



The Noumea PECC Round Table

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Scale and Scopes of Economies: A Panel Data Study on Airline Alliance

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Introduction

Aims:

This research aims to further the understanding of the airline business in the new era where the global regulatory environment and the economic climates differ greatly and global competition a reality.



Economy of Scale (Definition)

Economies of scale are said to be present in production when unit (average) cost decreases as output increases. There are various explanations for the presence of economies of scale, such as:

1. The existence of substantial fixed costs;
2. Opportunities for specialisation in the deployment of resources; and
3. A strong market position of factor inputs.



Economy of Scale (Difficulties)

Smaller airlines have higher direct operating cost because they operate thinner routes using smaller aircraft over shorter stage length. Therefore, the type of route and aircraft operated are likely to be more important determinant of cost rather than the economy of scale.



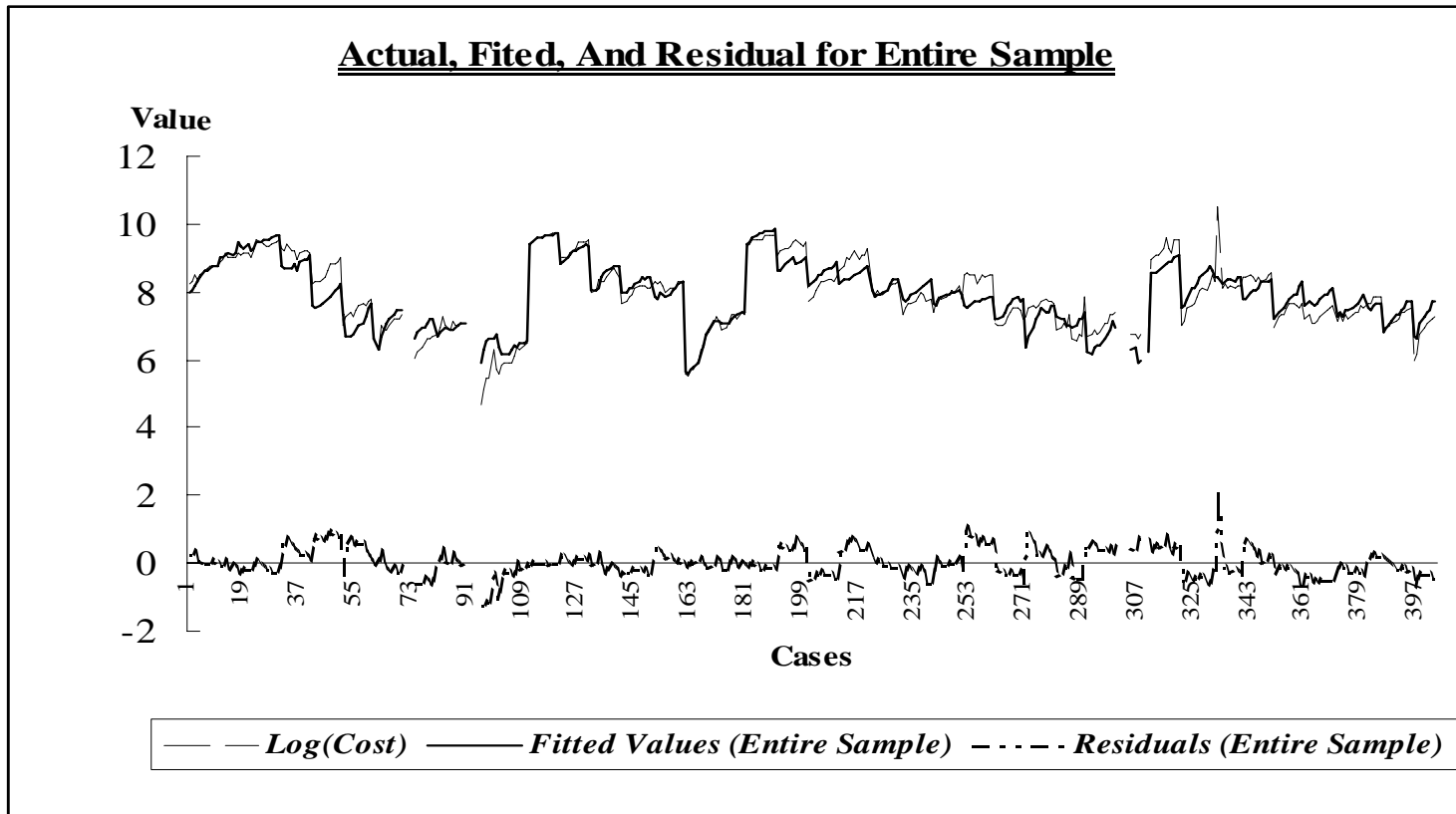
Economy of Scale (Previous Studies)

All previous studies have confirmed just that (Caves et al, 1984; Gillen et al, 1990; Bauer, 1990; Oum and Zhang, 1991; Kumbhakar, 1992; Keeler and Formby, 1994; Baltagi et al, 1995).

Data Source :

Sample data are compiled from the industry journal, Airline Business (yearly survey) from year 1991 to year 2000.

Economy of Scale





Economy of Scale

<i>Cross-sectional time-series LOGIT regression</i> <i>Number of observation = 278</i> <i>Number of groups = 29</i>			<i>Log likelihood = -29.48</i> <i>Wald chi2(1) = 127.55,</i> <i>p-value = 0.000</i>	
<i>Alliance</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>Z-value</i>	<i>p-value</i>
<i>Log(RPK)</i>	<i>2.40</i>	<i>0.71</i>	<i>-1.43</i>	<i>0.152</i>
<i>Log(Cost)</i>	<i>-1.02</i>	<i>0.55</i>	<i>4.33</i>	<i>0.000</i>
<i>Constant</i>	<i>18.21</i>			



Economy of Scale

Results:

The results support the preceding findings: non-alliance airlines seem to have lower RPK and higher Cost than airlines in alliance groupings. Apparently, all evidence shows that airlines with strategic partners are more likely to enjoy the scale of economy



Economy of Scope

Definitions:

Economies of scope are comparable to economies of scale but imply efficiency gains resulting from expansion of scope, or number of different output types, rather than from an increase in the volume of total output.





Economy of Scope (Aims)

The International Air Transport Association working party had pinpointed what these scopes were (IATA, 1985):

1. Attractions of large and widespread network;
2. Ability to dominate operation at a hub(s);
3. Control of distribution especially through computer reservation system (CRS);
4. Ability to exercise price leadership;
5. Value of network size in loyalty marketing schemes, e.g. Frequent Flyer Program;
6. Ranges of markets allow cross subsidising of competitive pricing on particular routes;
7. Marketing power of large-scale advertising.





Economy of Scope

In order to estimate the scope of economy, previous equation for a two product (companies) can be also be expressed as:

$$\sum_{i=1}^n C(q_i) \gg C\left(\sum_{i=1}^n Cq_i\right)$$



Economy of Scope

Data Limitations:

However, due the impossibility of separating the exact cost of the joint operation given the data limitation where there is a three to four years of delay to detail accounting information, the scope of economies can only be proxy by comparing cost per unit of output between the alliance airlines with the non-alliance.



Economy of Scope

Expected Outcomes:

For the theory to stay correct, airlines that are involved in alliance should have an overall lower Cost per RPK due to all the factors mentioned previously. By comparing the mean of these two groups, results are given as:



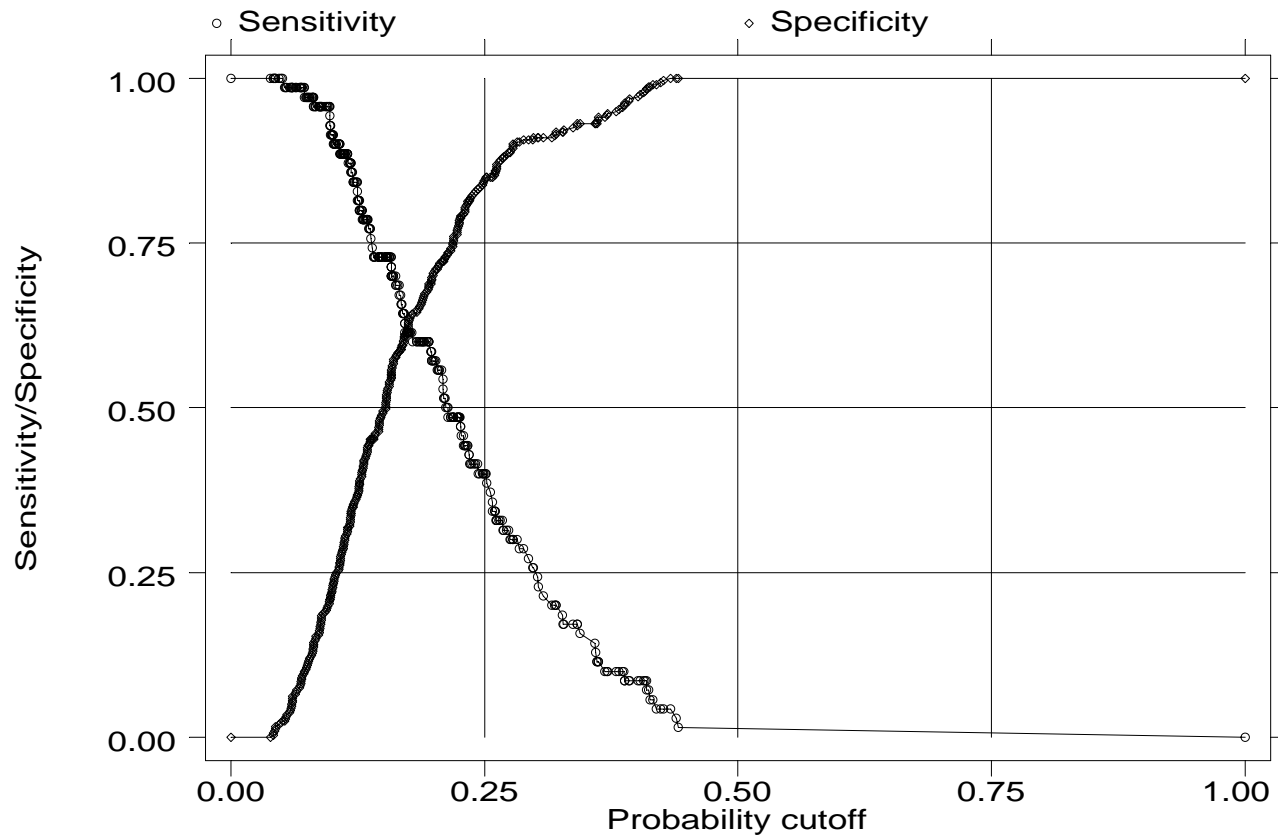
Economy of Scope (Results)

Two-sample t test with unequal variances

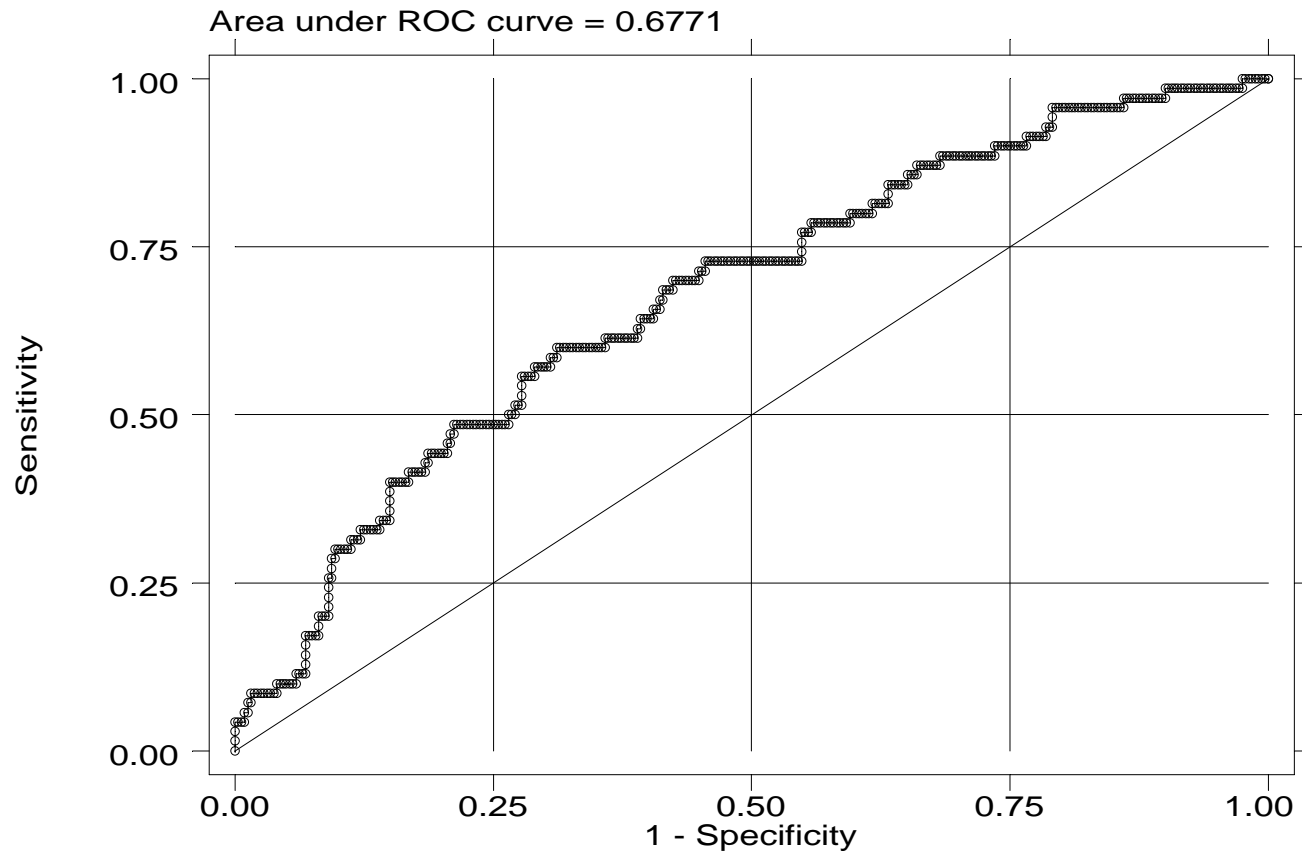
Group	Observation	Mean	Std. Deviation	95% Conf. Interval
Non-Alliance	321	0.133259	0.069959	0.125577-0.140941
Alliance	70	0.120536	0.049212	0.108812-0.132270
Combined	391	0.130981	0.066844	0.124335-0.137627
Difference		0.127229		-0.001237-0.026683

H_0 : Mean (Alliance) = Mean (Non-alliance)
 H_1 : Mean (Alliance) > Mean (Non-alliance)
Results: t -statistic= **1.8**, p -value = **0.04**
Hypothesis Test: Null hypothesis is **rejected**.

Economy of Scope (Results)



Economy of Scope (Results)





Economy of Scope

Results:

The result showed that airlines in the alliance group do have favourable cost benefit, or scope in so far as unit cost is concern. However, proxy based on unit cost is not the only way to examine the scope of economy given the objective listed earlier.



Economy of Scope

Results:

Airlines in the alliance group do have favourable cost benefit, or scope in so far as unit cost is concern. However, proxy based on unit cost is not the only way to examine the scope of economy given the objective listed earlier.

Furthermore, impact on joint advertising really cannot be tested under the present framework and the lack of more relevant data..



Concluding Remarks

The motivation behind forming alliances has raised much interest. It was considered that the objective was to achieve economies of scale and scope, however, previous studies do not support this theory. This research has illustrated that, by analysing panel data of all the major alliance groupings, the advantages achieved through being large and having a wide market reach throughout the world are significant motivators.



Concluding Remarks

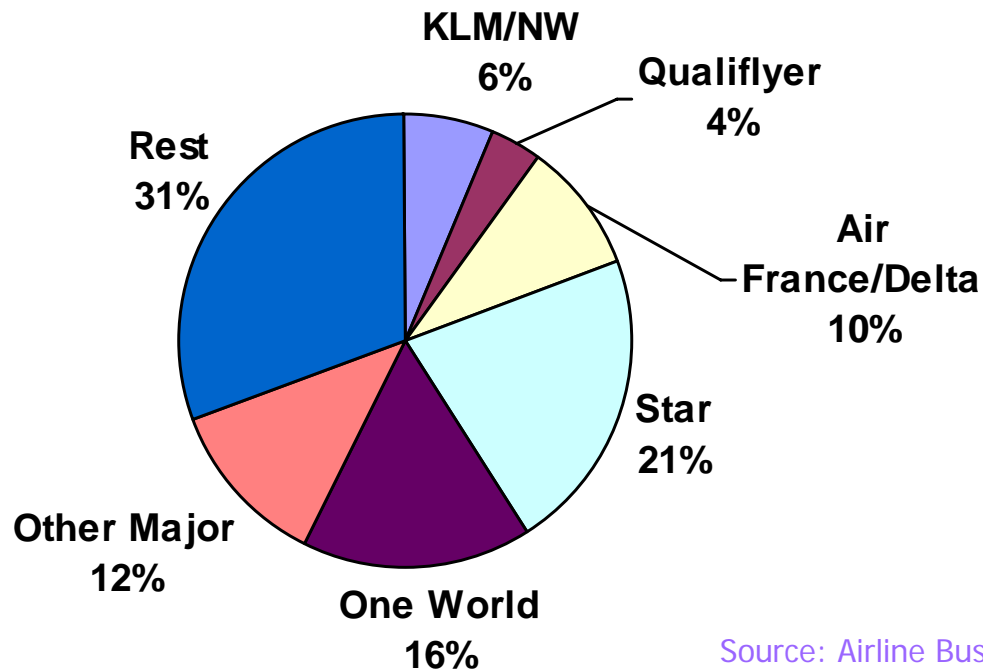
If the objective of airlines to enter the alliance agreement is to increase its network and market reach, then by forming alliance with major airlines from different part of the world would certainly achieve that. When airlines enter a alliance group, it would not only have gained access to new market, but also a larger percentage of the world market share



Concluding Remarks

The average market share in airlines were 11.44% of the world passenger market where as the non-alliance airlines only a very modest 1.34%, in this respect, scope of economies is certainly prominent for the alliance airlines.

Concluding Remarks



Source: Airline Business, 2000



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The End



Thank you

