

Joint WPIA and WPTC workshop on multinational production

Session 2 - Multinational production: inside or outside the firm?

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Business Groups as Hierarchies of Firms



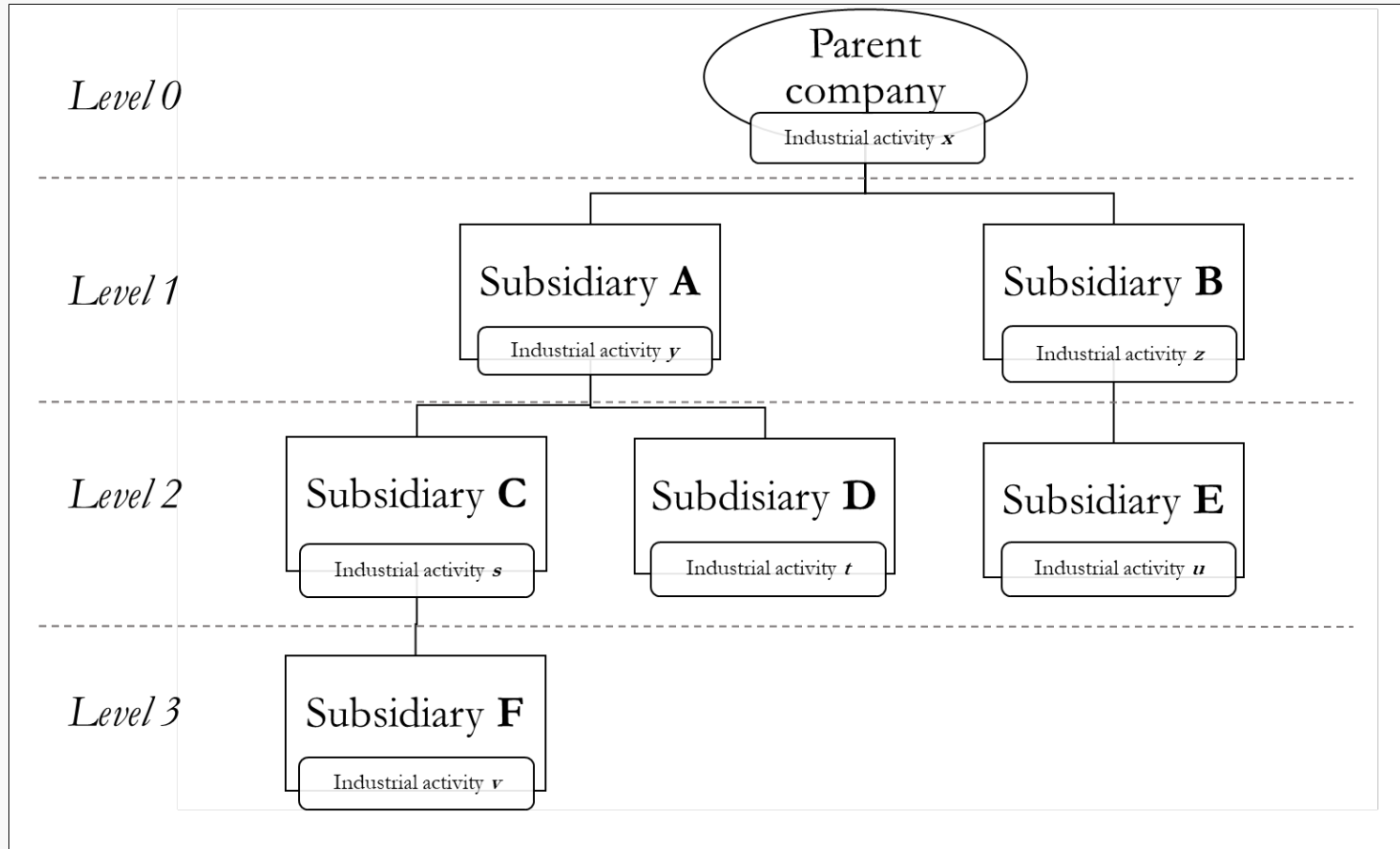
Based on Altomonte, C., Ottaviano, G.I.P. and Rungi, A. (2018) "*Business Groups as Knowledge-based Hierarchies of Firms*"

with critical inputs from Tommaso Sonno (CEP-LSE) on the Orbis BvD Historical Ownership Database

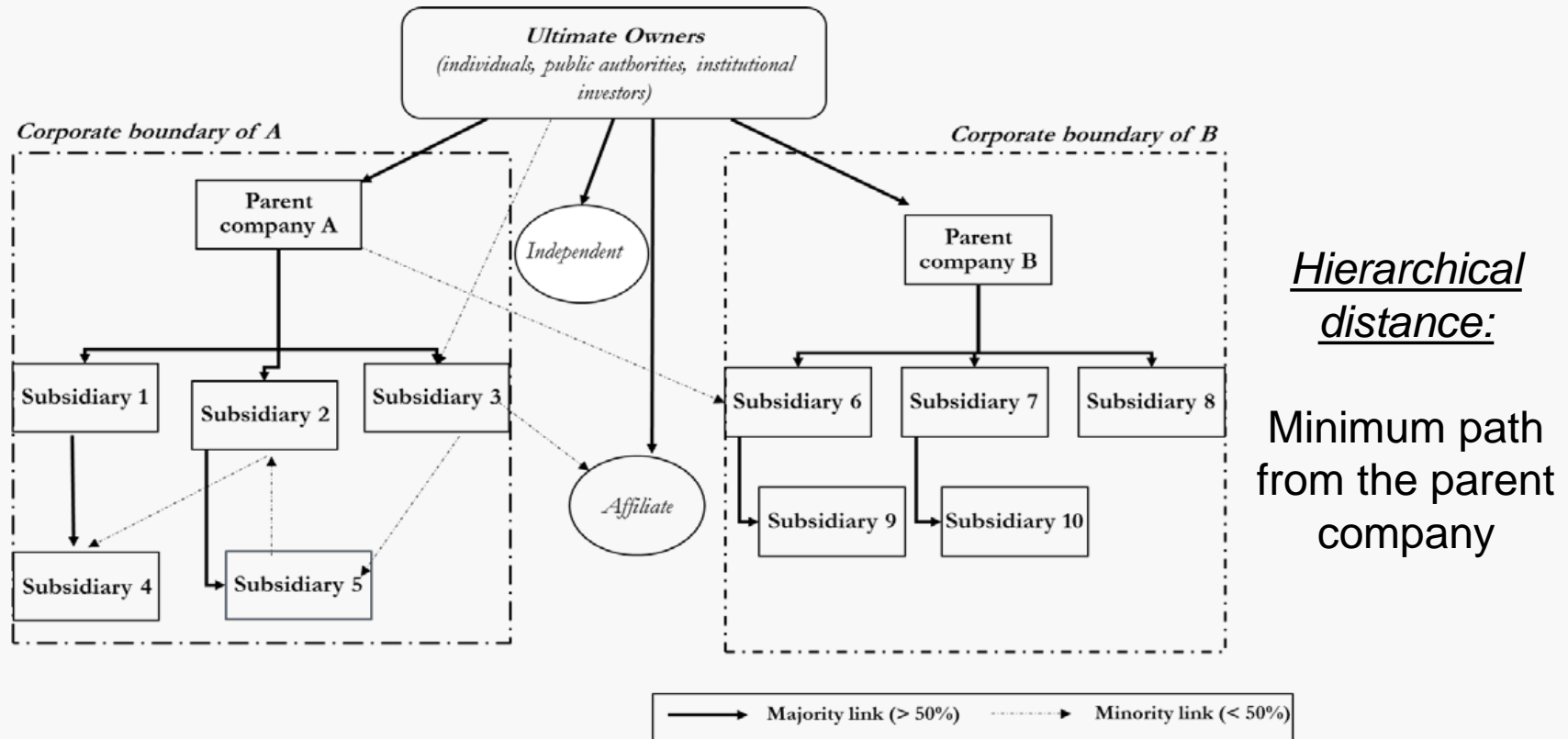
Relevance of Business Groups

- Business groups (BGs): collections of legally independent businesses, often extensively diversified, and interconnected by a medley of economic and social ties (Colpan et al., 2010). Key historical players in different episodes of industrialization: Italian *IRI*; German *Konzern*; Japanese *keiretsu*; Korean *chaebol*; *grupos economicos* in LA, etc.
- Key players of globalization: multinational enterprises are (international) business groups
- UNCTAD (2016) estimates that ~70% of MNEs have only one foreign affiliate (FA), but 'simple' BGs = 4% of total MNE value added; 60% of value added accounted for by few, large MNEs with > 100 affiliates (549 on average)
- 55% of FAs (75% of FAs in large MNEs) not directly owned by their ultimate owner => organized into hierarchies
- Average hierarchical depth of the largest MNEs is 7 levels of control
- BGs (either parent or affiliates in host countries) account for some 75% of US trade flows (BEA, 2012) or around 65% of French trade (Altomonte et al., 2013)

Business Groups as hierarchical graphs



Hierarchical distance in Business Groups



- Definitions in line with international 'manuals' for standards in national accounts and official statistics, OECD (2005), UNCTAD (2009), US BEA, etc.

Source: Rungi, Morrison & Pammolli (2017)

Business Groups 2015 (Rungi et al., 2017)

Host economy	Parent companies				Subsidiaries			
	All	%	Multinational	%	All	%	Foreign	%
Africa	5,102	0.22	4,169	2.07	30,346	0.64	17,088	2.27
Asia	105,449	4.45	19,142	9.51	316,014	6.67	99,624	13.24
Australia	58,788	2.48	2,771	1.38	136,189	2.87	14,750	1.96
EU	600,829	25.35	111,522	55.41	1,625,508	34.29	387,006	51.44
Latin America	30,058	1.27	18,247	9.07	83,227	1.76	51,693	6.87
Other Europe	36,073	1.52	14,089	7.00	84,045	1.77	22,441	2.98
Rest of the World	68,634	2.90	7,847	3.90	216,766	4.57	45,992	6.11
Russia	29,741	1.25	974	0.48	110,232	2.33	50,541	6.72
USA	1,435,218	60.56	22,511	11.18	2,138,025	45.10	63,220	8.40
Total	2,369,892	100.00	201,272	100.00	4,740,352	100.00	752,355	100.00

Source: Rungi et al. (2017)

Note: Parent companies and subsidiaries are retrieved through a methodology proposed in Rungi et al. (2017) aimed at identifying corporate control from bilateral ownership links. Bilateral links are retrieved from Orbis BvD data (2015 release).

The BVD Historical Ownership database (2015)

Univocal pairs of subsidiary-shareholder from Orbis 90,175,158

Affiliates attributable to one GUO 50C 14,522,524
(with level known) (14,239,404)

of which:

- Affiliates with ownership of the GUO known 6,276,238
(with level known) (6,111,435)

- Affiliates with ownership of the ISH known 5,159,479
(with level known) (5,087,705)

Affiliates with ownership of GUO & ISH known 4,598,882
(with level known) (4,565,691)

of which:

- Affiliates with precise data on ownership 2,430,621
(with level known) (2,403,920)

- Affiliates with approximated data on ownership 2,168,261
(with level known) (2,161,771)

Source: courtesy of Tommaso Sonno (CEP-LSE)

Note: Parent companies and subsidiaries are retrieved directly from the BvD Historical Ownership database (year 2015) restricting observations to companies attributed by BvD to a corporate Global Ultimate Owner (GUO) with total (direct or indirect) control >50.01%.

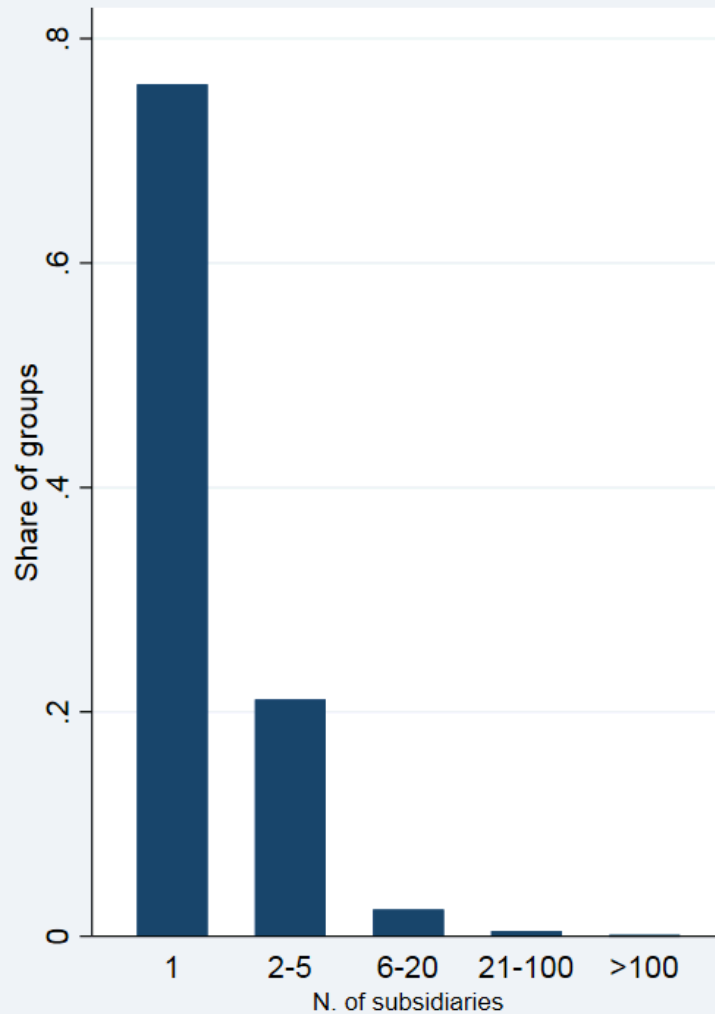
Hierarchical distance is defined as and reconstructed consistently with Rungi et al. (2017).

Business Groups 2015 (Bvd Data)

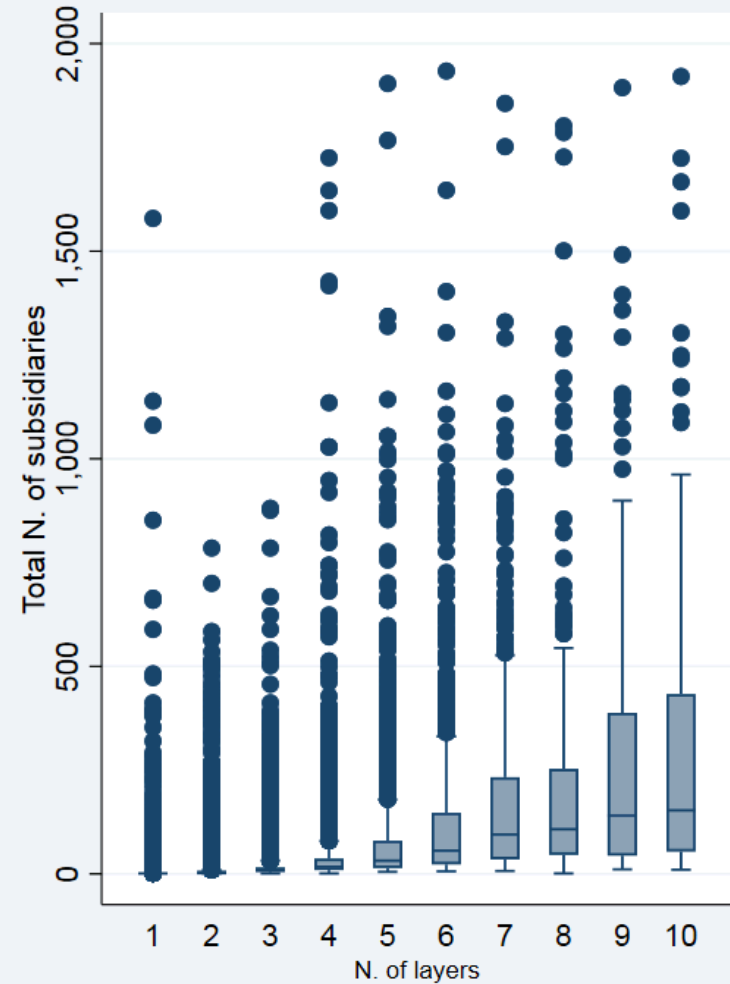
Host economy	Parent companies				Subsidiaries			
	All	%	Multinational	%	All	%	Foreign	%
Africa	6,592	0.27	4,520	2.09	42,261	0.82	26,228	2.43
Asia	104,674	4.30	25,690	11.86	407,790	7.94	172,280	15.97
Australia	77,048	3.16	2,963	1.37	173,048	3.37	31,926	2.96
EU	692,133	28.42	119,379	55.11	1,865,728	36.35	561,614	52.05
Latin America	28,530	1.17	17,874	8.25	93,409	1.82	68,330	6.33
Other Europe	64,697	2.66	16,244	7.50	149,628	2.91	35,547	3.29
Rest of the World	48,810	2.00	7,031	3.25	102,767	2.00	28,613	2.65
Russia	45,016	1.85	1,029	0.48	141,510	2.76	54,074	5.01
USA	1,368,262	56.17	21,876	10.10	2,156,967	42.02	100,286	9.30
Unassigned country	149,902	-	149,769	-	26,371	-	25,876	-
Total	2,585,664	100.00	366,375	100.00	5,159,479	100.00	1,104,774	100.00
Correlation with Rungi et al. (2017)	0.997	-	0.999	-	0.997	-	0.995	-

Source: courtesy of Tommaso Sonno (CEP-LSE)

Distribution of subsidiaries and layers



The graph shows the distribution of groups with given number of subsidiaries in the sample in year 2015.



Boxplot of the number of subsidiaries for groups characterized by given number of hierarchical layers in year 2015. Note that 10 means at least 10 layers. 13 GUOs with number of subsidiaries between 2,000 and 4,000 are excluded from the graph.

Number of subsidiaries per layer

Hierarchical distance	Domestic subsidiaries	%	Foreign subsidiaries	%	All subsidiaries	%
1	3,462,313	86.1	619,875	58.1	4,082,188	80.2
2	378,057	9.4	225,071	21.1	603,128	11.9
3	113,875	2.8	111,864	10.5	225,739	4.4
4	38,707	1.0	54,023	5.1	92,730	1.8
5	14,085	0.4	27,102	2.5	41,187	0.8
6	6,030	0.1	13,779	1.3	19,809	0.4
7	3,274	0.1	7,212	0.7	10,486	0.2
8	1,607	0.0	3,733	0.3	5,340	0.1
9	1,095	0.0	2,026	0.2	3,121	0.1
10	403	0.0	1,268	0.1	1,671	0.0
> 10	638	0.0	1,668	0.2	2,306	0.0
Total	4,020,084	100.0	1,067,621	100.0	5,087,705	100.0

Number of subsidiaries per layer (no 1-1)

Hierarchical distance	Domestic subsidiaries	%	Foreign subsidiaries	%	All subsidiaries	%
1	1,769,060	76.0	351,533	44.0	2,120,593	67.8
2	378,057	16.2	225,071	28.2	603,128	19.3
3	113,875	4.9	111,864	14.0	225,739	7.2
4	38,707	1.7	54,023	6.8	92,730	3.0
5	14,085	0.6	27,102	3.4	41,187	1.3
6	6,030	0.3	13,779	1.7	19,809	0.6
7	3,274	0.1	7,212	0.9	10,486	0.3
8	1,607	0.1	3,733	0.5	5,340	0.2
9	1,095	0.0	2,026	0.3	3,121	0.1
10	403	0.0	1,268	0.2	1,671	0.1
> 10	638	0.0	1,668	0.2	2,306	0.1
Total	2,326,831	100.0	799,279	100.0	3,126,110	100.0

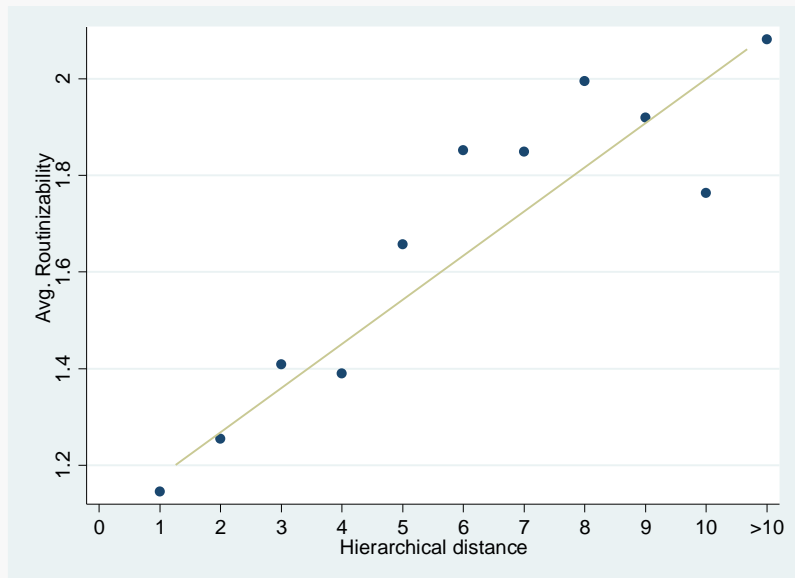
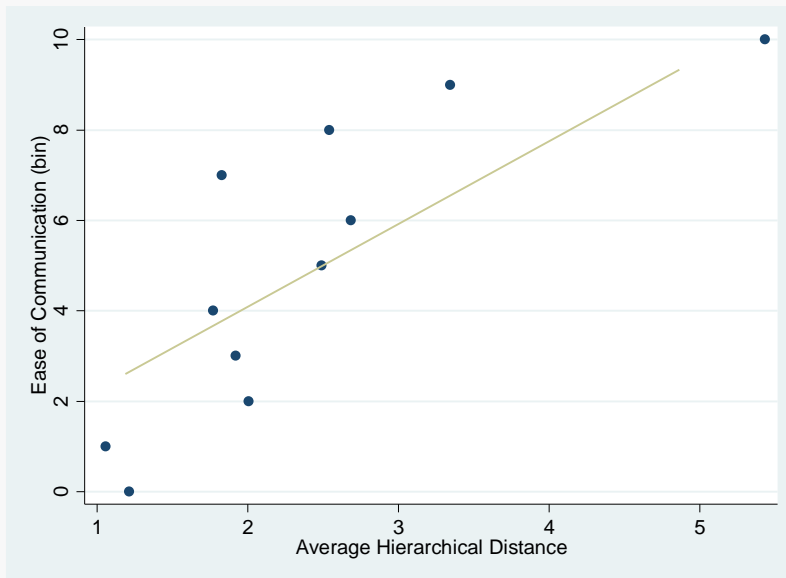
Avg. number of subsidiaries per BG/layer

level	BGs with:										
	1 layer	2 layers	3 layers	4 layers	5 layers	6 layers	7 layers	8 layers	9 layers	10 layers	> 10 layers
1	2.7	2.6	5.2	9.9	19.7	37.0	38.2	43.4	57.0	64.2	55.6
2		1.9	5.5	10.8	18.7	26.0	35.8	50.2	63.5	43.1	56.9
3			2.5	7.7	14.4	22.1	33.0	39.2	42.0	44.4	48.2
4				2.8	8.5	16.0	25.7	29.6	32.2	32.8	33.7
5					3.0	9.7	15.0	22.2	23.9	20.0	26.6
6						3.1	8.9	14.0	19.4	18.0	25.3
7							3.3	7.1	12.8	14.7	24.6
8								3.0	9.1	10.6	20.0
9									3.7	6.8	16.8
10										2.7	11.7
> 10											18.7
N. of BGs	468,301	113,394	21,323	5,969	2,241	930	498	252	136	74	111

Note: the Table shows the average number of affiliates per layer, for different sized BGs. The number of subsidiaries by GUOs has been cleaned for outliers in the upper 1 percentile.

"N. of BGs" reports the number of GUOs with a given number of maximum layers. 1,942,505 GUOs with only one subsidiary are excluded from this Table. Including them, the mean number of subsidiaries in level 1 for GUOs with 1 layer decreases to 1.3.

Hierarchical distance and industry characteristics



- Easiness in communication across subsidiaries => higher average hierarchical distance across the group
- More standardized production processes => subsidiaries placed at higher hierarchical distance

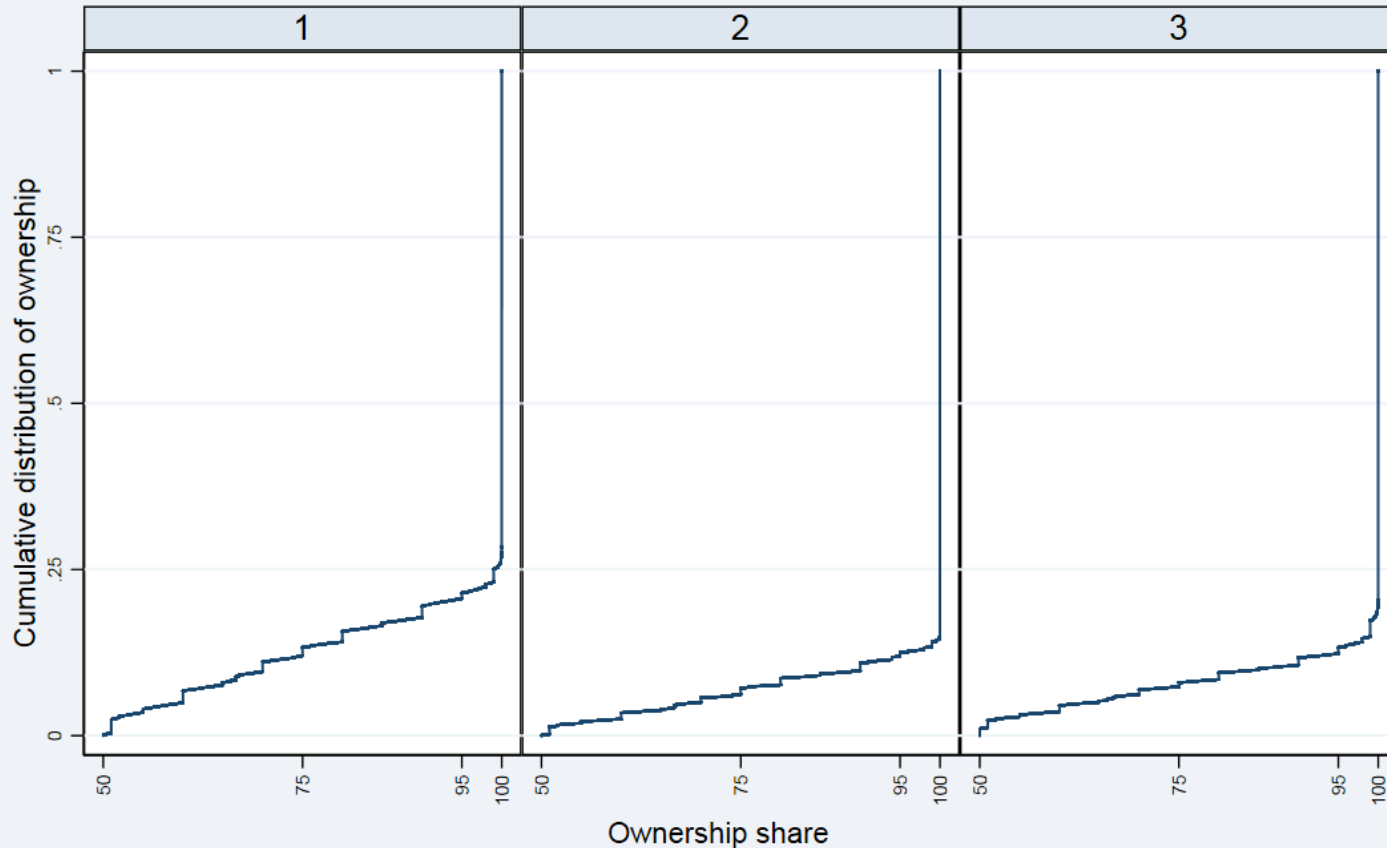
Avg. ownership share per BG/layer

level	BG with:										
	1 layer	2 layers	3 layers	4 layers	5 layers	6 layers	7 layers	8 layers	9 layers	10 layers	> 10 layers
1	94.3	97.2	96.9	97.0	97.6	97.5	97.8	97.1	98.7	96.0	98.4
2		99.6	99.6	99.6	99.6	99.8	99.3	100.0	98.0	99.2	99.9
3			99.7	99.6	99.6	99.9	99.2	100.0	99.4	99.8	99.4
4				99.7	99.8	99.9	99.4	100.0	97.6	99.5	99.6
5					99.8	100.0	99.5	100.0	97.4	100.0	99.6
6						100.0	98.5	100.0	99.4	100.0	99.0
7							99.2	100.0	99.4	100.0	96.5
8								100.0	99.1	100.0	95.7
9									99.6	100.0	96.5
10										100.0	98.0
> 10											98.9
N. of BGs	213,280	60,904	9,938	2,452	856	342	158	71	30	16	27

Note: the Table shows the mean ownership share per layer, for different sized BGs. "N. of BGs" reports the number of GUOs with a given number of maximum layers for which precise information on ownership is available. GUOs with only one subsidiary are excluded from the table; their mean ownership share is 100.0.

- No systematic relationship of ownership share with position in the hierarchy

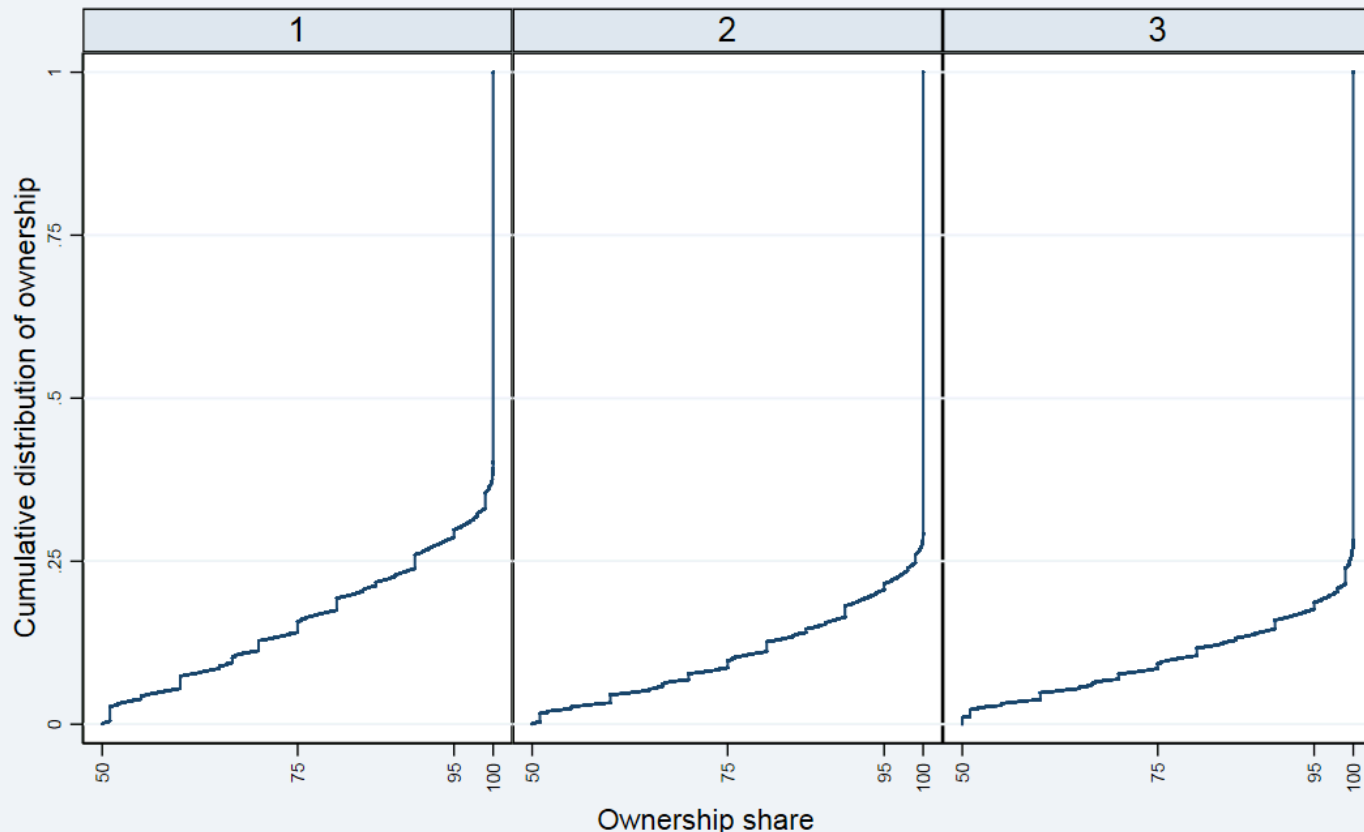
Ownership share of affiliates and IPR - host country



The graph refers to data of 2015. It shows the cumulative distribution of the ownership share of subsidiaries by different quantiles of the IPR index of the country in which the subsidiary is located (Park index for 2005). The first quantile contains 41.9% of the observations, and the main countries are AU (16.7% of the quantile), RU (12.7% of the quantile), and ES (8.8% of the quantile). The second quantile contains 28.2% of the observations, and the main countries are GB (38.8% of the quantile), DE (35.5% of the quantile) and SE (13.1% of the quantile). The third quantile contains 29.9% of the observations, and the main countries are NL (40.0% of the quantile), FR (15.0% of the quantile), and IT (13.0% of the quantile).

- No systematic relationship of ownership share with IPR in host country

Mean ownership share of GUOs and IPR - home country



The graph refers to data of 2015. It shows the cumulative distribution of the mean ownership share of GUOs by different quantiles of the IPR index of the country in which the GUO is located (Park index for 2005). The first quantile contains 28.0% of the observations, and the main countries are AU (28.6% of the quantile), RU (16.8% of the quantile), and NO (11.5% of the quantile). The second quantile contains 36.3% of the observations, and the main countries are DE (24.8% of the quantile), GB (20.6% of the quantile) and SE (11.2% of the quantile). The third quantile contains 35.7% of the observations, and the main countries are NL (42.9% of the quantile), IT (14.5% of the quantile), and FR (12.1% of the quantile).

- No systematic relationship of ownership share with IPR in home country