Summary Report on Net Economic Benefit of Joint Ventures

Market Study on the Airline Industry

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1.1 INTRODUCTION

ICF SH&E, with support from ICF GHK and Cambridge Economic Policy Associates, was commissioned by the Competition Commission of Singapore (CCS) in 2012 to undertake a market study of the airline industry in Singapore ("the Study"). The Study reviewed the current state of global and regional aviation markets, analysed the degree of competition on key routes flying through Singapore and examined whether certain joint ventures (JVs)[1] between airlines operating through Singapore have resulted in net economic benefit.

This summary note provides an overview of the net economic benefit assessment part of the Study and is intended for publication.

1.2 OBJECTIVES OF THE ASSESSMENT OF NET ECONOMIC BENEFIT

The objectives of the assessment were:

i) To determine whether the Japan Airlines/American Airlines (JAL/AA) JV has delivered net economic benefit;

ii) To determine whether the All Nippon Airways/Continental/United Airlines (ANA/CO/UA) JV has delivered net economic benefit;

iii) To explore what benefits JVs of this type might deliver in future.

The approach used was a cost-benefit analysis (CBA), underpinned by econometric analysis of the impact of JVs – the approach is set out in section 1.3 below.

At the point of commissioning, there were eight JVs operating through Singapore. Given the available data[2], CCS selected the JAL/AA and ANA/CO/UA alliances as case studies for detailed ex-post assessment in this Study. It should be noted that the two case study JVs are similar: they are both US-Japanese carriers on trans-Pacific routes, starting within half a year of each other. Thus, caution should be applied when generalising the results to other JVs.

[1] 'Joint ventures' refer to a formal business relationship between two or more airlines, usually involving risk-sharing at either the revenue or profit level on a route or set of routes. The objective of many JVs is to coordinate commercial activities between airline members to enable the partners to function as one competitive entity. Under these circumstances, the partners are indifferent as to which airlines' plane carries a passenger - often referred to as 'metal neutral' agreements.

JVs are often characterised by the following business activities: coordination on flight schedules, setting fares, establishing commission rates, signing contracts with corporate clients and travel agencies. In some jurisdictions, collusion on pricing, product, commissions is viewed as anti-competitive - and thereby illegal. The United States is the largest market that takes this view. Accordingly, many JVs seek anti-trust immunity from jurisdictions they touch.

[2] PAX-IS, the key dataset used in the assessment, covers the period from 2006 to September 2012. This dataset comprises monthly data on fares and passengers, by origin-destination pair and by airline.

1.3 COST-BENEFIT APPROACH TO ESTIMATING NET BENEFIT OF JOINT VENTURES

In a CBA, public benefit is weighed against public detriment. The CBA approach adopted in this Study drew on the interpretation of 'net benefit' set out in CCS' guidelines on agreements to be exempted from the section 34 prohibition[3]:

> *An agreement has net benefit if it contributes to —*
>
> *a) improving production or distribution; or*
> *b) promoting technical or economic progress,*
>
> *but does not —*
>
> *i) impose on the undertakings concerned restrictions which are not indispensable to the attainment of those objectives; or*
> *ii) afford the undertakings concerned the possibility of eliminating competition in respect of a substantial part of the goods or services in question.*
>
> Source: based on para 4.1 of CCS' 'Guidelines on Section 34 Prohibition', available online at: http://www.ccs.gov.sg/content/dam/ccs/PDFs/CCSGuidelines/S34_Jul07FINAL.pdf

Regarding scope of the CBA in this Study, CCS advised that the CBA should comprise a total welfare cost-benefit assessment, i.e. it should not be restricted to considering impacts on Singaporeans.

The literature on airline alliances provides established approaches for examining impacts on *fares* and *passenger numbers*. This is done through regression analysis, which allows for other determinants of supply and demand to be controlled for. The aim is to find models that provide a good fit to the data, allowing a robust 'counterfactual'[4] to be identified.

In this Study, a large number of possible econometric models were developed and tested, informed by approaches recommended in the literature. The models developed were generally "fixed effects"[5], involving different combinations of variables and in some cases "interacted"[6] variables.

The analysis undertaken provides insights into potential future impacts of JVs on fares and passenger numbers, based on models drawn from data across all JVs. This is supported by backward-looking net benefit assessments focusing on the two existing case study JVs. The models and approach are largely common to both forward and backward-looking analyses.

There is a wide range of other potential impacts of JVs, such as operating costs and service quality. It was not possible to estimate econometric models for these in this Study, given data constraints - but

[3] The Section 34 prohibition under the Competition Act in Singapore applies to agreements with the object or effect of preventing, restricting or distorting competition within Singapore.

[4] i.e. what would have happened if the alliance(s) of interest had not been formed.

[5] This is a technique commonly used where data are structured as a "panel". In panel datasets, each observation is associated with a specific time period and cross-sectional unit (in this case, a route between two cities). Fixed effects allow for route-specific factors that are relatively stable over time (such as the distance between two cities) to be controlled for in the analysis.

[6] Some variables might be expected to have a combined effect that is different from their individual effects added together. For example, the effect of JVs on fares or passenger numbers might vary depending on the level of competition on a route. "Interacting" two variables means including them jointly (i.e. multiplied together) in the regression equation, as well as on their own.

some (non-econometric) quantitative analysis was provided. The Study also included an assessment of competition impacts of alliances, which was incorporated into the net benefit assessment.

In summary, the costs and benefits analysed in this Study were:

- Fares (through econometric modelling);
- Passenger numbers (through econometric modelling);
- New routes;
- Reduction in travel times;
- Operating costs;
- Capacity;
- Scheduling / frequency;
- Tourism and economic development – in particular, it is considered that two sources provide clear net benefits to Singapore from increases in passenger traffic:

  i) spending at the airport: this includes increased revenue for restaurants, shops and hotels, as well as increased revenue for Singapore government through passenger service charges; and

  ii) economy-wide benefits in terms of trade and investment, resulting from increased business travel.

  Net benefits from additional tourist passengers are less certain given the significant numbers of Singaporean tourists flying out of the country.

Assessments were also provided for the two further tests that form part of CCS' net economic benefit definition:

- 'imposes restrictions' (indispensability test): i.e. whether the JV is required to achieve the objectives of the alliance, as compared to other options like a global alliance or entering a code share agreement;
- 'eliminates competition' (competition test): i.e. whether JVs have a material adverse effect on competition.

1.4 RESULTS

The headline results on passenger numbers and fares are summarised in the table below.

Exhibit 1-1: Headline Impacts of JVs on Passenger Numbers and Fares

JV	Passenger numbers	Fares
JAL/AA	• 14% increase on market overall • Most if not all increase captured by JV	• No change in individual fares • JV average fares go down significantly due to mix effects
ANA/CO/UA	• 5% increase on market overall • Increase in JV passengers (especially business class)	• Increase in business class fares • JV average fares go up due to mix effects • Market average fares go up across market
"Typical" JV of this kind	• 10% increase on market based on the JVs studied	• Not a meaningful question, since depends on airline strategy amongst other things

1.4.1 EX-POST ANALYSIS OF THE TWO CASE STUDY JOINT VENTURES

The backward-looking analysis suggests that while the two JVs have been net beneficial – particularly the JAL/AA JV - the benefits have not come from the expected source of fare reductions. **The main benefit of existing JVs has been an increase in passenger numbers, both at the market level and for the carriers in the JV.** These increases in passenger numbers are likely to have generated significant economic benefits for Singapore. While not quantifiable directly, economic benefits from increased trade and business travel are likely, as are more immediate benefits from increased airport revenue.

On fares, the picture is complex. Any changes following a JV appear to have been driven by what passengers do – which airlines they travel on, the routes they take and the proportion that travel in each fare class. These so-called "mix effects" can mean that average fares change even when fares offered by individual airlines or JVs remain the same. The analysis suggests that no *individual* fare on JAL/AA routes changed as a result of the JV, yet the *average* JAL/AA fare on a JV route went down. This could be explained by the observed increase in passenger numbers coming largely from passengers travelling in cheaper fare classes or on cheaper routes.

For ANA/CO/UA, there is evidence of increases in *individual* business class fares as well as in *average* fares as more passengers started to fly business class. In isolation, the finding of rising individual fares might indicate a detrimental impact on welfare. However, this is doubtful given that more passengers have been *choosing* to fly business class on the relevant JV routes. That fare changes differed between the two case study JVs also illustrates the point that impacts of JVs on fares are highly specific to the JV in question and to the strategy adopted by the airlines concerned.

In addition, there have been improvements in frequency and capacity of flights, on routes operated by both JVs - particularly to Tokyo. On balance, based on industry knowledge these effects should not be attributed to the JVs, but rather to the opening of Tokyo Haneda airport to new international flights and to JAL's 2010 bankruptcy and its subsequent restructuring (and that of AA). While not attributable to JVs, improvements in capacity and frequency are associated with an increase in the

intensity of competition on major hub-to-hub and hub-and-spoke routes. On some routes this has resulted in fare decreases, even where the structure of the market is not conducive to competition (i.e. the market has high Herfindahl-Hirschman index (HHI), market concentration, etc.).

There are a number of possible explanations for the observed effects on fares and passenger numbers, including a move to focus on quality. The opening of Tokyo Haneda airport to new international flights, and the impact of JAL's 2010 bankruptcy and restructuring, are also important considerations. It would be premature to draw firm conclusions about the lifetime impact of either JV yet. Both JVs were introduced at around the same time on similar routes, making it difficult to disentangle their individual impacts. Moreover, as the JVs took effect in April 2011 (JAL/AA) and October 2011 (ANA/CO/UA), only 4-6 quarters of post-JV data were available for each. This was not enough to consider long-term trends – updating the analysis to incorporate additional data becoming available over time would allow for a more robust assessment.

The combination of rising passenger numbers and neutral impact on individual fares would suggest that the JVs have delivered net benefit. Accompanying modelling analysis suggests that JVs (in combination with code-shares) bring more positive effects than code-shares alone – i.e. the JVs pass the 'indispensability test'. Furthermore, a comparison of HHI figures in 2010 versus those in 2012 on the JV routes – i.e. pre versus post alliance - suggests no overall reduction in competition, at least in the short term. Thus, the JVs pass the 'competition test'.

1.4.2 Ex-Ante Analysis of "Typical" Impact of Joint Ventures

Drawing on results from models estimated across all JVs provides insights into *future* impact. The key message is that JVs are likely to increase passenger numbers significantly (as per the backward-looking analysis of the two case study JVs). Analysis of all JVs suggests an increase of around 20%, though, given small data samples on the non-case-study JVs, a more robust estimate is closer to the average of the two case studies, i.e. 10%.

Notwithstanding the impact of JVs, other changes are also likely to have led to increased passenger numbers – these changes include increases in direct flights and in the provision of online[7] services[8]. Thus, caution is needed in attributing changes in passenger numbers solely to JVs.[9] Moreover, the two case study JVs, which have a large influence on the results, are similar: they are both US-Japanese carriers on trans-Pacific routes, starting within half a year of each other. Caution should be applied when generalising the results to assess future impacts of JVs on other routes.

The results on fare impacts are mixed and seem to depend more on factors not explicitly captured in the models (e.g. airlines' overall strategy). The analysis suggests an overall increase in fares when averaged across origin-destination pairs on JV-operated routes - but this seems to be due largely to movements of passengers between classes, airlines and routes.

[7] In the context of non-direct (i.e. stopping) services, 'online' services are operated by a single airline, whereas 'interline' services are operated by two or more airlines. Passengers are less likely to travel on interline routes, all other things being equal.

[8] If the JV enabled these changes it would be appropriate to attribute them to the JV.

[9] The models developed in this Study control for these effects as far as possible.

1.5 COMPARISON TO RESULTS FROM THE LITERATURE

Exhibit 1-2: Comparison to Results from the Literature

Results of analysis in this Study	Results from the literature
• Individual fares mostly do not change	• Reduction in fares of 13-25% • Recent literature looking at Pacific finds fare increases (Zou 2011[10])
• 10% increase in passengers in market overall • Substantial increase in JV passengers	• Increase in JV passengers of 52-88%

As shown in the table above, much of the literature suggests that JVs result *both* in significant passenger number increases *and* in sizeable fare reductions (13-25%). By comparison, the analysis in this Study demonstrates passenger increases – but no impact on fares. This raises the question: why do the results differ from those in the literature?

First, it should be noted that the markets considered in this Study (mainly the Singapore-North America market in 2006-2012) differ from those considered in the literature (mainly the US market in the 1990s). Moreover, when compared to earlier work, this Study was more comprehensive in terms of data – a quarterly panel dataset, spanning six years and all routes in the relevant markets, was used. By comparison, much of the literature considers only JV-specific routes. The key Whalen paper of 2005[11] looked at one data point in each year over ten years.

In addition, the literature on fare reductions is not unanimous. A paper by Zou in 2011 found that fares went *up* with alliances – although that paper looked at the impact of *global* market alliances rather than JVs. Finally, it is worth noting that alliances have been around for a long time now. Perhaps the "quick win" JVs that yield the greatest benefit have already been established.

1.6 CONCLUSION

Overall, the CBA for this Study suggests:

- Passenger numbers were up by 14% and 5%, respectively, on routes operated by the two case study JVs – JAL/AA, and ANA/CO/UA. Most, if not all, of these increases in passengers were captured by the JVs themselves.
- Individual fares (i.e. the fare in each ticket class) didn't change as a result of the JVs – with the possible exception of business class fares for ANA/CO/UA, which appear to have gone up.
- There is no evidence of other cost saving or route changing benefits that can be attributed to the JVs.

[10] Zou et al (2011): 'Assessing the price effects of airline alliances on complementary routes', Transportation Research Part E: Logistics and Transportation Review.

[11] W. Tom Whalen (2005) 'A Panel Data Analysis of Code Sharing, Antitrust Immunity and Open Skies Treaties in International Aviation Markets', U.S. Department of Justice - Antitrust Division

- Both JAL/AA and ANA/CO /UA appear to have delivered net benefit – although it is too early to be sure of the precise long-term magnitude, particularly for ANA/CO/UA. The JVs passed the 'indispensability' and 'competition' tests.
- Whilst JVs operating through Singapore do appear to have delivered net benefit, the benefits are not as large as those found in the literature for other markets.