

IDENTIFYING DATA CENTER DRIVERS IN EUROPE

by

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Agenda

1. Introduction
2. Literature review
3. Empirical analysis
 - Data description
 - Methodology
 - Main results
4. Conclusions



Introduction (1/2)

A data center is a facility composed of networked computers, storage systems and computing infrastructure that companies use to organise, process, store and disseminate large amounts of data.

A data center facility enables an organisation to gather its resources and infrastructure for data processing, storage and communications, including:

1. Systems for storing, sharing, accessing and processing data across the organisation
2. Physical infrastructure to support data processing and data communication
3. Utilities such as cooling, electricity, network access and uninterruptible power supplies (UPS)

Enterprise data centers increasingly incorporate facilities for securing and protecting cloud computing resources, as well as in-house and on-site resources.

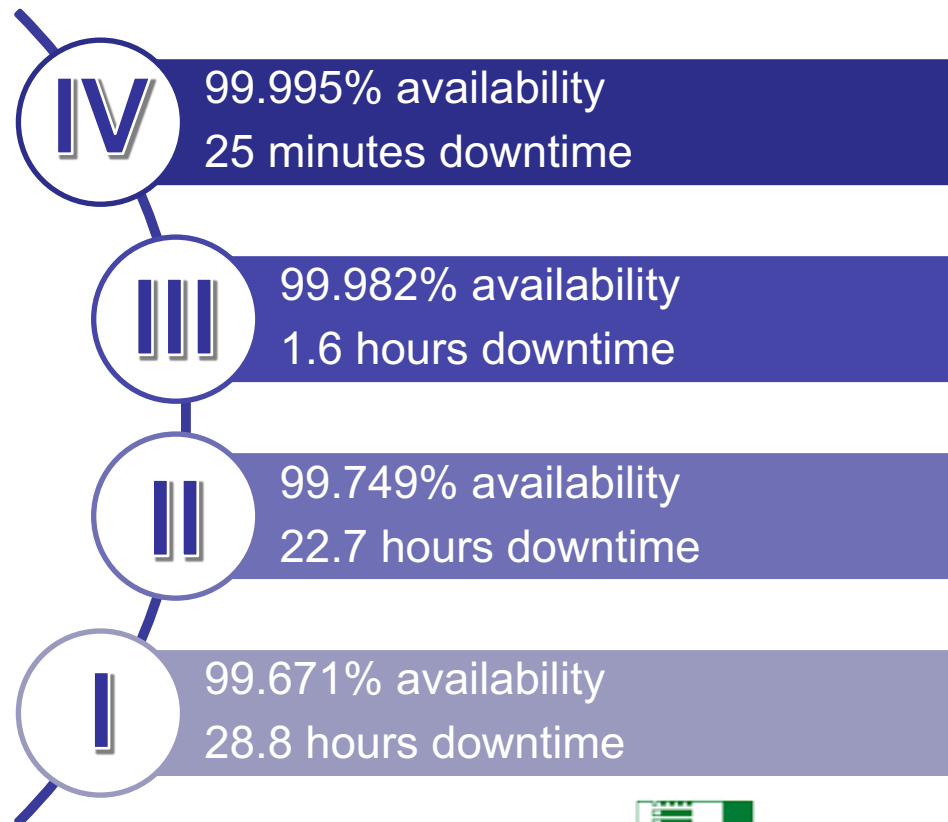


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Introduction (2/2)

Data centers can be classified by different levels of reliability or resilience, sometimes referred to as 'data center tiers'

TIER



Introduction (3/3)



The paper will consider all the third party data centers existing in the EU 28 countries in order to provide an updated map of the location choices in different European areas.

Data at city level will be supplemented with both census and companies data in order to study the main drivers that increase the interest for developing the data centers.

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Literature review (1/2)

Data storage service demand is increasing year by year and the smartworking approach adopted by several companies during the pandemic has increased significantly the interest of developing efficient solutions worldwide. The usage of third party data centers is growing and only few large corporations are using their own facilities for managing their data (Greenstein, 2020). The demand of data centers is expected to grow in the market for the next years but but there are still only few data centers traded in the real estate market (Colliers, 2022) and some European countries are considered among the more interesting locations for the investment pipeline of the main players in the market (Arcadis, 2021).



Literature review (2/2)

Literature on the location choices for data centers has shown that there are some technical constraints that matters for selecting the location related to the size of the area, the seismic and flood risk, the temperature, the electricity cost, and the quality of ethernet connection. Among the areas that satisfy these minimum requirements it is possible to distinguish the market for urban, suburban and footloose data center that may target different types of customers with an higher or a lower interest to visit the facilities over time (Greenstein and Fang, 2021). The development of a new building necessary for offering third party data storage service requires huge investments both in term of time necessary for completing the projects (around one year) and economic resources spent (more than € 100 millions for the smaller projects).



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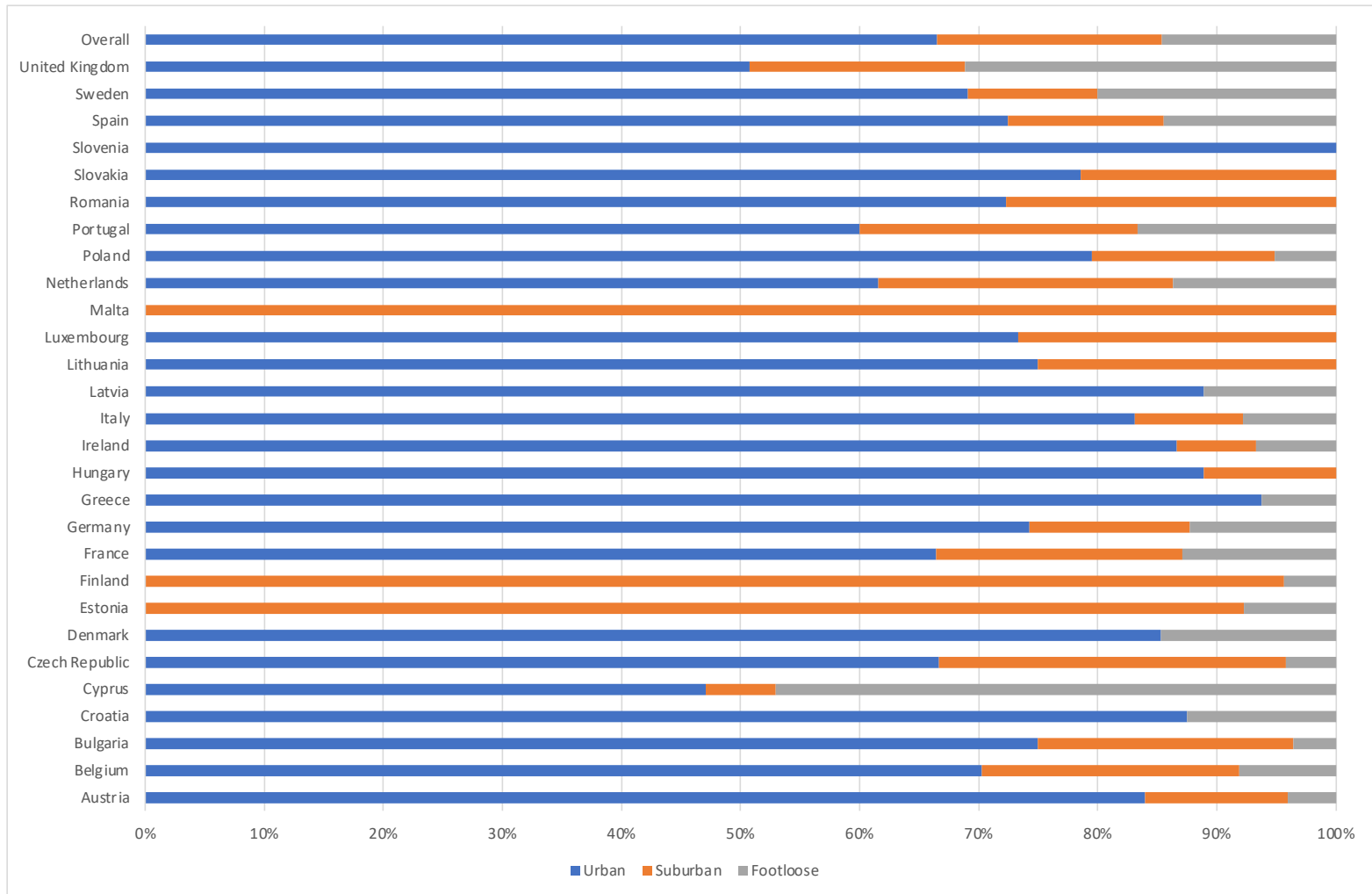
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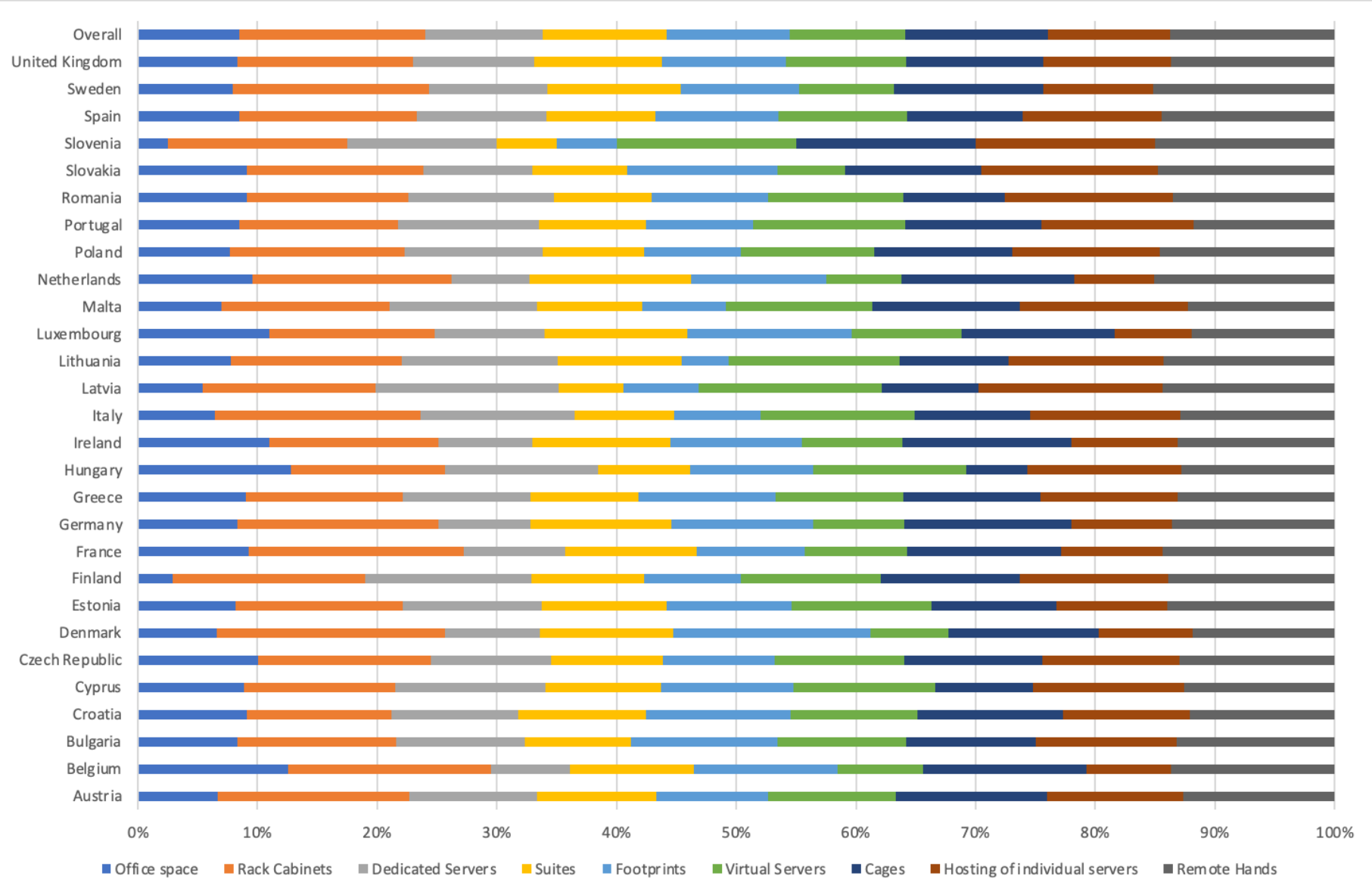
Sample (1/3)

	N° data centers	% Data Centers in the capital city	N° cities with data centers	N° of data centers by city
Austria	25	64.00%	7	3.57
Belgium	37	27.03%	15	2.47
Bulgaria	28	78.57%	6	4.67
Croatia	8	100.00%	1	8.00
Cyprus	17	47.06%	6	2.83
Czech Republic	24	50.00%	12	2.00
Denmark	34	52.94%	9	3.78
Estonia	13	69.23%	4	3.25
Finland	23	73.91%	6	3.83
France	155	30.97%	44	3.52
Germany	229	7.42%	41	5.59
Greece	16	56.25%	5	3.20
Hungary	9	88.89%	2	4.50
Ireland	30	76.67%	3	10.00
Italy	77	12.99%	29	2.66
Latvia	18	100.00%	1	18.00
Lithuania	12	75.00%	3	4.00
Luxembourg	15	73.33%	3	5.00
Malta	8	0.00%	6	1.33
Netherlands	117	47.01%	31	3.77
Poland	39	30.77%	13	3.00
Portugal	30	46.67%	8	3.75
Romania	47	48.94%	10	4.70
Slovakia	14	78.57%	4	3.50
Slovenia	8	0.00%	2	4.00
Spain	69	34.78%	22	3.14
Sweden	55	63.64%	14	3.93
United Kingdom	270	30.74%	65	4.15
Overall	1427	37.14%	372	3.84

Sample (2/3)



Sample (3/3)



Methodology (1/2)

Data collection



City data
Source: OECD statistics
Region and Cities



Country data
Source: Eurostat
Economy and Finance
Population and social conditions
General and regional statistics

Methodology (2/2)

Regression analysis

$$DataCenter_i = \alpha + Population_i + Area_i + \varepsilon_i$$

$$DataCenter_i = \alpha + Population_i + Area_i + Companies_C + GDP\ per\ capita_C + AverageEmployees_C +$$

$$+Income\ per\ capita_C + \sum_{K=1}^n \%Sector_C + \varepsilon_i$$

$$DataCenter_i = \begin{cases} 1 & \text{if at least one data center in the city/town} \\ 0 & \text{otherwise} \end{cases}$$

Overall

Urban

Suburban

Footloose



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Main results (1/2)

	Data centers	Urban DC	Suburban DC	Footloose DC
Population	0.0047**	0.0028**	0.0015**	0.015**
Area	0.0001**	0.0001**	0.0000**	0.0000**
Intercept	-0.0332**	-0.0201**	-0.0105**	-0.0106**
Observations	62426	62426	62426	62426
R ²	14.28%	11.62%	7.50%	8.78%

Main results (2/2)

	Data centers	Urban DC	Suburban DC	Footloose DC
Population	0.0051**	0.0034**	0.0015**	0.0016**
Area	-0.0003*	-0.0006**	0.0001	-0.0000
Companies	-0.0010*	-0.0001	-0.0012**	0.0007**
Employees	-0.0051**	-0.0044**	-0.0007	-0.0016*
GDP per capita	-0.0026	-0.0026	0.0018	-0.0039**
Average income	0.0034*	0.0016	0.0006	0.0024**
Mining & construction	-1.8367**	-1.8280**	-0.0375	-0.4636**
Manufacturing	-0.0313**	-0.0058	-0.0207**	-0.0074
Electricity and utilities	-0.0864**	-0.0993**	-0.0077	-0.0028
Water supply	0.7093	0.6330**	0.0380	0.2567**
Transportation	0.0144	0.0274**	-0.0105*	0.0060
Accommodation	0.0082	0.0278**	-0.0185**	0.0094
Observations	62426	62426	62426	62426
R ²	16.45%	13.71%	8.91%	10.18%

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Conclusions

- Results demonstrate that Data Centers are not assets that are appealing only in the main real estate markets of a Country and they could represent an interesting asset class for new developments even in small towns or areas
- The solution more frequently requested are still the urban solution while suburban and footloose solution seems to be not so requested in the European market.
- The type of building requested is normally addressed only to data storage and remote control solutions have a demand in the current market
- Areas selected for Data center development are influenced by the number of inhabitants, the size of the city, the number of companies, the average income, and the most relevant sector of activity.



Thanks for your attention

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