

Merger Policy when One Price Doesn't Fit all: price discrimination and policy in airline markets

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Is monopoly output restriction a (nearly) empty empirical box?

Lack of empirical evidence of output restriction as a result of exercise of market power

- *Horizontally – after horizontal mergers*
- *Vertically -- double marginalisation problem*

Theory: implausible that money would be left on the table?

- *Generates problems with the “merger paradox”*
- *And problems for total-surplus anti-trust (NZ)*

Diagram 1: Monopolist with no price discrimination

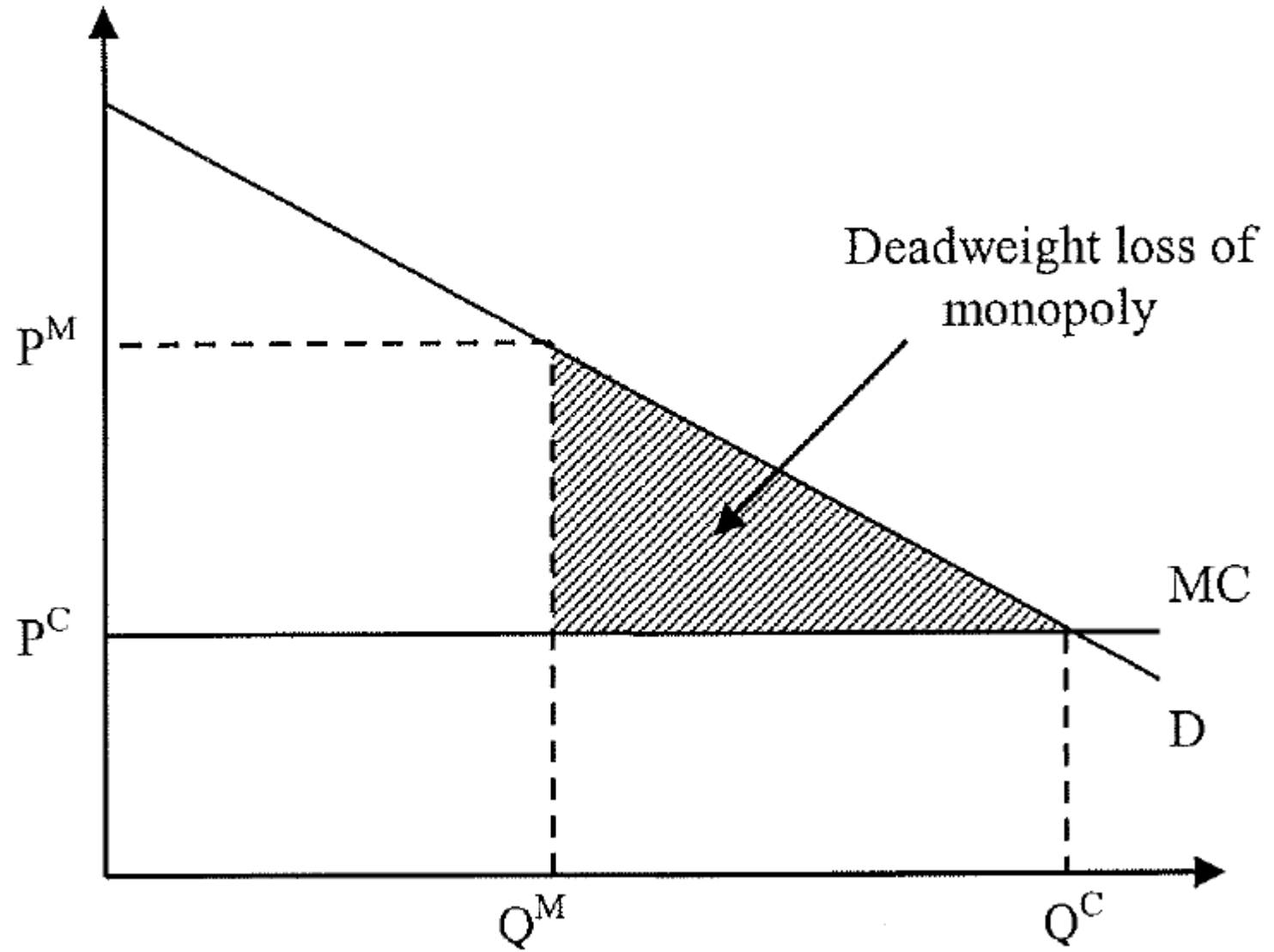
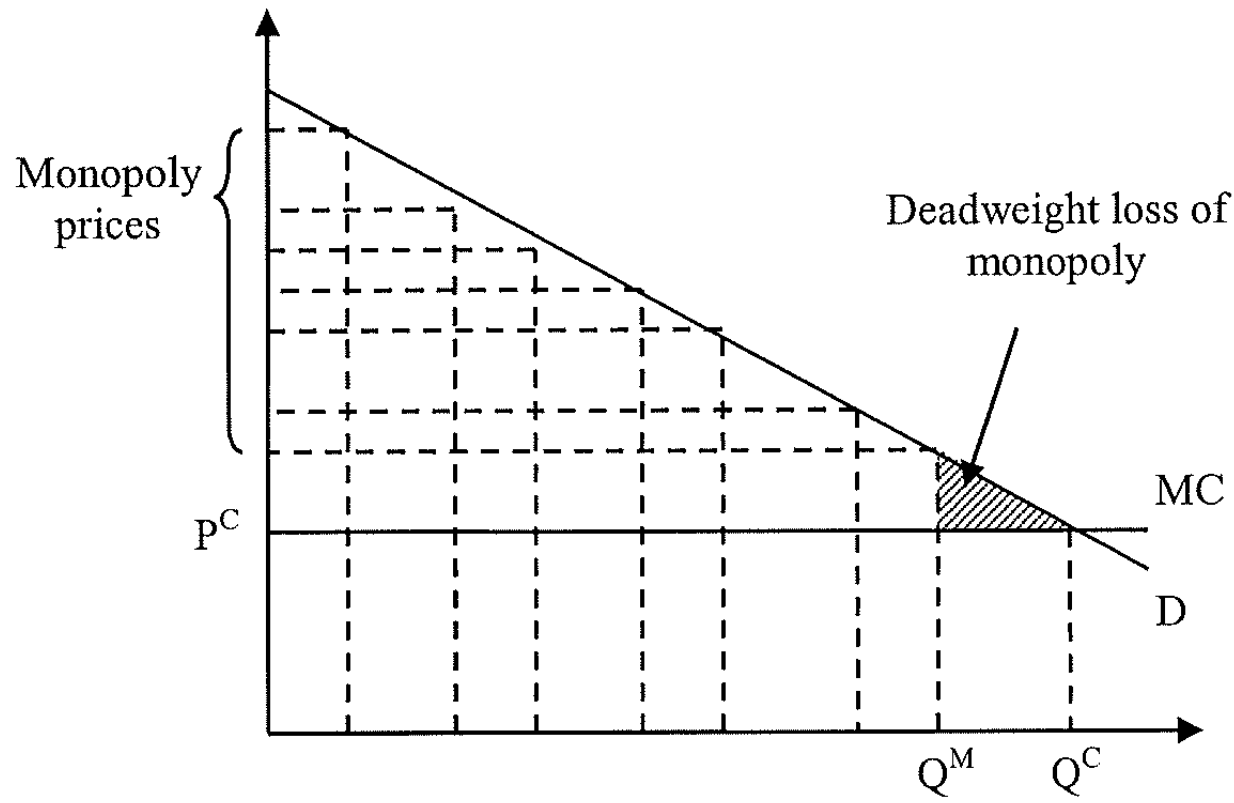


Diagram 3: Price discriminating monopolist with seven prices



Relation between Price Discrimination and Cournot-Nash Oligopoly

Say homogeneous product, $P = 1 - Q$; $MC = 0$

Output of price-discriminating monopolist:

$Q = n/(n + 1)$, where n = number of prices

Output of Cournot-Nash (single-price) oligopoly industry:

$Q = n/(n + 1)$, where n = number of firms

OK, so we need to model price discriminating oligopoly....

The context

the industry:

Passenger air travel – most extreme example of price discrimination....?

the policy:

Series of “merger” applications made by Air New Zealand: 2003, 2006, 2010

The first two were attempts to fully cartelise certain routes (almost *de facto* merger) by Air NZ and Qantas

- These two airlines had market shares from 80 to 100% on these routes!
- *How possibly could they expect to be allowed to merge? (They weren't, but...)*

2010 proposal was alliance between Air NZ and Virgin Blue (*this was authorised, with conditions*)

Playing the LCC card

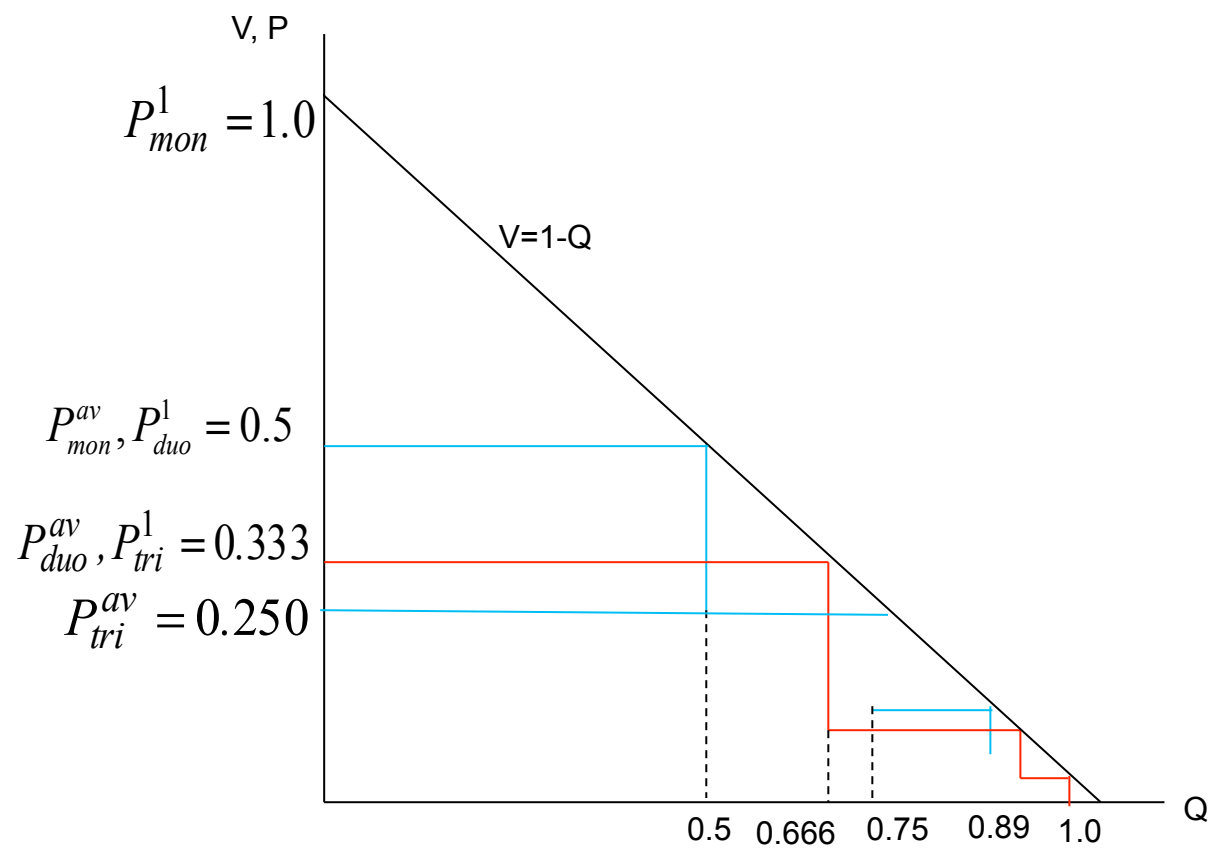
The airlines argued that they were under siege from a new business model – the “Low-Cost Carrier” model (Virgin/Pacific Blue)

- LCC competition for the price-sensitive “marginal customer”
- This competition would prevent the “legacy” carriers from raising prices to business customers etc

The theory

Hazledine (2006; 2011) builds model of (imperfect 1st degree) Price Discrimination in setting of homogeneous, symmetric, linear Cournot-Nash oligopoly

- HHI-Price effect same as for single-price case!
- With many prices, lowest price tends towards marginal cost
- But highest price does not tend to intercept value (except in monopoly 1st degree case)



Implications for the merger paradox

- Don't need to reduce total market output to raise prices with market power!
- Moves the merger paradox down one level
- That is, the merger of two firms in a homogeneous triopoly is not unprofitable

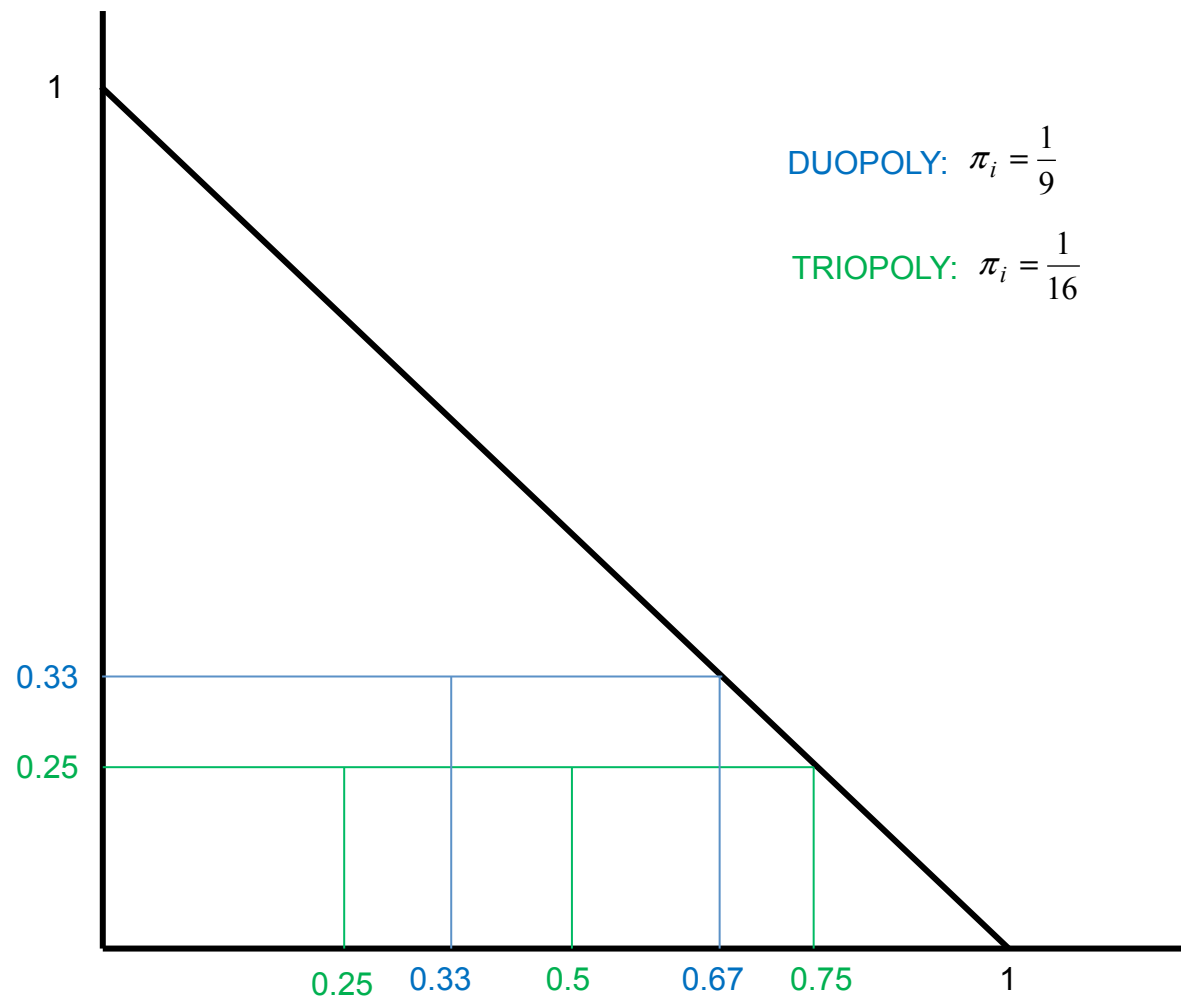


FIGURE 2: SINGLE-PRICE OLIGOPOLY

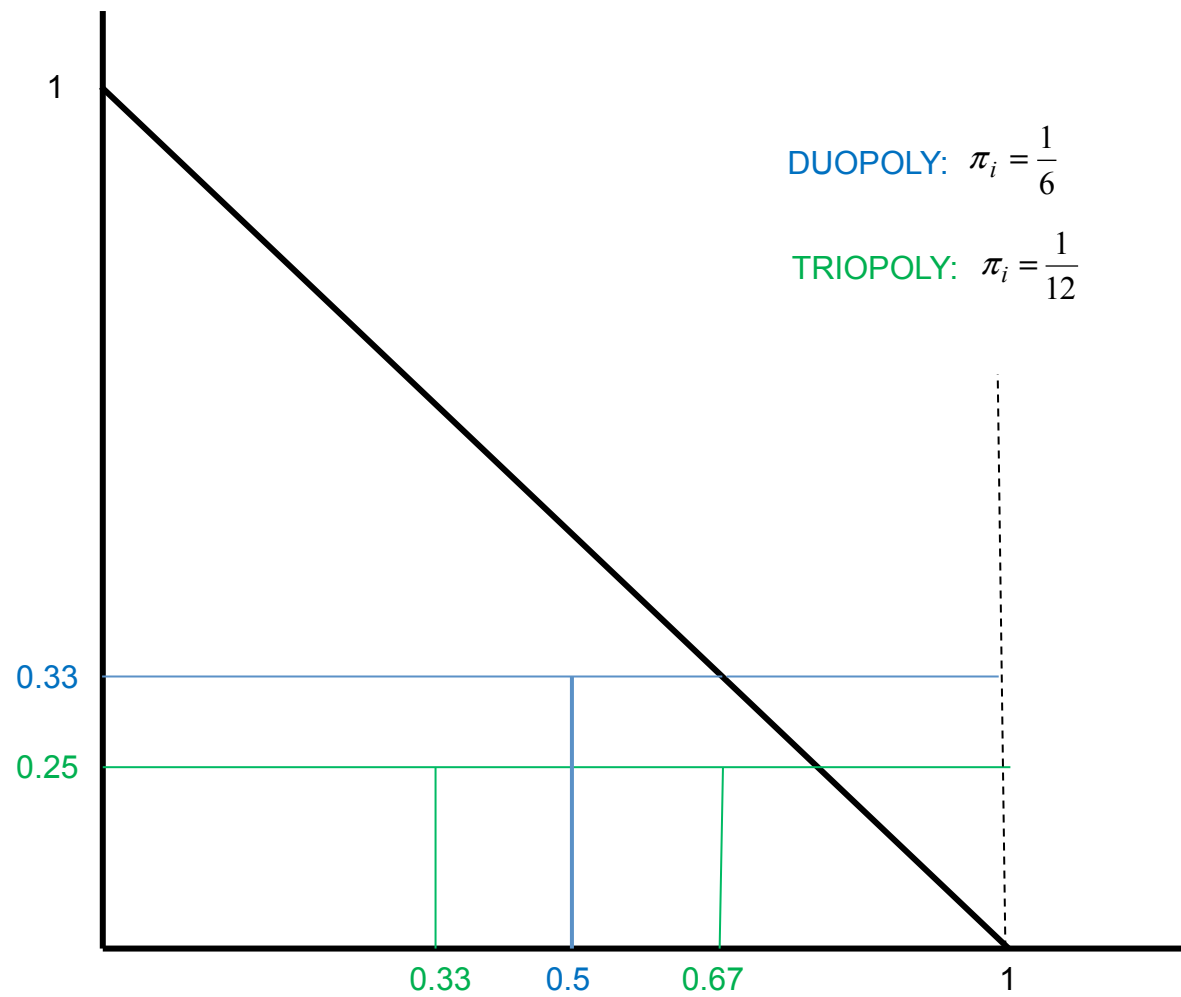


FIGURE 3: MANY-PRICE OLIGOPOLY

How to model our airline case?

Use a two-price model

- Assume high correlation between willingness to pay for a flight and willingness to pay for the perks and add-ons legacy carriers offer
- So, the LCC is competing on equal terms for the low-price customers, but not competing at all in the high-price segment of the market
- So here we have duopoly competing for high-value customers; triopoly for low-value

Essence of the model

When total market demand is $P = 1 - Q$

The Cournot-Nash equilibrium quantities are:

$$(6) \quad q_{1H} = 0.2(1 - c_1) + 0.1(1 - c_2)$$

$$(7) \quad q_{1L} = 0.4(1 - c_1) - 0.3(1 - c_2)$$

$$(8) \quad q_{2L} = 0.7(1 - c_2) - 0.6(1 - c_1)$$

We calibrate this to match typical pre-merger market shares

Then model the outcome if the two full-service airlines merge:

$$(9) \quad q_{1H} = 0.2(1 - c_1) + 0.2(1 - c_2)$$

$$(10) \quad q_{1L} = 0.6(1 - c_1) - 0.4(1 - c_2)$$

$$(11) \quad q_{2L} = 0.6(1 - c_2) - 0.4(1 - c_1)$$

TABLE 1: MERGER SIMULATION UNDER PRICE DISCRIMINATION

		COSTS OF TYPE-1 FIRMS	COSTS OF TYPE-2 FIRMS	HIGH PRICE	LOW PRICE	TYPE-1 HIGH-PRICE SALES	TYPE-1 LOW-PRICE SALES	TYPE-2 LOW PRICE SALES	TYPE-1 TOTAL PROFIT	ALLOCATIVE WELFARE LOSS
		C1	C2	Ph	Pl	Q1h	Q1l	q2l	π_1	Δ
TWO-PRICES	TRIOPOLY	0.2	0.18	0.52	0.27	48.4	14.8	9.4	16.7	0.2738
	DUOPOLY	0.2	0.18	0.68	0.35	32.4	15.2	17.2	18	1.1552
ONE PRICE	TRIOPOLY	0.2		0.4		60			12	2
	DUOPOLY	0.2		0.47		53.3			14.2	3.56

Econometric modelling

Used website data on lowest fares offered from 8 weeks through to one day prior to flights

- Observe large differences over time in airfares
- Average price strongly related to HHI

But

- Effect stronger for high prices
- HHI not much related to the lowest prices

Econometric modelling

Coefficients on Herfindahl Index and Airline Dummies in NZOZ airfare regressions (IV)			
	Average Price	Price 8 weeks out	Price day-before
HHI	0.290 (5.90)	0.127 (2.30)	0.574 (8.35)
QANTAS	-0.126 (-10.40)	-0.068 (-4.97)	-0.179 (-10.54)
PACIFIC BLUE	-0.212 (-8.78)	-0.089 (-3.26)	-0.331 (-9.76)
R ²	0.798	0.704	0.693

Implications for the merger proposal

- True that an effective LCC could discipline legacy carriers' pricing at the low-price end of the market, where mainly leisure travellers care a lot about price and not much about anything else (eg, frequency, service, airline perks)
- But not true that this “marginal customer” effect percolates throughout the full market – LCCs not competitive for high-value customers

Conclusion

- Hard to model asymmetric airline competition using single-price models
- Surprisingly easy to do it with a basic two-price price discrimination model
- Too easy? Too basic? With more complex pricing, we would lose the nice dichotomy between market structures
- And what about the 2010 AirNZ/VB proposal?