Competition in the domestic airline sector in Mexico*

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Outline of presentation

i. Summary of main results

ii. Review of competition concerns

iii. Structure of the market, 1989-2008

iv. Summary of 2009 econometric study

v. Policy recommendations & estimate of benefits
Summary of main results


   Compound growth rate of 5.40%, economy grew at 3.00%


   1989 HHI of 4396, 2008 HHI of 1766

3. Emergence of low cost carrier as strong competition.

   LCCs captured 1/3 of market within several years
4. Average fares are 30% lower on routes with low cost carriers, robust result.

5. Average fares are between 40% and 80% higher at Mexico City Airport (saturated) airport, robust result.

6. Average fares are between 11% and 23% lower when incumbents compete, statistical significance varies.
COFECO has examined competition conditions in airlines on several occasions, barriers identified:

1. No cabotage service and 25% foreign ownership restriction.

2. Barriers to airport facilities, esp. in saturated airport.

3. SCT discretion in awarding concessions and additional routes.

4. Structural barriers (sunk costs, attracting customers to new airline, etc).
Competition assessment

Number of Domestic Airline Passengers
1989-2008 (000)

CAGR = 4.1%

CAGR = 14.1%

Source: SCT, La Aviación Mexicana en Cifras, 1989-2008
Competition assessment

HHI for Domestic Airline Service
(Nationwide market based on passengers)

Source: SCT, La Aviación Mexicana en Cifras, 1989-2008
Competition assessment

Domestic share of Aeromexico, Mexicana & other Carriers
1989-2008

Source: SCT, La Aviación Mexicana en Cifras, 1989-2008
Competition assessment

Growth of Low Cost Airlines
Market Shares 2005-2008

Source: SCT, La Aviación Mexicana en Cifras, 1989-2008
Note: Avolar & Alma ceased operations in 2008
Summary

1. Strong output growth

2. Decreasing concentration

3. Strong performance by entrants
Data analysis, purpose

Investigate relationship between airline fares and:

1. Competition variables (# of airlines, # of low cost carriers, competition between incumbents).


3. Economic variables (economies of density, distance, demand, etc).

Use results to estimate impact of competition policy reforms.
Data analysis

Collected data on approximately 500 **domestic** routes, between April-August 2009.


8 airlines: (5 traditional: Aeromexico, Mexicana, Aeromar, Aviacsa, Magnicharter: 3 LCC: Interjet, VivaAerobus, Volaris). Obtained from SCT.

Lowest-quoted fares collected from airlines’ respective websites.
# Average fares by carriers

<table>
<thead>
<tr>
<th>Airline</th>
<th>Obs</th>
<th>Average distance/route</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>“Traditional” Carriers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aeromexico</td>
<td>354</td>
<td>964</td>
<td>2.88</td>
<td>1.90</td>
<td>0.75</td>
<td>15.41</td>
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<tr>
<td>Mexicana</td>
<td>347</td>
<td>866</td>
<td>2.98</td>
<td>1.37</td>
<td>0.95</td>
<td>15.24</td>
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<tr>
<td>Aeromar</td>
<td>97</td>
<td>677</td>
<td>5.15</td>
<td>3.09</td>
<td>1.25</td>
<td>14.36</td>
</tr>
<tr>
<td>Aviaccelar</td>
<td>10</td>
<td>869</td>
<td>2.90</td>
<td>1.37</td>
<td>0.95</td>
<td>5.20</td>
</tr>
<tr>
<td>Magnicharterer</td>
<td>13</td>
<td>803</td>
<td>2.45</td>
<td>0.97</td>
<td>1.46</td>
<td>4.40</td>
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<tr>
<td><strong>Average</strong></td>
<td>465</td>
<td></td>
<td><strong>3.05</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>“Low Cost” Carriers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interjet</td>
<td>145</td>
<td>977</td>
<td>2.01</td>
<td>0.91</td>
<td>0.90</td>
<td>4.70</td>
</tr>
<tr>
<td>Vivaeroobus</td>
<td>46</td>
<td>934</td>
<td>1.32</td>
<td>0.45</td>
<td>0.71</td>
<td>2.72</td>
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<tr>
<td>Volaris</td>
<td>82</td>
<td>1496</td>
<td>1.39</td>
<td>0.44</td>
<td>0.70</td>
<td>2.99</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>207</td>
<td></td>
<td><strong>1.78</strong> *</td>
<td></td>
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</tr>
</tbody>
</table>
## Low cost carrier impact

<table>
<thead>
<tr>
<th>“Low Cost” Carrier</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 LCC</td>
<td>290</td>
<td>3.44</td>
<td>2.46</td>
<td>0.64</td>
<td>14.29</td>
</tr>
<tr>
<td>1 LCC</td>
<td>157</td>
<td>2.17*</td>
<td>1.08</td>
<td>0.81</td>
<td>5.36</td>
</tr>
<tr>
<td>2 LCC</td>
<td>34</td>
<td>1.79*</td>
<td>0.49</td>
<td>0.91</td>
<td>2.98</td>
</tr>
<tr>
<td>3 LCC</td>
<td>16</td>
<td>1.61*</td>
<td>0.48</td>
<td>0.95</td>
<td>2.60</td>
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<tr>
<td>At least 1 LCC</td>
<td>207</td>
<td>2.06*</td>
<td>0.99</td>
<td>0.81</td>
<td>5.36</td>
</tr>
</tbody>
</table>
## Incumbent competition & Mexico City impact

<table>
<thead>
<tr>
<th></th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incumbent competition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>present</td>
<td>237</td>
<td>2.81</td>
<td>1.88</td>
<td>0.82</td>
<td>12.46</td>
</tr>
<tr>
<td>Incumbent competition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>not present</td>
<td>260</td>
<td>2.92</td>
<td>2.27</td>
<td>0.64</td>
<td>14.29</td>
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<tr>
<td>Airport not saturated</td>
<td>397</td>
<td>2.61</td>
<td>1.72</td>
<td>0.64</td>
<td>12.27</td>
</tr>
<tr>
<td>(Mexico City)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airport saturated</td>
<td>100</td>
<td>3.89*</td>
<td>2.96</td>
<td>1.16</td>
<td>14.29</td>
</tr>
</tbody>
</table>
Summary, differences in means

1. Average prices 40% lower on routes with at least one LCC.

2. Average prices 33% lower on routes not involving the Mexico City airport.

3. Average prices 4% lower when incumbents compete.

4. Need econometric model to examine how robust are the results and control for factors affecting fares.
Econometric models

(1) \( Y_i = X\beta + \varepsilon_i \)

Y is average airline **price/km** per route.

\( X \) is \( N \times k \) matrix of sample values of the independent variables and \( \beta \) are the \( k \) parameters to be estimated.

Main policy variables are: LCC, airportsat (Mexico City) and incumbentcomp, all dichotomous variables.
Econometric models

Additional X variables included: distance, prior year’s demand, leisure/non-leisure, income of origin & destination city.

Airport cost is added as a control: cost by airport of takeoff/landing fees, platform, security costs, etc.

Thus the airports at (Mexico City) variable measures the impact of high entry barriers and lack of potential competition.
Econometric models

\[(1) \quad Y_i = X\beta + \varepsilon_i\]

Assumption that $E[\varepsilon_i|X] = 0$, thus use ordinary least square to estimate parameters in (1).

Assumption is relaxed to account for the fact that LCC, number of comp. & demand may be endogenous.

That is, under assumption that $E[\varepsilon_i|X] \neq 0$, we use instrumental variables (IV) to estimate parameters in (1) and compare with the OLS estimates.
Econometric models

Percentage impact, OLS estimates

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airportsat (Mexico City)</td>
<td>.463***</td>
<td>.461***</td>
<td>.359***</td>
<td>.390***</td>
</tr>
<tr>
<td>Lcc</td>
<td>-.296*</td>
<td>-.291***</td>
<td>-.239***</td>
<td>-.255***</td>
</tr>
<tr>
<td>Incumbentcomp</td>
<td>-.310*</td>
<td>-.210***</td>
<td>-.212**</td>
<td>-.159**</td>
</tr>
<tr>
<td>Cdshmexmar</td>
<td>.401***</td>
<td>.319***</td>
<td>.491***</td>
<td>.376***</td>
</tr>
</tbody>
</table>

*p<.05, **p<.01, ***p<.001
## Econometric models

### Percentage impact, IV estimates

<table>
<thead>
<tr>
<th></th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airportsat (Mexico City)</td>
<td>.795***</td>
<td>.706***</td>
</tr>
<tr>
<td>Lcc</td>
<td>-.309*</td>
<td>-.349**</td>
</tr>
<tr>
<td>Incumbentcomp</td>
<td>-.113</td>
<td>-.229*</td>
</tr>
<tr>
<td>Cdshmexmar</td>
<td>.365**</td>
<td>.306**</td>
</tr>
</tbody>
</table>

*p<.05, **p<.01, ***p<.001
Policy implications (airlines)

Importance of addressing the conditions at the Mexico City airport. Alleviate saturation conditions so that barriers to entering and expanding are lowered.

Increases threat of entry and potential competition.

Consumer benefits can be high: 39 billion pesos/year

Average prices $3,043 pesos, model $60\%$ price reductions; 15.7 million passengers through Mexico City, 2008; Linear demand curve $Q(p) = a - bP$ and \(\text{price elasticity of } -1.2\)
Policy implications (airports)

Remove regulatory obstacles to new carriers entering the market and carriers expanding on routes.

 Guarantee that any safe airline can enter and expand.

Consumer benefits can be: 3.9 billion pesos/year

Average prices $3,151 pesos, model $\approx 30\%$ price reductions; 7 million passengers on routes with 0 LCC, assume this lowered to 3.5 million; Linear demand curve $Q(p) = a - bP$ and price elasticity of $-1.2$
Conclusions

1. Airline competition in Mexico is a success story. More passengers traveling, more options and lower prices.

2. Less concentrated market and declining trend, success of LCCs indicate barriers on certain routes are low.

3. Policymakers can improve situation by addressing bottleneck at Mexico City airport and making entry and expansion approval more transparent and timely.