



# **Airport Management in a Multi-Airport Region: The case of transfer of flights at Belo Horizonte**

Conrado de Siqueira Wuo

# Guide

- Theme presentation
- Theme importance
- Literature review
- Theoretical framework
- Models
- Results
- Conclusions and contributions

# Transfer of flights between Pampulha and Confins



- Pampulha
- 8 Km of downtown.
- Saturation 3 million
- Confins
- 40 Km of downtown.
- Saturation 10 million

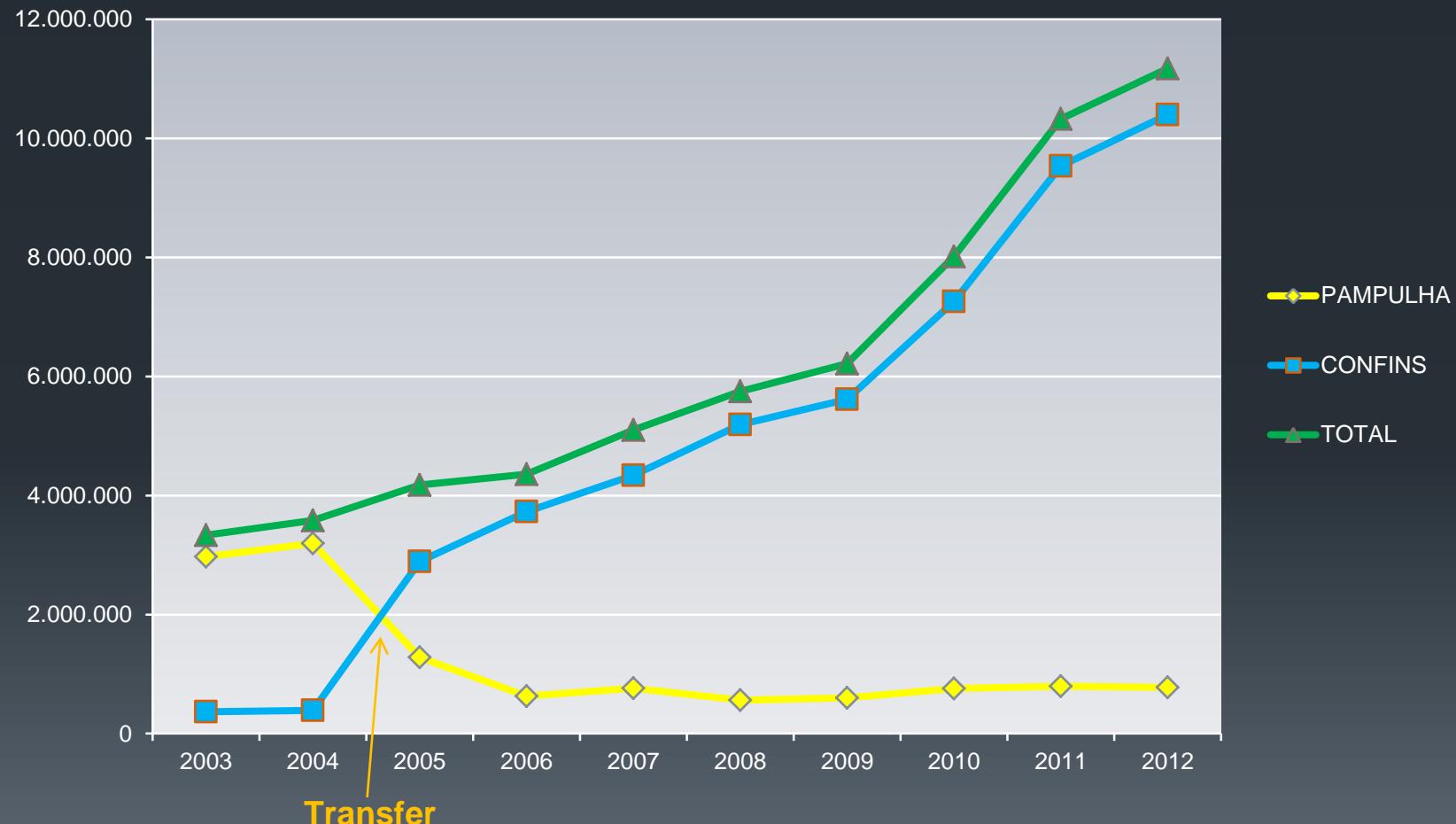


# Improvements

- Improvements already undertaken
- Future Improvements
- Project of “VLT”

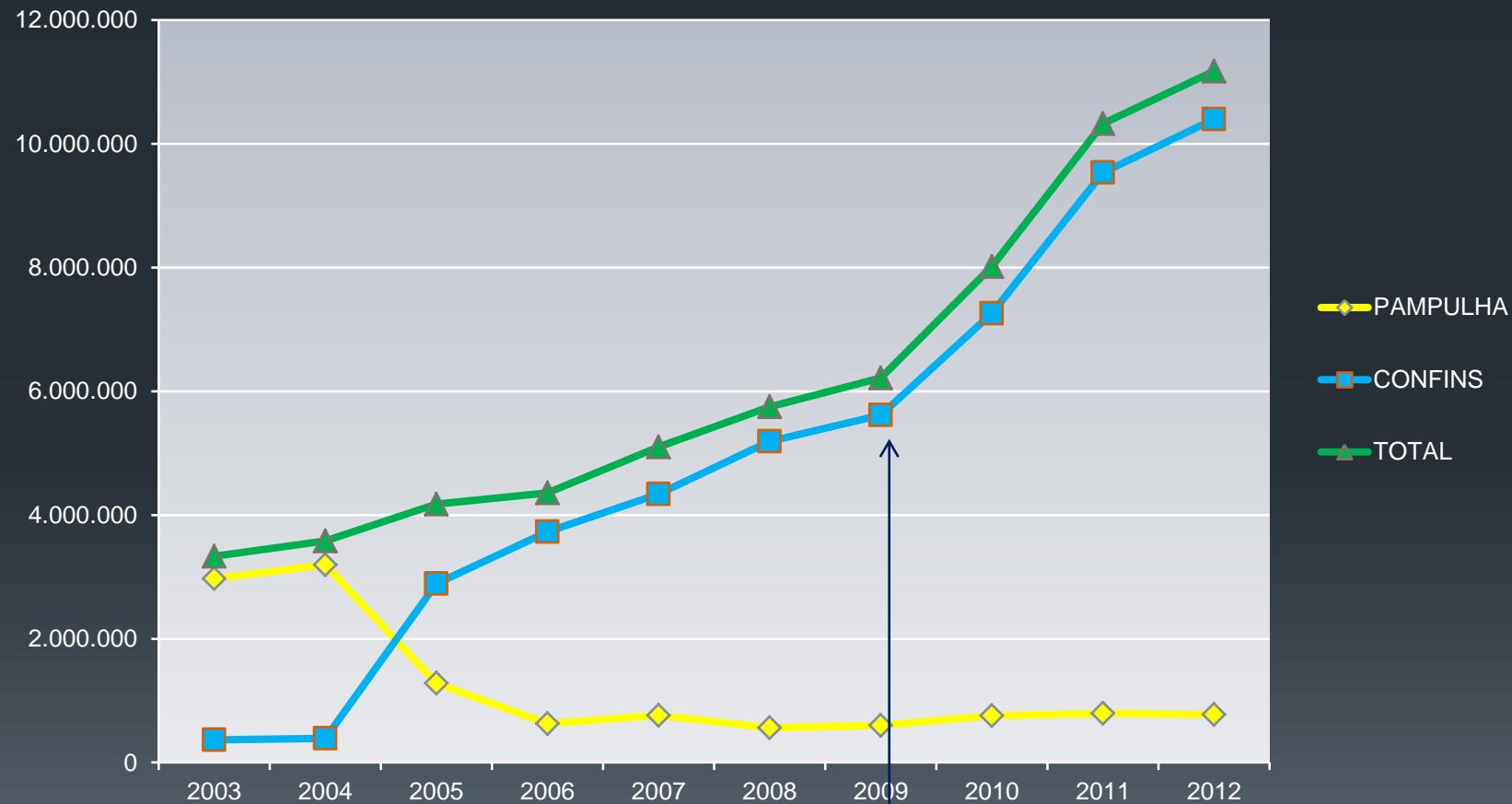


# Annual passengers





# Annual passengers





# Similary case: Dallas: Love Field and Dallas/Forth Worth





# Theme importance

- Underutilized
- Unnecessary investments
- People dissatisfaction



# Literature review

- Demand impactful:
  - Yield
  - Income per capita
  - Connections on the route
  - LCCs entry
- Possible impactful
  - Transfer
  - Middle class
  - Distance traveled



# Theoretical framework

- Expected signs
  - Negative for “Yield” and “Short-haul”
  - All other positive
- Tests
  - Unit root
  - Cointegration
  - Multicollinearity
  - Autocorrelation
  - Heteroskedasticity

# Theoretical framework: Middle class

- No statistical significance

# Theoretical Framework: Yield endogeneity

- Control method: Instrumental variables.
  - Selected:
    - Inc\_ffea(average unit cost of fuel per ask).
    - Inc\_lfea(average unit cost adjusted for distance and average stage of landing fees per ask).
    - Inc\_nfea(average unit cost of navigation fees per ask).
    - Inc\_insa(average unit cost of aircraft insurance per ask ).

# Theoretical Framework – Hypotheses

- H1: Demand increased due to the transfer.
- H2: Post-transfer demand changings it's not linear over the years.
- H3: After transfer, demand increases for long-hauls and decreases to short-haul.

# Models

- GMM and LIML
  - 1-Dummy after transfer
  - 2-Triennium Dummies
  - 3-Triennium Dummies interact with distance

# Econometric results: GMM/LIML

	(1) GMM	(2) LIML	(3) GMM	(4) LIML	(5) GMM	(6) LIML
ln yield	-0.4669**	-0.5300**	-0.7470***	-0.7808***	-0.6952***	-0.7010***
ln mean(income pcap)	0.7289**	0.6476*	-0.1684	-0.1806	-0.0905	-0.0638
ln max(conn share)	0.0106	-0.0083	-0.0343	-0.0517	-0.0305	-0.0383
After Transfer	0.1327**	0.1466**				
First Triennium AT			0.2788***	0.2800***		
Second Triennium AT			0.4145***	0.4116***		
Third Triennium AT			0.5439***	0.5420***		
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T1 Dist 900					0.4275***	0.4200***
T2 Dist 900					0.1517	0.1144
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T1 Dist>900					0.5412***	0.5351***
T2 Dist>900					0.6623***	0.6372***
T3 Dist>900					0.7339***	0.7201***
codeshare majors	0.0296	0.0345	0.0590***	0.0625***	0.0625***	0.0636***
pres lcc	0.3390***	0.3314***	0.3018***	0.2917***	0.3108***	0.3049***
pres budget	0.0210	0.0162	0.0017	-0.0013	0.0023	0.0030
pres small reg	0.0402	0.0428	0.0600**	0.0653**	0.0565**	0.0572**
R <sup>2</sup> Ajustado	0.9425	0.9417	0.9381	0.9373	0.9422	0.9421
RMSE	0.2961	0.2982	0.3073	0.3094	0.2975	0.2977
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N_Obs	4247	4247	4247	4247	4247	4247

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Third Triennium A1			0.0459***	0.0420***		
T1 Dist 300					0.1901***	0.1846***
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	(1)	(2)	(3)	(4)	(5)	(6)
After Transfer			0.1327**		0.1466**	
ln mean(income pcap)	0.1289***	0.0470*	-0.1084	-0.1806	-0.0903	-0.0058
ln max(conn share)	0.0106	-0.0083	-0.0343	-0.0517	-0.0305	-0.0383
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After Transfer			<b>0.1327**</b>		<b>0.1466**</b>	
ln mean(income_pcaps)	0.1289***	0.0470*	-0.1084	-0.1800	-0.0903	-0.0058
ln mean(caps_shares)	0.0106	0.0002	0.0242	0.0517	0.0205	0.0282
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T1 Dist>900					0.3412***	0.3551***
T2 Dist>900					0.6623***	0.6372***

Validates H2: Post-transfer demand changings it's not linear over the years.

	(1)	(2)	(3)	(4)	(5)	(6)
pres lcc	0.3390***	0.3314***	0.3018****	0.2917***	0.3108***	0.3049***
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# Econometric results: GMM/LIML

Dist 300	1,0053	0,9754
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Dist 600	1,2607	1,2284
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Dist 900	1,209	1,1486
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Dist>900	1,9374	1,8924
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# Conclusions

- Increase of demand after transfer.
- Distance factor.
- Time factor.

# Contributions

- Instrumental variables.
- Viable model to predict demand
- Triennium dummies.
- Interaction of dummies.

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THANK YOU ALL