

Assessing the long-term impact of air liberalization on international air passenger demand

A new model up to 2050

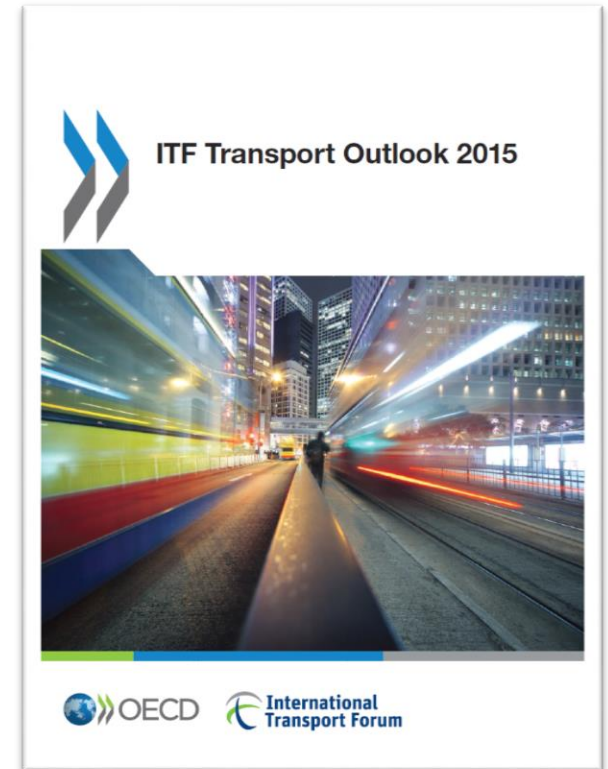
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Introduction

- ▶ Part of the work for the ITF Transport Outlook
 - ▶ Long-term trends (2030-2050)
 - ▶ Analysis of policies on a global scale
 - ▶ Scenario-based analysis



Geographical approach

- ▶ World divided into 310 regions
- ▶ Synthetic network between the regions



World airports colour-coded by region



Modelling approach

Origin-destination demand

Gravitational model

Socio-economic variables

GDP, trade, population

Cultural proximity variables

Language, emigration

Supply

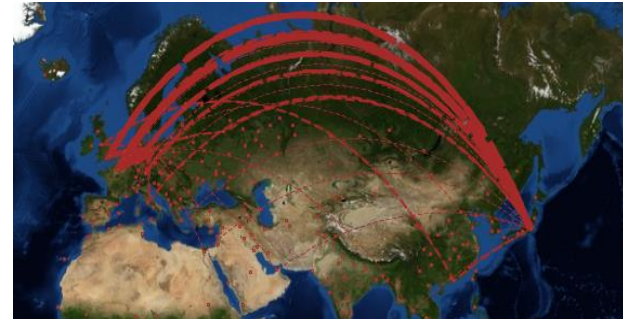
Min travel time, min number of transfers

Route choice


Logit model

Route characteristics

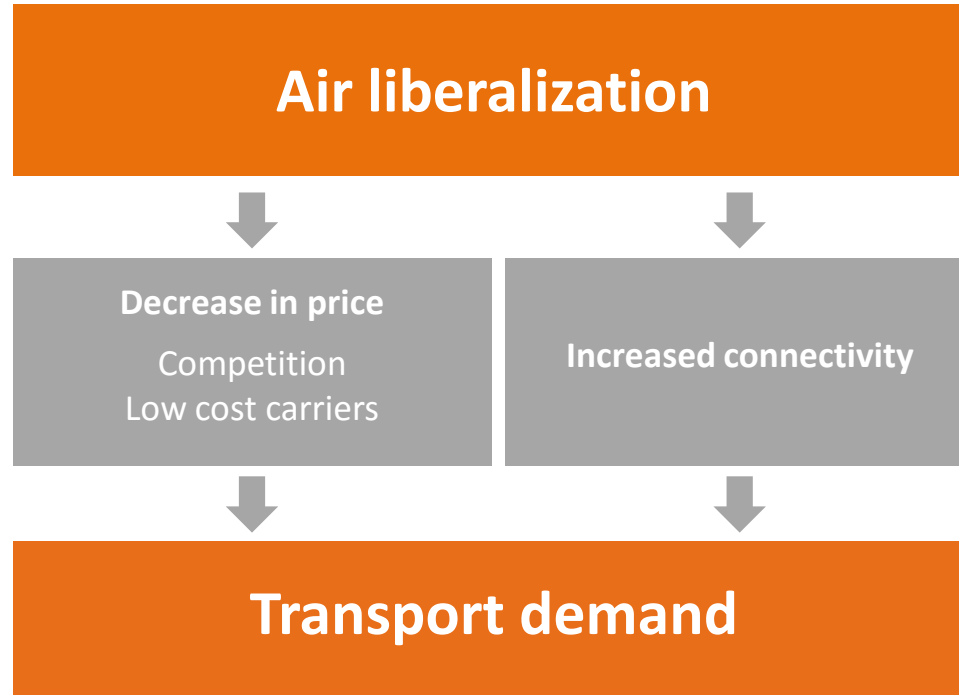
Reconstructed from air network



Calibration

- ▶ Route choice model
 - ▶ MIDT **route choice data** for years 2014-2015
 - ▶ Maximum-likelihood estimation
 - ▶ Coefficients very significant but overall fit not very good
 - ▶ Origin-destination demand model
 - ▶ Historical **on-flight passenger volumes**
 - ▶ Estimation: minimize differences between observed and estimated on-flight demand on all links
 - ▶ Average error on link: 12%
- 

Air liberalization



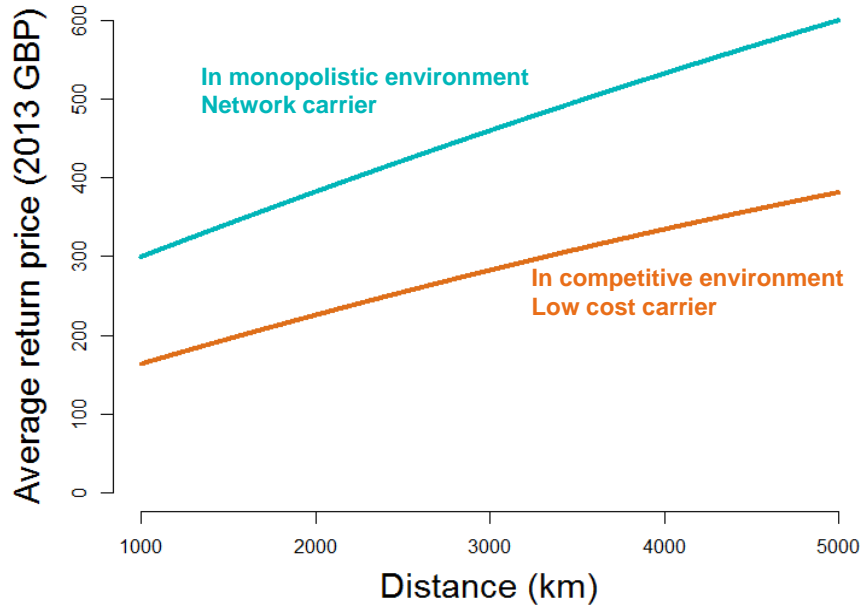
Competition

- ▶ Herfindahl–Hirschman Index (h-index) between pairs of region
 - ▶ With frequency
 - ▶ Alliance level
- ▶ Includes indirect frequencies
 - ▶ Weighted for quality of service

Prices in the models



Average price as a function of distance for direct intra-Asia flights in the database



Route choice

Nested logit model

Kilometric price

Number of transfers

Competition (h-index)

Low-cost carrier



Prices in the models

Origin-destination demand

Gravitational model

Competition

H-index

LCC

Route choice

Nested logit model

Kilometric price

Number of transfers

Competition (h-index)

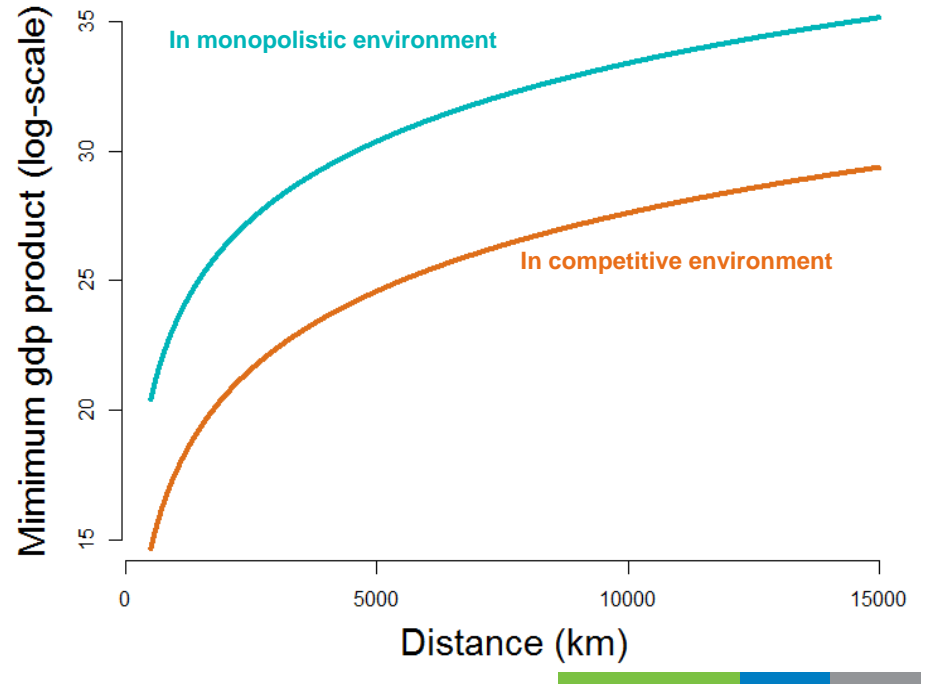
Low-cost carrier



Link creation

- ▶ Binomial model
 - ▶ Economic mass
 - ▶ Distance
 - ▶ Competition levels

GDP mass necessary for link creation as a function of distance



Network development scenarios

Static network

No evolution of price

No new link created

Dynamic network

Competition
Strong penetration of low-cost carriers

Free network evolution

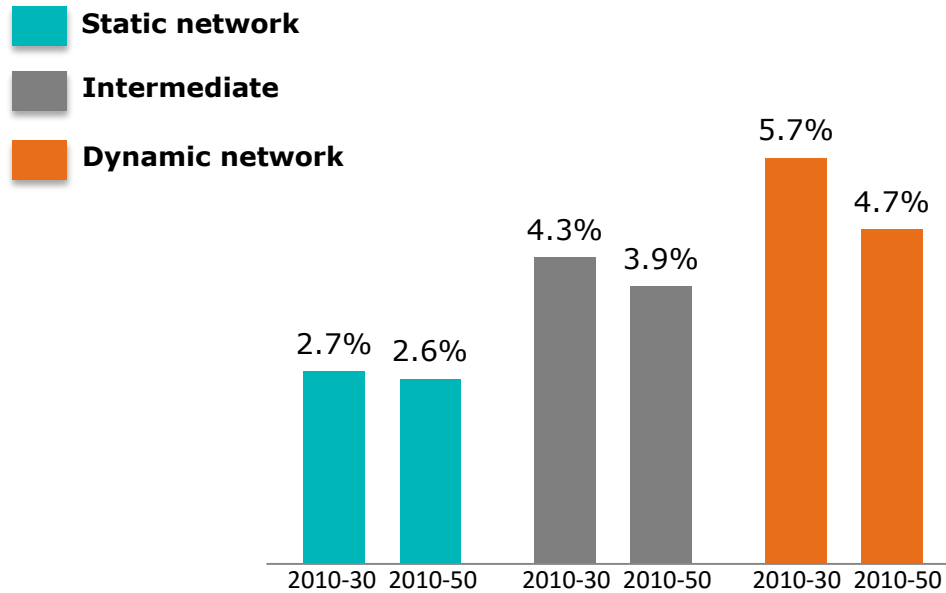
Intermediate

No exogenous increase in competition

Controlled network evolution

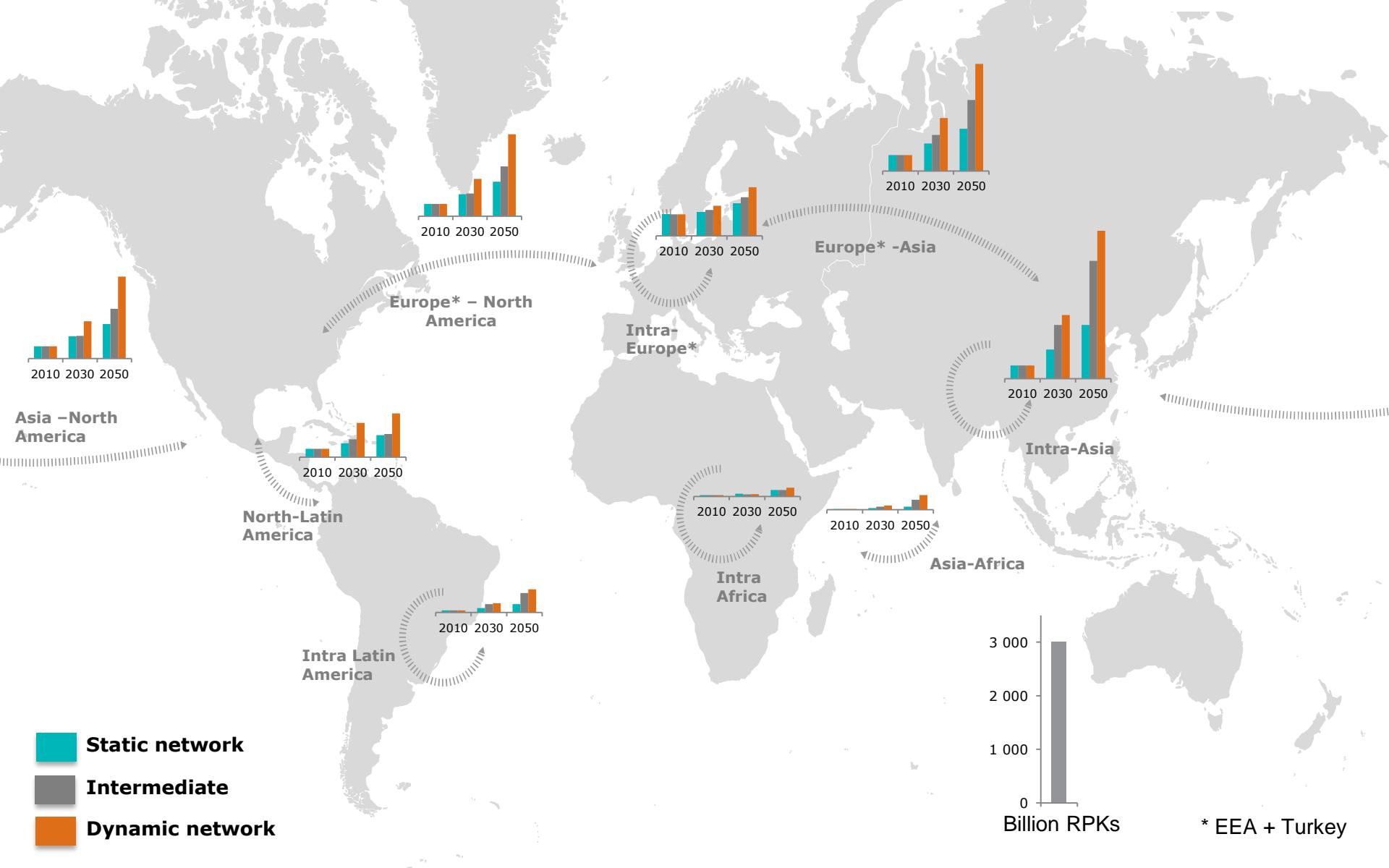


Result overview



International revenue passenger kilometres
Annual growth rate (CAGR)





Conclusion

Coherent global framework

**Analysis of policies
globally**

« Large » model

**Network evolution model
based on scenarios**

Redefinition of
key levers

Is the necessary
growth possible?



Thank you for your attention

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