Photo by Vyacheslav Firsov

AIRCRAFT SIZE AND TYPE IMPACTS ON REGIONAL AIR TRANSPORT DEMAND

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AIRLINE’S DILEMMA

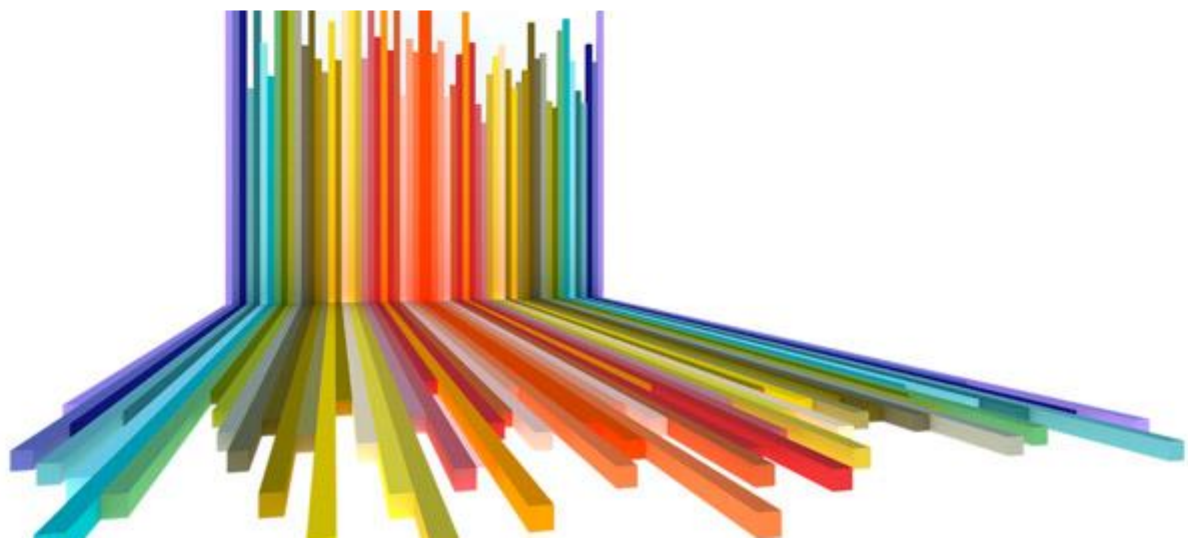
JETS AND TURBOPROPS OPTIONS

Note: Single class with pitch ranging from 30″ to 32″.

Source: Manufacturers’ website.

AIRCRAFT SELECTION

- ❖ Performance
- ❖ Acquisition costs
- ❖ Operational costs
- ❖ Maintenance costs
- ❖ Seat capacity
- ❖ Limitations



SUITABLE AIRCRAFT

Aircraft selection based on demand generation?

Photo by Mark Garfinkel

AIRCRAFT ENGINE TYPE

"Passengers have a clear preference for jets over turboprops, viewing the former as quieter, faster, safer and more comfortable"

Source: ARNOULT (2001) apud DRESNER, WINDLE and ZHOU (2002)
Photo by Gruber Maximilian

AIRCRAFT ENGINE TYPE & DEMAND

- Having lower fuel consumption, turboprops would increase demand through less expensive ticket prices.

- Flying faster, jets would increase demand through higher service frequency.

- Flying more, jets would diminish demand with greater ticket prices due to higher maintenance costs associated to higher flight cycles.

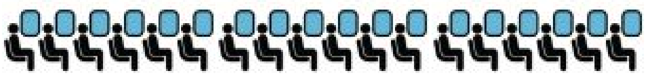
Source: RYERSON and HANSEN (2010); BRUECKNER and PAI (2009)

AIRCRAFT SIZE

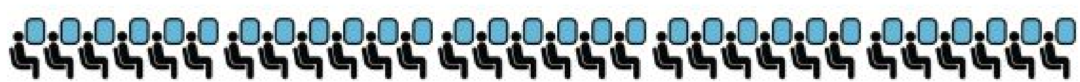
Most of recent articles reports how airlines meet demand selecting the right aircraft and not how the aircraft size affects demand.

Photo by Christian Wals

AIRCRAFT SIZE & DEMAND



- In order to supply demand, airlines have three options: use larger aircrafts, augment frequency or improve load factor.
- Since it is easier to fill small aircrafts, their operation is more profitable, allowing more frequency and thus, increasing demand.
- Operational costs (fuel, crew, airport tax) increase across aircraft size, but once they have more seats, ticket prices tend to be less expensive which increase demand.

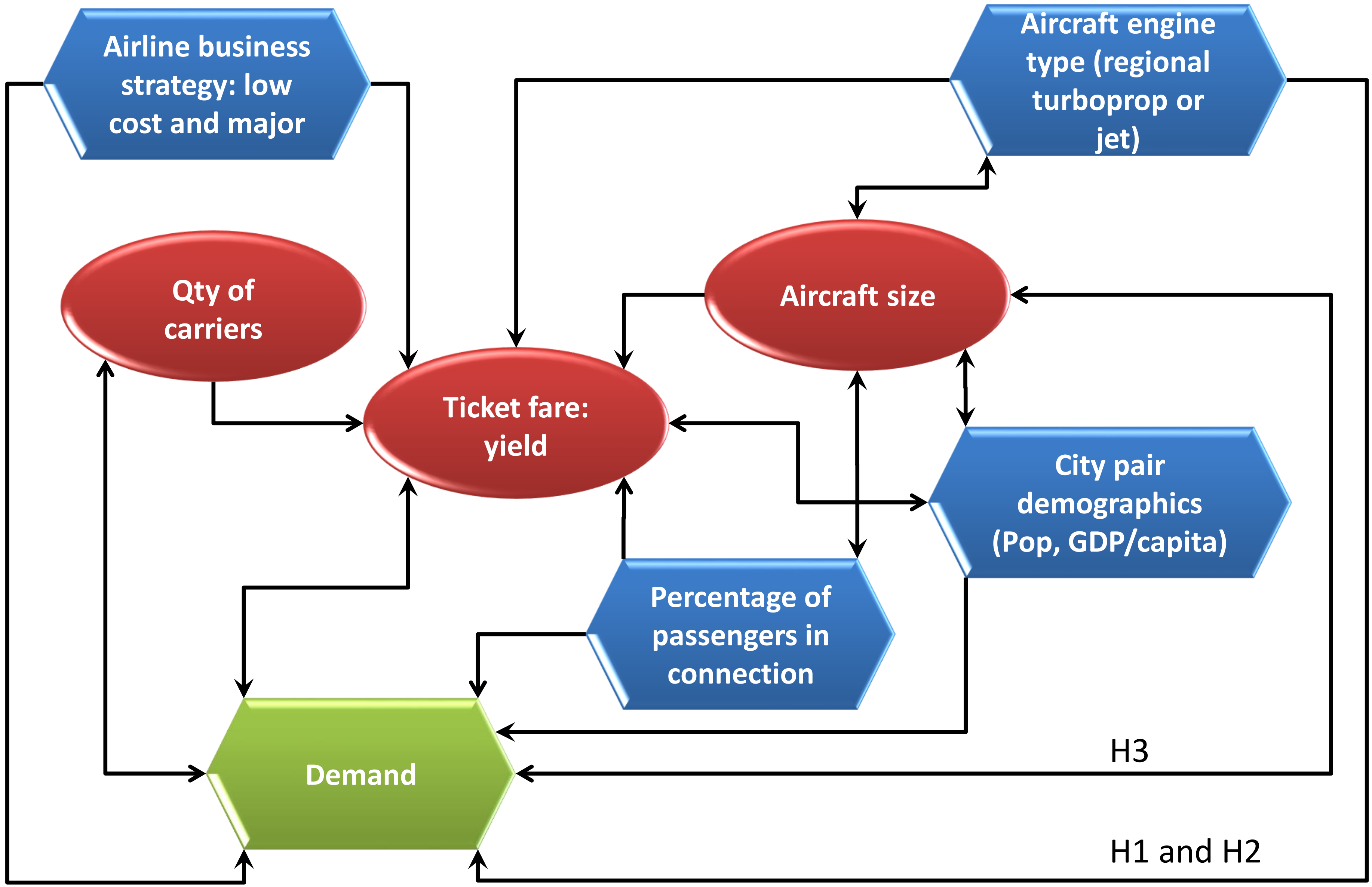


Source: GIVONI and RIETVELD (2009); WONG, PITFIELD and HUMPHREYS (2005); WEI and HANSEN (2005); SWAN and ADLER (2006)

HYPOTHESIS

- H1: Both jets and turboprops positively affect demand.
- H2: Jets enhance demand more than turboprops.
- H3: Small aircrafts enhance demand more than large ones.

ECONOMETRIC MODEL



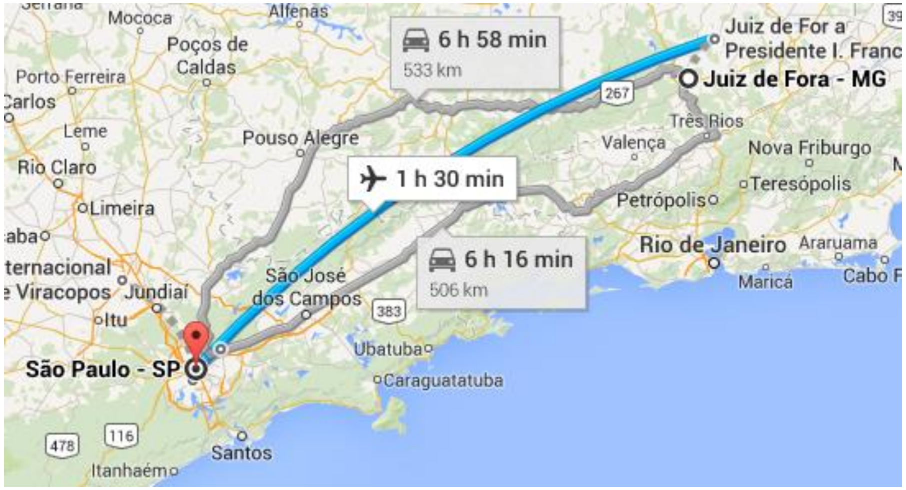
REGIONAL FLIGHTS

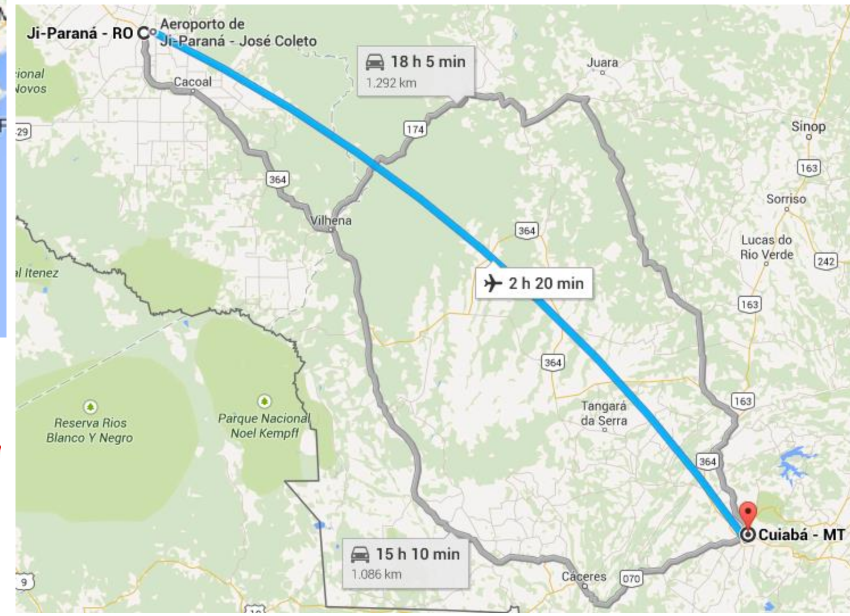
64 airports

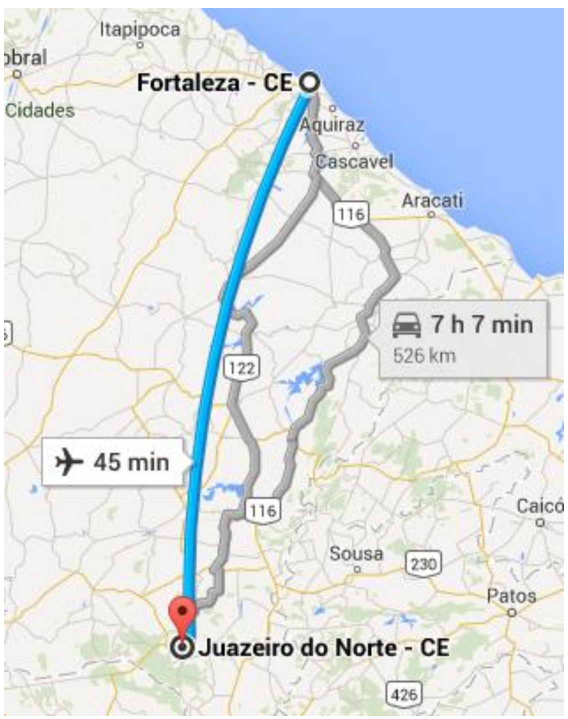
75 city pairs

2002 - 2012

REGIONAL FLIGHTS







RESULTS

	OLS	2SLS	GMM2S	LIML
ln yield	-0.1654***	-0.1976***	-0.2002***	-0.1977***
	[0.027]	[0.033]	[0.032]	[0.033]
ln n of carriers	0.2700***	0.3134***	0.3215***	0.3136***
	[0.020]	[0.027]	[0.026]	[0.027]
ln av aircraft size	0.3156***	0.3905***	0.3804***	0.3906***
	[0.033]	[0.037]	[0.037]	[0.037]
ln population (geo~)	2.4715***	2.7056***	2.6717***	2.7058***
	[0.339]	[0.340]	[0.339]	[0.340]
ln gdp per cap (ge~)	0.9264***	0.8314***	0.8202***	0.8313***
	[0.091]	[0.096]	[0.094]	[0.096]
ln maxshcond	0.0998***	0.1068***	0.1101***	0.1068***
	[0.017]	[0.017]	[0.017]	[0.017]
pres young LCC	0.2436***	0.2351***	0.2281***	0.2350***
	[0.021]	[0.020]	[0.020]	[0.020]
pres major	0.0925***	0.0586***	0.0570***	0.0586***
	[0.019]	[0.020]	[0.020]	[0.020]
pres regional TP	0.1085***	0.1031***	0.1032***	0.1030***
	[0.026]	[0.026]	[0.026]	[0.026]
pres regional jet	0.0787***	0.0574***	0.0544**	0.0574***
	[0.022]	[0.022]	[0.022]	[0.022]
pres mainline jet	-0.0003	-0.0347	-0.0317	-0.0347
	[0.027]	[0.027]	[0.027]	[0.027]
Adj_R2	0.8643	0.8661	0.8660	0.8661
RMSE	0.3203	0.3137	0.3139	0.3137
F	150.497	148.637	150.177	148.635
KP	.	391.3958	391.3958	391.3958
KP_PValue	.	0.0000	0.0000	0.0000
J	.	5.2600	5.2600	5.2603
J_PValue	.	0.5109	0.5109	0.5109
Weak_CD	.	1.8e+03	1.8e+03	1.8e+03
Weak_KP	.	459.3777	459.3777	459.3777
N_Obs	14706	13970	13970	13970

Notes:
- Estimated coefficients (standard errors in brackets)
- P-value representation: ***p<0.01, ** p<0.05, * p<0.10

CONCLUSION

- Both aircraft type and size are relevant for generating demand.
- Results suggest a demand generation criteria could be used when selecting an aircraft.
- Flying small aircrafts contributes more to demand than flying bigger aircrafts.
- Unlike expectations, data suggests TPs improve demand more than jets.


THANK
YOU
GRACIAS
ARIGATO
SHUKURIA
DANKSCHEEN
TASHAKKUR ATU
YAQHANYELAY
SUKSAMA
EKHMET
MEHRBANI
GRAZIE
PALDIES
BOLZÏN
MERCI
BİYAN
SHUKRIA
TINGKI
GOZAIMASHITA
EFCHARISTO
KOMAPSUMNIDA
MAAKE
JUSPAXAR

OBRIGADO

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