

# Getting there fast: Globalization, intercontinental flights and location of headquarters

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# Introduction

We examine location choices of large firms' headquarters in major European urban areas

Controlling for other factors, we focus on the role of the supply of non-stop intercontinental flights:

We claim that air traffic is an efficient mean of managing tacit information between cities.

Within Europe, the appropriate measure of international connectivity is the availability of direct intercontinental flights: Number of destinations and flight frequency.

# Motivation

Headquarters concentrated in large metropolitan areas (more geographical concentration in comparison to production activities).

Three agglomeration forces:

- 1) Diversity of business and financial intermediation services
- 2) Other headquarters to exchange information about market conditions
- 3) Better market access that depends on:
  - i) The size of the local market,
  - ii) The quality of the transport infrastructures

Note: The factors 2) and 3.ii) has influence on communication costs

# Motivation

Why is important to attract headquarters:

- 1) Reflection and cause of economic power
- 2) Major consumers of high-skilled and well paid labor
- 3) Technological spillovers (when knowledge-intensive sectors)

The role of headquarters within a firm is:

- i) Coordinate information across establishments (geographically dispersed if large firms)
- ii) Gather information about outside market conditions
- iii) Provide services with highly specific knowledge content

Location choices of headquarters must be similar to location choices of other knowledge-intensive activities like: High-technology manufactures, Finance and insurance services, business services (software, R &D, advertising, consultancy, legal and accounting services, market research, etc )

# Why air traffic is important for knowledge-intensive activities?

Trends in organization of firms in knowledge-intensive activities:

- 1) Separate production from management functions
- 2) Operate geographically on a global scale
- 3) Outsource many activities to external suppliers.

This is profitable only if transport and communication costs are low

- Reduction in transport costs of moving goods: New technologies, increase in the value added per ton
- But communication costs of moving people are still high and differ with location:
  - i) Travel time's opportunity cost depend on income
  - ii) Electronic and face-to-face contacts complement but not equivalent

# Why air traffic is important for knowledge-intensive activities?

Executing information exchanges between cities –face-to-face- can be critical for the headquarters (or other knowledge-intensive firms) that operate on a global scale: Communication costs are very important for these type of firms

Within this context, the quality of passenger transportation networks is crucial for transmitting information efficiently: It influences the costs and opportunities for face-to-face contacts between cities.

Firms that focus their business in managing not coded information need international connectivity when choosing a location.

# Why intercontinental traffic as measure of international connectivity of large urban areas?

1) Differences in the quality of passenger transportation networks are mainly related to direct intercontinental flights

- Most are well connected through highways and high-speed trains, and distances around the core spatial areas are short.

- Other with a more dispersed location have available frequent airline connections to a vast number of European destinations

2) Low cost carriers have a relevant share of intra-European air traffic and their operations are usually not addressed to business passengers: The amount of intra-European traffic is not necessarily a good indicator of the transport services for business travelers

3) Higher correlation between European traffic and other relevant factors for headquarters' location choices

# The empirical strategy

We estimate the following equation:

$$\text{Headquarters}_r = F(\text{Freq\_intercontinental}, \text{Wages}, \text{Fiscal\_Pressure}, \text{Industrial\_employment}, \text{Services\_employment}, \text{Population}, D^{\text{Capital}}, \text{GDP\_weight})$$

*Headquarters*: Number of headquarters of the 1000 largest European firms, in terms of sales, located in the corresponding urban area (Source: ELC's Europe's 15,000 largest companies, 2003)

*Freq\_intercontinental*: Weekly frequency of direct flights to selected intercontinental destinations (Source: OAG, 2004)

We account for the possible simultaneous determination of the two variables of interest



# Explanatory variables

- 1) **Frequency of intercontinental flights (+):** a higher amount of intercontinental flights will imply lower communication costs from the interchange of information across cities.
  
- 2) **Compensation per employee, (?):** higher wages may imply lower recruitment costs of skilled employees but they imply higher labor costs as well.
  
- 3) **Tax revenues of the government over GDP at the country, (-):** . Firms should try to minimize expenditures associated to taxes.
  
- 4) **Total employees in the industry sector (energy and manufacturing), (+):**
  - i) Proximity to production plants.
  - ii) Proximity to final demand.

# Explanatory variables

**5) Total employees in market services (Transport and communications, financial intermediation, business services), (+):**

- i) Proximity to other firm's offices
- ii) Proximity to the main specialized providers
- iii) Proximity to final demand

**6) Population (-):** If controlling for measures of market access, it captures congestion costs.

**7)  $D^{capital}$  (+):** Firms may take benefits from influencing political institutions and regulatory agencies

# Explanatory variables

**8) The percentage of the GDP of the corresponding region over the country ( $\xi$ ):** The value of this variable is strongly related to the size of the country.

Note: Data of explanatory variables refer to NUTS 2, except population (NUTS 3), capital (city) and fiscal pressure (country).

Sources: Cambridge econometrics, OECD, Eurostat

# Data

## Sample of urban areas (87):

Urban areas from the EU25 + Switzerland and Norway that:

- 1) More than 1 million inhabitants or
- 2) About 1 million inhabitants and with a large airport (top 50) or
- 3) Urban areas with at least two large headquarters

Note: We mean by urban areas NUTS 3

## Sample of intercontinental destinations (41):

Largest non-European airports in terms of international scheduled traffic to and from each geographical area & destinations located more than 3450 kilometers from any European airport

Note: Extra-EU traffic is not useful for our purposes

**Table 1. Sample of European urban areas  
(EU25 + Norway and Switzerland)**

Aachen, Aberdeen, **Amsterdam**, **Arnhem**, Athens, Barcelona, Basel, Belfast, Bergamo, Berlin, Bielefeld, Bilbao, Birmingham, Bonn, Braunschweig, **Breda**, Bristol, Brussels, Budapest, Clermont Ferrand, Copenhagen, Cork, Dortmund, Dublin, Duisburg Dusseldorf, Edimburgh, **Eindhoven**, Essen, Frankfurt, Freiburg, Geneve, Glasgow, Goteborg, Gutersloh, Hamburg, Hannover Helsinki, Hove, Karlsruhe, Kilkenny, Koblenz, Koln, Lausanne, Leeds, Lille, Lisbon, Liverpool, London, Luxembourg, Lyon, Madrid, Manchester, Marseille, Milan, Milton Keynes, Mondeville, Munich, Munster, Naples, Newcastle, Nottingham, Nurnberg Oslo, Paris, Porto, Prague, Rome, **Rotterdam**, Seville, Saint Etienne, Stavanger, Stockholm, Strasbourg, Stuttgart, Swindon, **The Hague**, **Tilburg**, Torino, Toulouse, Valencia, Verona, Vienna, Warsaw, Wiltshire, Wolfsburg Zurich

**Table 2. Sample of destinations for intercontinental flights**

Atlanta	Hong Kong	Osaka
Bangkok	Houston	Philadelphia
Beijing	Islamabad	Rio de Janeiro
Bogotá	Jakarta	Santiago de Chile
Bombay	Johannesburg	Sao Paulo
Boston	Kuala Lumpur	Seoul
Buenos Aires	Los Angeles	Shanghai
Caracas	Manila	Singapore
Chicago	Miami	Sidney
Colombo	Montreal	Taipei
Dallas	Mexico DF	Tokyo
Denver	Nairobi	Toronto
Doha	New York	Washington
Dubai	New Delhi	

**Table 3. Data for headquarters (HQ) at the urban area (TOP 15)**

<b>Urban Area (UA)</b>	<b>HQ<sub>UA</sub> (1)</b>	<b>HQ<sub>UA</sub> / HQ<sub>COUNTRY</sub> (2)</b>
London	146	77.25
Paris	101	84.87
Munich	52	17.22
Amsterdam	45	60.81
Dublin	41	85.42
Hamburg	39	12.91
Dusseldorf	35	11.59
Frankfurt	34	11.26
Stuttgart	30	9.93
Stockholm	23	85.19
Copenhagen	20	100.00
Zurich	18	54.55
Gutersloh	17	5.63
Milan	17	36.96
Köln	15	4.97

**Table 4. Data for headquarters (HQ) at the urban area (Netherlands)**

<b>Urban Area (UA)</b>	<b>HQ<sub>UA</sub> (1)</b>	<b>HQ<sub>UA</sub> / HQ<sub>COUNTRY</sub> (2)</b>
Amsterdam	45	60.81
The Hague	11	14.86
Rotterdam	8	10.81
Arnhem	3	4.05
Breda	3	4.05
Eindhoven	2	2.70
Tilburg	2	2.70
Total	74	100



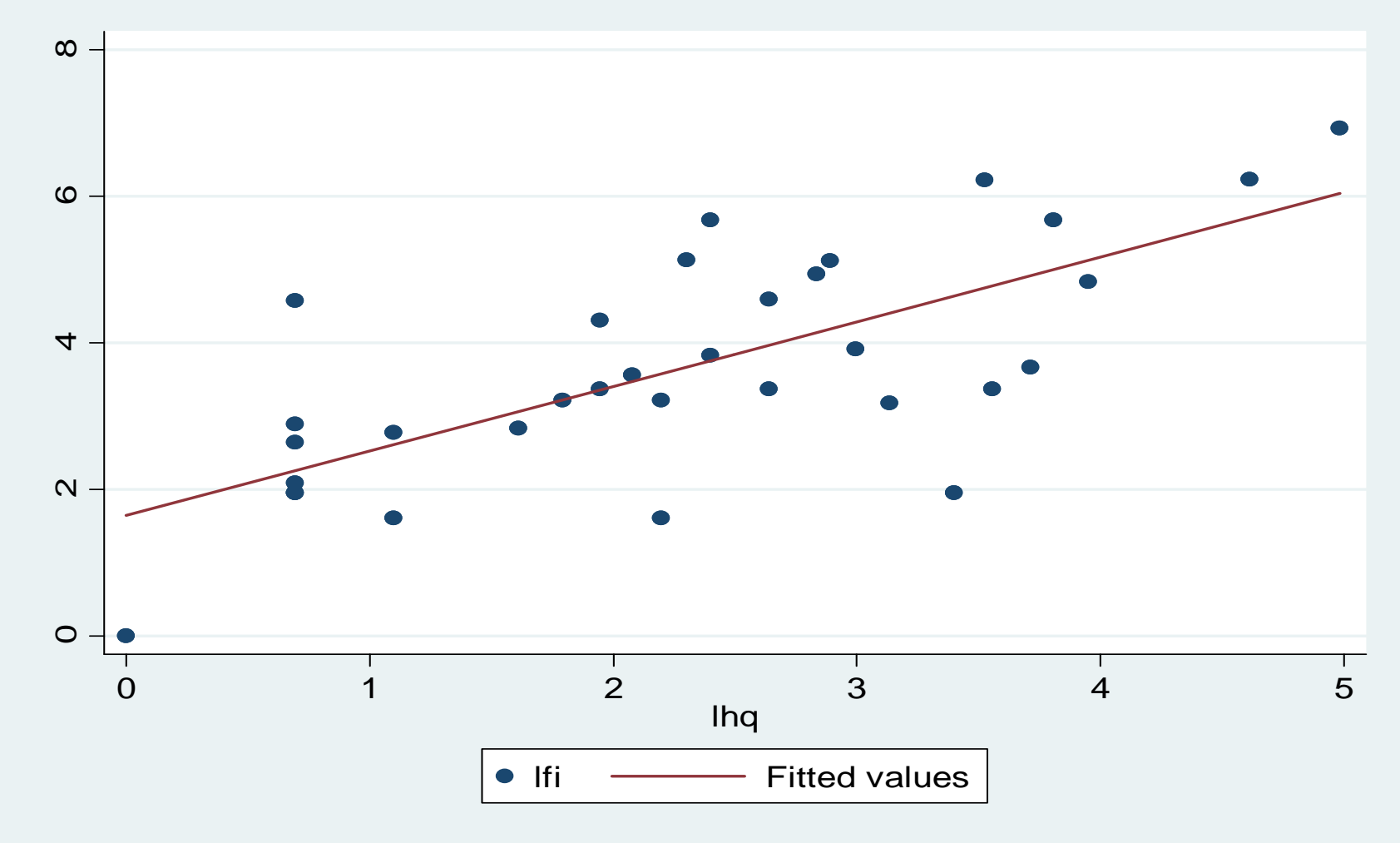
## **Note on data of headquarters and employment in industry and market services:**

1) The 52 urban areas with the largest number of headquarters in our sample concentrate around 94% of the 1000 largest firms' headquarters in Europe, while the corresponding region just concentrates almost 66% of industrial employment and 70% of market services employment.

2) The first 5 rank cities in terms of headquarters concentrate 41% of headquarters, 7% of industrial employment and 15% of market services employment

Important: Evidence of separation of headquarters from production facilities

**Figure 1. Range Scatter of headquarters (lhq) against intercontinental flights (lfi)**



**Note: To make easier the reading of the table, we exclude urban areas that do not have headquarters and/or airports with intercontinental flights (Data are in logarithms).**

**Table 5. Data for intercontinental flights (selected destinations) –Top 15**

<b>Airports</b>	<b>Number of weekly frequencies</b>
London (LHR, LGW, STD)	1021
Paris (CDG, ORY)	508
Frankfurt (FRA)	502
Amsterdam (AMS)	293
Madrid (MAD)	169
Zurich (ZRH)	168
Milan (MXP, LIN)	140
Munich (MUC)	125
Rome (FCO, CIA)	99
Manchester (MAN)	97
Vienna (VIE)	74
Copenhagen (CPH)	50
Brussels (BRU)	46
Dublin (DUB)	39
Lisboa (LIS)	35

**Table 6. Results of the empirical analysis**

<b>Variable</b>	<b>Sign</b>	<b>Statistical significance</b>	<b>Economic impact (elasticities)</b>
<i>Freq_intercontinental</i>	+	Yes	0.4
<i>Wages</i>	+	Yes	0.9
<i>Fiscal_Pressure</i>	-	No	-0.4
<i>Industrial_employment</i>	+	Yes	0.23
<i>Services_employment</i>	+	Yes	0.57
<i>Population</i>	-	Yes	-0.1
<i>D<sup>Capital</sup></i>	+	Yes	0.08
<i>GDP_weight</i>	-/+	NO	near to 0

Note: If we use intra-European traffic as explanatory variable, we find that this variables also influences on headquarters' location choices. However, the rest of explanatory variables get reduced their importance (due to correlation)

# CONCLUSION

We find that the supply of direct intercontinental flights is a major determinant of location choices of large firms' headquarters

## Implications:

1. New evidence about the contribution of transport infrastructures to urban growth
2. Transport policies must be aimed to develop international airports
4. Urban areas that want to promote knowledge-intensive activities must support their airports