

Evidence-based policymaking – quantitative analyses for smart specialisation – identifying the economic and innovative potential – definitions & examples

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Mapping economic and innovation potential: definitions & technical details



General remarks

- There is not one “JRC methodology”
- There are recommendations for data to be used and sources
- But depending on data availability, customized methodologies are required for different countries/regions

Mapping of economic potential

Remember: selection criteria

1. Critical mass
 - Absolute size of an industry matters, too small industries have a small economic impact
2. Degree of specialisation
 - Measures if, in relative terms, an industry is more important for (present in) the region
3. Average wages
 - Focus on industries with above average wages
4. Change over time
 - Growing industries are more likely to drive economic transformation

Collect Economic data

- Request detailed industry-level data from National Statistics Office at country and/or regional level:
 - Time series data for:
 - Number of enterprises
 - Persons employed / Employees
 - Turnover / Value added
 - Wages
- Example of data source: Structural Business Statistics
- Caveat: does not cover Agricultural sector and parts of the Public sector => need for additional data

Calculate Critical mass (CM)

Calculated as: $CM_i = e_i / e$

e_i : employment (number of employees or number of employed persons) in industry i in region

e : total employment in region

Example:

- Employment in Textiles in region $i = 2,000$
- Total employment in region $i = 50,000$
- Critical mass: 4% ($2,000 / 50,000$)

Calculate Degree of specialisation

Calculated as: $LQ_i = (e_i / e) / (E_i / E)$

LQ_i : Location Quotient for industry i in region

e_i : employment in industry i in region

e : total employment in region

E_i : employment in industry i in country

E : total employment in country

$LQ_i > 1$: above average degree of specialisation

Degree of specialisation - example

$$LQ_i = (e_i / e) / (E_i / E)$$

e_i : employment in Textiles in region = 2,000

e : total employment in region = 50,000

e_i / e : employment share in region = 4%

E_i : employment in Textiles in country = 25,000

E : total employment in country = 1,000,000

E_i / E : employment share in country = 2.5%

Degree of specialisation (4% / 2.5%) = 1.6

Calculate Average wages per employee

- Relative to average wages in region

Wages per employee in industry i divided by wages per employee for all industries in region

$$(w_i / e_i) / (w / e) (> threshold)$$

- Relative to average wages in industry

Wages per employee in industry i divided by wages per employee in same industry for all regions (country)

$$(w_i / e_i) / (W_i / E_i) (> threshold)$$

Average wages per employee - example

Average wages in industry i : 3,000

Average wages in region : 2,500

Average wages relative to region (index): 120

Average wages in industry i : 3,000

Average wages in industry i in country : 4,000

Average wages relative to national industry (index): 75

Decide on cut-off values for selection criteria

Option 1: Using averages for multiple years:

Degree of specialisation (LQ) $> X$

&

Relative size $> Y$

&

Wages relative to region $> Z_1$

&

Wages relative to industry $> Z_2$

Option 2: for at least X out of Y years AND for the average over the whole period

Results

- Applying the selection criteria will result in a list of industries that pass all criteria and are therefore defined as having a static or current economic potential
- Number of selected industries can be adjusted:
 - Using stricter criteria will lower this number
 - Relaxing the criteria will increase this number

Several options for dynamic analysis

- Calculate annual changes for 2012-2013, 2013-2014, 2014-2015, 2015-2016, 2016-2017, 2017-2018 and average annual change for 2012-2018 for every industry in region and country
 1. Average annual change relative to region for 2012-2018 needs to be positive & Annual change relative to region needs to be positive for at least X out of Y two-year periods
 2. Average annual change relative to industry for 2012-2018 needs to be positive & Annual change relative to national industry needs to be positive for at least X out of Y two-year periods

Dynamic analysis – alternative

- An industry is identified as having a dynamic economic potential if it fulfils all of the following criteria:
 - (Statistically) Significant increase over time in the number of employees
 - (Statistically) Significant increase over time in average wages
- Changes over time for the number of employees and average wages are estimated using the slope of a linear regression using two-year averages for the whole 2012-2018 period

Results

- Applying the selection criteria will result in a list of industries that pass all criteria and are therefore defined as having a dynamic economic potential
- Number of selected industries can be adjusted by either relaxing or tightening the selection criteria

Combining results

- Static and dynamic results can be combined to derive 3 types of industries with an economic potential:
 - Static and dynamic
 - Static only
 - Dynamic only

Mapping of innovation potential

Collect Innovation data from innovation survey

- Innovation surveys collect data on innovations and innovation activities directly from enterprises using a questionnaire including a wide range of questions
- No other data sources can provide the same in-depth data on innovation
 - R&D data are too limited as the majority of enterprises innovate without performing any R&D
 - Patents, trademarks and designs only capture a small part of the outcomes of enterprises' innovation activities

How to define an innovative enterprise

- An enterprise that has introduced at least:
 - A product innovation
 - A process innovation
 - A marketing innovation
 - An organisational innovation

Different options to identify innovation potential

- At least X number of enterprises should be an innovator
- Degree of specialisation (either comparing region to country or comparing country to other countries) should be above Y
- Used for Moldova study (2017)

Alternative for innovation potential

- At least X number of enterprises should be an innovator
- Critical mass (e.g. share of innovative enterprises in industry out of all innovative enterprises in region) should be above Y
- Used for Ukrainian regions study (2019)

Alternative for innovation potential

- Define new indicator measuring innovation intensity as the share of enterprises that introduced at least two types of innovation
- Share of enterprises with at least one innovation: above average share for region
- Share of enterprises with at least two innovations ('high-innovation intensive'): above average share for region
- Used for Imereti study (2020)

Issues

- Availability of innovation survey data:
 - Not all countries have implemented an innovation survey
 - Innovation surveys usually do not cover all industries but only those that are considered to be more innovative
 - National sample size might be too small to calculate data at NACE 3-digit level for countries
 - National sample size might be too small to calculate data at regional level (in particular for more detailed NACE levels)

Combine results for industries (example)

NACE	Industry	Employment - Static	Employment – Dynamic	Innovation	Economic & Innovation
10.3	Processing and preserving of fruit and vegetables			X	
10.5	Manufacture of dairy products			X	
10.6	Manufacture of grain mill products, starches and starch products			X	
10.8	Manufacture of other food products		X	X	X
18.1	Printing and service activities related to printing	X		X	X
20.1	Manufacture of basic chemicals, fertilizers and nitrogen compounds, plastics and synthetic rubber in primary forms		X	X	X
20.3	Manufacture of paints, varnishes and similar coatings, printing ink and mastics		X		
20.4	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations		X	X	X
20.5	Manufacture of other chemical products		X		

Examples

Topic of this part of the presentation

- Highlight technical issues / potential problems in performing a mapping of the economic analysis of the Eastern Partnership countries

Issue



- (Non) Availability of data
- Database: UNIDO INDSTAT: 3-digit economic data for the Manufacturing sector

Availability INDSTAT data EaP countries

		AM	AZ	BY	GE	MD	UA
101	Processing/preserving of meat						
102	Processing/preserving of fish, etc.						
103	Processing/preserving of fruit, vegetables						
104	Vegetable and animal oils and fats						
105	Dairy products						
106	Grain mill products, starches and starch products						
107	Other food products						
108	Prepared animal feeds						
110	Other food products						
120	Tobacco products						
131	Spinning, weaving and finishing of textiles						
139	Other textiles						
141	Wearing apparel, except fur apparel						
142	Articles of fur						
143	Knitted and crocheted apparel						
151	Leather; luggage, handbags, saddlery, harness;fur						
152	Footwear						
161	Sawmilling and planing of wood						
162	Wood products, cork, straw, plaiting materials						
170	Wood products, cork, straw, plaiting materials						
181	Printing and service activities related to printing						
182	Reproduction of recorded media						
191	Coke oven products						
192	Refined petroleum products						
201	Basic chemicals,fertilizers, etc.						
202	Other chemical products						
203	Man-made fibres						
210	Pharmaceuticals,medicinal chemicals, etc.						
221	Rubber products						
222	Plastics products						
231	Glass and glass products						
239	Non-metallic mineral products n.e.c.						
241	Basic iron and steel						
242	Basic precious and other non-ferrous metals						
243	Casting of metals						
251	Struct. metal products, tanks, reservoirs						
252	Weapons and ammunition						
259	Other metal products;metal working services						

		AM	AZ	BY	GE	MD	UA
261	Electronic components and boards						
262	Computers and peripheral equipment						
263	Communication equipment						
264	Consumer electronics						
265	Measuring, testing equipment; watches, etc.						
266	Irradiation/electromedical equipment,etc.						
267	Optical instruments and photographic equipment						
268	Magnetic and optical media						
271	Electric motors,generators,transformers,etc.						
272	Batteries and accumulators						
273	Wiring and wiring devices						
274	Electric lighting equipment						
275	Domestic appliances						
279	Other electrical equipment						
281	General-purpose machinery						
282	Special-purpose machinery						
291	Motor vehicles						
292	Automobile bodies, trailers and semi-trailers						
293	Parts and accessories for motor vehicles						
301	Building of ships and boats						
302	Railway locomotives and rolling stock						
303	Air and spacecraft and related machinery						
304	Military fighting vehicles						
309	Transport equipment n.e.c.						
310	Furniture						
321	Jewellery, bijouterie and related articles						
322	Musical instruments						
323	Sports goods						
324	Games and toys						
325	Medical and dental instruments and supplies						
329	Other manufacturing n.e.c.						
331	Repair of fabricated metal products/machinery						
332	Installation of industrial machinery/equipment						

Data availability

- 3-digit data for 71 industries for Armenia, Azerbaijan and Ukraine
- Limited 3-digit data for Georgia (37 industries) and Moldova (13 industries)
- Insufficient 3-digit data for Belarus (only one 3-digit industry, other industries at 2-digit) => not included in analysis
- Industries with smallest common base are included in analysis for all countries, incl. 2-digit industries: e.g. NACE 20 combining 201, 202, 203

Sufficiently covered industries EaP countries

		AM	AZ	BY	GE	MD	UA
101	Processing/preserving of meat						
102	Processing/preserving of fish, etc.						
103	Processing/preserving of fruit, vegetables						
104	Vegetable and animal oils and fats						
105	Dairy products						
106	Grain mill products, starches and starch products						
107	Other food products						
108	Prepared animal feeds						
110	Other food products						
120	Tobacco products						
131	Spinning, weaving and finishing of textiles						
139	Other textiles						
141	Wearing apparel, except fur apparel						
142	Articles of fur						
143	Knitted and crocheted apparel						
151	Leather; luggage, handbags, saddlery, harness;fur						
152	Footwear						
161	Sawmilling and planing of wood						
162	Wood products, cork, straw, plaiting materials						
170	Wood products, cork, straw, plaiting materials						
181	Printing and service activities related to printing						
182	Reproduction of recorded media						
191	Coke oven products						
192	Refined petroleum products						
201	Basic chemicals,fertilizers, etc.						
202	Other chemical products						
203	Man-made fibres						
210	Pharmaceuticals,medicinal chemicals, etc.						
221	Rubber products						
222	Plastics products						
231	Glass and glass products						
239	Non-metallic mineral products n.e.c.						
241	Basic iron and steel						
242	Basic precious and other non-ferrous metals						
243	Casting of metals						
251	Struct. metal products, tanks, reservoirs						
252	Weapons and ammunition						
259	Other metal products;metal working services						

		AM	AZ	BY	GE	MD	UA
261	Electronic components and boards						
262	Computers and peripheral equipment						
263	Communication equipment						
264	Consumer electronics						
265	Measuring, testing equipment; watches, etc.						
266	Irradiation/electromedical equipment,etc.						
267	Optical instruments and photographic equipment						
268	Magnetic and optical media						
271	Electric motors,generators,transformers,etc.						
272	Batteries and accumulators						
273	Wiring and wiring devices						
274	Electric lighting equipment						
275	Domestic appliances						
279	Other electrical equipment						
281	General-purpose machinery						
282	Special-purpose machinery						
291	Motor vehicles						
292	Automobile bodies, trailers and semi-trailers						
293	Parts and accessories for motor vehicles						
301	Building of ships and boats						
302	Railway locomotives and rolling stock						
303	Air and spacecraft and related machinery						
304	Military fighting vehicles						
309	Transport equipment n.e.c.						
310	Furniture						
321	Jewellery, bijouterie and related articles						
322	Musical instruments						
323	Sports goods						
324	Games and toys						
325	Medical and dental instruments and supplies						
329	Other manufacturing n.e.c.						
331	Repair of fabricated metal products/machinery						
332	Installation of industrial machinery/equipment						

Included industries

101	Processing/preserving of meat	20	Manufacture of chemicals and chemical products
102	Processing/preserving of fish, etc.	210	Pharmaceuticals, medicinal chemicals, etc.
103	Processing/preserving of fruit, vegetables	22	Manufacture of rubber and plastic products
104	Vegetable and animal oils and fats	23	Manufacture of other non-metallic mineral products
105	Dairy products	24	Manufacture of basic metals
106	Grain mill products, starches and starch products	25	Manufacture of fabricated metal products, except machinery and equipment
107	Other food products	26	Manufacture of computer, electronic and optical products
108	Prepared animal feeds	27	Manufacture of electrical equipment
110	Other food products	28	Manufacture of machinery and equipment n.e.c.
120	Tobacco products	29	Manufacture of motor vehicles, trailers and semi-trailers
13	Manufacture of textiles	30	Manufacture of other transport equipment
14	Manufacture of wearing apparel	310	Furniture
15	Manufacture of leather and related products	32	Other manufacturing
16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	33	Repair and installation of machinery and equipment
170	Wood products, cork, straw, plaiting materials		
181	Printing and service activities related to printing		
182	Reproduction of recorded media		
19	Manufacture of coke and refined petroleum products		

Issue



- (Non) Availability of data
- Database: ORBIS => aggregation of individual firm-level data to NACE 3-digit

Unequal availability of ORBIS data

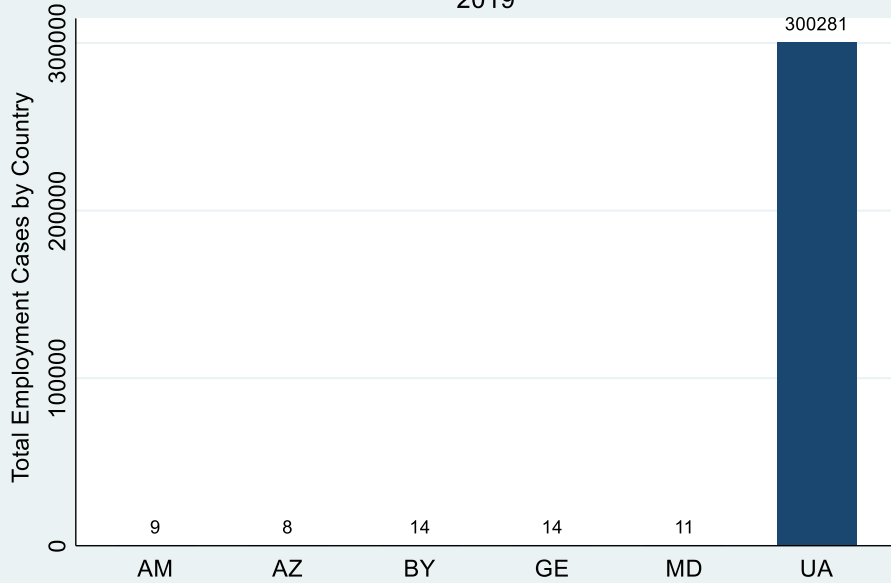
Findings:

- Highly unsymmetric distribution of available data among EaP countries
- Ukraine's data set contains the most values whereas other EaP countries have a limited number of values, most notable for 2018 and 2019

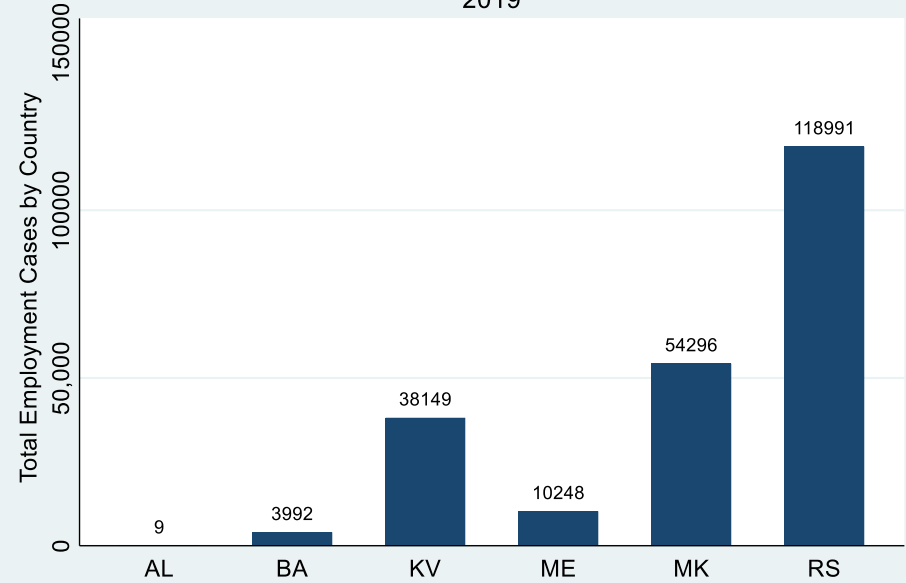


Distribution 2019

Distribution Nonmissing Data EaP Countries
2019

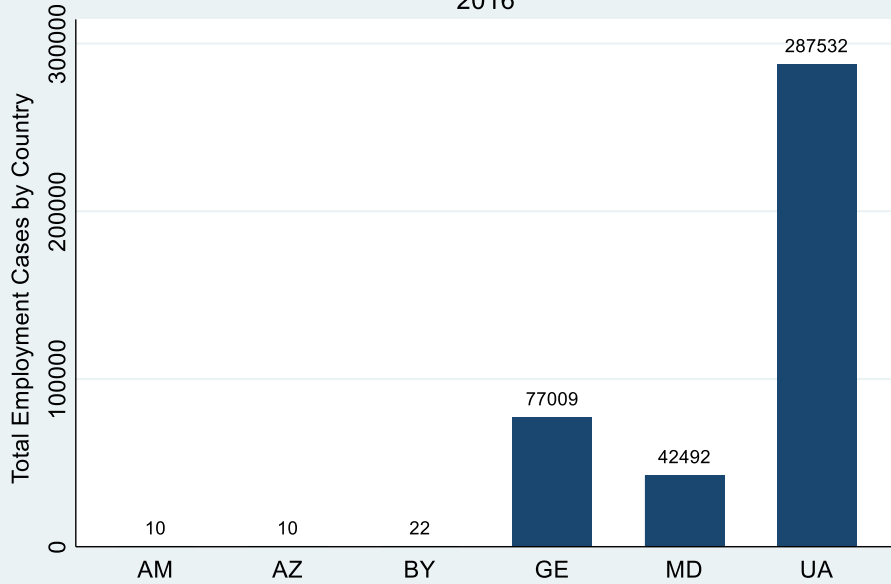


Distribution Nonmissing Data Western Balkan Countries
2019

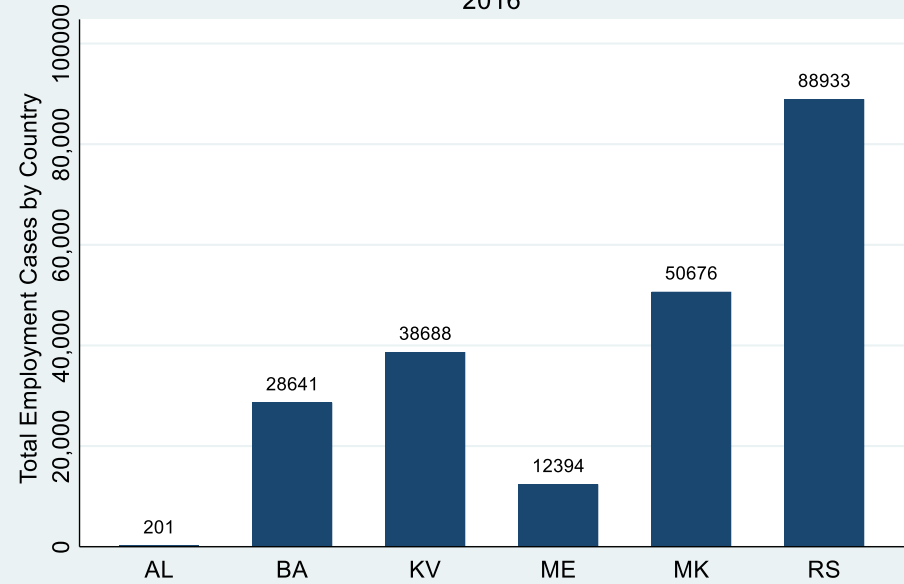


Distribution 2016

Distribution Nonmissing Data EaP Countries
2016



Distribution Nonmissing Data Western Balkan Countries
2016



Possible solutions to address this issue

Product Classification (SITC) next to NACE data:

- Less time consuming
- Higher data validity
- More likely to reflect the economic structure of EaP countries

Concord SITC export data into NACE data:

- Leads to a richer NACE data base more suitable for carrying out various innovation analyses
 - Might be a temporary solution to the lack of data

Selection of benchmark (countries)

- For regions within countries: country
- For countries:
 - European Union
 - Neighbouring countries
 - Other ???

Degree of specialisation (Location Quotient)

Calculated as: $LQ_i = (e_i / e) / (E_i / E)$

LQ_i : Location Quotient for industry i in country

e_i : employment in industry i in country

e : total employment in country

E_i : employment in industry i in **EaP aggregate**

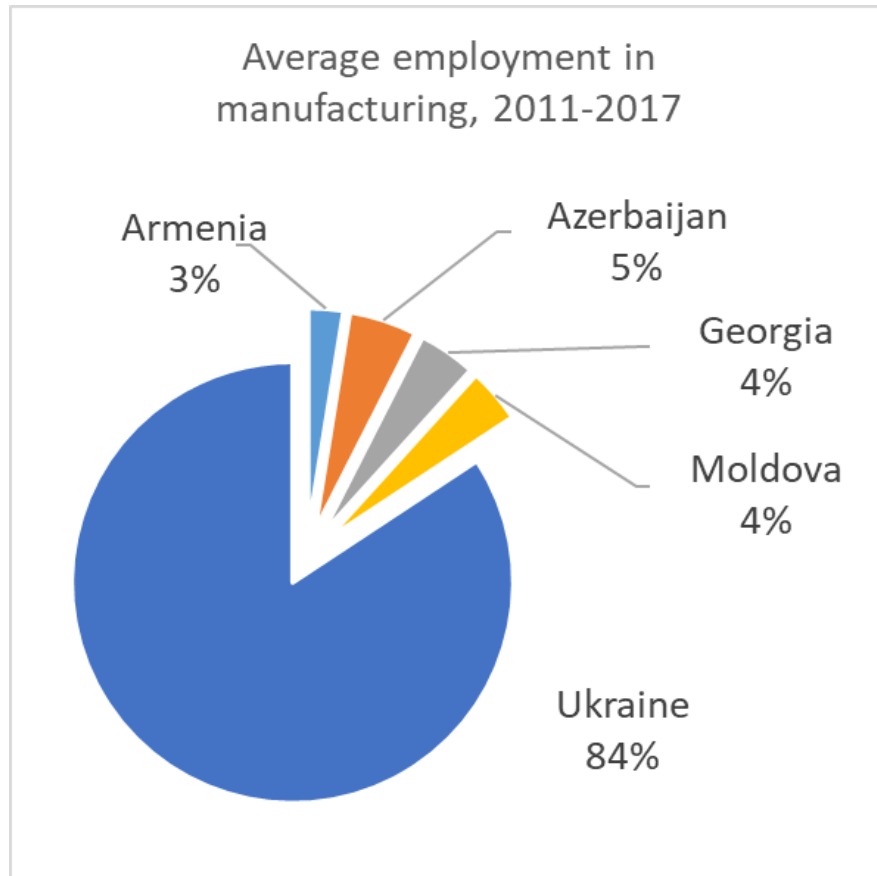
E : total employment in **EaP aggregate**

Issue



- For EaP countries: benchmark = aggregate or sum of EaP countries
- How to calculate this sum?
 - Weighted average (taking into account country size)?
 - Unweighted average?

Unequal size distribution for employment



INDSTAT database

- When using a weighted average, Ukraine would dominate the EaP total
- Alternative: use an unweighted average for employment shares

Weighted avg: no specialised industries in Ukraine

	EMPLOYMENT						EMPLOYMENT SHARE						SPECIALISATION					
	AR	AZ	GE	MD	UA	EaP	AR	AZ	GE	MD	UA	EaP	AR	AZ	GE	MD	UA	
101	13813	16478	20338	24937	377916	453482	3.9%	2.4%	3.5%	4.5%	3.2%	3.3%	1.201	0.733	1.065	1.369	0.989	
102	481	2146	1885	2435	45680	52627	0.1%	0.3%	0.3%	0.4%	0.4%	0.4%	0.360	0.823	0.850	1.152	1.030	
103	10376	18296	18600	17097	128954	193323	2.9%	2.7%	3.2%	3.1%	1.1%	1.4%	2.117	1.910	2.284	2.202	0.791	
104	607	5833	1233	5856	178103	191632	0.2%	0.8%	0.2%	1.0%	1.5%	1.4%	0.125	0.614	0.153	0.761	1.103	
105	12719	12825	16260	21617	396874	460295	3.6%	1.9%	2.8%	3.9%	3.4%	3.3%	1.090	0.562	0.838	1.169	1.023	
106	8887	13122	16219	5325	125104	168657	2.5%	1.9%	2.8%	1.0%	1.1%	1.2%	2.078	1.570	2.283	0.786	0.880	
107	51562	60563	71937	69322	933442	1186826	14.6%	8.8%	12.3%	12.4%	8.0%	8.5%	1.713	1.030	1.439	1.454	0.933	
108	9834	623	1159	1369	45631	58616	2.8%	0.1%	0.2%	0.2%	0.4%	0.4%	6.616	0.214	0.469	0.582	0.924	
110	40512	41351	68861	52741	288695	492160	11.5%	6.0%	11.8%	9.4%	2.5%	3.5%	3.246	1.695	3.321	2.668	0.696	
120	17073	2883	2809	4388	26653	53806	4.8%	0.4%	0.5%	0.8%	0.2%	0.4%	12.513	1.081	1.239	2.031	0.588	
13	1436	28670	2986	21557	122868	177517	0.4%	4.2%	0.5%	3.9%	1.0%	1.3%	0.319	3.259	0.399	3.024	0.821	
14	22164	18525	40335	101519	374109	556652	6.3%	2.7%	6.9%	18.2%	3.2%	4.0%	1.570	0.672	1.720	4.541	0.797	
15	2616	6721	3500	20076	143417	176330	0.7%	1.0%	0.6%	3.6%	1.2%	1.3%	0.585	0.769	0.471	2.835	0.965	
16	6559	10613	10956	7530	276622	312280	1.9%	1.5%	1.9%	1.3%	2.4%	2.2%	0.828	0.686	0.833	0.600	1.051	
170	6182	7683	7056	7401	221696	250018	1.8%	1.1%	1.2%	1.3%	1.9%	1.8%	0.975	0.620	0.670	0.737	1.052	
181	8379	12912	14681	8350	149547	193869	2.4%	1.9%	2.5%	1.5%	1.3%	1.4%	1.704	1.344	1.797	1.072	0.915	
182	39	307	211	0	1860	2417	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.636	2.563	2.072	0.000	0.913	
19	0	32938	0	560	202991	236489	0.0%	4.8%	0.0%	0.1%	1.7%	1.7%	0.000	2.811	0.000	0.059	1.018	
20	20991	48045	22986	7706	586117	685845	6.0%	7.0%	3.9%	1.4%	5.0%	4.9%	1.207	1.414	0.796	0.280	1.014	
210	4134	1423	17014	5503	163709	191783	1.2%	0.2%	2.9%	1.0%	1.4%	1.4%	0.850	0.150	2.106	0.714	1.013	
22	16613	33909	21574	24011	366216	462323	4.7%	4.9%	3.7%	4.3%	3.1%	3.3%	1.417	1.480	1.108	1.293	0.940	
23	31564	76656	56339	29809	669912	864280	9.0%	11.1%	9.6%	5.3%	5.7%	6.2%	1.440	1.790	1.547	0.859	0.920	
24	19246	38163	76248	2094	1384878	1520629	5.5%	5.5%	13.0%	0.4%	11.8%	10.9%	0.499	0.506	1.190	0.034	1.081	
25	6323	29134	20966	18012	603827	678262	1.8%	4.2%	3.6%	3.2%	5.2%	4.9%	0.368	0.867	0.734	0.661	1.056	
26	7970	11539	449	7678	268037	295673	2.3%	1.7%	0.1%	1.4%	2.3%	2.1%	1.063	0.788	0.036	0.647	1.076	
27	8732	24471	4072	20348	444144	501767	2.5%	3.6%	0.7%	3.6%	3.8%	3.6%	0.686	0.984	0.193	1.010	1.050	
28	4342	34630	1536	12435	1101649	1154592	1.2%	5.0%	0.3%	2.2%	9.4%	8.3%	0.148	0.605	0.032	0.268	1.132	
29	0	2859	0	14851	362998	380708	0.0%	0.4%	0.0%	2.7%	3.1%	2.7%	0.000	0.152	0.000	0.971	1.131	
30	123	17492	11348	429	833426	862818	0.0%	2.5%	1.9%	0.1%	7.1%	6.2%	0.006	0.409	0.312	0.012	1.146	
310	4436	26929	19723	24949	249162	325199	1.3%	3.9%	3.4%	4.5%	2.1%	2.3%	0.538	1.671	1.440	1.910	0.909	
32	7669	6422	3058	5538	136446	159133	2.2%	0.9%	0.5%	1.0%	1.2%	1.1%	1.901	0.814	0.456	0.867	1.017	
33	4687	41862	23471	12688	502589	585297	1.3%	6.1%	4.0%	2.3%	4.3%	4.2%	0.316	1.443	0.952	0.540	1.019	
	352417	688709	585506	558131	11713114	13897877												

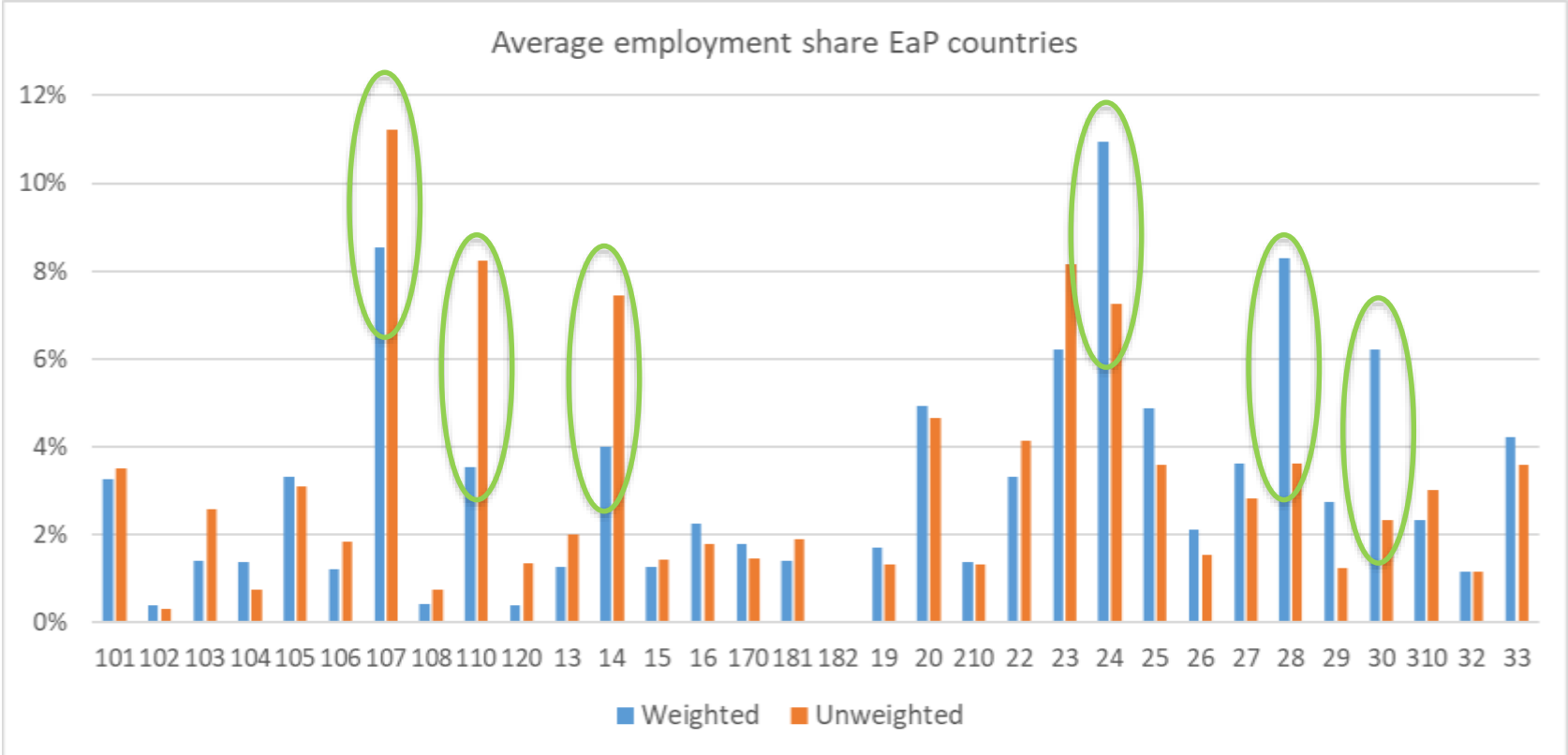
Unweighted average: different results

	EMPLOYMENT						EaP	EMPLOYMENT SHARE						EaP	SPECIALISATION				
	AR	AZ	GE	MD	UA	AR		AZ	GE	MD	UA	AR	AZ		GE	MD	UA		
101	13813	16478	20338	24937	377916	--	3.9%	2.4%	3.5%	4.5%	3.2%	3.5%	1.121	0.684	0.994	1.278	0.923		
102	481	2146	1885	2435	45680	--	0.1%	0.3%	0.3%	0.4%	0.4%	0.3%	0.428	0.976	1.008	1.367	1.222		
103	10376	18296	18600	17097	128954	--	2.9%	2.7%	3.2%	3.1%	1.1%	2.6%	1.137	1.026	1.227	1.183	0.425		
104	607	5833	1233	5856	178103	--	0.2%	0.8%	0.2%	1.0%	1.5%	0.8%	0.227	1.115	0.277	1.381	2.001		
105	12719	12825	16260	21617	396874	--	3.6%	1.9%	2.8%	3.9%	3.4%	3.1%	1.163	0.600	0.895	1.249	1.092		
106	8887	13122	16219	5325	125104	--	2.5%	1.9%	2.8%	1.0%	1.1%	1.8%	1.368	1.033	1.502	0.517	0.579		
107	51562	60563	71937	69322	933442	--	14.6%	8.8%	12.3%	12.4%	8.0%	11.2%	1.304	0.784	1.095	1.107	0.710		
108	9834	623	1159	1369	45631	--	2.8%	0.1%	0.2%	0.2%	0.4%	0.7%	3.757	0.122	0.267	0.330	0.525		
110	40512	41351	68861	52741	288695	--	11.5%	6.0%	11.8%	9.4%	2.5%	8.2%	1.396	0.729	1.428	1.147	0.299		
120	17073	2883	2809	4388	26653	--	4.8%	0.4%	0.5%	0.8%	0.2%	1.4%	3.585	0.310	0.355	0.582	0.168		
13	1436	28670	2986	21557	122868	--	0.4%	4.2%	0.5%	3.9%	1.0%	2.0%	0.204	2.083	0.255	1.933	0.525		
14	22164	18525	40335	101519	374109	--	6.3%	2.7%	6.9%	18.2%	3.2%	7.5%	0.844	0.361	0.925	2.441	0.429		
15	2616	6721	3500	20076	143417	--	0.7%	1.0%	0.6%	3.6%	1.2%	1.4%	0.520	0.684	0.419	2.520	0.858		
16	6559	10613	10956	7530	276622	--	1.9%	1.5%	1.9%	1.3%	2.4%	1.8%	1.036	0.858	1.041	0.751	1.314		
170	6182	7683	7056	7401	221696	--	1.8%	1.1%	1.2%	1.3%	1.9%	1.5%	1.203	0.765	0.826	0.909	1.298		
181	8379	12912	14681	8350	149547	--	2.4%	1.9%	2.5%	1.5%	1.3%	1.9%	1.247	0.983	1.315	0.785	0.670		
182	39	307	211	0	1860	--	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.514	2.072	1.675	0.000	0.738		
19	0	32938	0	560	202991	--	0.0%	4.8%	0.0%	0.1%	1.7%	1.3%	0.000	3.614	0.000	0.076	1.310		
20	20991	48045	22986	7706	586117	--	6.0%	7.0%	3.9%	1.4%	5.0%	4.6%	1.281	1.501	0.845	0.297	1.076		
210	4134	1423	17014	5503	163709	--	1.2%	0.2%	2.9%	1.0%	1.4%	1.3%	0.879	0.155	2.179	0.739	1.048		
22	16613	33909	21574	24011	366216	--	4.7%	4.9%	3.7%	4.3%	3.1%	4.2%	1.136	1.186	0.888	1.037	0.753		
23	31564	76656	56339	29809	669912	--	9.0%	11.1%	9.6%	5.3%	5.7%	8.2%	1.098	1.365	1.180	0.655	0.701		
24	19246	38163	76248	2094	1384878	--	5.5%	5.5%	13.0%	0.4%	11.8%	7.2%	0.754	0.765	1.798	0.052	1.632		
25	6323	29134	20966	18012	603827	--	1.8%	4.2%	3.6%	3.2%	5.2%	3.6%	0.499	1.176	0.995	0.897	1.433		
26	7970	11539	449	7678	268037	--	2.3%	1.7%	0.1%	1.4%	2.3%	1.5%	1.473	1.091	0.050	0.896	1.490		
27	8732	24471	4072	20348	444144	--	2.5%	3.6%	0.7%	3.6%	3.8%	2.8%	0.875	1.254	0.246	1.287	1.339		
28	4342	34630	1536	12435	1101649	--	1.2%	5.0%	0.3%	2.2%	9.4%	3.6%	0.339	1.385	0.072	0.614	2.590		
29	0	2859	0	14851	362998	--	0.0%	0.4%	0.0%	2.7%	3.1%	1.2%	0.000	0.336	0.000	2.155	2.509		
30	123	17492	11348	429	833426	--	0.0%	2.5%	1.9%	0.1%	7.1%	2.3%	0.015	1.085	0.828	0.033	3.039		
310	4436	26929	19723	24949	249162	--	1.3%	3.9%	3.4%	4.5%	2.1%	3.0%	0.416	1.292	1.113	1.477	0.703		
32	7669	6422	3058	5538	136446	--	2.2%	0.9%	0.5%	1.0%	1.2%	1.2%	1.880	0.806	0.451	0.857	1.006		
33	4687	41862	23471	12688	502589	--	1.3%	6.1%	4.0%	2.3%	4.3%	3.6%	0.370	1.690	1.115	0.632	1.193		
	352417	688709	585506	558131	11713114	--													

Comparison of results (# of selected industries)

	Weighted average	Unweighted average
Armenia	9	3
Azerbaijan	8	5
Georgia	8	4
Moldova	7	4
Ukraine	0	5

Difference in results due to differences in average EaP employment shares



Issue



- Selection of years
- If we have data for X years, when is an industry above the specialisation threshold:
 - For all X years individually
 - For a minimum of Y years
 - For the whole time period

Example for Georgia: which industries to select

	2011	2012	2013	2014	2015	2016	2017	2011-2017
101	0.921	0.911	1.002	1.042	0.935	1.094	1.007	0.994
102	1.033	1.018	1.013	1.034	0.988	0.866	1.074	1.008
103	1.061	1.026	1.085	1.193	1.487	1.483	1.185	1.227
104	0.468	0.406	0.318	0.215	0.244	0.197	0.166	0.277
105	0.927	0.907	0.916	0.874	0.874	0.906	0.859	0.895
106	1.608	1.622	1.449	1.454	1.368	1.502	1.539	1.502
107	1.043	1.043	1.036	1.116	1.043	1.135	1.224	1.095
108	0.106	0.123	0.137	0.661	0.791	0.734	1.140	0.267
110	1.269	1.276	1.418	1.513	1.451	1.492	1.563	1.428
120	0.475	0.458	0.441	0.405	0.357	0.251	0.202	0.355
13	0.148	0.169	0.250	0.219	0.406	0.256	0.296	0.255
14	0.878	0.907	0.896	0.902	0.967	0.990	0.902	0.925
15	0.494	0.488	0.494	0.366	0.385	0.391	0.330	0.419
16	1.167	1.209	0.872	1.021	0.899	1.095	0.979	1.041
170	0.842	0.806	0.761	0.805	0.812	0.847	0.881	0.826
181	1.190	1.186	1.362	1.336	1.362	1.380	1.383	1.315
182	1.234	1.357	1.067	2.264	2.097	0.429	1.072	1.675
19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.728	0.733	0.711	0.845	1.008	1.062	1.020	0.845
210	2.258	2.178	2.228	2.082	2.261	2.102	2.070	2.179
22	0.843	0.846	0.821	0.932	0.921	0.847	0.976	0.888
23	1.304	1.280	1.229	1.098	1.124	1.103	1.157	1.180
24	1.878	2.028	2.052	1.743	1.616	1.648	1.621	1.798
25	0.964	0.927	1.057	0.995	1.000	0.991	1.023	0.995
26	0.073	0.082	0.034	0.049	0.026	0.048	0.031	0.050
27	0.172	0.170	0.269	0.193	0.273	0.319	0.309	0.246
28	0.065	0.050	0.056	0.083	0.052	0.098	0.105	0.072
29	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.789	0.763	1.203	0.789	0.801	0.737	0.687	0.828
310	1.064	1.063	1.069	1.149	1.167	1.061	1.179	1.113
32	0.589	0.594	0.390	0.441	0.352	0.374	0.403	0.451
33	1.641	1.673	1.039	0.861	0.950	0.798	0.803	1.115



Choice of selection criteria

- Number of identified/selected industries depends on threshold value of selection criteria
- E.g. a threshold of 1.5 for the degree of specialisation (Location Quotient) will result in a lower number of selected industries compared to a threshold of 1.25

		SPECIALISATION		1.5		1.25
		AR	AZ	GE	MD	UA
101	Processing/preserving of meat	1.160	0.708	1.028	1.322	0.955
102	Processing/preserving of fish, etc.	0.391	0.893	0.923	1.250	1.118
103	Processing/preserving of fruit, vege	1.480	1.335	1.597	1.540	0.553
104	Vegetable and animal oils and fats	0.161	0.792	0.197	0.981	1.422
105	Dairy products	1.125	0.581	0.866	1.208	1.057
106	Grain mill products, starches and sta	1.650	1.246	1.812	0.624	0.699
107	Other food products	1.481	0.890	1.244	1.257	0.807
108	Prepared animal feeds	4.793	0.155	0.340	0.421	0.669
110	Other food products	1.952	1.020	1.997	1.605	0.419
120	Tobacco products	5.573	0.482	0.552	0.904	0.262
13	Manufacture of textiles	0.249	2.542	0.311	2.358	0.640
14	Manufacture of wearing apparel	1.098	0.470	1.203	3.176	0.558
15	Manufacture of leather and related	0.551	0.724	0.443	2.668	0.908
16	Manufacture of wood and of produc	0.920	0.762	0.925	0.667	1.168
170	Wood products, cork, straw, plaiting	1.077	0.685	0.740	0.814	1.162
181	Printing and service activities relate	1.440	1.136	1.519	0.906	0.773
182	Reproduction of recorded media	0.569	2.292	1.853	0.000	0.816
19	Manufacture of coke and refined pe	0.000	3.162	0.000	0.066	1.146
20	Manufacture of chemicals and chem	1.243	1.456	0.819	0.288	1.044
210	Pharmaceuticals, medicinal chemica	0.865	0.152	2.142	0.727	1.030
22	Manufacture of rubber and plastic p	1.261	1.317	0.986	1.151	0.836
23	Manufacture of other non-metallic	1.246	1.549	1.339	0.743	0.796
24	Manufacture of basic metals	0.601	0.609	1.432	0.041	1.300
25	Manufacture of fabricated metal pro	0.423	0.998	0.845	0.761	1.216
26	Manufacture of computer, electron	1.235	0.915	0.042	0.751	1.249
27	Manufacture of electrical equipmen	0.769	1.103	0.216	1.132	1.177
28	Manufacture of machinery and equi	0.206	0.842	0.044	0.373	1.576
29	Manufacture of motor vehicles, trai	0.000	0.209	0.000	1.339	1.560
30	Manufacture of other transport equ	0.008	0.594	0.453	0.018	1.665
310	Furniture	0.469	1.457	1.255	1.666	0.793
32	Other manufacturing	1.890	0.810	0.454	0.862	1.012
33	Repair and installation of machinen	0.341	1.557	1.027	0.582	1.099
		5	5	6	6	5

		SPECIALISATION		1.25		1.25
		AR	AZ	GE	MD	UA
		1.160	0.708	1.028	1.322	0.955
		0.391	0.893	0.923	1.250	1.118
		1.480	1.335	1.597	1.540	0.553
		0.161	0.792	0.197	0.981	1.422
		1.125	0.581	0.866	1.208	1.057
		1.650	1.246	1.812	0.624	0.699
		1.481	0.890	1.244	1.257	0.807
		4.793	0.155	0.340	0.421	0.669
		1.952	1.020	1.997	1.605	0.419
		5.573	0.482	0.552	0.904	0.262
		0.249	2.542	0.311	2.358	0.640
		1.098	0.470	1.203	3.176	0.558
		0.551	0.724	0.443	2.668	0.908
		0.920	0.762	0.925	0.667	1.168
		1.077	0.685	0.740	0.814	1.162
		1.440	1.136	1.519	0.906	0.773
		0.569	2.292	1.853	0.000	0.816
		0.000	3.162	0.000	0.066	1.146
		1.243	1.456	0.819	0.288	1.044
		0.865	0.152	2.142	0.727	1.030
		1.261	1.317	0.986	1.151	0.836
		1.246	1.549	1.339	0.743	0.796
		0.601	0.609	1.432	0.041	1.300
		0.423	0.998	0.845	0.761	1.216
		1.235	0.915	0.042	0.751	1.249
		0.769	1.103	0.216	1.132	1.177
		0.206	0.842	0.044	0.373	1.576
		0.000	0.209	0.000	1.339	1.560
		0.008	0.594	0.453	0.018	1.665
		0.469	1.457	1.255	1.666	0.793
		1.890	0.810	0.454	0.862	1.012
		0.341	1.557	1.027	0.582	1.099
		9	9	9	10	5

Changing selection criteria

- Example for Ukraine
- => [Excel file](#)

Thank You!



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