



Get there and around. The role of transportation infrastructures in MNEs' location choices at the city-level

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Motivation

- **Transportation infrastructures** make cities and regions closer, allowing firms to face lower transport costs, better access to local market and potentially higher levels of **connectivity** →
 - *"Intensity with which people, goods, capital, and knowledge flow across space" (Belderbos, 2018:11)*
- **Firm location** patterns are driven by multiple factors, including changes in **accessibility** brought about by transportation infrastructures
- Scarce evidence on the influence of accessibility on location decisions of MNEs engaged in manufacturing and R&D activities at the **city level**
- IB literature shows the positive impact of international connectivity in **firm's location** choices, though there is scarce empirical evidence on how **urban mobility** affects those choices

Aim of this paper

- Disentangle MNEs' location choices in cities focusing on transportation infrastructures facilities as location's drivers.
- Get a better grip on the investment's location in a between-cities perspective
- Evaluate how different functions of the value chain, i.e. Manufacturing, Logistics and R&D respond to different degrees of accessibility, allowed by the quality and extension of hard infrastructures

Background Literature

International Business

- Location as host of the "fine-sliced" activities of MNEs
- Knowledge based **connections** between global centers of excellence are pivotal
- Positive influence of international connectivity on firm's location choices



Transportation Economics

- Market-oriented corporate activities (e.g. finance and retail) are positively affected by the density of transportation network
- Transportation facilities are considered as a location bounded resource affecting firms' location decisions

Data

FDi Markets → commercial online database provided by the Financial Times and contains information on cross border investments.

- For each project, FDi Markets reports information on the industry and main business activity involved in the project, the location where the investment takes place (host country, regions and cities), as well as the name and location of the investing company (home).

Urban Mobility Tools UT-DAT (World Bank) → city – level dataset which contains information on city's mobility characteristics for 92 cities in 2011

Resulting database →

- 7. 947 International Investments Projects from 2012 -2015
- 70 cities
- 4.701 MNEs

Cities



Cities

City	Logistics	Manufacturing	R&D	City	Logistics	Manufacturing	R&D	City	Logistics	Manufacturing	R&D
Accra	4	5	2	Hamburg	25	13	10	Paris	26	9	32
Ahmedabad	5	16	7	Hanoi	18	59	15	Pune	10	129	113
Amsterdam	27	9	7	Helsinki	5	1	3	Rome	4	3	1
Athens	2	4	1	Ho Chi Minh City	23	81	28	Rotterdam	26	22	1
Bangalore	25	103	414	Hong Kong	53	23	42	Santiago	7	11	9
Bangkok	12	60	24	Jaipur	2	9	1	Sao Paulo	9	68	34
Beijing	33	131	182	Jakarta	7	34	5	Seville	6	15	2
Berlin	7	18	11	Johannesburg	10	26	8	Shanghai	125	608	369
Bogota	7	13	9	Kolkata	10	14	13	Singapore	98	284	246
Bologna	6	1	1	Krakow	5	23	16	Stockholm	8	5	18
Budapest	33	39	38	Kuala Lumpur	10	21	19	Stuttgart	1	6	5
Busan	2	14	1	Kunming	1	7	1	Surabaya	1	7	
Cairo	6	22	10	Lisbon	11	4	1	Tallinn	14	29	7
Cebu	2	4	4	London	25	20	32	Tokyo	12	3	32
Chandigarh	1	3	2	Madrid	19	18	26	Toronto	10	13	24
Chennai	24	165	116	Manchester	11	10	5	Turin	3	7	10
Chicago	15	6	8	Manila	5	6	7	Valencia	7	11	2
Copenhagen	8	2	23	Marseilles	6	6	1	Vancouver	7	4	14
Curitiba	2	20	6	Milan	16	10	15	Warsaw	22	21	21
Danang	6	14		Moscow	38	56	26	Washington DC	1	2	1
Dubai	76	95	32	Munich	8	9	22				
Dublin	16	10	53	Nantes	5	11	2				
Geneva	1	1	4	New York	7	69	18				
Glasgow	8	13	11	Newcastle upon Tyne	7	5	4				
Guangzhou	25	202	34								

Methodology

Estimated Model → Conditional Logit Model (McFadden, 1974)

- **Dependent Variable** → binary variable with value 1 if a given project i made by the firm f at time t is located in the city j , 0 otherwise.
- A vector of covariates X including connectivity factors both within and between cities and other controls
- Tested for the aggregate sample and for distinct functions of the value chain (Manufacturing, R&D, logistics).

Variables

Main Explanatory Variables → city level mobility characteristics, UT-DAT

Getting Around (Intra connectivity) →

- Average Time to Work (all modes; Redding & Turner, 2014)
- Average trip by car (km)
- Total Number of Public Transport Vehicles – excluding trains and regional railways

Getting There (Inter Connectivity) →

- Presence of a Port – Dummy 0,1 (both sea and river ports; Kawamura, 2001, 2018; Chin et al., 2005)
- Total Number of Public Mass Transit Vehicles – including trains and regional railways

Moderating Factors →

- Daily Boardings in Public Transport, both within city and across cities
- Road Density (KM)
- Population Density
- Public Transport Energy Use in MJ/Pax KM)



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Results

	Manufacturing	Logistics	Research & Development
Getting Around (Intra Connectivity)			
Average time of journey to work (minutes)	-0.00921***	-0.0100*	-0.0109***
Average trip length by car (km)	-0.0659***	-0.0277**	-0.0228***
Log Tot. Number of PT Vehicles - Excluding Railways	0.210***	0.108**	0.451***
Getting There (Inter Connectivity)			
Presence of a Port - Dummy 0,1	0.697***	0.312***	0.422***
Log Tot. Number of PT Mass Transit Vehicles - Including Regional Railway	0.160***	0.132***	0.0483***
Control Variables			
Log Road Length Density	-0.363***	-0.219***	-0.470***
Log Daily Tot Million Boardings in Public Transport	0.0533	0.223*	0.403***
Log Daily Tot Million Boardings in Mass Transit	-0.0433**	-0.0148	-0.0740***
Log Population Density (KM)	-0.0970*	-0.0979	0.0601
Public Transport Energy Use (MJ/ Pax km)	-0.645***	-0.542***	-1.279***
Log City Area (KM2)	0.223***	0.0626	0.211***
Minimum Hourly Wage rate (PPP \$ 2007)	-0.143***	0.00823	0.152***
Log of Stock Inward FDI 2003-2011			
Observations	142,756	48,576	114,980



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Conclusion

- Preliminary findings reveal that the external (inter-city) accessibility of a city is positively associated with the location of MNE activities. At the same time, the extension and effectiveness of the urban mobility system (intra-city transport infrastructure) also affects the attractiveness of a city to MNEs, especially for those engaged in R&D activities. Lower time to work journeys and a capillary public transport network makes a city more attractive, while longer average trip by car within cities dampen their attractiveness.
- Also, the preliminary findings show that MNEs engaged in distinct function of the value chain may exploit different mobility facilities. While Logistics is more attracted by interconnectivity measure (getting there), R&D activities enjoy higher level of intra connectivity.



Steps ahead

- However in order to deepen our current understanding and to strengthen the empirical analysis we will further control:
 - city dummy for cities where the port is considered as a urban mobility mean
 - Industrial sector, since the location may be driven by the specialization degree of a certain place, e.g. Palo Alto as a global center of excellence
 - Control for maintenance costs to avoid overestimation
 - Cope with unobserved heterogeneity and implement a random coefficient model to identify and explore firm heterogeneous effects.
 - Estimate the magnitude with which each kind of connectivity attracts FDI



Thank you for the attention!

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