assets has been consistently at or below the lower bound for the benchmark WACC throughout the period, with its average return being 389 basis points below, but that since 2011/12 Brisbane airport has achieved a return on aeronautical assets close to the bottom of the range of our estimated reasonable WACC;
- Melbourne airport’s return on aeronautical assets has generally been within the range of reasonable estimates of the WACC for a benchmark provider of aeronautical services, falling below our estimated lower bound in just one year and exceeding our upper bound estimate in two other years; over the entire assessment period, Melbourne airport’s average return on aeronautical services is 11.96 per cent, just 24 basis points above the mid-point of our estimated reasonable range for the WACC;
- for Perth airport, the return on aeronautical assets has, on average, been within the range of reasonable estimates of the WACC, falling below our estimated lower bound in two years and exceeding our upper bound estimate in three other years; over the entire assessment period, Perth airport’s average return is 12.74 per cent, which is close to the 75th percentile of our estimate of the reasonable range for the WACC; and
- Sydney airport’s return on aeronautical assets has been below our estimated lower bound for the benchmark WACC for most of the assessment period, but then rising to be close to the top of our upper bound assessment since 2013/14; over the entire assessment period, Sydney airport’s average return on aeronautical services has been 65 basis points below the average of our estimated lower bound for the benchmark WACC.

Overall, these results strongly support a conclusion that none of the four airports can be said to have set prices or achieved levels of profit that can be said to reflect the exercise of any market power. Further, although not the focus is our report, the Productivity Commission's 2011 findings in relation to rates of productivity growth and trends in service quality achieved by the airports are also consistent with the conclusion that there has been no exercise of market power in the provision of aeronautical services.

1. Introduction

This report has been prepared for the Australian Airports Association and relates to the four airports – Sydney, Melbourne, Brisbane and Perth (the airports) – the subject of the airports price monitoring regime administered by the Australian Competition and Consumer Commission (ACCC). The performance of the airports regulatory regime has been subject of two substantial reviews undertaken by the Productivity Commission, in 2007 and 2012, with these reviews following an earlier 2002 Productivity Commission review that recommended price caps that then applied to aeronautical services be abolished, and replaced with a price monitoring regime.

The Productivity Commission is to undertake a further detailed review of the performance of the regulatory regime for airports over the twelve months commencing late June 2018.⁴ In light of that review, the AAA has asked us to undertake an assessment of the extent to which the pricing of aeronautical services provided by the four airports during the period that the monitoring regime has been in place can be said to reflect the exercise of market power.

Importantly, for the purposes of this report, that the four airports possess a degree of market power in the provision of aeronautical services is taken as given. In that context, the focus of our report is the extent to which any market power can be said to have manifested itself in the form of prices for aeronautical services that exceed the long run economic cost of those services.

The significance of this question arises because an assessment to the effect that aeronautical services are being provided in accordance with outcomes that would be expected under a workably competitive market would imply that the current monitoring regime and its associated arrangements is functioning effectively as a means for curbing the intrinsic market power of the four monitored airports.

Our report is structured in three principal sections:

- section 2 presents the results of a review of the academic and regulatory literature addressing both the definition of and means of testing for the exercise of market power, with particular attention to assessments of market power that focus on pricing performance, as distinct from structural indicators of market power;
- section 3 reviews the approaches adopted by the Productivity Commission during its 2006 and 2011 reviews of the airports' price monitoring regime in assessing whether any of the four airports could be said to have exercised their market power in aeronautical services, as well as commentary by the ACCC in its recent airport monitoring reports; and
- section 4 is devoted to the reporting the results of our empirical assessment of market power by reference to the framework we establish in sections 2 and 3, ie, an empirical analysis of the price cost relationship for aeronautical services, and so the economic returns to airports, over the 15 year period since the price monitoring regime has been in place.

⁴ Morrison, S, *Inquiry into the economic regulation of airport services*, Terms of reference, 22 June 2018

2. Firms using market power earn higher profits

In this section, we review the economic and regulatory literature in relation to the identification and measurement of firms' market power. The significance of the concept of market power is that an assessment to the effect that aeronautical services were being provided in accordance with outcomes that would be expected under its antithesis – a workably competitive market – would imply that the current price monitoring regime and its associated arrangements were functioning effectively as a means for curbing the intrinsic market power of the four price monitored airports.

Our review of the literature shows that:

- welfare can be reduced when a market is not workably competitive, in which case firms serving that market are likely to earn above normal economic profits on a sustained basis;
- although there is a wide range of structural indicators relevant to an assessment of whether firms *have* market power, the question to be addressed in the context of the Productivity Commission's review is whether airports have *used* a significant degree of market power on a sustained basis – this principally involves an assessment of whether prices or profits have been significantly above the workably competitive level over a sustained period; and
- there are number of potential pitfalls to which careful attention needs to be given in any profitability analysis directed at the assessment of market power, of which the most important are that:
 - > the estimation of an appropriate, contemporaneous WACC for comparison with the achieved rates of return earned by the four price monitored airports can be a significant task;
 - > returns can be expected to vary in accordance with the stage of the capital life cycle, since the prevalence of periodic, large investment outlays is a prominent feature of airport capital investment programs;
 - > the absence of excessive profits is not itself sufficient to imply there has been no exercise of market power if service quality has fallen or the rate of innovation is poor; and
 - > there is a need for any finding of rates of profit above normal rates of return to be both significant and sustained for an inference as to the exercise of market power to be available.

2.1 Market power is the antithesis of perfect competition

In explaining the concept of market power, it is helpful to describe its antithesis, being the state of perfect competition, as well as its practical manifestation, ie, workable competition.

2.1.1 Perfect competition

Perfect competition is a theoretical construct under which competition is as vigorous as can be conceived. It involves many identical sellers competing to sell a homogeneous product to many buyers.⁵ There are no barriers to entry, so that a firm will enter and undercut the incumbents whenever the price of the product exceeds its marginal cost of production.⁶ It follows that, under conditions of perfect competition, prices are equal to the marginal cost of production,⁷ and so firms do not earn any positive economic profit.⁸

⁵ Morgan, M Katz, and Rosen, H, *Microeconomics*, McGraw-Hill Education, United Kingdom, 2006, pp 368-374

⁶ The cost of production includes the opportunity cost of not using resources for an alternative use.

⁷ In economics, equilibrium refers to the circumstance in which it is in no one's interest to change their production or consumption decisions. In practice, markets are rarely if ever in equilibrium, because the factors that guide consumption and production decisions are constantly evolving.

⁸ Economic profit is any amount remaining once economic cost is subtracted from a firm's revenue. Revenue is the sum of the payments that a firm receives from the sale of its output while economic cost is a firm's total expenditures on the inputs used to produce that output, measured in terms of their opportunity cost. Perfect competition involves no risks to either buyers or sellers, since it involves an

Total welfare is maximised under perfect competition because:

- prices reflect the marginal cost of providing the product, so that output increases to the point at which the benefit to consumers of increasing production by a small amount is equal to the cost of doing so – this is known to economists as allocative efficiency;
- costs of production are minimised because managers of firms have an incentive to do so, and because less efficient firms will not survive – this is known to economists as productive efficiency; and
- firms have an incentive to innovate and invest in new and better products that meet changing consumer tastes – this is known to economists as dynamic efficiency.

In contrast, a firm with market power has the ability to set and sustain prices above the competitive level.⁹ Such a firm may exercise market power through:¹⁰

- not striving to reduce its costs;
- reducing the quality of its product below the competitive level; and/or
- setting a price above or reducing output below the competitive level.

These actions reduce welfare through the provision of an inferior product and/or a lower level of output, relative to that under perfect competition.

However, the assumptions necessary for competition to be perfect do not hold for the vast majority of real world markets. Such imperfections include, for example:

- that almost all firms have a degree of market power, because their products are differentiated to some degree, so that not all buyers will immediately switch to an alternative supplier in the face of a price rise;
- there are usually some barriers to entry that prevent new firms from competing immediately from the point when incumbent firms make a small positive economic profit;
- many forms of production involve significant capital costs that cannot readily be deployed in any other enterprise, with the consequence that the marginal cost pricing rule that applying under perfect competition may prevent a firm from recovering all of its economic costs;
- consumers and firms do not have perfect information, and so market transactions are burdened by the costs of discovering and choosing between alternatives, the negotiation of sales and purchases, etc; and
- firms rarely all face the same costs – those firms with lower costs than the market average will be able to earn a positive economic profit, whilst others may not.

It follows that an individual firm may be able to set its prices at above their long run economic cost without losing all of its customers, and so many firms are periodically able to earn some amount of positive economic profits.

Further, some degree of market power is essential for competition to operate effectively, through its role in establishing the incentive for firms to offer better products.¹¹ Without the ability to establish some market power in light of innovation, there would be no benefit from improving products or reducing costs.

assumption that buyers and sellers both have perfect information. See: Morgan, M Katz, and Rosen, H, *Microeconomics*, McGraw-Hill Education, United Kingdom, 2006, p 220

⁹ See: Motta, M, *Competition Policy: Theory and Practice*, pp 40-41 and Werden, *Identifying Market Power in Electric Generation*, Public Utilities Fortnightly, 15 February 1996. The competitive level is that which would eventuate under perfect competition.

¹⁰ Firms may also undertake rent-seeking activities, whereby they lobby for rules that increase their market power. See: Motta, M, *Competition Policy: Theory and Practice*, p 44

¹¹ For example, patent laws confer a monopoly over newly developed production technology or products, in order to encourage innovation – of which the most widely recognised example is pharmaceutical patents that are designed to provide incentives for firms to develop new drugs.

2.1.2 Workable competition

The fact that perfect competition almost never arises has caused economists to discuss the idea of workable or effective competition, ie, the state in which competition is working as well as one might hope in a market economy.

The term 'workable competition' was first coined in 1940 by Clark as a basis for describing competition in a market that is less extreme than the idealised benchmark of perfect competition, but serves as a realistic standard against which market power can be measured.¹² Clark notes that, in favourable circumstances, existing and potential competitors may provide a check on the tendency of firms to exploit market power over the long run by increasing prices or reducing output.¹³

Workable competition was described by the US Attorney-General's National Committee in its study of anti-trust laws in 1955 as follows:

The concept of "workable" or "effective" competition can perhaps best be described as the economists' attempt to identify the conditions which could provide appropriate leads for policy in assuring society the substance of the advantages that competition should provide...

The basic characteristic of effective competition in the economic sense is that no one seller, and no group of sellers acting in concert, has the power to choose its level of profits by giving less and charging more. Where there is workable competition, rival sellers, whether existing competitors, or new or potential entrants into the field, would keep this power in check by offering or threatening to offer effective inducements, so long as the profits to be anticipated in the industry are sufficiently attractive in comparison with those in other employment when all risks and other deterrents are taken into account. The result would be to force the seller who sought to increase his profits above this level by employing a high-price, limit-output monopoly policy either to give it up, or to lose ground to his rivals at a rate sufficient to reduce his profits, thus defeating the policy.

In other words, there are sufficient competitive constraints in a workably competitive market to keep prices and profits in check, at least to an extent.

The Hilmer Committee report on National Competition Policy defined workable competition as a benchmark against which market power could be measured, by reference to the level of prices that could be sustained:¹⁴

In markets characterised by workable competition, charging prices above the level of long run average costs will not be possible over a sustained period, for higher returns will attract new market entrants or lead customers to choose a rival supplier or product.

The Hilmer Committee report also implicitly defined the 'long run average costs' as an 'efficient' level of pricing, noting that where workable competition was absent, firms may be able to price above the efficient level. More generally, the report noted that the '*promotion of effective competition and the protection of the competitive process are generally consistent with maximising economic efficiency*'.¹⁵

Similarly, the Australian Competition Tribunal (the Tribunal) has said that a market is sufficiently competitive (a similar concept to workably competitive) to warrant the withdrawal of regulatory intervention if:¹⁶

...the market experiences at least a reasonable degree of rivalry between firms each of which suffers some constraint in their use of market power from competitors (actual and potential) and from customers. The criteria for such competition are structural (a sufficient number of sellers, few inhibitions on entry and expansion), conduct-based (eg no collusion between firms, no

¹² Clark, J.M. (1940) "Towards a concept of workable competition", *The American Economic Review*, 30(2), pp. 241-256

¹³ *Ibid*, pp. 246-247

¹⁴ Independent Committee of Inquiry on National Competition Policy, *National Competition Policy Review*, 25 August 1993, p. 269.

¹⁵ *Ibid*, pp. 4-5

¹⁶ Application by Chime Communications Pty Ltd (No 2) [2009] ACompT 2, Para 48

exclusionary or predatory tactics) and performance-based (eg firms should be efficient, **prices should reflect costs** and be responsive to changing market forces). [emphasis added]

It has also been suggested that in the presence of workable competition there would be no need for regulatory intervention in such a market to reduce the level of market power.¹⁷ For example, the High Court of New Zealand has said:¹⁸

Rather, the legacy of Clark's notion is that workable competition is a practical description of the state of an industry where government intervention to make the market work better is not justified because the socially desirable outcomes generated by competition already exist to a satisfactory degree.

To summarise, in a workably competitive market:

- the ability of firms profitably to set prices above (or quality below) the competitive level over the long term is constrained;
- there is no need for the government to intervene otherwise to constrain firms' market power; and
- the revenue earned by suppliers over the long term will approximate the efficient costs of supplying the product or service.

The converse is true for markets that are not workably competitive, eg, a firm will only face weak restrictions in its ability profitably to set prices above the competitive level over the long term. This leads to the same welfare losses as set out above for when there is market power.

It is difficult to draw a precise threshold for which prices that exceed such a level are not consistent with workable competition. However, the most relevant factors cited in the literature to be taken into account are:

- the longer the period over which prices are above the competitive level, the more likely it is that such a market is not workably competitive;
- high prices and/or rates of profit are less likely to be caused by the absence of workable competition if they involve a firm that has lower costs or better products than others in the market; and
- the greater the extent to which prices are above the competitive level, the more likely it is that the market in which they occur is not workably competitive.

The significance of such a threshold arises because an assessment to the effect that aeronautical services were being provided in accordance with outcomes that would be expected under a workably competitive market would imply that the current price monitoring regime and its associated arrangements were functioning effectively as a means for curbing the intrinsic market power of the four price monitored airports

2.2 Literature on the identification of market power

The principal interest of competition economics in relation to market power is identifying firms that possess a significant degree of market power, since this is often a threshold for enforcement of competition laws.¹⁹ There is also a strong focus in the literature on whether firms have used market power to harm their competitors, since unilateral conduct of this form is generally prohibited. Comparatively speaking, much less attention is given in the literature to the question as to whether firms have used their market power to set high prices for customers, principally because antitrust or regulatory inquiries directed at this particular

¹⁷ Indeed, it has been suggested that workable competition is present when no policy would improve social welfare.

¹⁸ *Wellington International Airport Ltd v Commerce Commission* [2013] NZHC 3289 (11 December 2013), paras. 12-13

¹⁹ For example, a threshold condition for invoking the s46 or unilateral conduct provisions of the *Competition and Consumer Act 2004* is that a firm has '...a substantial degree of power in a market...'

question are conducted only infrequently.²⁰ This is because it is generally not a breach of competition law²¹ for a firm simply to set 'high' or 'excessive' prices. Rather, the question of whether or not prices in a particular market are too high generally only arises in circumstances where some form of regulatory intervention is being contemplated or evaluated – as is the essential question that falls to be assessed by the Productivity Commission in its forthcoming airports inquiry.

There is a rich literature on the structural indicators that may be helpful to determine whether a firm has market power. This shows that a firm usually has more market power when:²²

- barriers to entry and/or expansion are higher;
- economies of scale and/or scope are greater;
- market concentration is greater;
- product differentiation is greater;
- buyer power is less and/or transactions costs are higher;
- the existing economic regulation of the market is weaker; and
- vertical integration is greater.

However, the way in which these factors combine to give a firm market power in a dynamic environment is complex and needs to be examined on a case-by-case basis. This literature is not relevant to the question of whether the four price monitored airports may be exercising their market power, because the background presumption is that the airports *have* market power. Rather, the focus of attention in the context of the Productivity Commission inquiry is the question of whether the airports have *used* market power, since the presence or absence of such evidence would establish inferences as to the success or otherwise of the price monitoring regime in curbing the airports' intrinsic market power.

The primary ways to assess whether market power has been used are to examine the extent to which:²³

- prices are persistently above the competitive level; or
- profits are consistently excessive.

The analysis of whether market power has been used to set prices or earn profits that are above the competitive level is generally last on the list of indicators of market power found in the economic literature, and is often not mentioned at all. The reasons include that:²⁴

- the principal interest of competition economics is identifying firms that possess market power, since this is often a threshold for enforcement of the unilateral conduct provisions of competition laws;
- the identification of firms with market power by reference to rates of profit alone would risk many false positives, since there are many reasons other than the possession of market power as to why a firm may be earning abnormally high profits, such as above average levels of innovation or efficiency improvement;

²⁰ OECD, *Excessive Pricing*, pp 9-11

²¹ We note that some interpretations of Article 102 of the Treaty on the Functioning of the European Union, which prohibits the abuse of a dominant position in a market, have found excessive prices to be a breach of this provision.

²² Motta, M, *Competition Policy: Theory and Practice*, pp 40-41; Office of Fair Trading, *Assessment of market power*, 2004, pp 9-25, European Commission, *Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services*, July 2002, paras 73-78; European Commission, *DG Competition discussion paper on the application of Article 82 of the Treaty to exclusionary abuses*, 2005, paras 28-42 and *Re Queensland Co-operative Milling Association Ltd* (1976) 25 FLR 169.

²³ Office of Fair Trading, *Assessment of market power*, 2004, p 25

²⁴ Office of Fair Trading, *Assessment of market power*, 2004, p 25. High levels of prices or profits are not mentioned as indicators of market power in: European Commission, *Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services*, July 2002

- profit based measures are subject to many practical implementation difficulties, such as determining the appropriate measure of cost for the purposes of measuring market power from company accounts;²⁵
- firms can have different levels of prices for many reasons that may have nothing to do with market power, such as a lower cost of supply than other firms, a better product, or variances in demand or scale across markets; and
- the effect of market power can be to raise costs, which may mitigate the profit consequences of prices being above the competitive level.

The consequence is that economic literature on the role and application of profitability analysis as a means for assessing the extent to which market power may have been exercised is more limited, although nevertheless, it does contain some important and consistent themes.

2.3 Profitability analysis and the assessment of market power

In a perfectly competitive market, a firm's revenue is equal to its total costs, implying that the rate of return on invested capital for a particular business is equal to its cost of capital for that activity.²⁶ Only when profits rise above this level may evidence be established that a firm has used its market power.

The role of profitability analysis as the basis for conclusions as to whether profits are above the competitive level has been described as a test for 'excess profits', which are defined as the difference between:²⁷

- actual earnings before the deduction of interest charge – such as, earnings before interest and taxes or EBIT – of a firm; and
- a 'normal' profit or earnings measure, being the firm's cost of capital multiplied by its capital employed at the commencement of each measurement period (usually, a year).

A similar approach to the definition of excessive profits has been adopted by:

- the New Zealand Commerce Commission in its pricing principles developed for Auckland, Christchurch and Wellington airports;²⁸ and
- the United Kingdom (UK) Competition Commission in its investigation of the aggregates, cement and ready-mix concrete market.²⁹

The UK Competition Commission has stated that:³⁰

... where, persistently, profits are substantially in excess of the cost of capital for firms that represent a substantial part of the market could be an indication of limitations in the competitive process.

The economic and regulatory literature provides a number of insights on the practical implementation and interpretation of profitability analysis for the purposes of assessing market power. These include:

- that the relevant metric for evaluating market power is a firm's economic profits rather than accounting profits;
- the role and estimation of a 'normal' rate of return;

²⁵ Motta, M, *Competition Policy: Theory and Practice*, p 116

²⁶ Alan Gregory, *Excessive prices and the role of profitability analysis* | *OECD Roundtables Excessive Pricing*, February 2012, pages 389

²⁷ Alan Gregory, *Excessive prices and the role of profitability analysis* | *OECD Roundtables Excessive Pricing*, February 2012, pages 390-391

²⁸ NZ Commerce Commission, *Final Report | Part IV Inquiry into Airfield Activities at Auckland, Wellington, and Christchurch International Airports*, 1 August 2002, page 169

²⁹ Competition Commission, *Aggregates, cement and ready-mix concrete market investigation*, | *Final report*, 14 January 2014, page 7

³⁰ Competition Commission, *Market Investigation References* | *Competition Commission Guidelines*, June 2003, page 35

- the measurement of profitability over a subset of an asset's life;
- how best to allocate costs;
- the appropriate treatment of intangible assets;
- that profitability analysis provides no insights regarding whether the firm is offering a low quality or high cost service; and
- that any excess profits must be substantial and sustained to support a finding as to the exercise of market power.

We discuss each of these insights in turn below, and draw any relevant implications for the assessment of the four price monitored airports.

2.3.1 Economic vs accounting profits

The principal reason that firms produce financial data on their revenues, costs and assets is the requirement to publish accounts for statutory and tax purposes. These accounts are developed following strict accounting principles and standards, but do not necessarily reflect economic measures of costs and profits.

A firm's accounting profit is the difference between its revenues and operating expenses, which includes an allowance for the allocation over time of the cost of past investments, ie, depreciation. In contrast, economic profit is the difference between a firm's revenues, operating expenses and the *opportunity costs* of inputs used to make its sales, where the *opportunity cost* of using a unit of resource is the maximum amount that a unit could earn elsewhere.

There is widespread recognition in the literature that:³¹

'[o]nly economic profits are possibly relevant and reliable for evaluating market power'.

The consequence of this distinction is that a measure of economic profits must be derived from statutory accounting data, which may not be a simple task. For example, differences between accounting and economic rates of depreciation can give a misleading picture of the rate of profitability. This phenomenon has been illustrated³² by reference to the example of non-constant asset replacement patterns, under which the use of return on capital employed (ROCE) together with conventional straight-line accounting depreciation will cause ROCE to be lower in the early years of an asset's life and higher in the later years. The consequence is not that profitability analysis is impossible, but that there is a need to be aware of the age profile of the asset base when interpreting ROCE numbers.³³

Consistent with long standing recognition of these distinctions, the financial information disclosed to the ACCC by the four price monitored airports – which must be reconciled to but is different from that appearing in the airports' statutory accounts – can be taken to have as one of its purposes the establishment of a more 'economic' framework for the measurement of relevant revenues, costs and levels of profit in relation to the provision of aeronautical services.

2.3.2 Estimation of a normal rate of return

One of the most significant practical difficulties in undertaking a profitability analysis is the estimation of a normal rate of return, ie, the rate of return under workable competition. The New Zealand Commerce Commission has said that the relevant rate of return for assessing performance is the rate that reflects what

³¹ See: Bork, Robert and Sidak, Gregory, *The Misuse of Profit Margins to Infer Market Power*, Journal of Competition Law & Economics, 9(3), September 2013, page 513

³² Alan Gregory, *Excessive prices and the role of profitability analysis* | OECD Roundtables Excessive Pricing (2011), February 2012, pages 392-393

³³ Alan Gregory, *Excessive prices and the role of profitability analysis* | OECD Roundtables Excessive Pricing (2011), February 2012, page 393

equity and debt security providers could be earning by committing their funds to alternative projects with similar risk. In other words, the normal rate of return is equal to the opportunity cost of capital.³⁴

Since companies are typically funded by a combination of debt and equity, most regulators and competition authorities estimate the opportunity cost of capital by means of a weighted average cost of capital (WACC). The WACC is simply the sum of the cost of debt and the cost of equity weighted by the proportion of these two forms of capital finance.

In a report for the Office of Fair Trading, Oxera highlights a number of matters that should be considered when estimating the cost of capital including:³⁵

- the need to ensure consistency between the profitability measure and the cost of capital benchmark, including consistency with:
 - > the treatment of taxation;
 - > the use of constant prices (ie, prices without adjustment for inflation) or current prices (ie, prices with adjustment for inflation); and
 - > time period of assessment;
- an appreciation that it is difficult to estimate the cost of capital with precision, and that it is common to use a range rather than a point estimate of the cost of capital, which may involve using estimates derived from more than one financial model;
- that business hurdle rates include premiums for project specific risk and so do not reflect the opportunity cost of capital; and
- that the estimation of the WACC uses firms with similar risks to the firm or industry under investigation, and when selecting comparators it is common to use:
 - > other companies in the same industry and in the same region;
 - > other industries with similar characteristics operating in the same region; and
 - > companies in the same industry but operating in other regions.

The consequence of this requirement is that the estimation of an appropriate, contemporaneous WACC for comparison with the achieved rates of return earned by the four price monitored airports will be an important task in undertaking a profitability assessment in the context of the forthcoming Productivity Commission inquiry.

2.3.3 Measuring profitability over a subset of an asset's life

The economic profits of a firm can only be precisely calculated over the life of the firm. However, as a practical matter the analysis of economic profits is commonly required to be undertaken over a shorter period. An assessment of profit margins over a truncated period gives rise to a requirement for robust estimates of the economic value of assets at both the start and end of the assessment period.

However, accounting book values generally do not align to the economic value of assets, which undermines the ability of profitability analysis to provide meaningful insights into whether a firm has exercised market power. The use of accounting asset values was discussed in the context of UK Competition Commission's investigations of BAA airports in 2009. The Competition Commission noted that:³⁶

³⁴ NZ Commerce Commission, *Final Report | Part IV Inquiry into Airfield Activities at Auckland, Wellington, and Christchurch International Airports*, 1 August 2002, page 147

³⁵ Oxera, *Assessing profitability in competition policy analysis | Economic Discussion Paper 6 | A report prepared for the Office of Fair Trading by Oxera*, July 2003, pages 114-119

³⁶ Competition Commission, *BAA airports market investigation | Working paper on the financial and investment performance of BAA's non-designated airports*, 12 May 2008, page 4

We were aware of the limitations of our HCA [**Historic cost accounting**]-based analysis. Although the returns from Aberdeen seemed very high, the airports all had large amounts of long-lived assets such as runways that had been built in the 1970s and were in the balance sheets at an unindexed book value that fell far short of their depreciated replacement cost.

Similar concerns have been highlighted in the academic literature, noting that:³⁷

For newly purchased assets, accounting book values will be accurate measures of value to the business, assuming the decision to acquire the asset has been the result of a rational NPV analysis. However, through time there can be a gulf between accounting book values and MEAs [**modern equivalent assets**]. The most obvious examples of why such a gulf might emerge include inflation and technological change.

Consistent with these sentiments, Oxera has also observed that rates of return can vary considerably over the life cycle of a firm and particularly those that require periodic, large investment outlays – unless full life-cycle returns are compared, it is important to take account of the stage of the capital life cycle of the firm or industry being assessed.³⁸

In the case of the four price monitored airports, the need for appropriate asset values at the start and end of any assessment period is largely met by the arrangements prescribed for reporting aeronautical asset values under the ACCC monitoring regime, particularly following the 'line in the sand' asset valuation decision taken in 2007. Beyond this, it is also important to take into account that returns typically vary in accordance with the stage of the capital life cycle, since the prevalence of periodic, large investment outlays is a prominent feature of airport capital investment programs.

2.3.4 Cost and allocation issues

The practical assessment of profit margins can be complicated by the requirement to allocate costs and assets to different products and services produced by a firm. This requirement arises when a firm produces multiple products and services, but where concerns in relation to the exercise of market power affect a segment of the business.

The task of allocating costs typically begins with the classification of costs into the following three categories:

- direct costs – being costs that can be directly and exclusively attributed to a product;
- joint costs – being costs associated with a single production process that produces multiple products; and
- common costs – being those that arise when multiple products are produced together but could be produced separately.

Cost allocation issues arise whenever joint or common costs are prevalent in the segment of the business for which there are market power concerns. Although there a number of accepted methods for allocating joint and common costs, this process can typically give rise to scope for discretion.

In case of the airports' monitoring regime, the basis upon which costs are allocated between aeronautical and non-aeronautical services is specifically addressed by way of ACCC guidelines and by a statutory requirement that cost allocations be certified as compliant by auditors,³⁹ with the purpose of ensuring consistency between each of the airports and over time.

³⁷ Alan Gregory, *Excessive prices and the role of profitability analysis* | *OECD Roundtables Excessive Pricing* (2011), February 2012, page 394

³⁸ Oxera, *Assessing profitability in competition policy analysis* | *Economic Discussion Paper 6* | *A report prepared for the Office of Fair Trading by Oxera*, July 2003, pages 114-119

³⁹ Section 142, *Airports Act 1996* (Cth).

2.3.5 Intangible assets

As a matter of principle, the establishment of an economic value of a firm's assets applies to both tangible and intangible assets. However, financial accounts typically do not record the full value of intangible assets. For example, the cost of research and development (R&D) expenditures are typically written off in the year in which they are incurred, whereas the intangible assets potentially created by R&D are often not incorporated into the balance sheets of firms. Ignoring the value of intangible assets can lead to the profitability of a firm being overstated.

This issue is a particular concern in industries characterised with significant innovation which has been recognised by UK Competition Commission:⁴⁰

At points in time, the profits of some firms may exceed what might be termed the 'normal' level. Reasons for this could include, ... the fact that some firms may be earning profits gained as a result of past innovation.

It is not clear that the value of any intellectual property that may have been developed by the four price monitored airports is likely to be a significant consideration in assessing returns to their aeronautical businesses.

2.3.6 Service quality and cost structure

The analysis of a firm's profits cannot inform the question as to whether a firm may have exercised any market power through reductions in service quality (below that sought by its customers) or inefficiency in its cost structure. Put another way, the absence of excessive profits is not itself sufficient to imply there has been no exercise of market power if service quality has fallen or the rate of innovation is poor.

Paul Geroski, Chairman of the UK Competition Commission has labelled such conduct as follows:⁴¹

A monopolist may well take its reward in the form of high profits, but, equally, it might also use its position to enjoy the easy life instead. Furthermore, a monopolist that has had to compete to acquire its monopoly position may well have dissipated many of the rents which that position gives it. Either way, the outcome is that a firm with market power that opts for the quiet life will not be seen to be earning persistently high profits. It follows, then, that it would not necessarily be correct to infer the absence of a monopoly problem from the absence of persistently high profits.

Similarly, the New Zealand Commerce Commission has observed:⁴²

As a general principle, rate-of-return figures must be used with care when assessing efficiency, as the returns reflect changes in both revenues (pricing) and costs. A firm with market power may earn high returns by raising prices rather than lowering costs. Excess returns might be present, but be absorbed in higher costs, so that allocative inefficiency is both obscured, and augmented by a further loss in the form of productive inefficiency. For these reasons, the efficiency with which resources are being used should ideally be assessed.

2.3.7 Excessive profits must be significant and sustained

Finally, a profitability assessment should focus on whether achieved rates of return that are significantly and persistently higher than normal rates of return. This point was emphasised by Professor Yarrow in a report for the New Zealand Commerce Commission in the context of its rate of return review for airports. Professor Yarrow noted that the role of the information disclosure regime for airports is that:⁴³

⁴⁰ Competition Commission, *Market Investigation References | Competition Commission Guidelines*, June 2003, page 35.

⁴¹ Paul Geroski, *Profitability analysis and competition policy*, Oxera Agenda April 2005, page 2

⁴² NZ Commerce Commission, *Final Report | Part IV Inquiry into Airfield Activities at Auckland, Wellington, and Christchurch International Airports*, 1 August 2002, page 168

⁴³ George Yarrow, *Responses to questions raised by the Commerce Commission concerning WACC estimates for information disclosure purposes in the airports sector*, February 2016, page 2

It follows that best-practice policies that engage with market power issues, including policies that are directed against excessive pricing or excessive profitability, are focused on problems that are likely to occur only when market power and its exercise rise above threshold levels at which any further increases tend to become harmful, not when they deviate from zero. Antitrust or competition law practice is the most obvious source of examples.

The need for any finding of rates of profit above normal rates of return to be sustained for an inference as to the exercise of market power to be available is also consistent with the observations above as to the expectation that rates of return are likely to vary over the course of a capital investment cycle.

2.4 Conclusion

Intervention in a market may be warranted when market power is being exercised to a sufficiently great extent that the performance of the market – in terms of price, output and/or service quality outcomes – is inconsistent with workable competition and expected to remain so. In practical terms, the workable competition standard means that:

- no one or more firms are able profitably to set prices above (or quality below) the competitive level over the long term; and
- the revenue earned by suppliers over the long term will approximate the efficient costs of supplying the product or service.

The economic literature is rich with the identification of structural indicators of whether firms have market power, such as market shares, barriers to entry, etc. However, for the purpose of drawing inferences as to the performance of the airports' price monitoring regime – which has been designed to curb the presumed market power of the airports – the focus is whether there has been any exercise of market power. This requires an assessment of whether prices and/or profits are significantly and persistently above the competitive level.

The literature summarised above provides insights on both:

- the role and purpose of an assessment as to whether a firm's profits are *significantly* and *persistently* high in assessing market power; and
- the practical implementation and interpretation of profitability analysis designed to undertake such an assessment.

3. Previous analysis of airports' profitability

In this section, we review the approaches adopted by the Productivity Commission during its 2007 and 2012 reviews of the airports' price monitoring regime in assessing whether any of the four airports could be said to have exercised their market power in aeronautical services. We also review more recent observations made by the ACCC in its annual airport price monitoring reports.

3.1 Productivity Commission

Since the introduction of the current light-handed regulatory regime in 2002, the Productivity Commission has undertaken two reviews of the price of airport services. The fundamental purpose of these reviews has been to assess the performance of the existing price monitoring regime and, to the extent its performance may have fallen short of expectations, to identify whether a more intrusive form of regulation should be adopted

3.1.1 Guiding principles

In 2006, the Productivity Commission's first assessment of the price monitoring regime analysis was primarily guided by the extent of compliance with the pricing principles that had been set out by the Australian government. These specified that:

'...efficient prices broadly should generate expected revenue that is not significantly above the long-run costs of efficiently providing aeronautical services.'⁴⁴

Following this review, the Australian government set out the Aeronautical Pricing Principles, which build on the more general Part IIIA pricing principles for infrastructure of national significance.⁴⁵ In its 2011 review, the Productivity Commission interpreted the Aeronautical Pricing Principles as an overarching set of principles that should govern assessments of airport behaviour.⁴⁶

The Aeronautical Pricing Principles state that prices for aeronautical services and facilities provided by airports should:⁴⁷

(i) be set so as to generate expected revenue for a service or services that is at least sufficient to meet the efficient costs-of providing the service or services; and

(ii) include a return on investment in tangible (non-current) aeronautical assets, commensurate with the regulatory and commercial risks involved and in accordance with these Pricing Principles;

Where:

'For the purpose of determining aeronautical prices through commercial negotiations, [efficient costs] should be long-run costs unless another basis is acceptable to the airports and their customers.'⁴⁸

⁴⁴ Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, p 12

⁴⁵ Costello, P, *Productivity Commission report – Review of price regulation of airport services*, 20 April 2007, <https://ministers.treasury.gov.au/DisplayDocs.aspx?doc=pressreleases/2007/032.htm&pageID=003&min=phc&Year=&DocType=0>, accessed 27 September 2017

⁴⁶ Productivity Commission, *Economic regulation of airport services*, 14 December 2011, p LI

⁴⁷ Costello, P, *Productivity Commission report – Review of price regulation of airport services*, 20 April 2007, <https://ministers.treasury.gov.au/DisplayDocs.aspx?doc=pressreleases/2007/032.htm&pageID=003&min=phc&Year=&DocType=0>, accessed 27 September 2017

⁴⁸ Costello, P, *Productivity Commission report – Review of price regulation of airport services*, 20 April 2007, <https://ministers.treasury.gov.au/DisplayDocs.aspx?doc=pressreleases/2007/032.htm&pageID=003&min=phc&Year=&DocType=0>, accessed 27 September 2017

This suggests that the Productivity Commission was guided by the principle that an analysis of return on investment, taking into account the risks, is an appropriate basis for determining prices charged by airports.

3.1.2 Rates of return/profitability measures

Consistent with the evolution of these review principles, the Productivity Commission suggested in 2006 that an analysis of achieved rates of return would be a suitable approach, stating that:⁴⁹

...the appropriate test is whether the ex-post rate of return on aeronautical assets has been 'reasonable' relative to the risks involved.

In 2006, the ACCC and the Board of Airline Representatives Australia (BARA) both made submissions to the Productivity Commission in support of this form of test. BARA submitted that, given the setting, it considered pre-tax return on assets as the only meaningful measure of pricing conduct.⁵⁰ The ACCC submitted that a test of whether airports exercise their market power by increasing prices above a competitive level involved assessing whether the ex-post rate of return on aeronautical assets has been 'reasonable' relative to the risks.⁵¹

However, the Productivity Commission noted in its 2006 and 2011 reviews that drawing conclusions about the exercise of market power from rates of return data, either in a single period or over time, was difficult.⁵² The Productivity Commission identified fluctuations of the rate of return over the investment cycle and the dependency of the rate of return on asset values ascribed under accounting standards as problems.⁵³ These cautionary considerations, which we discuss further below, appear to form the principal reason that the Productivity Commission has not undertaken comprehensive analyses of rates of return in its previous reviews.

Investment cycle effects

The Productivity Commission has previously explained that rates of return vary in relation to 'investment cycle effects'.⁵⁴ Given that airport investment is large and lumpy, new capacity is often constructed in anticipation of long term passenger growth. Hence augmentation usually leads to excess capacity and low returns in the early years following any such investment. Over time, as capacity utilisation improves, revenues and prices will tend to increase, resulting in higher rates of return.

Melbourne Airport made submissions to the Productivity Commission's reviews in 2006 and 2011 to this effect.⁵⁵ Melbourne Airport submitted that returns may reflect the point an airport is at in the 'capacity cycle' or 'large future capital programs', with returns on assets is negatively correlated with surplus capacity.⁵⁶ It explained low returns reflect the presence of surplus capacity and high returns occur when average costs fall

⁴⁹ Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, p 19

⁵⁰ Board of Airline Representatives of Australia, *Response to the Draft Report of the Productivity Commission's inquiry into price regulation of airport services*, submission 48, October 2006, p 16

⁵¹ ACCC, *Submission to the Productivity Commission's inquiry into price regulation of airport services*, submission 39, August 2006, p 72

⁵² Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, p 20; Productivity Commission, *Economic regulation of airport services*, 14 December 2011, p 111

⁵³ Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, p 20; Productivity Commission, *Economic regulation of airport services*, 14 December 2011, p 111

⁵⁴ Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, p 21

⁵⁵ Melbourne Airport, *Productivity Commission Inquiry into Price Regulation of Airport Services*, submission 13, July 2006, p 17; Melbourne, Airport, *Productivity Commission inquiry into Economic Regulation of Airport Services – response to issues paper*, submission 29, April 2011, pp 96-97

⁵⁶ Melbourne Airport, *Productivity Commission Inquiry into Price Regulation of Airport Services*, submission 13, July 2006, p 17; Melbourne, Airport, *Productivity Commission inquiry into Economic Regulation of Airport Services – response to issues paper*, submission 29, April 2011, pp 96-97

below long run incremental costs.⁵⁷ Therefore, it would anticipate airports have different levels of return at different points in time and 'yearly fluctuations are less relevant than trends over longer periods.'⁵⁸

This view was also shared by Perth Airport, which submitted to the 2011 Productivity Commission review that it had been operating 'at a high tempo' and was approaching capacity, and so was at a point in the capital investment cycle for which returns are expected to be higher.⁵⁹ It also stated that without substantial new investment, its current business could not be sustained.⁶⁰

Sydney Airport similarly noted in a submission to the 2011 Productivity Commission review that returns on individual investments and in individual years vary from cost of capital.⁶¹

The Productivity Commission went further to state that a business' rate of return *should vary* across time.⁶² It explained that it is economically efficient for an airport to charge lower prices when it has excess capacity to attract demand for its infrastructure, which leads to a lower rate of return. Conversely, it is efficient to charge higher prices as capacity or congestion increase to dampen demand and encourage new investment, which leads to a higher rate of return.

In a submission to the Productivity Commission's 2006 review, the ACCC suggested that taking a long-term view when assessing pricing behaviour can address the problems associated with examining a firm's returns at a single point in time:⁶³

...the excess earnings measure is sensitive to the period over which it is measured, and only provides a definitive answer on the extent to which the revenues earned by firms were greater than costs when considered over the entire life of the asset. An assessment of excess earnings over a small part of the life of an airport is subject to myopia and could be misleading, especially if the revenues of an airport over the remaining term of the lease are significantly different from the airport's revenues during the period examined.

Perth Airport expressed a similar view in its submission to the 2011 Productivity Commission review, stating an assessment of the exercise of market power should focus on whether prices are excessively above the efficient price of production for services, as opposed to the absolute level of profitability at a point in time.⁶⁴ Therefore, returns need to be assessed over a sufficient time to take into account the full cost of providing the services.⁶⁵

These submissions were consistent with the Productivity Commission's own view, that a regulator should examine both periods of high and low returns in its analysis, stating that:⁶⁶

While rates of return may vary over time, a business must earn its WACC *on average* to make investment attractive. But if a regulator acts to curtail high rates of return, while ignoring periods

⁵⁷ Melbourne Airport, *Productivity Commission Inquiry into Price Regulation of Airport Services*, submission 13, July 2006, p 17

⁵⁸ Melbourne Airport, *Productivity Commission Inquiry into Price Regulation of Airport Services*, submission 13, July 2006, p 17
Melbourne, Airport, *Productivity Commission inquiry into Economic Regulation of Airport Services – response to issues paper*, submission 29, April 2011, pp 96-97

⁵⁹ Westralia Airports Corporation, *Response to the Inquiry into Economic Regulation of Airport Services*, submission 41, 8 April 2011, p 49

⁶⁰ Westralia Airports Corporation, *Response to the Inquiry into Economic Regulation of Airport Services*, submission 41, 8 April 2011, p 49

⁶¹ Sydney Airport, *Economic Regulation of Airport Services Submission to the Productivity Commission Inquiry*, submission 46, 8 April 2011, p 42

⁶² Productivity Commission, *Economic regulation of airport services*, 14 December 2011, p 127

⁶³ ACCC, *Submission to the Productivity Commission's inquiry into price regulation of airport services*, submission 39, August 2006, p 74

⁶⁴ Westralia Airports Corporation, *Response to the Inquiry into Economic Regulation of Airport Services*, submission 41, 8 April 2011, p 49

⁶⁵ Westralia Airports Corporation, *Response to the Inquiry into Economic Regulation of Airport Services*, submission 41, 8 April 2011, p 49

⁶⁶ Productivity Commission, *Economic regulation of airport services*, 14 December 2011, p 127

of low returns, then the business will not earn the returns needed to attract investment funds. This movement by a regulator only against high returns is known as 'asymmetric truncation'. [*emphasis in original text*]

In other words, the rate of return should be calculated over the effective life of an asset.⁶⁷

Asset valuations

In its 2006 review, the Productivity Commission noted that achieved rates of return were critically dependent on the values of aeronautical assets ascribed by airports, particularly where the basis for the valuation of such assets has changed.⁶⁸ The ACCC also noted in its submission to the 2006 Productivity Commission review that profitability measures are affected by changes in valuations of the assets by airport operators.⁶⁹ The valuation of aeronautical assets and moves by some airports to update the historical values that had applied prior to the airports' privatisation, was a substantial point of contention in submissions to the Productivity Commission's first review of the price monitoring regime.

In light of that contention, the Productivity Commission's 2006 review included a recommendation that more prescriptive regulatory accounting requirements be adopted, including a 'line in the sand' valuation for aeronautical asset values, that facilitates the assessment of long term returns on aeronautical services.⁷⁰

Despite the introduction of the line in the sand approach, in a submission to the 2011 Productivity Commission review, the Board of Airline Representatives took issue with rate of return measures from the ACCC's Regulatory Accounts, due to its asset valuation methodology. It argued that revalued assets overstate actual investments in aeronautical infrastructure undertaken by airports.⁷¹

A submission by Virgin Blue, based on analysis undertaken by Allen Consulting Group (ACG), examined whether airports had complied with the government's review principles, by comparing the long run cost of airports with their actual revenues to test pricing behaviour.⁷² ACG calculated long run cost on the basis of the regulatory value of each airport, derived for all airports other than Sydney, as the value consistent with the revenue earned under the previous price control regime, and taken from the ACCC's 2001 decision on Sydney Airport's aeronautical charges for Sydney Airport, adjusted for operational expenditure and investment.⁷³

The Productivity Commission considered that the basis for valuation employed by ACG to be problematic, stating that it led to asset values that were too low.⁷⁴ It stated that prices under the previous price cap did not directly relate to the actual cost of provision of aeronautical services since, for example, they had been set following a single till approach applied across the Federal Airports Corporation portfolio of airports. It followed that the prices under the previous regime were unlikely to be a good basis for efficient pricing. Consistent with these findings, it would not be appropriate for a long-term assessment of airports' profitability to extend back beyond 2002.

Benchmarking of returns

The challenges that arise from the existence of investment cycle effects and changes in asset valuation highlight some of the practical difficulties in the comparing or benchmarking of returns of different airports. In

⁶⁷ Productivity Commission, *Economic regulation of airport services*, 14 December 2011, p 101

⁶⁸ Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, p 20

⁶⁹ ACCC, *Submission to the Productivity Commission's inquiry into price regulation of airport services*, submission 39, August 2006, p 44

⁷⁰ Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, p 81

⁷¹ Board of Airline Representatives of Australia Inc, *Submission to the Productivity Commission's inquiry into price regulation of airport services*, April 2011, p 18

⁷² Virgin Blue, *Price regulation of airport services*, Submission 27, 21 July 2006, p 4

⁷³ Allen Consulting Group, *Productivity Commission Review of Airport Pricing*, Submission 27, July 2006, p 9

⁷⁴ Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, p 27

2006 the Productivity Commission cited observations in the ACCC's airport monitoring report that benchmarking rates of return was not informative, since measured returns depend on the asset valuations made by each airport operator, and could not provide insight into the operational performance of airports. Further, Melbourne airport submitted to the 2006 Productivity Commission review that persistent differences in the level of returns between airports could be expected based on levels of efficiency in airport design and operations, the nature of markets served, and management skill.⁷⁵

3.1.3 Other factors considered by the Productivity Commission

The Productivity Commission also made a number of observations about aeronautical prices and the cost and capital intensity of airport services.

Prices

The Productivity Commission observed that prices for airport services are set by long-term contracts, typically of five years, although it was aware of contracts that have had terms of seven and ten years.⁷⁶ The prices set in long term contracts are based on a range of assumptions regarding factors such as market growth, cost movements and anticipated financial market conditions that affect the cost of capital. If the outcomes of these factors do not match assumptions, ex post returns may be higher than anticipated, without an airport having exercised its market power.⁷⁷

This phenomenon is particularly relevant for passenger growth and for changes in financial market variables that affect the cost of capital. If passenger growth exceeds or falls short of expectations, revenues and returns will be higher or lower than expected, since the airports' costs do not increase commensurately.⁷⁸ Similarly, structural trends in interest rates – such as that which has been in place for the past twenty or so years – may mean that prices struck under long term agreements will cause revenue and returns in any particular year to exceed the present day cost of capital. The Productivity Commission noted in 2006 that there had been some adjustments at some airports to allow for the impact of unanticipated passenger growth, although it anticipated that such issues would be adjusted for appropriately in subsequent contract negotiations.⁷⁹

Costs/capital intensity

The nature of capital costs in the provision of airport services is relevant to an analysis of the pricing behaviour of airports. The Productivity Commission noted that cost data alone provided limited insights into the reasonableness of prices, given the nature of capital costs in the provision of airport services.⁸⁰ The provision of airport services is capital intensive, and assets typically have long lives. For so long as there is ample capacity, costs are stable over time and average costs decrease with passenger growth.

Productivity and service quality

The Productivity Commission has recognised that trends in productivity and services quality are both relevant considerations in any assessment of market power, and it considered a variety of material put before it on these dimensions of airport performance during its 2006 and 2011 reviews.⁸¹

In examining long term trends in these variables in its 2011 review, the Productivity Commission observed that airport sector productivity has improved in the post-privatisation period, while changes in efficiency and

⁷⁵ Melbourne Airport, *Productivity Commission Inquiry into Price Regulation of Airport Services*, submission 13, July 2006, pp 17-18

⁷⁶ Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, p 15

⁷⁷ Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, p 28

⁷⁸ Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, p 28

⁷⁹ Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, p 28

⁸⁰ Productivity Commission, *Review of price regulation of airport services*, 14 December 2006, pp 18-19

⁸¹ Productivity Commission, *Economic regulation of airport services*, 14 December 2011, p 71

technology have been positive.⁸² In reviewing airports' service quality performance, the Productivity Commission found that no market power concerns arose in relation to this parameter.⁸³

3.2 ACCC monitoring reports

The ACCC has monitored quality, prices, costs and profits relating to the supply of aeronautical services at airports since privatisation. In its Airport monitoring report 2015-16 and in related press releases, the ACCC observed for the first time that:

- over the past ten years, the four airports the subject of the monitoring report had collected \$1.57 billion in 'additional payments' from airlines than would have been the case if the airports had instead held average prices constant in real terms (for the same passenger volumes);⁸⁴ and
- profit margins – as measured by earnings before interest, tax and amortisation or EBITA – on aeronautical services 'remain high'.⁸⁵

The ACCC's most recent Airport monitoring report 2016-17⁸⁶ makes reference to its earlier 'additional payments' estimate, suggesting it would be a 'key consideration' for the current Productivity Commission inquiry. Nevertheless, the ACCC did not update its 'additional payments' estimate for the ten year period to 2016-17. Our replication of its methodology (described below), suggests the estimate for this later period declined to \$1.29 billion.

3.2.1 Average price

The ACCC's contention that airlines have made \$1.57 billion in 'additional payments' to airports over the decade to 2015-16 was derived by reference to the change in revenue per passenger, a 'proxy measure for average airport prices', which the ACCC described as 'useful'.⁸⁷ The estimate is not the result of any direct assessment of aeronautical charges and how they have changed over time. In order to derive its proxy for airport charges and its conclusion as to apparent 'additional payments' made by airlines, the ACCC followed the process we describe below:

1. Aeronautical revenue (ie, airport income in relation to aeronautical services) collected in 2006-07 was divided by the total passenger numbers in that same year – in other words, the revenue per passenger in 2006-07 price terms, which is the ACCC's proxy for price.
2. Aeronautical revenue per passenger was scaled up by the change in consumer price inflation so as to express the same estimate of 2006-07 revenue per passenger in 2015-16 price terms.
3. The revenue per passenger estimate for 2006-07 but expressed in 2015-16 price terms was multiplied by the number of passengers in each year between 2006-07 to 2015-16 to derive an estimate of aeronautical revenue in that year had airport prices risen in line with the CPI. In other words, the aeronautical revenues that would have been realised each year had average prices remained at 2006-07 levels.
4. Outturn aeronautical revenues in each year were converted to 2015-16 price terms to derive the annual realised aeronautical revenue in 2015-16 prices.
5. Annual 'additional payments' were defined as the difference between the four airports' actual aeronautical revenue in 2015-16 price terms, and the hypothetical revenue per passenger had the ACCC's 'average price proxy' remained at its 2006-07 level (but also expressed in 2015-16 price terms).

⁸² Productivity Commission, *Economic regulation of airport services*, 14 December 2011, p 61

⁸³ Productivity Commission, *Economic regulation of airport services*, 14 December 2011, p 154

⁸⁴ ACCC, *Airport Monitoring Report 2015-16*, March 2017, p 7

⁸⁵ ACCC, *Airport Monitoring Report 2015-16*, March 2017, p xi

⁸⁶ ACCC, *Airport Monitoring Report 2016-17*, April 2018, p 26

⁸⁷ ACCC, *Airport monitoring report 2015-16*, March 2017, p xi

Our analysis shows that average aeronautical revenue per passenger is a poor proxy for the prices charged to users of airports. We describe the reasons for this conclusion below.

The 'average price' measure selected by the ACCC is an oversimplification that is upwardly biased by the faster growth in more-expensive-to-serve international passenger services. The ACCC acknowledges the effect that the changing mix of passengers may have on its proxy for prices, and recognises that an ideal measure would assess prices directly. It suggests that constructing a new airport price index would 'involve a number of complexities', but takes no steps to develop such a measure.

Rather, the ACCC seeks to compare increases in airport fees to the fare price growth of airlines, even though airports provide very different services from airlines and face quite different cost drivers

3.2.2 Structural and cyclical reasons for reported cost increases

The ACCC's emphasis on 'additional payments' of \$1.57 billion having been made to airports is derived by reference to the difference between the decade long rates of growth in aeronautical revenue per passenger and the consumer price index (CPI).

Setting aside the problems with using aeronautical revenue per passenger as a proxy for airport prices, it is also important to take account of reasons why it should be expected that the price of aeronautical services would have increased over the decade to 2015-16. Substantial upgrades to capital assets that have been required to accommodate greater passenger numbers, as well as the acquisition of terminals formerly owned by airlines, both of which mean that price increases exceeding the rate of consumer price inflation should be expected at the four airports.

Demand for air travel grew steadily over the decade to 2015-16, necessitating substantial capital investment in new and upgraded terminals and runways. The cost of such expansions in airport capital assets needs to be recovered through a combination of natural growth in passenger numbers and/or individual aeronautical charges.

The most significant investments made by the four airports include:

- the development of new international terminal infrastructure and a major northern access road at Brisbane airport;
- an ongoing construction of a new parallel runway at Brisbane airport;
- the expansion of international capacity in Perth airport's Terminal 1 and the construction of a new pier to facilitate Virgin's domestic operations;
- Perth airport's new Terminal 2 to facilitate regional and low cost domestic operations; and
- Melbourne airport's significant expansion of its discount and regional airline terminal, T4.

The ACCC suggested in its 2015-16 monitoring report that airports' ability to spread the cost of capital investment across more passengers may be expected to put downward pressure on the average cost per passenger.⁸⁸ However, the extent of the increase in passenger numbers over the decade to 2015-16 is, for most airports, a fraction of the increase in capital investment that has taken place. In particular:

- Brisbane increased its capital invested in aeronautical assets by 73 per cent, in the face of a 27 per cent increase in passenger numbers;
- Melbourne saw a 51 per cent increase in passengers, but its capital assets have increased by more than three times this figure;
- Perth served 79 per cent more passengers in 2015-16 than 2006-07, compared with a 280 per cent increase in its aeronautical assets; and

⁸⁸ ACCC, *2015-16 Airport monitoring report*, March 2017, p 10

- finally, in contrast, Sydney experienced passenger growth of 31 per cent compared with asset growth of 8 per cent, but experienced greater international passenger growth.

It is clear from the extent of these differences in rates of passenger growth and capital investment that increasing passenger numbers over the decade to 2015-16 were not sufficient to enable all airports to fund capacity expansion projects without some near-term increases in passenger charges.

The ACCC drew on this information to raise a question as to:⁸⁹

...whether the airports have sufficient incentive to maintain cost control rather than simply passing on costs to customers.

In the following section, we discuss three reasons not identified by the ACCC as to why the extent of airport capital investment is explicable by reference to circumstances that are inconsistent with the adverse inferences drawn above.

3.2.3 Factors explaining the increase in capital investment

Our analysis has identified three separate considerations that each contribute to the phenomenon observed by the ACCC of airport capital investment substantially exceeding the rate of growth in passenger numbers.

Initial values for three airports did not reflect the service capability of their assets

The ACCC's monitoring report draws its comparisons by looking at changes over the decade to the 2015-16 financial year. However, the starting point for this decade was affected by the Commonwealth government decision to adopt a 'line in the sand' approach to the valuation of aeronautical assets. This decision became effective from 30 June 2007, and adopted the asset values that had been in place as at 30 June 2005.⁹⁰

Around the time of the 'line in the sand' decision, some airports were revising the basis for valuing their aeronautical assets, so as to bring them into line with an optimised depreciated replacement cost (ODRC) valuation.⁹¹ An ODRC approach to asset valuation better reflects the service potential of assets, as compared with the typical, depreciated historic cost method, which tends to understate the service capability of partly used assets.

Of the four airports the subject of the ACCC's monitoring regime, the aeronautical assets for Sydney and Perth airports had been revalued on an ODRC basis prior to the 'line in the sand' decision.⁹² In contrast, Brisbane airport had moved to adopt ODRC-based values for its aeronautical assets as at June 2006, but was required by the 'line in the sand' decision to revert to the asset values it had recorded in June 2005.⁹³ For the airports that had not revalued assets to reflect their ODRC value prior to June 2005, aeronautical asset values were understated relative to both their service capability and cost of replacement. Subsequently, as those assets are replaced, those airports' capital-related costs can be expected to increase more than proportionately to the growth in their service capability.

We understand that, upon taking the lease in 1997, Melbourne airport revalued its aeronautical assets on a ODRC basis. However, it is likely that the continuing application of conventional accounting standards would mean that, by June 2005, Melbourne airport's reported asset values would also understate the service capability of its assets. It follows that the June 2007 locking-in of an asset valuation that reflected traditional accounting methods – rather than those assets' service potential – is likely to mean that new capital investment has also added disproportionately to Melbourne airport's aeronautical asset values.

⁸⁹ ACCC, *2015-16 Airport monitoring report*, March 2017, p 10

⁹⁰ ACCC, *Airport monitoring report 2006-07*, March 2008, p 2

⁹¹ See: ACCC, *Airport monitoring report 2015-16 (Appendix A4)*, March 2017, p 181; and NERA, *Initial Value of Regulatory Assets - the Australian Experience*, 6 December 2009, pp 28-31

⁹² NERA, *Initial Value of Regulatory Assets - the Australian Experience*, 6 December 2009, p 31

⁹³ NERA, *Initial Value of Regulatory Assets - the Australian Experience*, 6 December 2009, p 31

Further, the circumstances of Brisbane airport reinforce the artificiality of the asset values applying at the start of the period compared by the ACCC. In consequence of the 'line in the sand' decision, the monitored value of Brisbane airport's aeronautical assets between 2006-07 and 2007-08 was reduced by 33 per cent, despite there being no corresponding change in the service capability of its physical assets.⁹⁴

The changes that were made (or not made) to the monitored value of aeronautical assets in 2006-07 had the effect – for three of the four airports – of significantly compromising the merit of long term comparisons of the relationship between passenger growth and changes in aeronautical asset values. They also undermine the basis for the ACCC's adverse inferences as to the trend that could be expected in aeronautical revenues per passenger, and airports' incentive for cost control.

Responsibility for some services has shifted from airlines to airports

Domestic terminal services at Australian airports were historically provided by major domestic airlines, under long term leases of terminal buildings. Progressively, the control of these terminals, along with responsibility for the provision of the associated aeronautical services, is reverting to the airports themselves. The effect of these transactions, without any necessary changes to the services provided to passengers, is:

- to increase the aeronautical capital base of airports and, correspondingly, to release capital otherwise provided by airlines; and
- to introduce explicit payments by airlines for domestic terminal services now provided by airports, and so to increase the aeronautical revenues of airports.

Consistent with this trend, in 2015 Sydney airport agreed to acquire the Qantas domestic terminal, T3, for \$535 million.⁹⁵ The full financial effects of this change in service provider will be captured within the ACCC's monitoring report from 2015-16 onwards. The purchase of T3 was Sydney airport's largest capital investment in that year, and can be expected to increase Sydney airport's reported aeronautical costs and revenues from that time. Melbourne, Perth and Brisbane Airports are still to complete the transition whereby terminals used by Qantas shift from long term leases to being incorporated into the aeronautical asset base.

Although the ACCC's monitoring report does acknowledge these changed arrangements, it does not draw attention to their role in qualifying the adverse inferences it makes in relation to increasing capital costs and average aeronautical revenues at the four airports.

New capacity likely to have been more costly than existing capacity

Beyond the artificially low initial value of assets at three airports, there are a number of reasons why the aeronautical capacity expansions delivered between 2006 and 2016 were likely to have been more costly per unit of passenger demand than the capacity implied by those airport's existing assets in 2005, irrespective of how they were valued. In particular:

- major new investments, such as Perth's Terminal 1 Pier and Melbourne's Terminal 4, offer much more passenger amenity than existing assets,⁹⁶ and this can be expected to be reflected in higher build costs;
- the cost of construction significantly increased during the decade, on account of pressures flowing from the resources construction boom;⁹⁷

⁹⁴ NERA, *Initial Value of Regulatory Assets - the Australian Experience*, 6 December 2009, p 31

⁹⁵ ACCC, *2015-16 Airport monitoring report*, March 2017, p 138

⁹⁶ Overall airport quality ratings in 2006-07 were as follows: Brisbane's international services and facilities were satisfactory, and the domestic rating was good; in Melbourne, Perth and Sydney, both were satisfactory. In 2015-16, all airports had an overall quality level of good. See: ACCC, *Airport monitoring report 2011-12*, April 2013, pp 108, 151, 198 & 246, and ACCC, *Airport monitoring report 2015-16*, March 2017, p 57, 86, 119 & 150

⁹⁷ WT Partnership, *Interim review of Australian construction market conditions*, November 2016

- space constraints can result in increasingly expensive projects – for example, Brisbane airport is constructing a new runway on the site of the old river delta, which requires costly surcharging of the land, affecting both the cost and timing of the project;
- capacity expansions that respond to peak demand growth that is more rapid than average demand growth will tend to have a higher cost per total airport passenger throughput than the asset base as a whole;
- airports have incurred significant additional capital and operating costs to comply with more stringent, government-mandated security requirements;
- when airports are operational, the construction of additional capacity must be undertaken while flights are still landing and departing, with this requirement contributing substantially to the incurrence of costs over and above the value of the existing assets; and
- much of the capacity development in the past decade (with its strong emphasis on terminals) involved upgrading existing – and in some cases, quite old – assets, which is inherently more expensive than capacity deployed at greenfield sites.

Investments reflect the long-run costs of incremental capacity

Significant infrastructure investments are, by their very nature, lumpy. Investment decisions must be made on the basis of the capacity necessary to meet long-term demand predictions, not the level of capacity required for the coming year, or the one following. Neither terminal services nor runways can be procured in 10,000 or even 100,000 annual passenger increments.

Notwithstanding, the ACCC suggests that passenger volume growth may be able to fund increases to capacity, by spreading the cost over more passengers.⁹⁸ In our opinion, this is an unhelpful observation, and is unlikely to be valid over the decade the subject of the most recent monitoring report.

Airport aeronautical charges must reflect the long run cost of incremental capacity, often procured in lumps much greater than the generally observed, annual increases in passenger numbers. For this reason, it should be expected that periods of significant capacity expansion will coincide with increases in the unit cost of that capacity, with this unit cost then drifting lower as it becomes more heavily utilised. Such step changes in capacity are inevitable and efficient, on account of the impracticability of adding terminal or runway infrastructure in smaller increments.

In assessing the price implications of such developments, the most important metric is the long run unit cost of the added capacity, rather than the nearer term price consequences of ensuring that infrastructure projects are developed at the right size, quality and at the right time.

3.2.4 Comparisons with airline fare growth are not insightful

Finally, in the context of drawing adverse inferences as to the extent to which average aeronautical charges have increased and the sufficiency of incentive for airports to keep costs down, the ACCC's monitoring report⁹⁹ drew a comparison between:

- the \$1.57 billion it labelled as additional payments made by airlines to airports, and associated 'increased prices' for aeronautical services; and
- its contention that 'best discount' airfares had fallen by 36 per cent in inflation adjusted terms over the same decade.

In our opinion, such a comparison lacks insight and risks obfuscating the questions at hand in the ACCC's monitoring report.

⁹⁸ ACCC, *Airport monitoring report 2015-16*, March 2017, p 10

⁹⁹ ACCC, *Airport monitoring report 2015-16*, March 2017, p 7

The ACCC stated that average 'best discount' airfares had fallen by 36 per cent in real terms over the decade since July 2006, while restricted economy fares had fallen 17 per cent.¹⁰⁰ These observations amount to a very partial perspective on the aviation industry over the decade to 2015-16. For example, independent commentators have observed that airlines were able to maintain – and grow – profit margins over this period, despite decreasing prices, because costs have fallen more swiftly than revenues. Airline costs over that period fell as a result of substantial reductions in fuel prices, higher seating density on planes due to technological advance and changing preferences, as well as improvements in matching capacity with demand, thus increasing load factors.¹⁰¹

Moreover, although the ACCC draws attention to a 36 per cent fall in 'best discount' prices, and the 17 per cent reduction in 'restricted economy' fares, it omits any reference to the fact that business fares fell by only 4.9 per cent over the same period.¹⁰²

Although operating within the same supply chain for air travel, airports are not in the same market and do not provide the same service as airlines. The cost drivers for each of these functions are also quite different – airports have not benefited from the same trends that have seen airline costs fall significantly over the past decade. Irrespective of the period being considered, these differences reinforce that ad hoc comparisons of price trends in the two sectors are apt to mislead.

3.2.5 Return on assets best measure of profitability

In addition to its observation that airports had collected \$1.57 billion in additional payments from airlines, the ACCC also stated that its contended increase in average airport prices has been used 'to grow profit margins'.¹⁰³ Again, the ACCC used this observation to draw adverse inferences as to the commercial conduct of airports.

The analysis we present in section 3.2.3 shows that all four airports have made investments that have increased their aeronautical asset base, and that for three airports these increases have been substantial. It is elementary that – all else equal – the reported profit margin of firms supplying services involving the deployment of substantial capital assets require a higher profit margin (ie, profit as a percentage of revenue) than those firms that deploy relatively less capital. On this principle alone, the ACCC's observation that airports had used higher aeronautical charges 'to grow profit margins' does not provide any economic foundation for a suggestion as to the misuse of market power.

Provided the nature and extent of investment is directed to the needs of its users, a much more appropriate metric for assessing the level of profit earned by an infrastructure service provider is its return on assets, since this measures the rate of profit earned having regard to the total capital employed. The ACCC's own report shows the return on assets for each airport's aeronautical assets; this metric indicates that the return on aeronautical assets has been in decline in the past several years at Melbourne, Perth and Brisbane airports and, in Sydney, has gradually increased until the final year of the period.¹⁰⁴

These observations are quite inconsistent with the ACCC's statements that the airports have reaped 'additional payments' and used their increased revenue to grow profit margins. On the contrary, these data

¹⁰⁰ ACCC, *Airport monitoring report 2015-16*, March 2017, p 7

¹⁰¹ Oliver Wyman, *Airline Economic Analysis 2015-16*, pp 6-7, accessed at <http://www.oliverwyman.com/content/dam/oliver-wyman/global/en/2016/jan/oliver-wyman-airline-economic-analysis-2015-2016.pdf>

¹⁰² BITRE, *Domestic Airfare Indexes – Airfare time series from October 1992 to April 2017*, April 2017, accessed at https://bitre.gov.au/statistics/aviation/air_fares.aspx

¹⁰³ ACCC, *Airport monitoring report 2015-16*, March 2017, p xii

¹⁰⁴ We note in relation to Sydney airport that the asset values in the ACCC's monitoring reports are not indexed for consumer price inflation, whereas the pricing model adopted at the time the ACCC formally determined Sydney airport's prices in 2001 assumed its asset value would be indexed annually for inflation. We understand that Sydney airport has since continued to apply the indexed asset value method in the context of its price negotiations with airlines, and that other airports have adopted similar indexation models in their pricing negotiations. One consequence is that the return on assets figures reported in the ACCC's monitoring report will overstate the return that airports are achieving on their indexed asset values – even after the corresponding adjustment to its targeted aeronautical revenues for asset value appreciation.

suggest that the new capital investment has recently been made by the airports is still to satisfy the usual criterion of earning a reasonable return on capital.

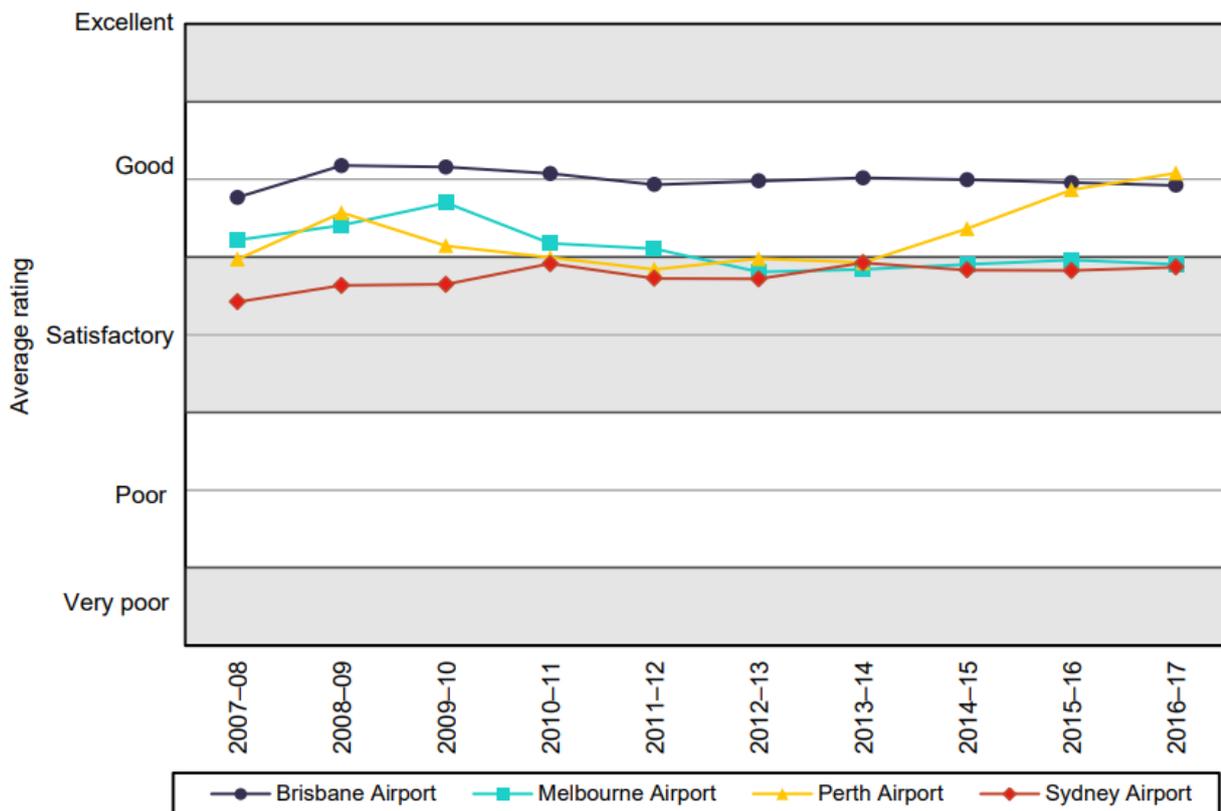
3.2.6 Quality monitoring

The ACCC also publishes the results of its quality monitoring of the aeronautical services provided by the four monitored airports. The source of these data is surveys completed by airport users (both passengers and airlines) that ask respondents to rate their level of satisfaction with services and facilities on a scale from 1 to 5, and from objective indicators collected by the ACCC.¹⁰⁵ The overall weighted average weightings of quality, shown in Figure 2, were interpreted by the ACCC as demonstrating:¹⁰⁶

Over the past 10 years, Sydney and Perth airports have shown modest improvements in their average weighted quality of service ratings while Brisbane Airport has remained unchanged. Melbourne Airport has had a small drop over the same period.

Although quality ratings have fluctuated over time, the magnitude of the changes are small. It is difficult to draw firm conclusions about the direction of changes without undertaking statistical tests of the underlying data. However, from the figure below, it appears to be clear that the quality of services provided by the monitored airports has not declined over the last decade.

Figure 2: Overall weighted average ratings of quality of service, 2007-08 to 2016-17



Source: ACCC, Airport monitoring report 2016-17, April 2018, p 47, figure 2.6.1.

¹⁰⁵ ACCC, Airport monitoring report 2015-16, March 2017, p 20

¹⁰⁶ ACCC, Airport monitoring report 2015-16, March 2017, p 20

4. Profitability assessment of the four airports

In this section we report the results of our empirical assessment of market power by reference to the framework we establish in sections 2 and 3, ie, an empirical analysis of the price cost relationship for aeronautical services, and so the economic returns to airports, over the 15-year period since the price monitoring regime has been in place.

4.1 Methodology

The essence of our profitability analysis is the derivation of an annual comparison of:

- the rate of earnings before interest and tax (EBIT) as a percentage of the aeronautical asset base for each of the four airports, in each year since 2003 through to 2017, using data disclosed by the ACCC in its annual airport price monitoring reports;¹⁰⁷ and
- an estimated range for the pre-tax nominal,¹⁰⁸ weighted average cost of capital (WACC) for a benchmark Australian airport, derived using readily available upper and lower bounds for each WACC parameter, as drawn from either airport or other infrastructure service provider decisions made by the ACCC.

The purpose of the estimated WACC that we adopt for this comparison is not to provide an opinion on the likely cost of capital for any particular airport, but rather to identify the range of estimates that is reasonably able to be drawn from material readily available in the context of regulatory decisions on infrastructure pricing. We describe the basis for these annual estimates at section 4.6 below.

In the following four sections, we present the results of our analysis for Brisbane, Melbourne, Perth and Sydney airports, respectively.

¹⁰⁷ In undertaking this analysis, each of the four airports was provided with an opportunity to review and correct the revenue and asset data reported by the ACCC in its annual airport price monitoring reports. Any corrections made to the ACCC-reported figures are indicated in the relevant section for each airport.

¹⁰⁸ The pre-tax nominal form of the WACC is that which corresponds to the earnings before interest and tax measure of airport profitability, as published by the ACCC.

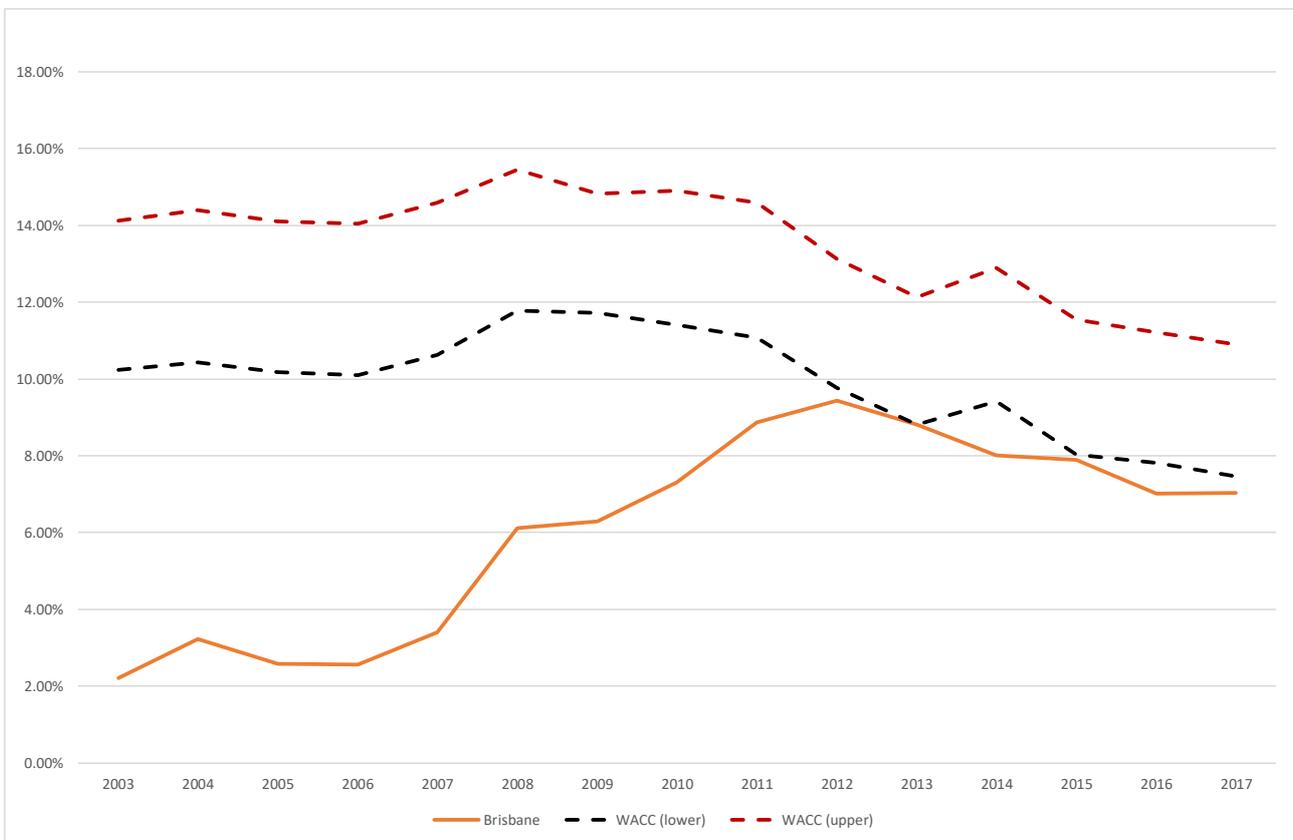
4.2 Brisbane airport

Figure 3 shows the return on aeronautical assets at Brisbane airport in each year during the period 2002/03 to 2016/17.

The reported return on aeronautical assets at Brisbane airport has been consistently at or below the WACC for a benchmark provider of aeronautical services throughout the period, although since 2011/12 Brisbane airport has achieved a return on aeronautical assets close to the bottom of the range of our estimated reasonable WACC.

Over the assessment period, Brisbane airport’s average return on aeronautical assets has been 389 basis points below our estimate of the reasonable lower bound for the WACC.

Figure 3: Returns on aeronautical assets for Brisbane Airport¹⁰⁹



¹⁰⁹ The ACCC’s 2004/05 Airport pricing monitoring and financial report states that Brisbane airport’s aeronautical revenue for 2003/04 was \$71.557 million. Brisbane airport has indicated that aeronautical revenue for 2003/04 was \$74.862 million, as reported in the 2003/04 Airport pricing monitoring and financial report. We note that this change has no material impact on our analysis of aeronautical returns at Brisbane airport.

4.3 Melbourne Airport

Figure 4 shows the return on aeronautical assets at Melbourne airport in each year during the period 2002/03 to 2016/17.

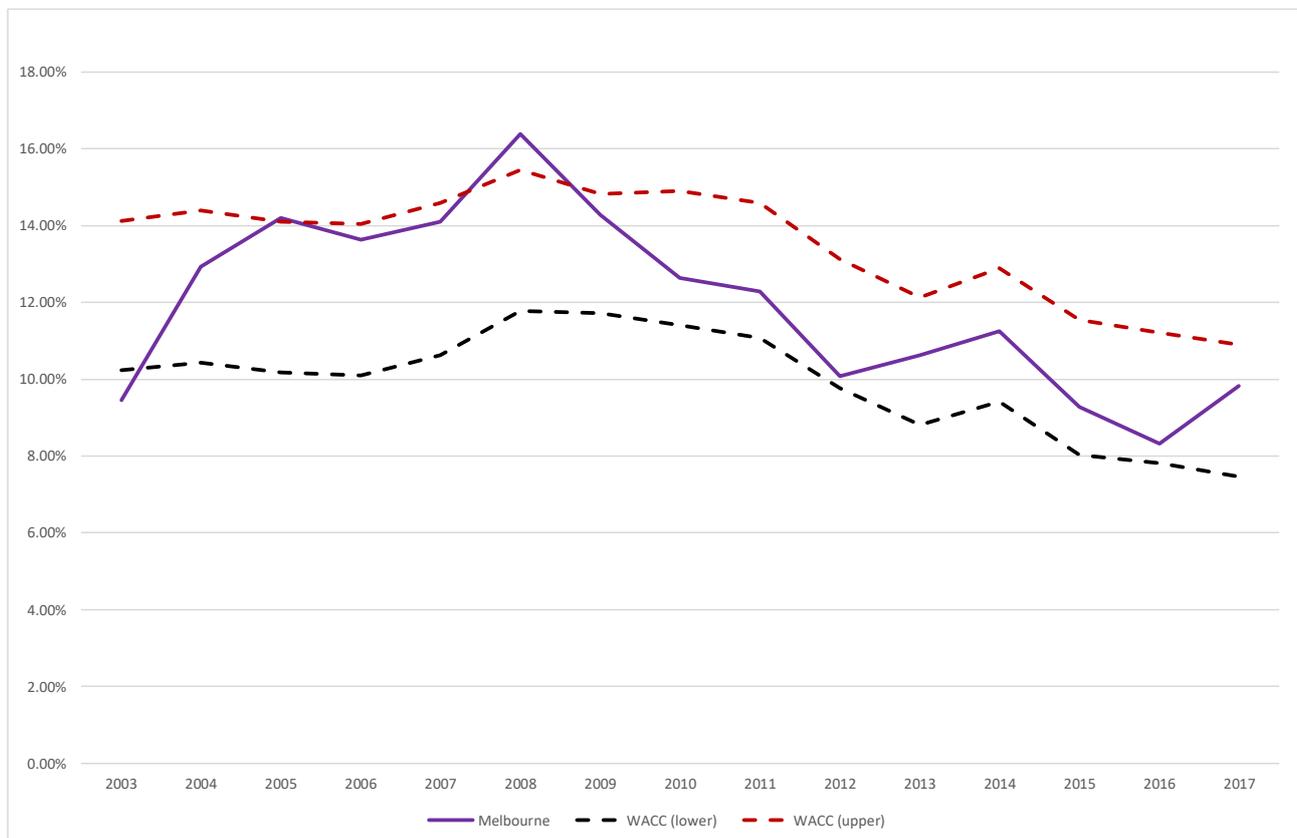
The reported return on aeronautical assets at Melbourne airport has generally been within the range of reasonable estimates of the WACC for a benchmark provider of aeronautical services through the period.

Melbourne airport’s return on aeronautical assets:

- was below our reasonable lower bound estimate of the WACC in 2002/03; and
- exceeded our reasonable upper bound estimate of the WACC in 2004/05 and 2007/08.

Over the assessment period Melbourne airport’s average return on aeronautical services is 11.96 per cent, which is close to mid-point of our estimated reasonable WACC range of 11.72 per cent.

Figure 4: Returns on aeronautical assets for Melbourne Airport¹¹⁰



¹¹⁰ The ACCC’s 2015/16 Airport pricing monitoring and financial report incorrectly reports \$83.83 million in abnormal aeronautical revenue for associated with the change in the fair value of investment property. Melbourne airport has indicated that the change in the fair value of investment property should be allocated to non-aeronautical revenues.

4.4 Perth Airport

Figure 5 Figure 3 shows the return on aeronautical assets at Perth airport in each year during the period 2002/03 to 2016/17.

The reported return on aeronautical assets at Perth airport has, on average over the period, been within the range of reasonable estimates of the WACC for a benchmark provider of aeronautical services.

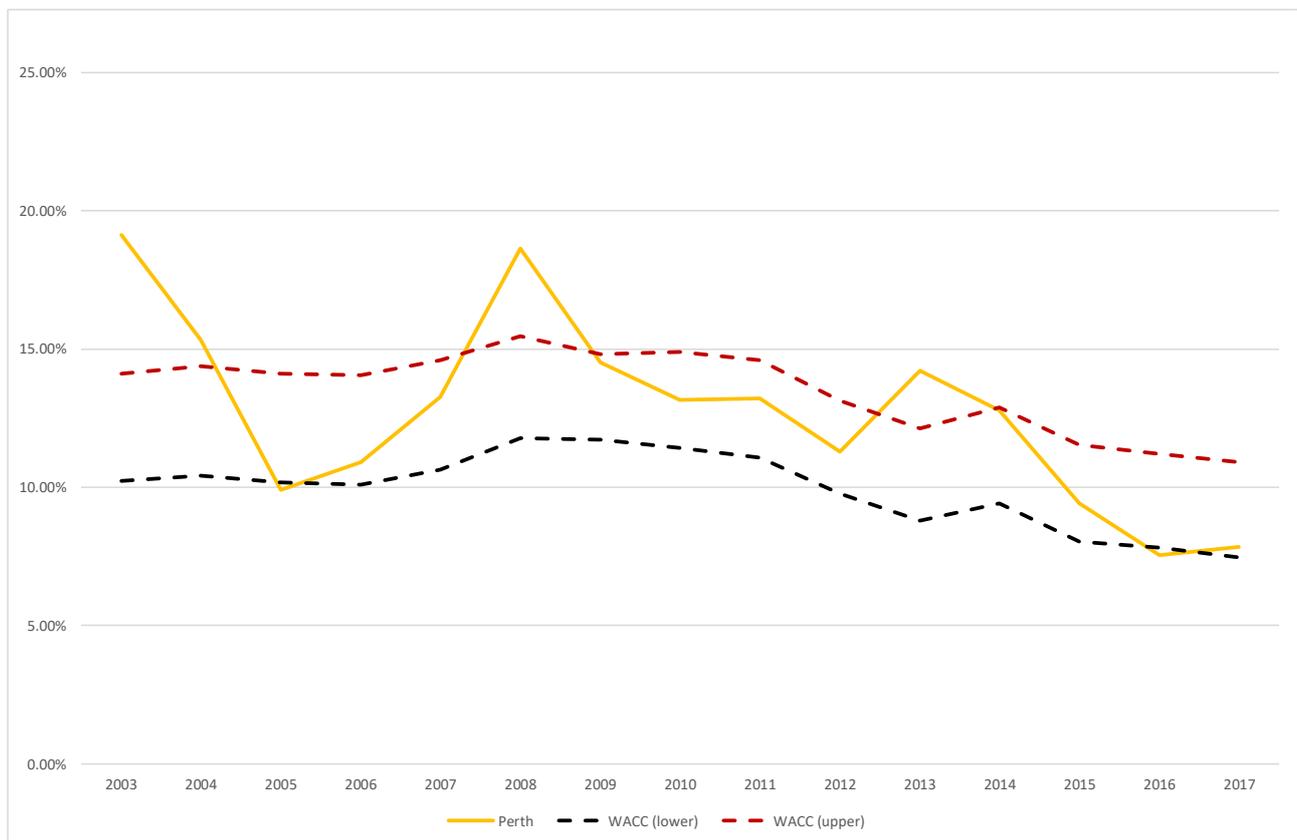
Perth airport’s return on aeronautical assets:

- was below our reasonable lower bound estimate of the WACC in 2004/05 and 2015/16; and
- exceeded our reasonable upper bound estimate of the WACC in 2002/03, 2003/04, 2007/08 and 2012/13.

In the most recent three years, Perth airport’s return on aeronautical assets has been at or below the lower bound of our estimated range for the WACC.

Over the assessment period Perth airport’s average return on aeronautical services is 12.74 per cent, which is close to the 75th percentile of our estimate of the reasonable range for the WACC.

Figure 5: Returns on aeronautical assets for Perth Airport



4.5 Sydney Airport

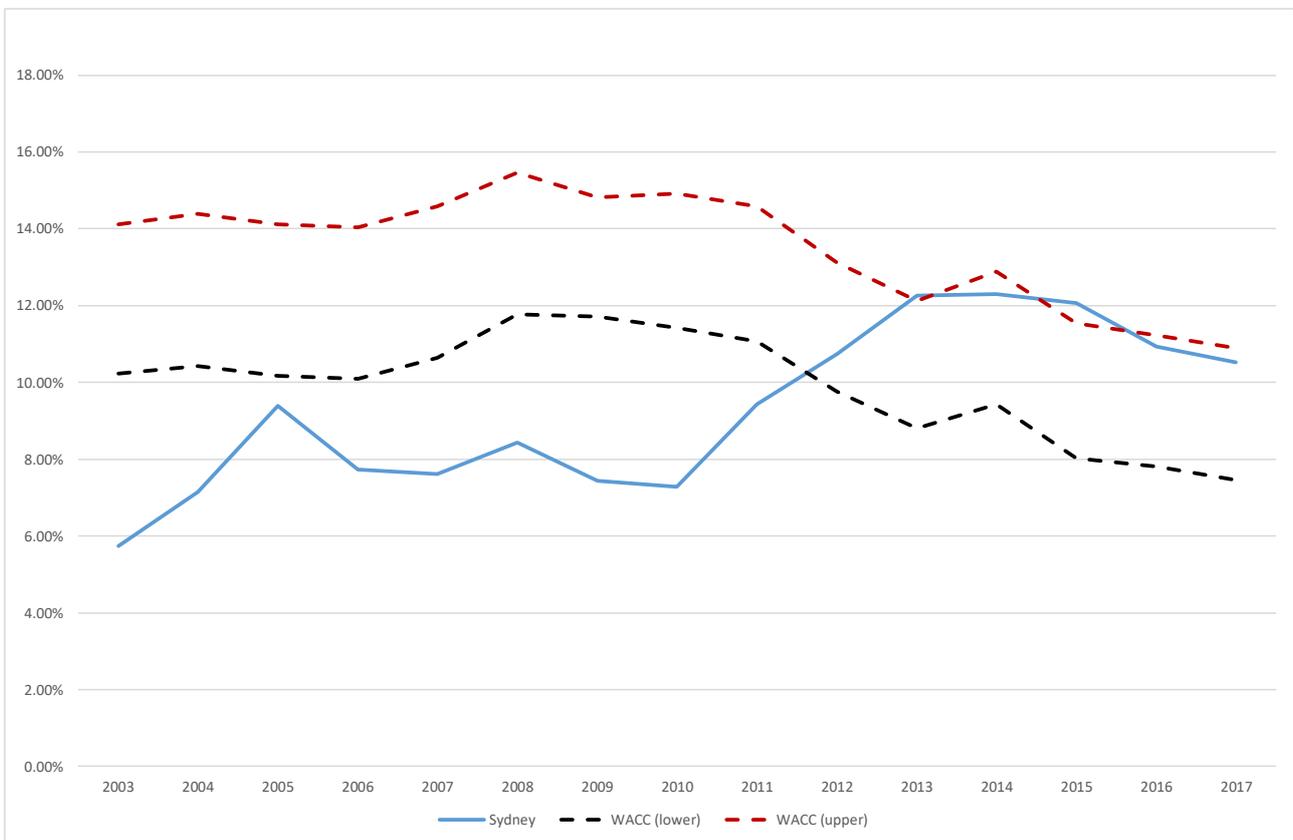
Figure 6 shows the return on aeronautical assets at Sydney airport in each year during the period 2002/03 to 2016/17.

The reported return on aeronautical assets at Sydney airport has been below our estimated lower bound for the WACC of a benchmark provider of aeronautical services for the majority of the assessment period.

For the first nine years of the price monitoring regime, Sydney airport earned a return on aeronautical services below our estimate lower bound for the WACC. Since 2013/14 the returns on aeronautical assets at Sydney airport have been close to the top of our upper bound estimate of the reasonable range for the WACC.

Sydney airport’s average return on aeronautical services over the assessment period has been 65 basis points below the average of our estimated lower bound for the WACC.

Figure 6: Returns on aeronautical assets by Sydney Airport



4.6 Estimated upper and lower bound WACCs

We have adopted a conventional regulatory approach to estimating the reasonable range for the WACC for a benchmark provider of aeronautical services, and a form of WACC that is consistent with the accounts reported by the ACCC in its airport monitoring reports.

In particular, we have adopted:

- a pre-tax form of WACC, since this is consistent with the use of earnings before interest and tax (EBIT) as the numerator of the return on assets calculation; and
- a nominal form of WACC, since this is consistent with aeronautical asset values (used as the denominator in the return on assets calculation) not being indexed for changes in the CPI.

The pre-tax nominal WACC has been calculated using the following formulae:

- the nominal pre-tax WACC:

$$WACC_{Nom} = \frac{r_e \times E}{1 - \tau(1 - \gamma)} + r_d \times D$$

where:

r_e is the nominal after tax return on equity, calculated in the formula below

r_d is the nominal return on debt, estimated using independent estimates of the yield on 10 year BBB-rated corporate debt

T is the corporate income tax rate, which has been 30 per cent in each year of the assessment period

γ is the market value of imputation credits created

E is the proportion of equity used to finance aeronautical assets by a benchmark aeronautical service provider

D is the proportion of debt used to finance regulated assets by a benchmark provider of aeronautical services

- the nominal after tax return on equity is estimated using the Sharpe-Lintner capital asset pricing model (CAPM):

$$r_e = r_f + \beta \times MRP$$

where:

r_f is the risk-free rate, estimated using the yield on 10-year Commonwealth government securities (CGS)

β is the equity beta of a benchmark provider of aeronautical services

MRP is the market risk premium.

Table 1: Upper and lower bound WACC parameter values

| WACC component | Lower bound | Upper bound |
|---|-------------------------------------|-------------------------------------|
| Debt proportion | 50% | 60% |
| Equity proportion | 50% | 40% |
| Nominal risk-free rate (annual average) | 10-yr annualised CGS | 10-yr annualised CGS |
| Return on debt (annual average) | 10-yr annualised BBB corporate debt | 10-yr annualised BBB corporate debt |
| Market Risk Premium | 5.50% | 6.50% |
| Asset beta | 0.6 | 0.7 |
| Debt beta ¹¹¹ | 0.08 | 0.13 |
| Equity beta | 1.11 | 1.54 |
| Corporate tax rate | 30% | 30% |
| Franking credits | 0.50 | 0.25 |

4.6.1 Gearing

Gearing represents a ratio of the value of debt to total capital (debt and equity). It is used to weight the return on debt and the return on equity when calculating WACC.

We have adopted the gearing assumptions of:

- 50 per cent in our lower bound WACC, consistent with the gearing ratio proposed by Sydney airport in 2001;¹¹² and
- 60 per cent in our upper bound WACC, consistent with the gearing ratio adopted by the ACCC for both Sydney and Melbourne airports in 2001.

4.6.2 Risk free rate

The risk-free rate is estimated by reference to the average daily annualised yields of the 10-year Commonwealth government securities (CGS) over each financial year of the assessment period. This is consistent with the method used by the Australian Energy Regulator (AER) and many jurisdictional regulators to estimate the risk-free rate for regulated infrastructure businesses.

4.6.3 Return on debt

We have estimated the return on debt by reference to the average end-of-month annualised yields for BBB-rated corporate debt with a term to maturity of 10 years. This is the benchmark debt used by the Australian Energy Regulatory (AER) for regulated gas and electricity networks.

¹¹¹ We note that most regulators (including the AER and ACCC) now adopt a debt beta of zero in their de-levering and re-levering formula. However, in our opinion adopting this current convention to re-lever past asset beta decisions is inappropriate, since the change in the beta transformation formula would also be expected to change the value of the de-levered asset beta. For example, adopting a zero debt beta together with an asset beta of 0.6 and gearing of 60 per cent would result in an equity beta of 1.50. This compares with the ACCC Sydney airport decision to adopt an equity beta of 1.37 (with 60 per cent gearing and an asset beta of 0.6).

¹¹² We note that adopting a gearing ratio of, say, 30 per cent does not materially increase the lower bound WACC estimate. This is consistent with the focus of the ACCC's decisions being on the relevant asset beta.

To calculate historical debt yields, we used all available third party data sources. Where more than one data source is available, we have taken a simple average. The debt yields use the following sources:

- July 2002 to May 2004, using data from CBA Spectrum;
- June 2004 to December 2004, using an average of CBA Spectrum and Bloomberg BFV data;
- January 2005 to July 2010, using an average of CBA Spectrum, Bloomberg and Reserve Bank of Australia (RBA) data; and
- August 2010 to June 2017, using an average of CBA Spectrum and RBA data.

4.6.4 Beta

Under the CAPM, beta compensates investors for systematic risk, being that which cannot be avoided by holding a diversified portfolio of investments.

With the exception of Sydney airport, betas for Australian airports are not observable, either directly or, since the delisting of the Australian Infrastructure Fund, indirectly. Guidance must therefore be found from previous regulatory decisions and data from relevant overseas markets.

During the period of airport price controls, the ACCC used asset beta in the range of 0.6 (for the Sydney pricing decision in 2000) through to 0.8 for Launceston. For the Phase 1 airports (Perth, Melbourne and Brisbane) it adopted asset beta values of 0.7. In the period following removal aeronautical service price controls, the ACCC has used an asset beta of 0.55 in assessing successive price notifications in relation to services provided by Airservices Australia.

In other jurisdictions, the United Kingdom's Civil Aviation Authority (CAA) has estimated asset beta ranges for Heathrow and Gatwick airports of 0.42 to 0.52 and 0.46 to 0.58, respectively,¹¹³ while the New Zealand Commerce Commission's empirical analysis of 26 listed international airports over two recent five-year periods (2006-2011 and 2011-2016) resulted in it estimating an average industry wide asset beta of 0.65.¹¹⁴

In applying its asset beta estimate for the purpose of specifying 'input methodologies' for New Zealand airports' pricing decisions, the Commerce Commission made a 0.05 downward adjustment (ie, adopted an asset beta of 0.6) on account of its view that observed betas relate to airports' multidivisional business, and so overstate the applicable beta for aeronautical activities.¹¹⁵ Subsequently, the Commerce Commission has affirmed the use of an asset beta of 0.6 for New Zealand airports in its most recent draft reports reviewing the pricing decisions and expected performance for Auckland and Christchurch airports.¹¹⁶

However, international airport beta decisions – and the underlying material on which they draw – must be approached carefully. In particular:

- international betas are measured relative to other equity markets, which may reduce their usefulness as measures of the systematic riskiness of Australia airports' aeronautical activities;
- listed airport entities may have limited comparability to Australian airports' aeronautical business, and will be affected by differences such as scale, the extent of airport and intermodal competition, route mix, regulatory and taxation arrangements; and

¹¹³ CAA, op cit, page 52.

¹¹⁴ Commerce Commission, *Input Methodologies review decision | Topic paper 4: Cost of capital issues*, 20 December 2016, para 471-474.

¹¹⁵ Commerce Commission, *Input Methodologies review decision | Topic paper 4: Cost of capital issues*, 20 December 2016, para 475-486.

¹¹⁶ Commerce Commission, *Review of Christchurch International Airport's pricing decisions and expected performance (July 2017 – June 2022) | Draft report*, 19 July 2018, page 58.

Commerce Commission, *Review of Auckland International Airport's pricing decisions and expected performance (July 2017 – June 2022) | Draft report*, 26 April 2018, page 78.

- many listed airport companies have relatively small amounts of equity held in private hands, are thinly traded, and may effectively be government controlled.

Having regard to the above points of reference, we have made lower and upper bound beta assumptions as follows:

- an asset beta of 0.60 in our lower bound WACC that, when de-levered/re-levered with the assumed gearing ratio of 50 per cent and a debt beta of 0.08, results in an equity beta of 1.11 – as consistent with that determined by the ACCC for Sydney airport in 2001;¹¹⁷ and
- an asset beta of 0.70 in our upper bound WACC that, when de-levered/re-levered with the assumed gearing ratio of 60 per cent and a debt beta of 0.13, results in an equity beta of 1.54 – as consistent with that determined by the ACCC for Melbourne Airport in 2000.¹¹⁸

4.6.5 Corporate tax rate

The Australian corporate income tax rate has been 30 per cent over the assessment period starting in July 2002 to June 2017.

4.6.6 Gamma

Gamma is the proportion of forecast company income tax costs that is not recovered from users. A portion of company tax costs does not need to be recovered from users because the Australian imputation tax system allows imputation credits created from the payment of company income tax to be redeemed by domestic equity holders. Put another way, not all company costs need to be recovered from users because equity owners also derive some value from the payment of company income tax. However, a dollar of tax paid does not necessarily translate into a dollar of value for equity owners.

Gamma is commonly calculated as the product of a distribution rate for imputation credits and the market value of distributed credits, ie:

$$\gamma = F \times \theta$$

Where:

- F represents the distribution rate, ie, the proportion of credits created that are distributed to investors through franked dividends; and
- θ (theta) represents the market value of distributed imputation credits.

We have adopted lower and upper bound gamma assumptions of:

- 0.50 in our lower bound WACC, representing the highest correct value adopted by the AER/ACCC over the assessment period;¹¹⁹ and
- 0.25 in our upper bound WACC, representing the lowest value adopted by the AER/ACCC over the assessment period.

¹¹⁷ We have adopted the Appleyard and Strong de-levered/re-levered formula used in the ACCC's Sydney airport decision to convert the decision asset and debt betas to an equity beta with an assumed gearing of 50 per cent.

¹¹⁸ ACCC, *Melbourne Airport Multi-user Domestic Terminal New Investment Decision*, August 2000, page 10.

¹¹⁹ We note that the AER determined a gamma value of 0.65 for electricity transmission in 2008. The AER was subsequently found by the Australian Competition Tribunal to have erred in determining this value; however, the regulatory framework did not allow for this error to be applied for electricity transmission determinations until 2013.

5. Conclusion

Our analysis of reported rates of return in the provision of aeronautical services by the four airports show that average returns have in each case fallen within the average lower and upper bound estimates of the cost of capital for a benchmark Australian airport. Two airports – Perth and Melbourne – have reported rates of return below the mid-point of the 15-year average lower and upper bound WACC, while two others – Brisbane and Sydney – have reported rates of return above the fifteen year mid-point of those averages.

These results strongly support a conclusion that none of the four airports can be said to have set prices or achieved levels of profit that can be said to reflect the exercise of any market power. Further, although not the focus of our report, the Productivity Commission's 2011 findings in relation to rates of productivity growth and trends in service quality achieved by the airports are also consistent with the conclusion that there has been no exercise of market power in the provision of aeronautical services.



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