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Divestment strategies in multinational firms
The role of peer effects and geographical distance

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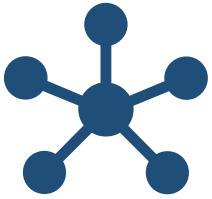
Background

MNEs Expansion

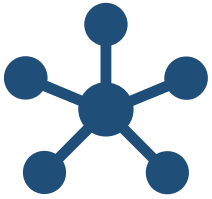


Who\Why\Where

- Productive firms [Helpman, Melitz & Yelpman, 2004]
- Mkt seeking vs Cost efficiency – Horiz. and Vert. FDI [Helpman, 1984; Markusen, 1984]
- Complex MNEs [Ekholm et al.,2003; Yeaple 2003]
- Regional networks [Egger et al., 2014]

Background

MNEs Expansion



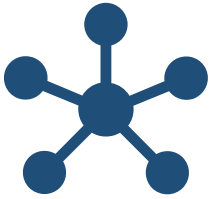
Di-vestment

Foreign Direct Divestment (FDD)

- Reverse FDI theory [Boddewyn, 1979, 1983]
- Understudied phenomenon [OECD, 2020; Sethuram & Gaur, 2024]

Background

MNEs Expansion



Di-vestment

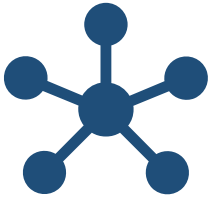
De-globalisation

Changes in the MNEs geography (?)

- Covid-19 GVC disruption
- Geopolitical tensions

Background

MNEs Expansion



Di-vestment

De-globalisation

Distance

Geographical distance

FDI literature
- Gravity equation [Tinbergen, 1962]

Divestment lit.
- Home bias [Boddewyn 1983; Resmini & Vittucci-Marzetti, 2020]

This paper

aims to study **MNEs' divestment behaviour** by examining network changes over the 2019-2022 period as response to the pandemic shock.

Gap #1: see MNE as **networks**, not as independent firms
→ endogenous peer group effect

Gap #2: assign the net effect of **geographical distance**
→ Geographical distance + *gravitas*

RQ: What drives MNE divestment?

1. ***Strong*** divest.: Is distance a driver of subsidiaries **exit**? Are individual exit dynamics influenced by those of the peers belonging to the same MNE network?
2. ***Weak*** divest.: Is distance a driver of subsidiaries **downsizing**? Are individual size adjustment dynamics influenced by those of peers belonging to the same MNE network?

This paper

Main findings

- Peer effects affects both *Strong* and *Weak* Divestment

  → heterogeneity by **MNE integration type** [Oberhofer & Pfaffermayr, 2013]
  (-) competition in groups at **horizontal predominance**

  (+) synergies in groups at **vertical predominance**

- Distance increases downsizing (*Weak* div.) in pred. horizontal groups

→ Quicker adjustment mechanism in horizontal structures

→ Geographical restructuring can happen not only along GVCs!

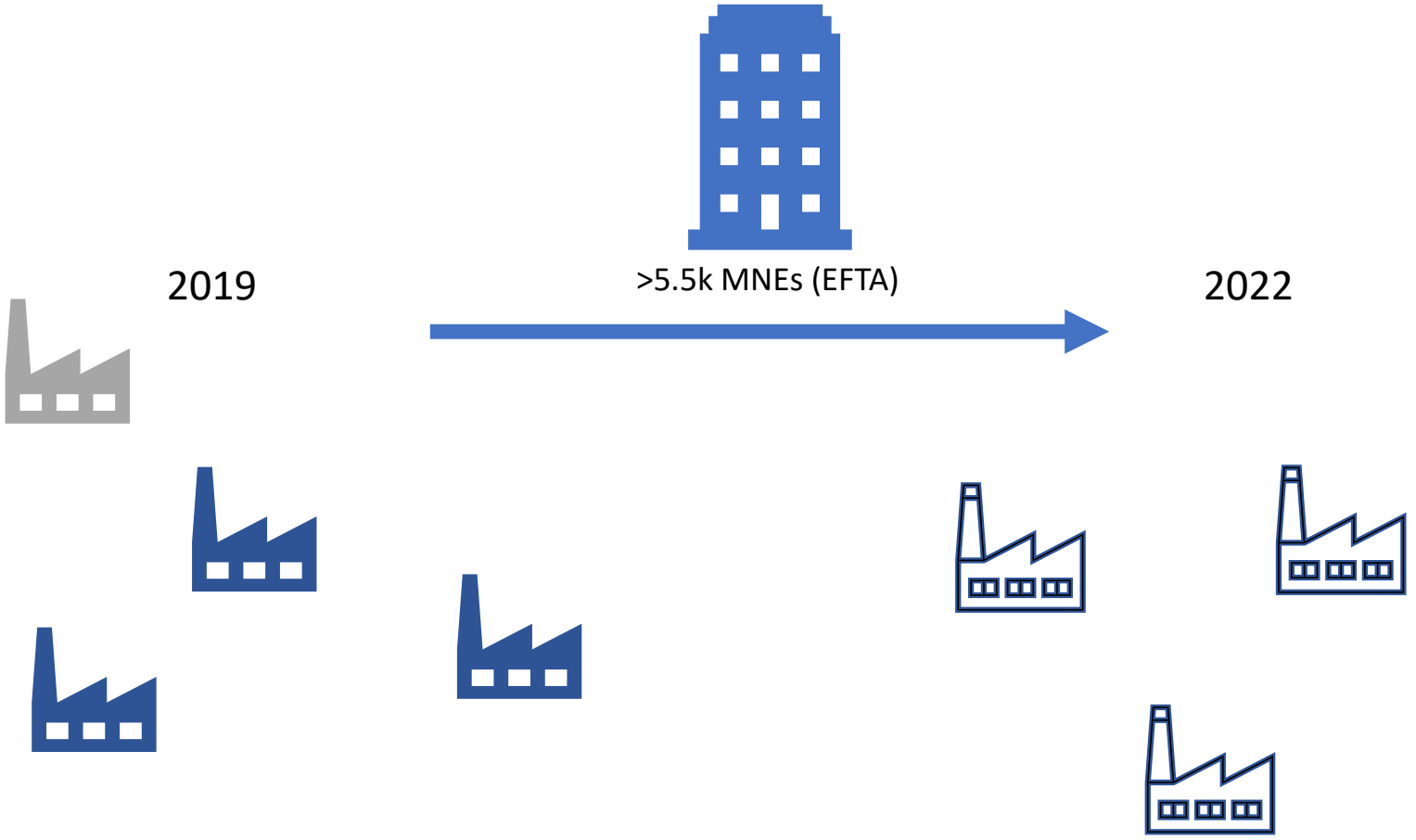
RQ: What drives MNE divestment?

1. ***Strong*** divest.: Is distance a driver of subsidiaries **exit**? Are individual exit dynamics influenced by those of the peers belonging to the same MNE network?

2. ***Weak*** divest.: Is distance a driver of subsidiaries **downsizing**? Are individual size adjustment dynamics influenced by those of peers belonging to the same MNE network?

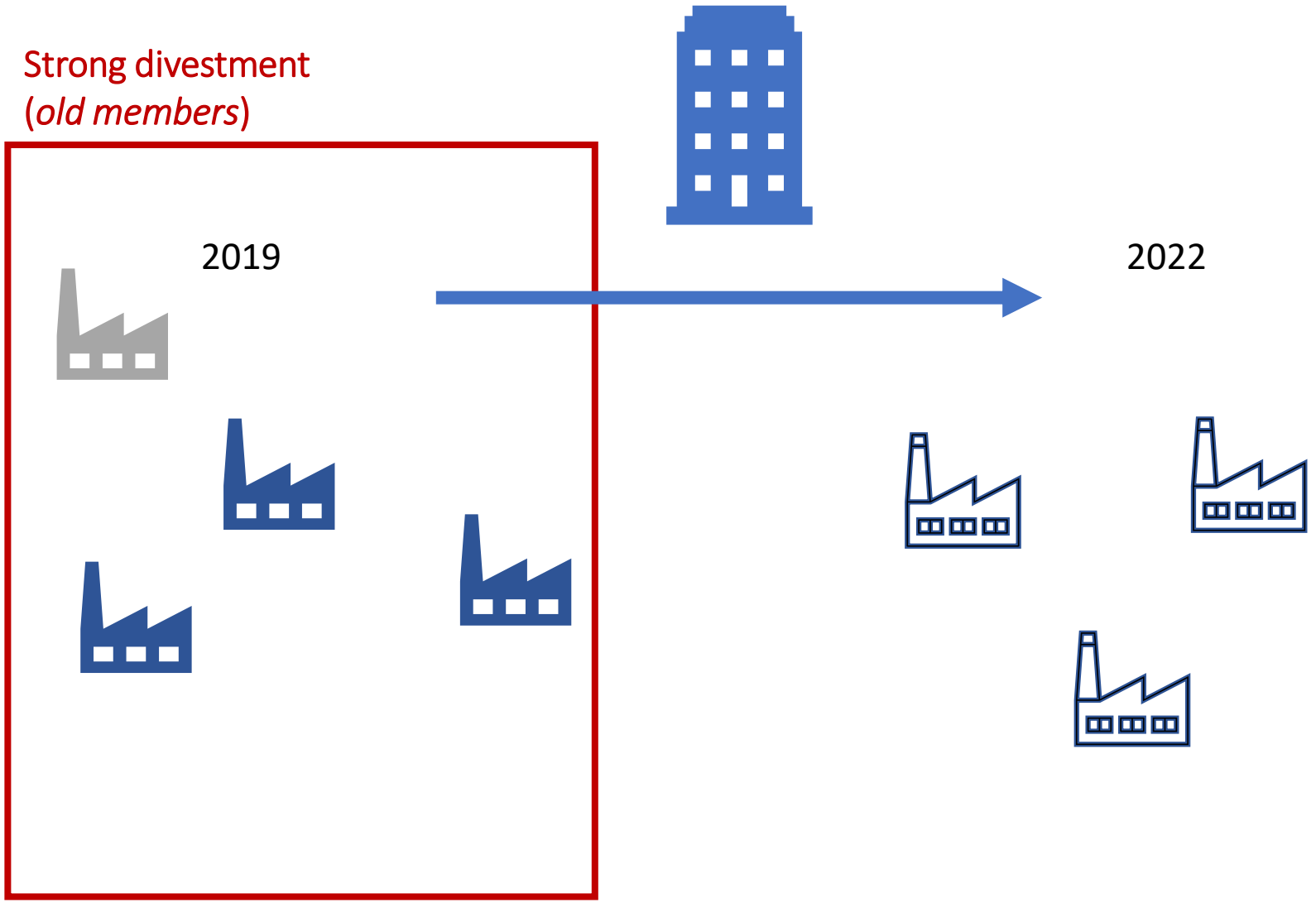
The MNE structure

The MNE structure

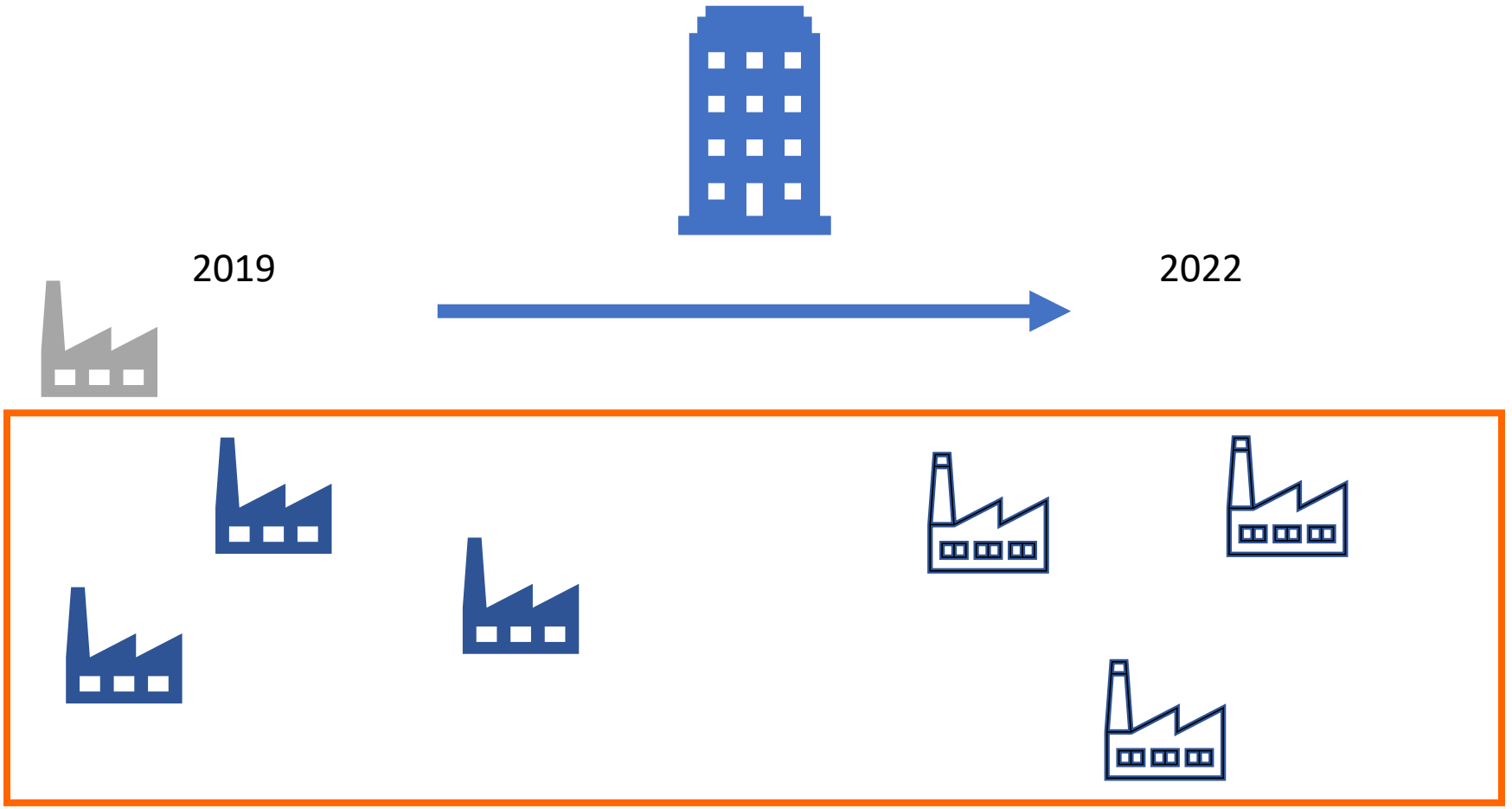


>98k subsidiaries (worldwide)

The MNE structure



The MNE structure



Weak divestment
(*active members*)

Literature

Streams: firm divestment, MNE theory and gravity model

- Individual factors
  - Demographics: size & age [Brudlerl & Schussler, 1990; Norbäck et al., 2015; Gibrat, 1931]
  - Performance (economic & financial): sales, liabilities [Berry, 2013]
- **Parent-subsidiary relationship**
  - MNE integration and within-group spillover: vertical vs horizontal networks [Berry 2013; Feinberg and Phillips, 2004;Markusen 1984]
  - **Geographical distance**: impediment to FDI [Larch, Norbäck & Urban, 2015]
  - Distance co-factors [Head and Mayer, 2014], e.g.:
    - cultural and institutional distance
    - monetary (tariffs) and non-monetary (regulations) trade costs
    - presence trade agreements
  - MNE integration & distance: Trading versus non-trading MNEs [Egger, 2008; Markusen, 2002]
- Contextual factors: host industry + host country characteristics

Data Sources

Variable name	*Data source*	*Level observed*
Individual	Orbis (BvD)	Firm level
Financial and demographics, status		
Bilateral factors		
Geographical distance	CEPII GeoDist	Bilateral, country
Cultural proximity (language, colonial ties)	CEPII GeoDist	Bilateral, country
Intra-EU27 investment	Orbis (BvD)	Bilateral, country
Institutional distance	QoG (World Bank)	Bilateral, country
Trade policies		
Tariff (ad valorem equivalent)	WITS (World Bank)	Bilateral, country-industry (NACE2)
Non-tariff measures (i.e., NTMs)	I-TIP (World Trade Organization)	Bilateral, country-industry (NACE2)
Service Trade Restrictiveness Index STRI	OECD STRI database	Unilateral, country-industry
Industry level characteristics		
Market growth rates (GVA)	Various sources (Eurostat, OECD Productivity database, the OECD ICIO, national accounts)	Unilateral, country-industry (NACE2)

Empirical Strategy

i: subsidiary [r : parent company]

$$y_{ir} = \alpha_r + \lambda\, \bar{y}_{-ir} + \boldsymbol{X}_{ir}\beta + \epsilon_{ir} \qquad (1)$$

- y_{ir} outcome variable [dichotomous/continuous]
- $\bar{\boldsymbol{y}}_{-\boldsymbol{ir}} = \frac{1}{m_r - 1}\sum_{\substack{j=1 \\ j \neq i}}^{m_r} y_{jr}$, i.e. the leave-1-out average outcome of i's peers
  - λ captures the *global* within-group spillover, i.e. **endog. peer-group effect**
  - Foundation: Social interaction model [Manski, 1993] ⇔ Spatial Lag Model with block-diagonal *W* [Anselin & Arribas-Bel, 2013]
- $\boldsymbol{X}_{ir}$ set of regressors, incl. **geographical distance**
- ϵ_{ir} clustered at parent company level

Empirical Strategy

Two-stage least square (2SLS) [Binary case]

i: subsidiary, s: NACE, k: host cnt [r : parent company, l: home cnt]

$$\hat{\bar{y}}_{-i(sk)r(l)} = \alpha_r + \bar{\boldsymbol{X}}_{-ir}\,\gamma + \boldsymbol{X}_{ir}\,\eta + \bar{\epsilon}_{-iskr} \qquad (2.a)$$

$$y_{i(sk)r(l)} = \alpha_r + \lambda\,\hat{\bar{y}}_{-i(sk)r(l)} + \boldsymbol{X}_{ir}\,\beta + \epsilon_{iskr} \qquad (2.b)$$

- $\bar{\boldsymbol{X}}_{-ir}$ leave-one-out group characteristics
- Additionally: $\alpha_s, \alpha_k, \alpha_{kk}$

- Strong Divest.: firm exit (LPM) + endog. peer effects

Empirical Strategy

Social interaction model (Lee, 2007) [Continuous case]

i: subsidiary, s: NACE, k: host cnt [r : parent company, l: home cnt]

Thanks to the equivalence $z_{-ir} = \sum_{j \neq i}^{m_r} z_{jr} = \sum_{j}^{m_r} z_{jr} - z_{ir} = m_r \bar{z}_r - z_{ir}$

- Eq. (1) can be rewritten as

$$y_{i(sk)r(l)} = \frac{\lambda}{m_r - 1}\left(m_r \bar{y}_r - y_{i(sk)r(l)}\right) + \boldsymbol{X}_{i(sk)r(l)}\beta + \alpha_r + \alpha_s + \alpha_k + \alpha_{kk} + \epsilon_{i(sk)r(l)} \quad (3)$$

- Group mean re-centering leads to the *within-group* equation:

$$\left(y_{i(sk)r(l)} - \bar{y}_r\right) = \left[-\frac{\lambda}{m_r - 1}\left(y_{i(sk)r(l)} - \bar{y}_r\right)\right] + \left[\boldsymbol{X}_{i(sk)r(l)} - \overline{\boldsymbol{X}_r}\right]\beta +$$

$$+ \left(\alpha_s - \overline{\alpha_{r,s}}\right) + \left(\alpha_k - \overline{\alpha_{r,k}}\right) + \left(\alpha_{kk} - \overline{\alpha_{r,kk}}\right) + \left(\epsilon_{i(sk)r(l)} - \bar{\epsilon}_r\right) \quad (4)$$

Empirical Strategy

- Eq. (4) reduced form

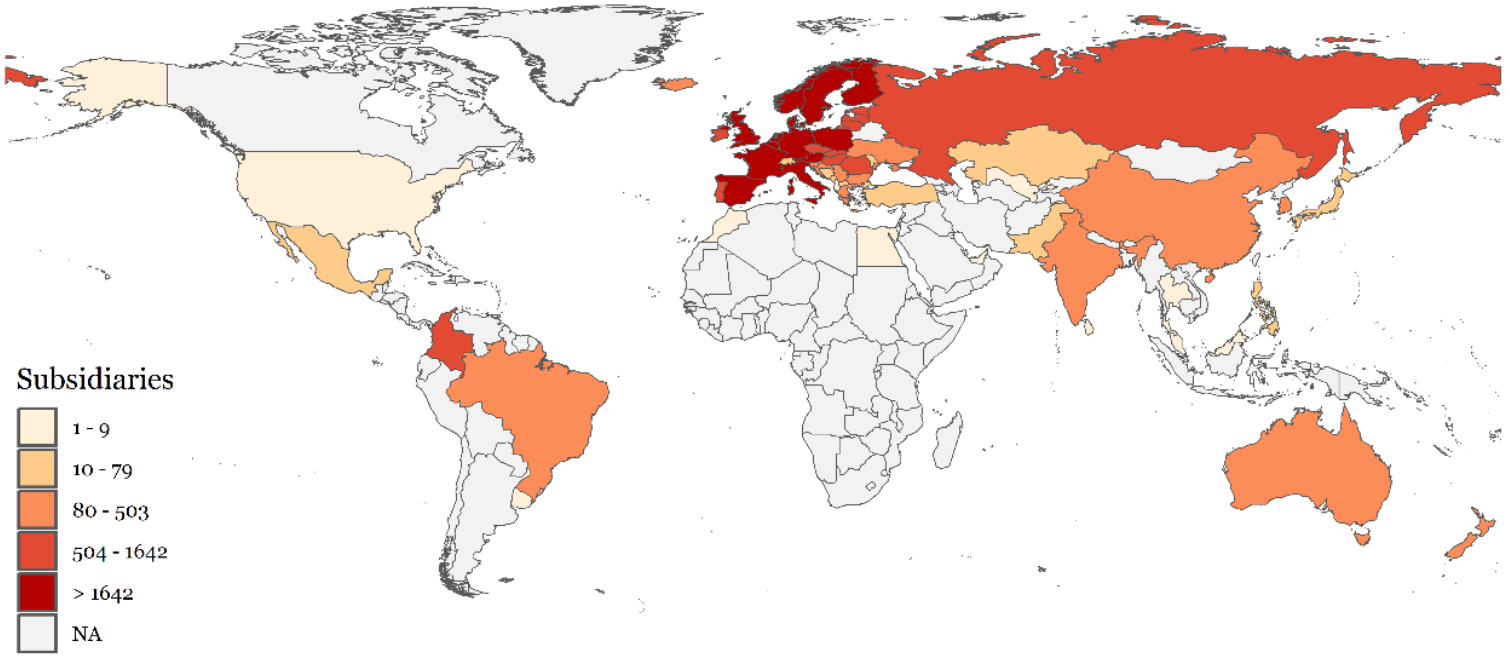
$$\left(y_{i(sk)r(l)} - \bar{y}_r\right) = \frac{m_r - 1}{m_r - 1 + \lambda}\left[\left(\boldsymbol{X}_{i(sk)r(l)} - \overline{\boldsymbol{X}_r}\right)\beta + \left(\alpha_s - \overline{\alpha_{r,s}}\right) + \left(\alpha_k - \overline{\alpha_{r,k}}\right) + \right.$$
$$\left. + \left(\alpha_{kk} - \overline{\alpha_{r,kk}}\right) + \left(\epsilon_{ir} - \bar{\epsilon}_r\right)\right] \qquad (5)$$

- $\frac{1}{m_r - 1} \times E[Eq.5]$ is used to instrument $\frac{(y_{ir} - \bar{y}_r)}{m_r - 1}$ through a 2-step procedure [Lee, 2007]

- Weak Divest: firm Δsize + endog. peer effects

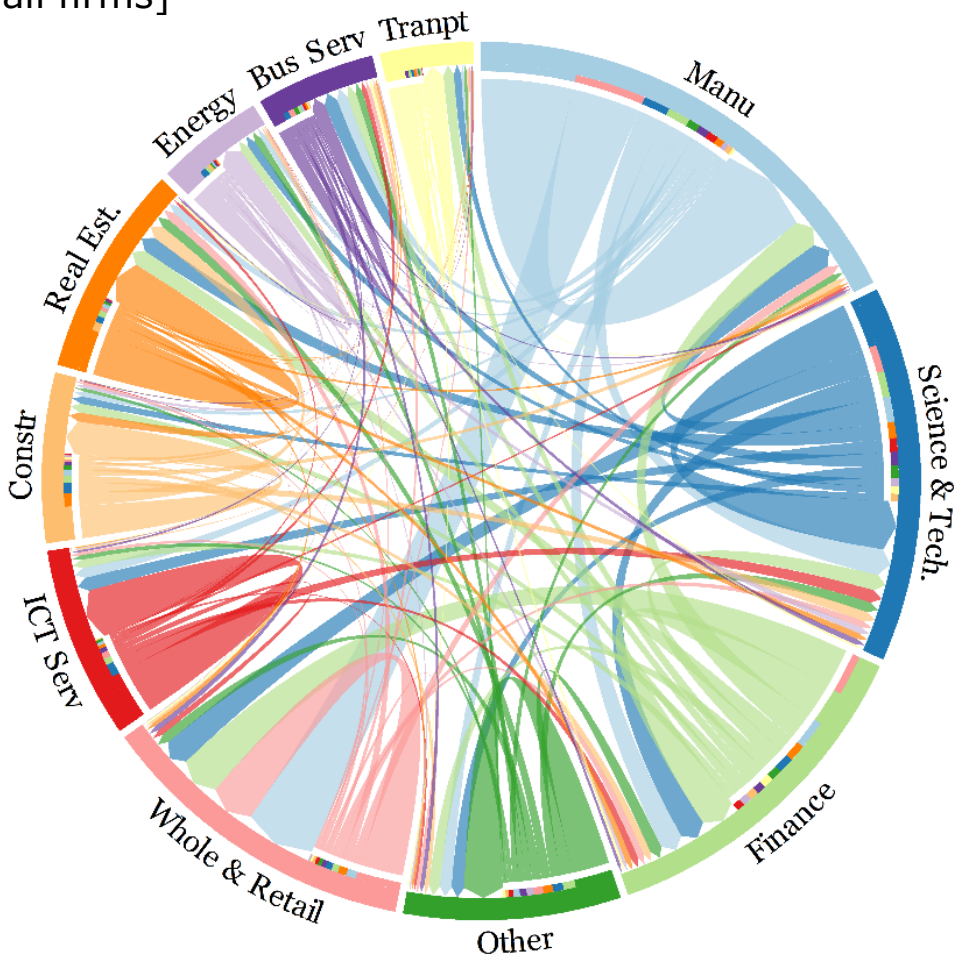
The sample

- Private corporations from EFTA [Orbis BvD]: ≥1 subsidiary abroad, > 50% ownership
  - → 5,892 parent companies (group size: 16.72 [IQR: 4-14])
  - → 98,537 companies worldwide
- Status timeline [activity/inactivity status]
  - → 93,295 old (~10% exit rate) + 5,242 new members



The sample

Sectoral distribution [all firms]



Predominance: continuum scale [0-100] where *pure* horizontal [100] and vertical integration [0] are the extremes (based on group primary industry)

The sample

	Old members		New members	Total
	Active	Exit		
	(N=84091)	(N=9204)	(N=5242)	(N=98537)
Total assets rate of change (percentage change)				
Median (Q1, Q3)	0.20 (-0.05, 0.70)		0.36 (-0.03, 2.86)	
Initial size - Total assets (Mln 2019 USD)				
Median (Q1, Q3)	7.72 (1.63, 40.20)	2.65 (0.37, 27.59)	0.19 (0.01, 3.20)	6.37 (1.18, 36.53)
Age				
Median (Q1, Q3)	15.00 (7.00, 26.00)	12.00 (6.00, 22.00)	2.00 (1.00, 2.00)	14.00 (5.00, 24.00)
Parent relatedness (same NACE 3-dig)				
Median (Q1, Q3)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)
Distance to home country (km)				
Median (Q1, Q3)	**278.19** (210, 884)	**278.19** (185,756)	**267.54** (214, 817)	**278.19** (206, 868)

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Binary case
Subsidiary Exit

Results – subsidiary exit

	Second stage IV-2SLS		
	(1)	(2)	(3)
	IV-2SLS	IV-2SLS	IV-2SLS
	Whole smp.	Predom.Vert.	Predom.Horiz.
Peers effect	**0.007*** **	**0.017*** **	**-0.012*** **
	(0.002)	(0.004)	(0.001)
Distance	**-0.003**	**-0.001**	**-0.006**
	(0.003)	(0.004)	(0.008)
N	91579	74149	17424
No. groups	5863	4670	1193
Subsidiaries characteristics (age, size, parent relatedness)	Yes	Yes	Yes
Bilateral factors	No	No	No
Host industry dummies (NACE 2d.)	Yes	Yes	Yes
Host country dummies	Yes	Yes	Yes
Intra-national dummies	Yes	Yes	Yes
F-statistic	516.305	433.964	83.545
Kleibergen-Paap rk LM stat.	111.956***	65.848***	48.544***
F-statistic first stage	21.734	12.730	10.521
Hansen J statistic	6.283	5.768	6.834
Hansen J p-value	0.179	0.217	0.145

Clustered standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Results – subsidiary exit

First stage

Robustness checks:

- Distance cofounding factors
- Groups active in > 2 countries
- Groups owning > 2 subsidiaries
- Excl. finance and insurance companies (i.e. NACE K-L)

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Continuous case
Subsidiary Δ size

Results - Subsidiary Δ size

	(1) Whole sample	(2) Predom. Vert.	(3) Predom. Horiz.
Peers effect	**0.1433**	**0.0665**	**-0.5282*** **
	(0.1294)	(0.1523)	(0.1890)
Distance	**0.0033**	**0.0118**	**-0.0849** **
	(0.0111)	(0.0117)	(0.0351)
Industry characteristics			
Market growth	0.0826		
	(0.0507)		
N	78126	62285	15841
No. groups	5499	4408	1091
Subsidiaries characteristics (age, init. size, interact. age-init. size, parent relatedness)	Yes	Yes	Yes
Bilateral factors	Yes	Yes	Yes
Host industry dummies	Yes	Yes	Yes
Host country dummies	Yes	Yes	Yes
Intra-national dummies	Yes	Yes	Yes
Within R^2	0.038	0.043	0.050

*i.e., for an average subsidiary, a **10%** ↑ in parent-subsidiary distance → **almost ↓1%** (.64%) in growth rate*

Clustered standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Results - Subsidiary Δ size

Robustness checks:

- Less restrictive sample (i.e. no distance co-factors)
- Groups active in > 2 countries
- Groups owning > 2 subsidiaries
- Excl. finance and insurance companies (i.e. NACE K-L)
- Groups active in UK, RU, UA, plus non-active

Conclusions

- What drives MNEs divestment strategies?
- Network changes of >5.5k MNEs over the period 2019-2022
- *Divestment nuances: strong* (exit) and *weak* (downsizing)
  - (end.) peer group effects & geographical distance

- MNE integration structure matters!
  - Peer group effect influences *Strong* and *Weak* divestment
    - (-) resource competition in (pred.) horizontal groups
    - (+) synergies in (pred.) vertical groups
  - Distance affects downsizing (*Weak*) in (pred.) horizontal groups

→ quicker adjustment mechanism in horizontal structures

→ Geo. restructuring can happen not only along GVCs!

Limitations: short-term effects, no test on the channels of foreign divestment – firm features, mkt conditions, geopolitical factors

Thank you for your attention!

Any question?

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Empirical Strategy

2-step procedure Lee [2007]

- Step 1: Assuming $\lambda = 0$
  - estimate $\frac{(y_{i(sk)r(l)} - \bar{y}_r)}{m_r - 1}$ on RHS of Eq.(5) to obtain a first $\frac{\widehat{(y_{i(sk)r(l)} - \bar{y}_r)}}{m_r - 1}$
  - Use Step 1 to run Eq. (4) (structural within eq.) and obtain a first $\hat{\lambda}_0$
- Step 2:
  - Use $\frac{\widehat{(y_{i(sk)r(l)} - \bar{y}_r)}}{m_r - 1 - \widehat{\lambda_0}}$ to rerun Eq. (4) and obtain final $\hat{\lambda}$

Binary case: First stage

Back

	First Stage Dependent Variable: Group share of switchers					
	Whole sample		Predom. Vertical		Predom. Horiz.	
	Coeff.	St.Error	Coeff.	St.Error	Coeff.	St.Error
Leave-one-out group characteristics						
avg Age	-.030	.023	-.021	.028	-.478***	0.139
avg Initial size (Tot. Assets)	-.659***	.274	-1.13***	.192	-2.14***	0.610
share Parent relatedness (same NACE 3-dig.)	-.009	.009	-.018*	.011	0.033**	0.140
avg Distance	-.277	.295	-.0004	.0003	.0007	.0008
avg Liability	-.774***	.211	-.103*	.063	-.304	.294
Subsidiary characteristics						
Parent relatedness	-.063	.056	-.095	.065	.109	.085
(same NACE 3-dig)						
	.0008	.001	.001	.001	-.011	.004
Age					***	
Age^2	-2.9E-05	-1.1E-05	-2.1E-05	-1.0E-05	-6.2E-05	4.6E-05
Size (reference group: Large)						
Medium	.034	.025	.078***	0.027	-.03	.074
Small	-.602***	.034	-.624***	.037	-.457***	.093
Liability	.02***	.003	.032***	0.003	.022**	.008
Bilateral barriers to trade						
Distance	-.094***	.034	-.071**	0.022	-.346***	.150
N	91579		74149		17424	
No. groups						
F-test of excluded instruments	F(5,85528) =	21.73	F(5,69292) = 12.73		F(5, 16063)= 10.52	

RB Binary case: Distance + bilateral factors

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	Main Table Whole smp.	(2) Whole smp.	(3) Predom. Vert.	(4) Predom. Horiz.
Bilateral factors				
Distance	-0.003	-0.003	-0.002	-0.0001
	(0.003)	(0.003)	(0.004)	(0.010)
Intra-EU (Reference group: No)		-0.003	-0.009	0.050
		(0.010)	(0.011)	(0.033)
Cultural Proximity		-0.003	-0.008	0.049**
		(0.008)	(0.008)	(0.021)
Institutional distance		0.010***	0.008**	0.019*
		(0.004)	(0.004)	(0.012)
Host industry trade policies				
Tariff host country		0.001	0.002*	-0.001
		(0.001)	(0.001)	(0.001)
Tariff home country		-0.002**	-0.002***	-0.001
		(0.001)	(0.001)	(0.005)
NTMs host country		0.0002*	0.0003**	-0.001*
		(0.0002)	(0.0002)	(0.001)
NTMs home country		-0.0003**	-0.0003***	-0.0003
		(0.0001)	(0.0002)	(0.001)
STRI host country		-0.057**	-0.051*	-0.071
		(0.024)	(0.026)	(0.064)
STRI home country		0.071*	0.047	0.214**
		(0.037)	(0.039)	(0.104)
N	91579	88788	71718	17064
Nr. groups	5863	5766	4604	1162
Peers effect	Yes	No	No	No
Subsidiary characteristics	Yes	Yes	Yes	Yes
Host industry dummies	Yes	Yes	Yes	Yes
Host country dummies	Yes	Yes	Yes	Yes
Intra-national dummies	Yes	Yes	Yes	Yes
Within R^2		0.077	0.086	0.043

RB Binary case: Groups >2 countries

Back

	LPM Whole smp.	LPM Predom. Vert.	LPM Predom. Horiz.
Bilateral factors			
Distance	-0.004	-0.002	-0.007
	(0.004)	(0.004)	(0.011)
Intra-EU (Reference group: No)	0.001	-0.005	0.066*
	(0.011)	(0.011)	(0.038)
Cultural Proximity	0.002	-0.005	0.054**
	(0.008)	(0.008)	(0.023)
Institutional distance	0.008**	0.006	0.018
	(0.004)	(0.004)	(0.012)
Tariff host country	0.001	0.002*	-0.001
	(0.001)	(0.001)	(0.002)
Tariff home country	-0.002***	-0.002***	-0.011
	(0.001)	(0.001)	(0.010)
NTMs host country	0.0002*	0.0003***	-0.002**
	(0.0001)	(0.0001)	(0.001)
NTMs home country	-0.0003**	-0.0003**	-0.00001
	(0.0001)	(0.0001)	(0.001)
STRI host country	-0.063**	-0.047*	-0.143**
	(0.025)	(0.027)	(0.071)
STRI home country	0.074*	0.051	0.237*
	(0.040)	(0.042)	(0.128)
N	71327	59613	11708
Nr. groups	3125	2615	510
Peers effect	No	No	No
Subsidiary characteristics	Yes	Yes	Yes
Host industry dummies	Yes	Yes	Yes
Host country dummies	Yes	Yes	Yes
Intra-national dummies	Yes	Yes	Yes
Within R^2	0.077	0.086	0.043

RB Binary case: Groups >2 subsidiaries

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	(1) LPM Whole sample	(2) LPM Predom. Vertical	(2) LPM Predom. Horizontal
Peers effect	0.009**	0.012***	-0.014***
	(0.004)	(0.004)	(0.003)
Distance	-0.002	-0.001	-0.006
	(0.003	(0.003)	(0.008)
N	90475	73266	17201
No. groups	5311	4229	1082
Subsidiary characteristics	Yes	Yes	Yes
Bilateral factors	No	No	No
Host industry dummies	Yes	Yes	Yes
Host country dummies	Yes	Yes	Yes
Intra-nat. dummies	Yes	Yes	Yes
Log likelihood	-8476.11	-9829.97	3412.012
F- statistic	510.397	455.52	73.968
Kleibergen-Paap rk LM statistic	120.509	99.78	36.099
F-statistic first stage	23.519	20.26	7.115
Hansen J statistic	6.29	3.2	4.006
Hansen J p-value	0.178	0.525	0.405
Correct Predict. (%)	90.68	90.82	90.10

RB Continuous case: Groups active >2 cntr

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	(1) Whole sample	(2) Predom. Vertical	(3) Predom. Horizontal
Peers effect	0.1717	0.2314	-0.9048**
	(0.2421)	(0.2630)	(0.3691)
Distance	0.0033	-0.0780**	0.0091
	(0.0116)	(0.0384)	(0.0121)
N	62834	51903	10931
No. groups	3181	2265	516
Subsidiary characteristics	Yes	Yes	Yes
Bilateral factors	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Intra-national dummies	Yes	Yes	Yes
Within R^2	0.042	0.045	0.066

RB Continuous case: Groups with >2 subs

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	(1) Whole sample	(2) Predom. Vertical	(3) Predom. Horizontal
Peers effect	0.6449***	0.7459***	-0.8364***
	(0.1815)	(0.2005)	(0.2710)
Distance	0.0040	-0.0759**	0.0111
	(0.0111)	(0.0353)	(0.0117)
N	75705	15139	60566
No. groups	4980	973	4007
Subsidiary characteristics	Yes	Yes	Yes
Bilateral factors	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Intra-national dummies	Yes	Yes	Yes
Within R^2	0.0440	0.0591	0.0479

RB Continuous case: no distance co-factors

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	(1) Col (1) Table 5	(2) Predom. Vert.	(3) Predom. Horiz.	(4) Predom. Horiz.	(5) Predom. Horiz.
Peers effect	0.0729	0.0599	-0.5666***	-0.5565***	-0.5379***
	(0.0965)	(0.1450)	(0.2107)	(0.1935)	(0.1919)
Distance	0.0106	0.0138	**-0.0263**	**-0.0294**	**-0.0766****
	(0.0114)	(0.0120)	**(0.0366)**	**(0.0362)**	**(0.0388)**
Intra-EU				**0.2184***	**0.2869****
				(0.1177)	**(0.1258)**
Cultural Proximity					**-0.2119***
					(0.1197)
Industry characteristics					
Mkt growth1920	0.0856*	0.0601	0.1954	0.1941	0.2397
	(0.0451)	(0.0441)	(0.1575)	(0.1571)	(0.1757)
N	84887	67996	16891	16891	16697
No. groups	5654	4511	1143	1143	1131
Bilateral factors	No	No	No	No	No
Country dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes
Intra-national dummies	Yes	Yes	Yes	Yes	Yes
Within R^2	0.038	0.043	0.048	0.048	0.048

RB Continuous case:

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