

Stylized Facts and Empirical Assessment of the Insider-Outsider Society Structure (WP2)

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In a Nutshell

- **Motivation:** "insider-outsider society" model - individual groups of society ("insiders") control or influence government, for insiders' collective benefit.
- **Contribution:** Classification of countries run by an insiders' government or not, by exploring single indices and constructing composite indicators considering industry level labor, financial, innovation and market structure insights
- **Findings:** ITA & SVK appear as the most consistent countries run by an insiders' government, followed by CZE, ESP, GBR, GRC, NLD

Motivation

- The "**insider-outsider society**" model proposes a politicoeconomic system characterized by selfish elites with market power.
- These **elites** cooperate to influence the government in protecting and **promoting** their collective **self-interest**.
- Economies dominated by insider groups exhibit **lower productivity and growth** (Kollintzas et al., 2018).
- Empirical testing aims to assess the market **distortions and competitiveness of economies**.
- A way to assess the "**competitiveness**" of an economy is to examine how competitive its **industries** are.

Location in Literature

First strand - Insider-Outsider Theory

- Cole & Ohanian (2004): New Deal policies increased insider advantages, hindering Great Depression recovery.
- Kollintzas et al. (2018): Insider-outsider labor market in Greece contributes to economic stagnation.

Second strand - Economic index construction

- Methodological Innovations: Pollesch & Dale (2016)→ Normalization impacts index weights, Mero-Figueroa et al. (2020)→ Comprehensive well-being indicator.
- Ram (1982): Principal components for economic indices.
- Vyas & Kumaranayake (2006): PCA for socio-economic status indices.
- Vasilyeva et al. (2018): PCA to assess social sector institutional quality in 25 countries.
- Kurek et al. (2022): PCA vs. Analytical Hierarchy Process for local competitiveness.
- Batista-Foguet et al. (2004): PCA in cross-national socio-economic comparisons.

Methodology

- **Goal** → construction of a composite index to enhance the classification of a country's characterization as **insider-outsider** based on industry aspects.
- **Inter-industry** and **intra-industry** analysis
- Use **Principal Component Analysis (PCA)**
- Rank **industries** based on relative performance.
- Classify Countries as **insiders** or **outsiders** based on relevant **criteria**.

NACE Rev. 2

Nomenclature of Economic Activities

A	Agriculture, forestry and fishing
B	Mining and quarrying
C	Total manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage; waste management and remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative and support service activities
O	Public administration and defence; compulsory social security
P	Education
Q	Health and social work
R	Arts, entertainment and recreation
S	Other service activities

~~T Activities of households as employers, undifferentiated goods~~

~~U Activities of extraterritorial organisations and bodies~~

ISIC ver. 4

International Standard Industrial Classification

VA0: Agriculture, forestry and fishing
VB: Mining and quarrying
VC: Manufacturing
VD: Electricity, gas, steam and air conditioning supply
VE: Water supply, sewerage, waste management and remediation activities
VF: Construction
VG: Wholesale and retail trade, repair of motor vehicles and motorcycles
VH: Transportation and storage
VI: Accommodation and food service activities
VJ: Information and communication
VK: Financial and insurance activities
VL: Real estate activities
VM: Professional, scientific and technical activities
VN: Administrative and support service activities
VO: Public administration and defence, compulsory social security
VP: Education
VQ: Human health and social work activities
VR: Arts, entertainment and recreation
VS: Other service activities
VT: Act. of HH as employers, undif. G&S-producing activities of HH for own use
VU: Activities of extraterritorial organizations and bodies

Source	Variables
Eurostat	<ul style="list-style-type: none"> • Value Added • Compensation • Operating surplus and mixed income, net • Employees
OECD	<ul style="list-style-type: none"> • USA (VA, Compensation Operating surplus and mixed income, net) • Exchange rates
EUKLEMS	<ul style="list-style-type: none"> • R&D capital stock • Employees
WDI	<ul style="list-style-type: none"> • Price Index

	Variable	Construction
wpr	Wage Premium	$((\text{rce}/\text{median interindustry rce}) - 1) * 100$
npm	Net profit Margin	Operating surplus and mixed income, net / Value Added
rd	% of Total R&D per industry	$(\text{R\&D Capital Stock}_{\text{industry}} / \text{R\&D Capital Stock}_{\text{Total}}) * 100$
hhi	Herfindahl-Hirschman Index - Value Added	$((\text{VA}_{\text{industry}} / \text{VA}_{\text{Total}}) * 100)^2$
rce	Real Compensation per Employee	Real Compensation in millions / Total Employees in thousands

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PCA1

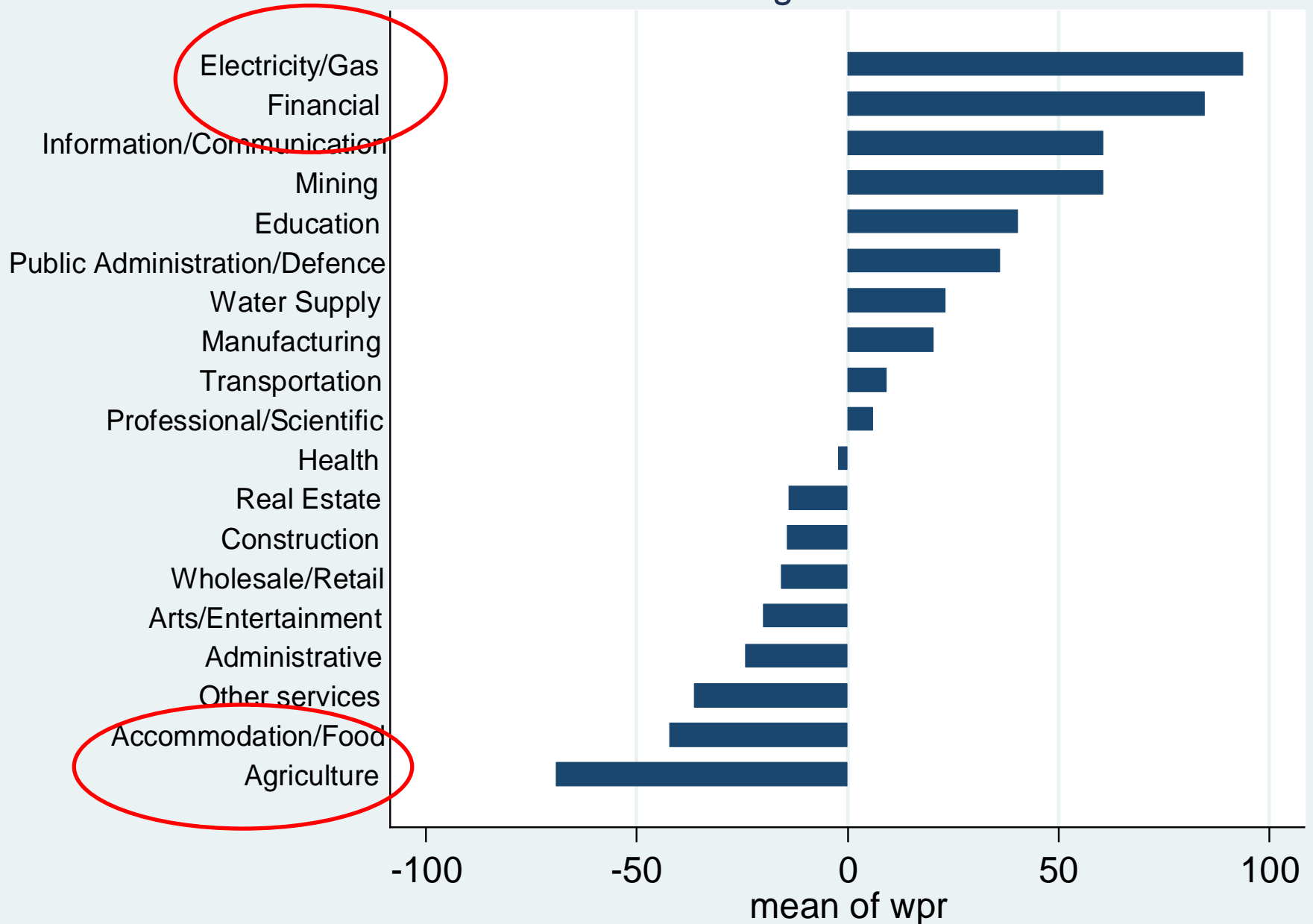
	Variable	Construction
wpr	Wage Premium	$((\text{rce}/\text{median interindustry rce}) - 1) * 100$
npm	Net profit Margin	Operating surplus and mixed income, net / Value Added
rd	% of Total R&D per industry	PCA2 $(\text{R\&D Capital Stock industry} / \text{R\&D Capital Stock Total}) * 100$
hhi	Herfindahl-Hirschman Index - Value Added	$((\text{VA industry} / \text{VA Total}) * 100)^2$
rce	Real Compensation per Employee	Real Compensation in millions / Total Employees in thousands

18 countries, 19 industries 2000-2017

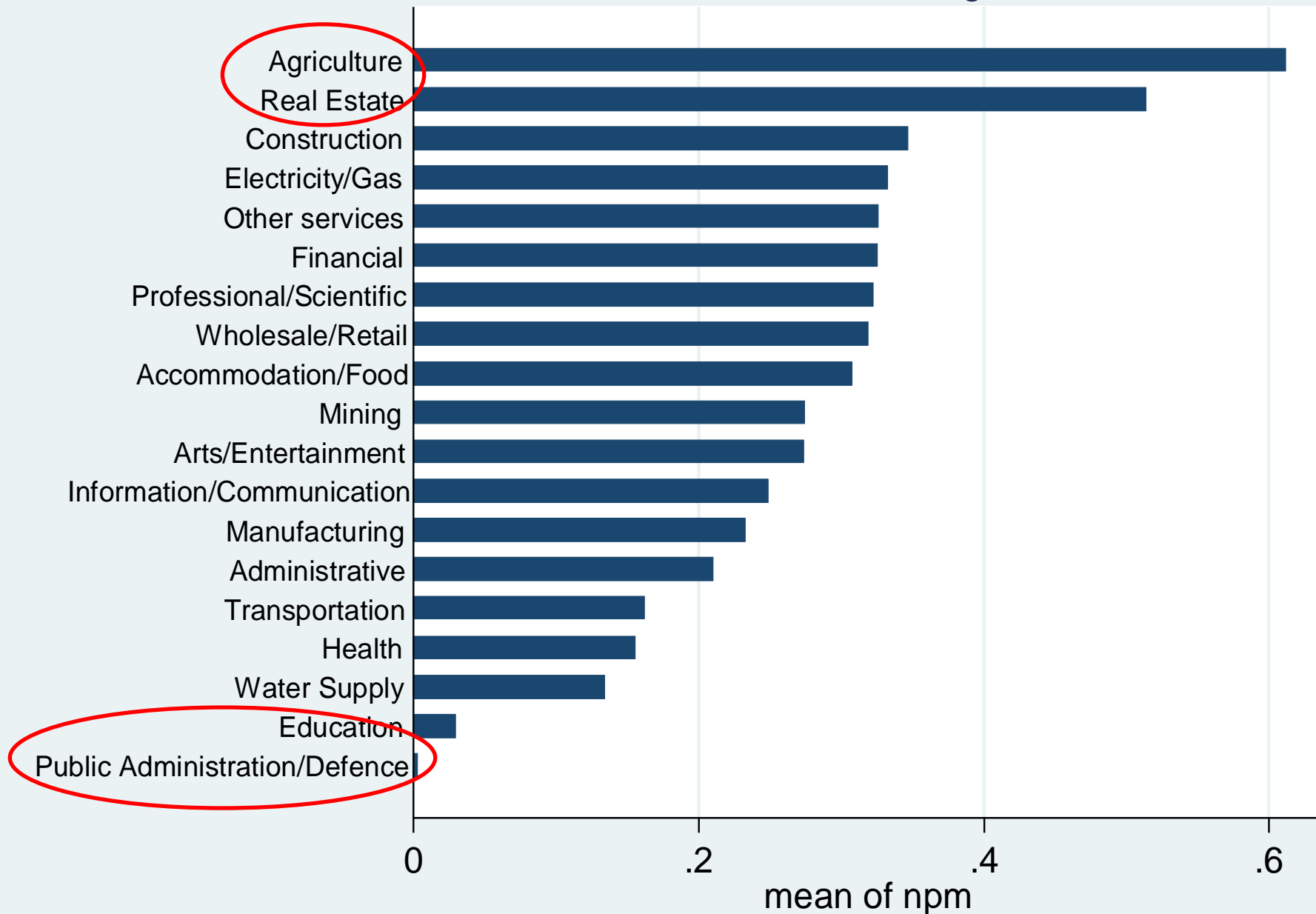
Variable	Obs	Mean	Std. dev.	Min	Max
wpr	6,480	7.981685	52.80561	-93.86127	407.4715
npm	6,462	.2586372	.2038278	-1.104091	1.067651
rd	6,373	5.083948	11.86759	0	72.82498
hhi	6,480	45.26675	90.21781	.0001038	889.011

	wpr	npm	rd	hhi
wpr	1.0000			
npm	-0.1628*	1.0000		
rd	0.0999*	-0.1342*	1.0000	
hhi	0.0459*	0.0878*	0.5916*	1.0000

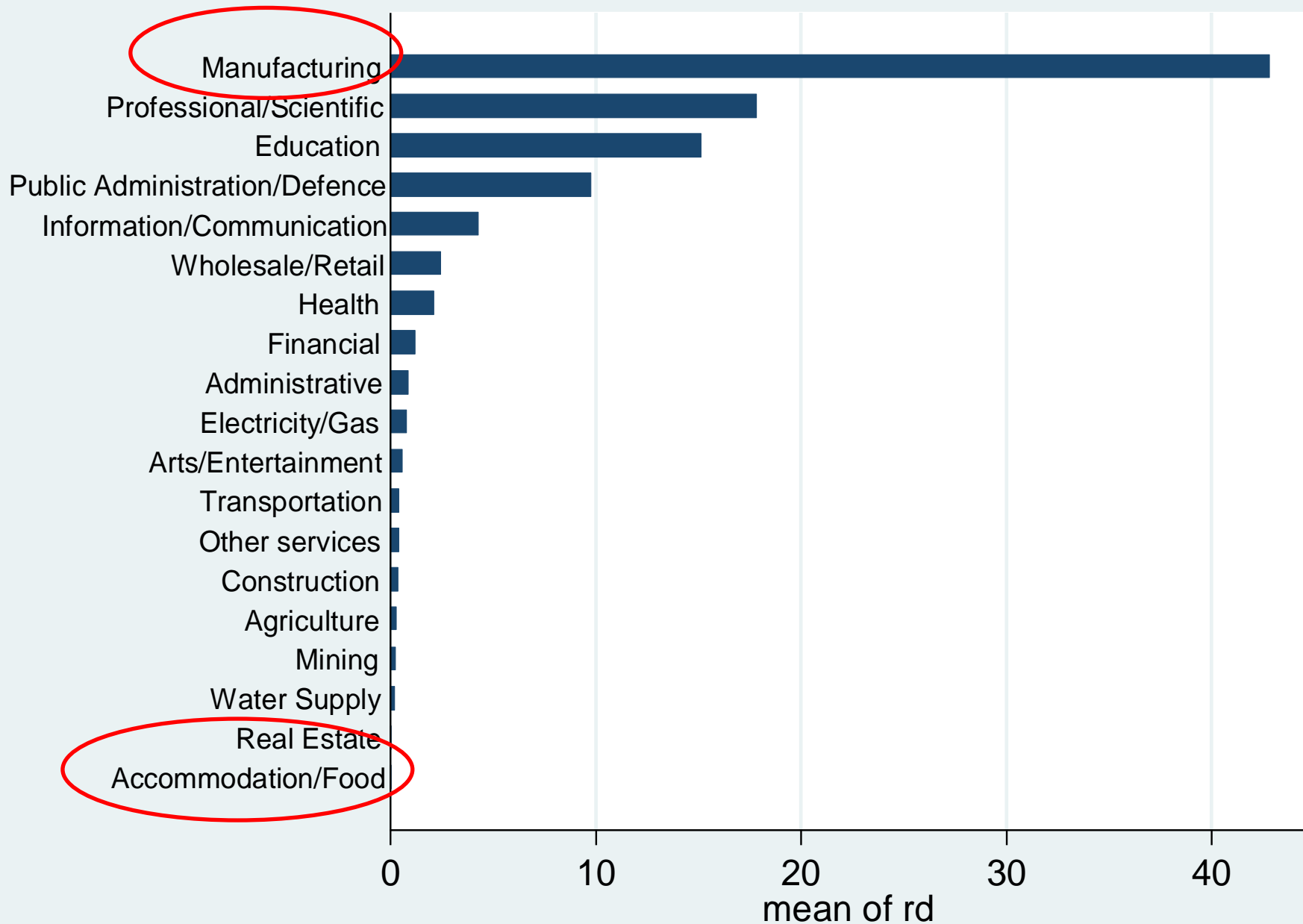
Wage Premium



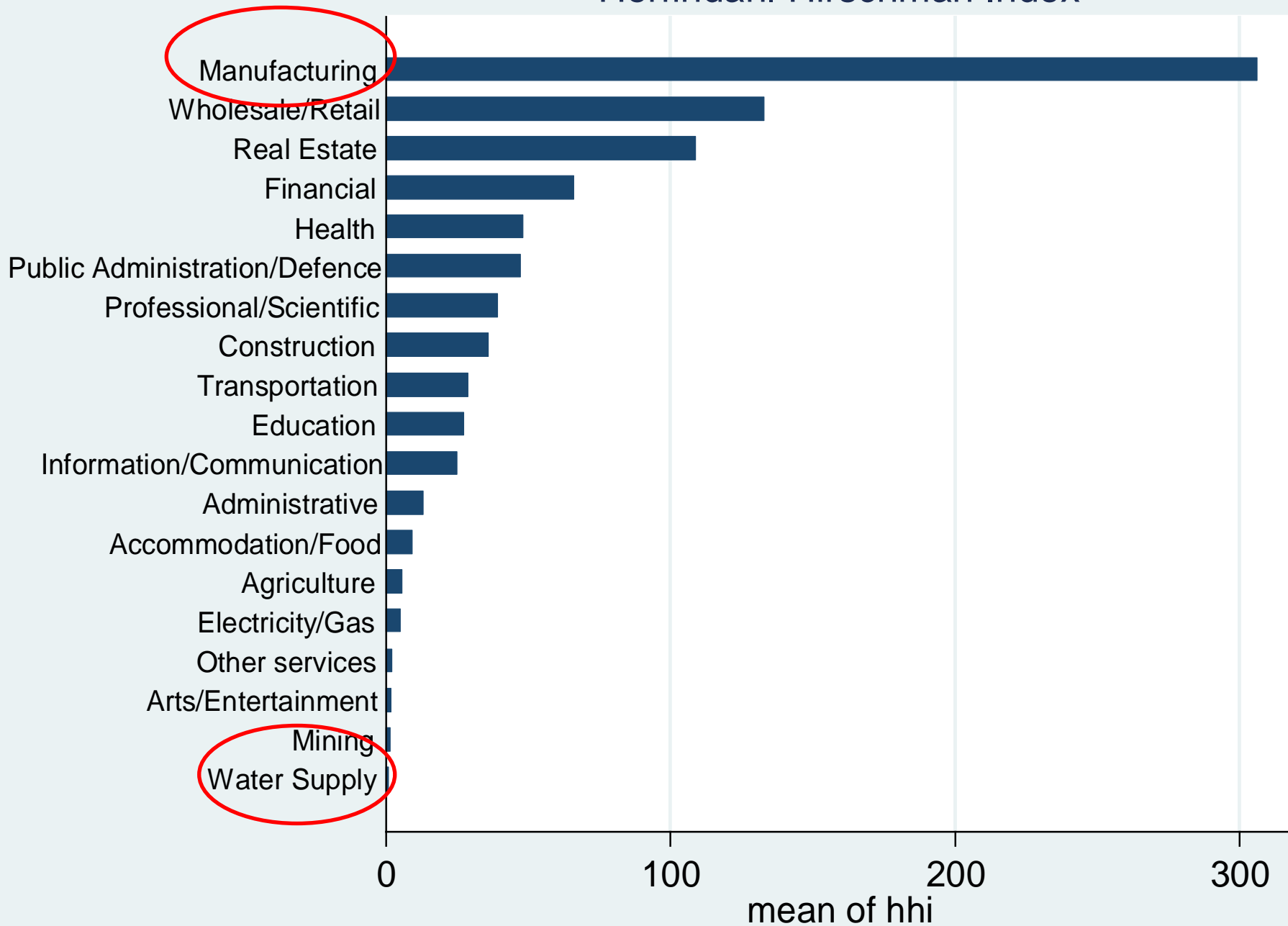
Net Profit Margin



% of Total R&D



Herfindahl-Hirschman Index



Composite indexes

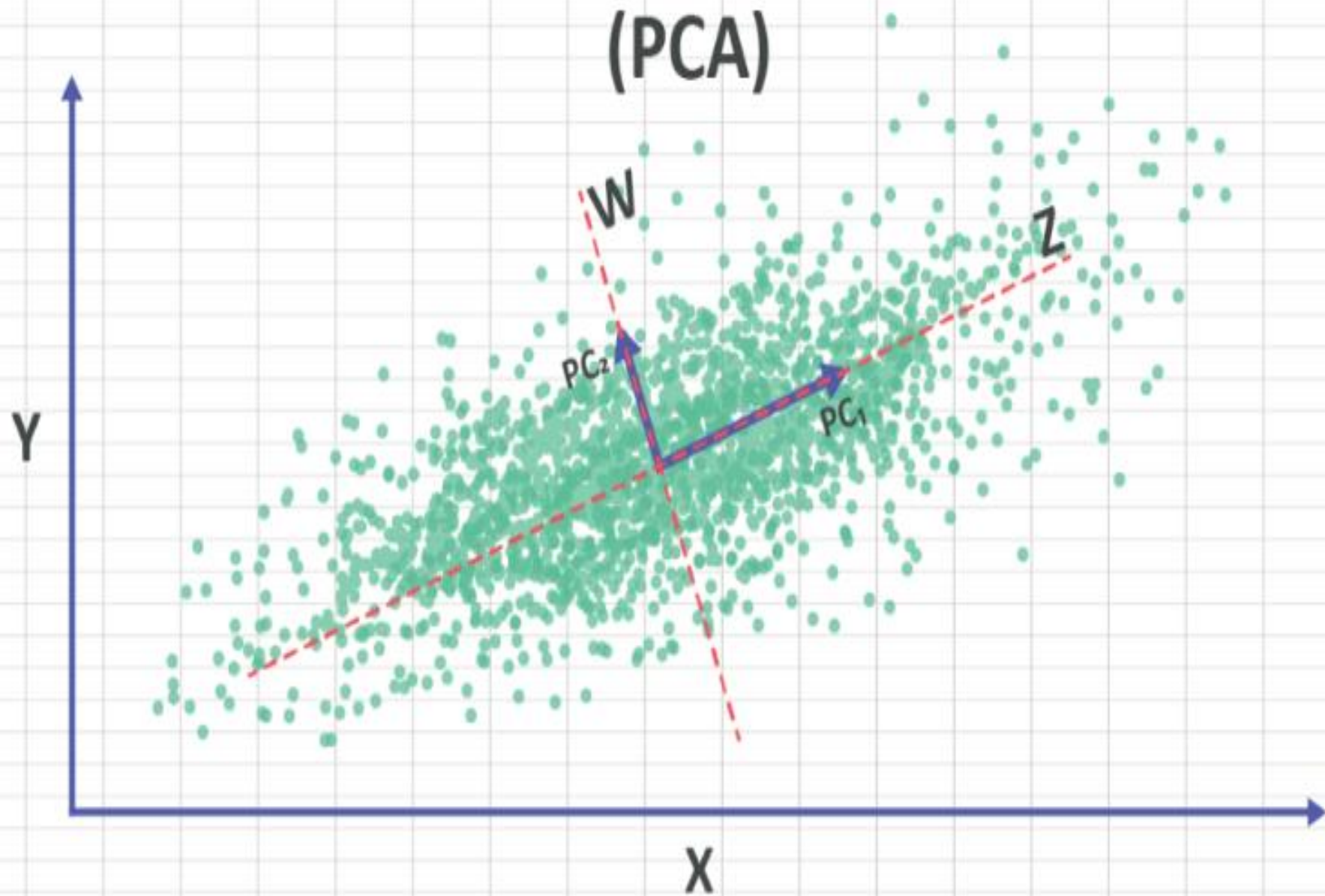
Principal Component Analysis per Country-year

- PCA1 → wpr & npm
 - Capture labor & financial insights
- PCA2 → wpr & npm & rd & hhi
 - Further capture innovation capacity & market structure

Principal Component Analysis

- **Purpose:** Reduces data dimensionality while preserving variance.
- **Key Steps:**
 - Standardize the data.
 - Compute covariance matrix and extract eigenvalues/eigenvectors.
 - Transform data into principal components.
- The **first principal component** captures the most variance, the second captures the next most, and so on. In our case we use the first principal component

Principal Component Analysis (PCA)



Classification Steps & Criteria

First step → Rank each country's industries according to each indicator (wpr, npm, PCA1, and PCA2)

We examine whether the indicator of a country's given industry lies above the respective intra-industry median. If so, this industry is a potentially an insiders' industry.

Second step → aggregating the GDP value attributed to these industries

First criterion is that the industries ranked above the median intra-industry values must collectively contribute to **more than 50% of the country's GDP**

Third step → evaluate the frequency with which a country appears in the top five of the intra-industry rankings vs. in the bottom five

Second criterion A country must appear **more frequently in the top five intra-industry rankings than in the bottom five.**

Satisfying these two criteria, a country is characterized as one run by an insiders' government.

Classification Steps & Criteria

First step → Rank each country's industries according to each indicator (**wpr, npm, PCA1, and PCA2**)

We examine whether the indicator of a country's given industry lies above the respective intra-industry median. If so, this industry is a potentially an insiders' industry.

Wage Premium

Industry	Agriculture, forestry and fishing		Mining and quarrying		Manufacturing		Electricity, Gas, Steam and Air Conditioning Supply		Water Supply; Sewerage, Waste Management and Remediation Activities	
median	-71.377		52.911		18.087		84.700		15.313	
order	country	value	country	value	country	value	country	value	country	value
1	SVN	-92.54	HUN	-7.17	SVN	-3.97	SWE	42.43	USA	-28.95
2	AUT	-91.97	FIN	-0.51	HUN	0.54	SVN	48.17	FIN	6.58
3	GRC	-89.46	LUX	6.20	CZE	2.37	DNK	51.24	HUN	6.78
4	BEL	-83.40	SWE	26.82	SVK	5.53	USA	52.77	SVN	7.88
5	LUX	-81.32	FRA	29.70	LUX	6.92	FIN	57.35	SVK	8.90
6	ESP	-78.90	SVK	31.79	NLD	9.49	LUX	70.35	FRA	10.26
7	FIN	-77.31	ESP	40.38	SWE	13.64	NLD	71.77	CZE	10.99
8	USA	-73.26	BEL	42.50	GRC	14.51	GBR	71.78	DNK	11.64
9	FRA	-72.96	SVN	45.66	FRA	17.45	HUN	82.39	LUX	15.02
10	ITA	-69.80	CZE	60.16	ESP	18.72	CZE	87.02	SWE	15.60
11	GBR	-67.59	AUT	61.62	DNK	18.74	SVK	99.31	AUT	20.38
12	NLD	-67.39	ITA	63.70	ITA	21.00	FRA	102.50	ESP	23.86
13	DEU	-66.40	DEU	96.43	FIN	24.87	DEU	120.54	NLD	25.30
14	DNK	-65.49	DNK	99.61	AUT	30.96	ITA	121.44	DEU	32.65
15	SWE	-56.60	USA	108.86	GBR	31.03	AUT	125.95	ITA	39.01
16	HUN	-48.78	GBR	122.38	BEL	48.17	GRC	145.53	GBR	52.28
17	CZE	-29.77	GRC	127.39	USA	51.60	ESP	147.72	BEL	54.93
18	SVK	-28.94	NLD	137.33	DEU	54.31	BEL	187.91	GRC	104.78

Net Profit Margin

Industry	Agriculture, forestry and fishing		Mining and quarrying		Manufacturing		Electricity, Gas, Steam and Air Conditioning Supply		Water Supply; Sewerage, Waste Management and Remediation Activities	
median	0.578		0.251		0.224		0.317		0.125	
order	country	value	country	value	country	value	country	value	country	value
1	DNK	0.300	FRA	-0.296	LUX	0.112	SVK	0.056	LUX	-0.186
2	SWE	0.449	HUN	0.026	FRA	0.124	SVN	0.162	SVK	-0.081
3	USA	0.453	SVN	0.064	BEL	0.143	ITA	0.203	SVN	-0.075
4	SVK	0.464	DEU	0.174	SVN	0.153	HUN	0.249	HUN	-0.004
5	NLD	0.495	BEL	0.174	DEU	0.165	FRA	0.267	SWE	0.018
6	DEU	0.506	USA	0.188	GBR	0.184	NLD	0.286	ITA	0.018
7	ITA	0.514	FIN	0.228	DNK	0.194	AUT	0.296	BEL	0.086
8	FRA	0.538	ESP	0.237	ITA	0.195	USA	0.301	DEU	0.090
9	CZE	0.574	SWE	0.249	SWE	0.196	BEL	0.316	FRA	0.113
10	LUX	0.582	CZE	0.253	AUT	0.252	LUX	0.319	DNK	0.136
11	GBR	0.625	GRC	0.265	USA	0.261	DEU	0.361	CZE	0.195
12	BEL	0.680	SVK	0.317	FIN	0.267	CZE	0.381	ESP	0.206
13	HUN	0.710	ITA	0.322	ESP	0.290	GBR	0.407	NLD	0.212
14	SVN	0.738	GBR	0.361	NLD	0.292	DNK	0.408	USA	0.235
15	AUT	0.789	LUX	0.395	SVK	0.307	FIN	0.444	AUT	0.271
16	FIN	0.813	AUT	0.424	CZE	0.308	SWE	0.458	FIN	0.275
17	ESP	0.859	DNK	0.764	HUN	0.319	GRC	0.510	GBR	0.392
18	GRC	0.934	NLD	0.802	GRC	0.426	ESP	0.559	GRC	0.513

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PCA1 (wpr & npm)

MIN – MAX NORMALIZATION

Industry	Agriculture, forestry and fishing		Mining and quarrying		Manufacturing		Electricity, Gas, Steam and Air Conditioning Supply		Water Supply; Sewerage, Waste Management and Remediation Activities	
median	0.782		0.570		0.574		0.579		0.546	
order	country	value	country	value	country	value	country	value	country	value
1	DNK	0.678	FRA	0.362	BEL	0.529	SVK	0.459	LUX	0.416
2	SVK	0.711	SVN	0.498	DEU	0.534	ITA	0.505	SVK	0.463
3	SWE	0.723	USA	0.507	FRA	0.541	BEL	0.507	SVN	0.466
4	USA	0.736	DEU	0.509	LUX	0.544	SVN	0.536	ITA	0.484
5	NLD	0.749	HUN	0.518	GBR	0.557	AUT	0.540	HUN	0.496
6	DEU	0.753	GRC	0.526	SVN	0.567	FRA	0.544	SWE	0.499
7	CZE	0.756	BEL	0.545	ITA	0.568	HUN	0.549	BEL	0.501
8	ITA	0.758	CZE	0.565	DNK	0.569	DEU	0.570	DEU	0.518
9	FRA	0.770	GBR	0.568	SWE	0.573	NLD	0.571	FRA	0.541
10	LUX	0.794	ESP	0.572	USA	0.575	LUX	0.586	DNK	0.550
11	GBR	0.802	SWE	0.586	AUT	0.584	USA	0.590	ESP	0.571
12	HUN	0.825	ITA	0.591	FIN	0.595	CZE	0.600	NLD	0.572
13	BEL	0.835	FIN	0.596	ESP	0.608	GRC	0.614	CZE	0.575
14	SVN	0.865	SVK	0.610	NLD	0.615	GBR	0.621	AUT	0.599
15	FIN	0.885	AUT	0.634	SVK	0.624	ESP	0.633	FIN	0.610
16	AUT	0.885	LUX	0.659	CZE	0.626	DNK	0.635	USA	0.617
17	ESP	0.905	NLD	0.739	HUN	0.632	FIN	0.645	GBR	0.627
18	GRC	0.943	DNK	0.748	GRC	0.666	SWE	0.661	GRC	0.642

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PCA2 (wpr & npm & rd & hhi)

Industry	Agriculture, forestry and fishing		Mining and quarrying		Manufacturing		Electricity, Gas, Steam and Air Conditioning Supply		Water Supply; Sewerage, Waste Management and Remediation Activities	
median	0.325		0.249		0.539		0.259		0.229	
order	country	value	country	value	country	value	country	value	country	value
1	DNK	0.274	FRA	0.150	LUX	0.317	SVK	0.221	LUX	0.172
2	SWE	0.301	HUN	0.214	GRC	0.380	ITA	0.232	SVK	0.193
3	SVK	0.302	SVN	0.216	GBR	0.409	SVN	0.237	SVN	0.194
4	USA	0.302	DEU	0.228	FRA	0.451	BEL	0.246	ITA	0.207
5	DEU	0.311	USA	0.232	USA	0.456	HUN	0.248	HUN	0.207
6	NLD	0.315	BEL	0.235	NLD	0.461	AUT	0.251	SWE	0.210
7	ITA	0.316	GRC	0.241	DNK	0.466	NLD	0.253	BEL	0.218
8	FRA	0.321	ESP	0.247	ESP	0.474	FRA	0.256	DEU	0.221
9	CZE	0.324	CZE	0.248	BEL	0.531	LUX	0.259	FRA	0.229
10	LUX	0.326	FIN	0.251	ITA	0.547	DEU	0.263	DNK	0.232
11	GBR	0.333	SWE	0.251	SWE	0.600				
12	BEL	0.346	GBR	0.262	AUT	0.639				
13	SVN	0.362	ITA	0.262	SVK	0.667				
14	HUN	0.364	SVK	0.263	HUN	0.746				
15	AUT	0.368	AUT	0.279	FIN	0.746				
16	FIN	0.375	LUX	0.280	DEU	0.754				
17	ESP	0.386	DNK	0.344	SVN	0.757				
18	GRC	0.408	NLD	0.345	CZE	0.849				

considerable changes in the rankings for PCA2 vs PCA1 when considering innovation capacity & market structure



Classification Steps & Criteria

Second step → aggregating the GDP value attributed to these industries

First criterion is that the industries ranked above the median intra-industry values must collectively contribute to **more than 50% of the country's GDP**

Wage Premium			Net Profit Margin		
Country	Number of Industries above median Intra-industry value	% of GDP	Country	Number of Industries above median Intra-industry value	% of GDP
AUT	12	64.61%	AUT	10	58.64%
BEL	13	80.59%	BEL	9	48.74%
CZE	11	35.80%	CZE	18	93.42%
DEU	13	69.86%	DEU	6	21.31%
DNK	7	33.41%	DNK	4	10.82%
ESP	10	53.84%	ESP	14	76.59%
FIN	10	71.45%	FIN	8	41.07%
FRA	8	40.57%	FRA	3	16.45%
GBR	6	19.29%	GBR	13	57.29%
GRC	12	43.31%	GRC	18	88.91%
HUN	10	53.02%	HUN	9	59.08%
ITA	12	54.16%	ITA	15	77.27%
LUX	9	52.69%	LUX	10	65.30%
NLD	6	27.43%	NLD	11	60.06%
SVK	13	59.11%	SVK	13	74.37%
SVN	6	28.44%	SVN	4	15.38%
SWE	10	40.51%	SWE	5	21.16%
USA	12	79.05%	USA	6	44.42%
Total	180	53.80%	Total	176	62.95%

PCA1 (wpr & npm)			PCA2 (wpr & npm & rd & hhj)		
Country	Number of Industries above median Intra-industry value	% of GDP	Country	Number of Industries above median Intra-industry value	% of GDP
AUT	10	57.29%	AUT	10	59.37%
BEL	6	22.80%	BEL	8	39.31%
CZE	17	90.15%	CZE	14	73.40%
DEU	7	21.16%	DEU	8	50.59%
DNK	6	16.70%	DNK	7	40.35%
ESP	14	77.35%	ESP	12	59.94%
FIN	11	56.24%	FIN	13	72.08%
FRA	4	24.51%	FRA	5	37.04%
GBR	13	62.76%	GBR	13	59.09%
GRC	15	80.25%	GRC	15	80.15%
HUN	9	53.70%	HUN	9	55.99%
ITA	15	71.65%	ITA	14	78.38%
LUX	8	58.85%	LUX	7	54.01%
NLD	14	69.63%	NLD	14	64.06%
SVK	13	79.09%	SVK	12	71.59%
SVN	6	28.10%	SVN	6	44.78%
SWE	6	24.86%	SWE	6	42.17%
USA	6	39.70%	USA	8	40.58%
Total	180	60.54%	Total	181	60.86%

Classification Steps & Criteria

Third step → evaluate the frequency with which a country appears in the top five of the intra-industry rankings vs. in the bottom five

Second criterion A country must appear **more frequently in the top five intra-industry rankings than in the bottom five**

3

Wage Premium			Net Profit Margin		
Country	Number of Industries in Top 5	Number of Industries in Low 5	Country	Number of Industries in Top 5	Number of Industries in Low 5
AUT	3	3	AUT	6	4
BEL	8	2	BEL	2	6
CZE	2	3	CZE	10	0
DEU	5	3	DEU	2	3
DNK	3	4	DNK	2	12
ESP	5	6	ESP	4	0
FIN	4	7	FIN	5	4
FRA	3	4	FRA	1	10
GBR	3	7	GBR	6	4
GRC	11	7	GRC	13	2
HUN	6	5	HUN	4	5
ITA	8	5	ITA	14	1
LUX	6	5	LUX	6	7
NLD	2	9	NLD	7	2
SVK	5	3	SVK	8	4
SVN	4	9	SVN	1	13
SWE	7	7	SWE	1	10
USA	10	6	USA	3	8

3

PCA1 (wp & npm)			PCA2 (wp & npm & R&D & HHI)		
Country	Number of Industries in Top 5	Number of Industries in Low 5	Country	Number of Industries in Top 5	Number of Industries in Low 5
AUT	6	6	AUT	7	7
BEL	1	6	BEL	1	3
CZE	7	0	CZE	5	1
DEU	2	5	DEU	1	5
DNK	2	10	DNK	4	8
ESP	5	1	ESP	5	3
FIN	6	6	FIN	5	4
FRA	2	6	FRA	3	6
GBR	7	4	GBR	6	3
GRC	11	3	GRC	14	2
HUN	3	5	HUN	5	9
ITA	12	3	ITA	9	4
LUX	6	8	LUX	4	7
NLD	7	2	NLD	8	1
SVK	10	4	SVK	9	6
SVN	1	9	SVN	1	11
SWE	4	8	SWE	3	7
USA	3	9	USA	5	8

Country Classification as ones run by an insiders' government

PCA1 (wp & npm)			PCA2 (wp & npm & R&D & HHI)			Wage Premium			Net Profit Margin		
	CZE			CZE			BEL			AUT	
	ESP			ESP			DEU			CZE	
	GBR			FIN			HUN			ESP	
	GRC			GBR			ITA			GBR	
	ITA			GRC			LUX			GRC	
	NLD			ITA			SVK			ITA	
	SVK			NLD			USA			NLD	
				SVK						SVK	

Country Classification as ones run by an insiders' government

PCA1 (wp & npm)			PCA2 (wp & npm & R&D & HHI)			Wage Premium			Net Profit Margin		
	CZE			CZE			BEL			AUT	
	ESP			ESP			DEU			CZE	
	GBR			FIN			HUN			ESP	
	GRC			GBR			ITA			GBR	
	ITA			GRC			LUX			GRC	
	NLD			ITA			SVK			ITA	
	SVK			NLD			USA			NLD	
				SVK						SVK	

Country Classification as ones run by an insiders' government

PCA1 (wp & npm)			PCA2 (wp & npm & R&D & HHI)			Wage Premium			Net Profit Margin		
	CZE			CZE			BEL			AUT	
	ESP			ESP			DEU			CZE	
	GBR			FIN			HUN			ESP	
	GRC			GBR			ITA			GBR	
	ITA			GRC			LUX			GRC	
	NLD			ITA			SVK			ITA	
	SVK			NLD			USA			NLD	
				SVK						SVK	

Country Classification as ones run by an insiders' government

PCA1 (wp & npm)			PCA2 (wp & npm & R&D & HHI)			Wage Premium			Net Profit Margin		
	CZE			CZE			BEL			AUT	
	ESP			ESP			DEU			CZE	
	GBR			FIN			HUN			ESP	
	GRC			GBR			ITA			GBR	
	ITA			GRC			LUX			GRC	
	NLD			ITA			SVK			ITA	
	SVK			NLD			USA			NLD	
				SVK						SVK	

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	GRC			GBR			ITA			GBR	
	ITA			GRC			LUX			GRC	
	NLD			ITA			SVK			ITA	
	SVK			NLD			USA			NLD	
				SVK						SVK	

Conclusion

- Wage premium classification of countries differs significantly
- PCA indices result in rankings more influenced by Net Profit Margin
- ITA & SVK appear as the most consistent countries run by an insiders' government, followed by CZE, ESP, GBR, GRC, NLD
- FIN appears as a country run by an insiders' government only in PCA2 (wp & npm & rd & hhi)
- USA, LUX, BEL, DEU, HUN appear only in Wage Premium classification



Thank You
For Your Attention