

# U-LEAD

WITH EUROPE

## Preparation of the SSRD 2021-2027: Regional typology based on SDG indicators

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THE MINISTRY OF REGIONAL DEVELOPMENT,  
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## Why are territorial typologies relevant

- Comparing the performance of regions of similar types is useful in detecting similar characteristics of the development paths (OECD, 2011)
- Ideally, development policies should not be the same for all types of territories
  - Typology of oblasts
  - Problematic territories
  - Growth poles

- **OECD:** Based on the demographic density and accessibility analysis:
  - *Predominantly Urban / Intermediate / Predominantly Rural*
  - Extended to *Rural close to a city* and *Remote rural*
- **DG REGIO / Eurostat:**
  - *Degree of urbanization (DEGURBA)*
  - Based on local labour market areas / services: *Functional urban areas*
  - Based on geography: *Metropolitan regions, Border, Islands, Coastal areas, Mountain areas*
- **World Bank (for countries)**
  - Based on income per capita: *Low income / Middle income / High income*
- **Other:**
  - Based on industrial structure: *Agriculture oriented / Industry oriented / Services oriented*

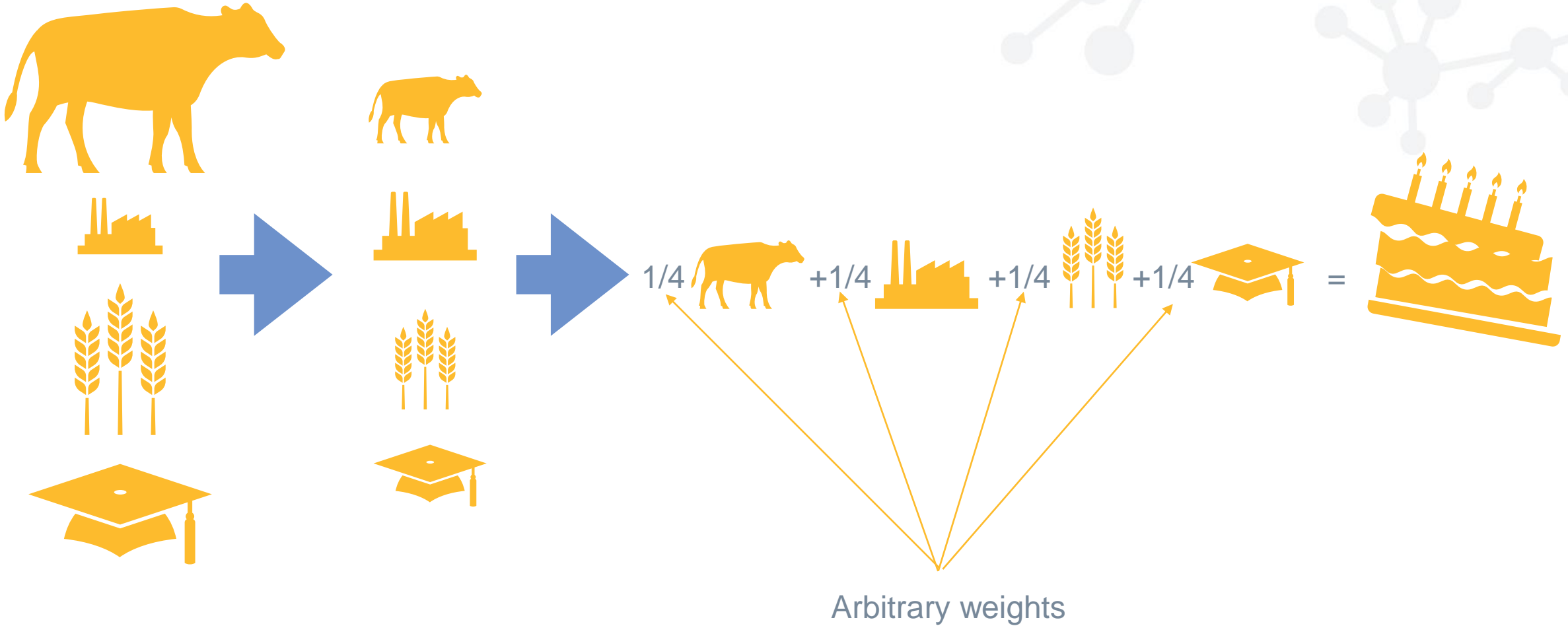


[Mykhnenko \(2006\)](#). Ukraine's diverging space-economy: The Orange Revolution, post-soviet development models and regional trajectories



[Mykhtviyishyn and Michalski \(2017\)](#). Language Differentiation of Ukraine's Population

# Typical mistakes in indicators for typologies



# MinRegion's implicit typologies

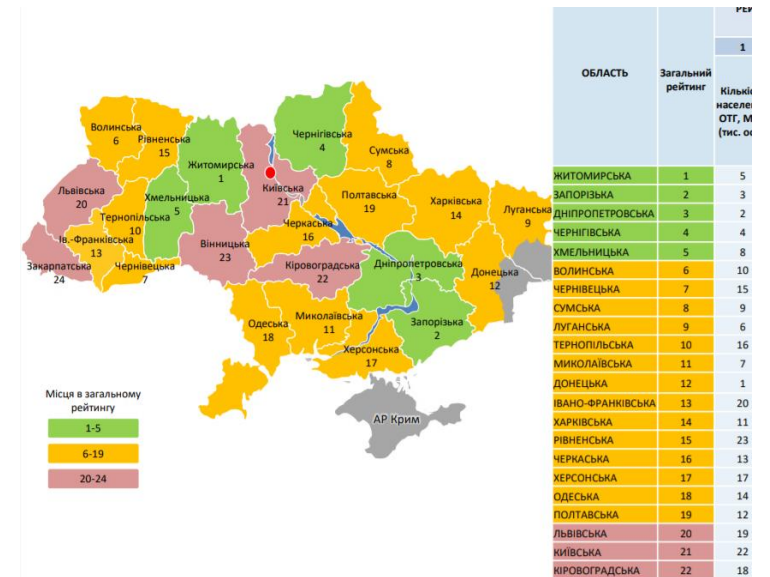
- According to regional development (“Рейтингова оцінка регіонів”)
  - Based on ranking of individual indicators



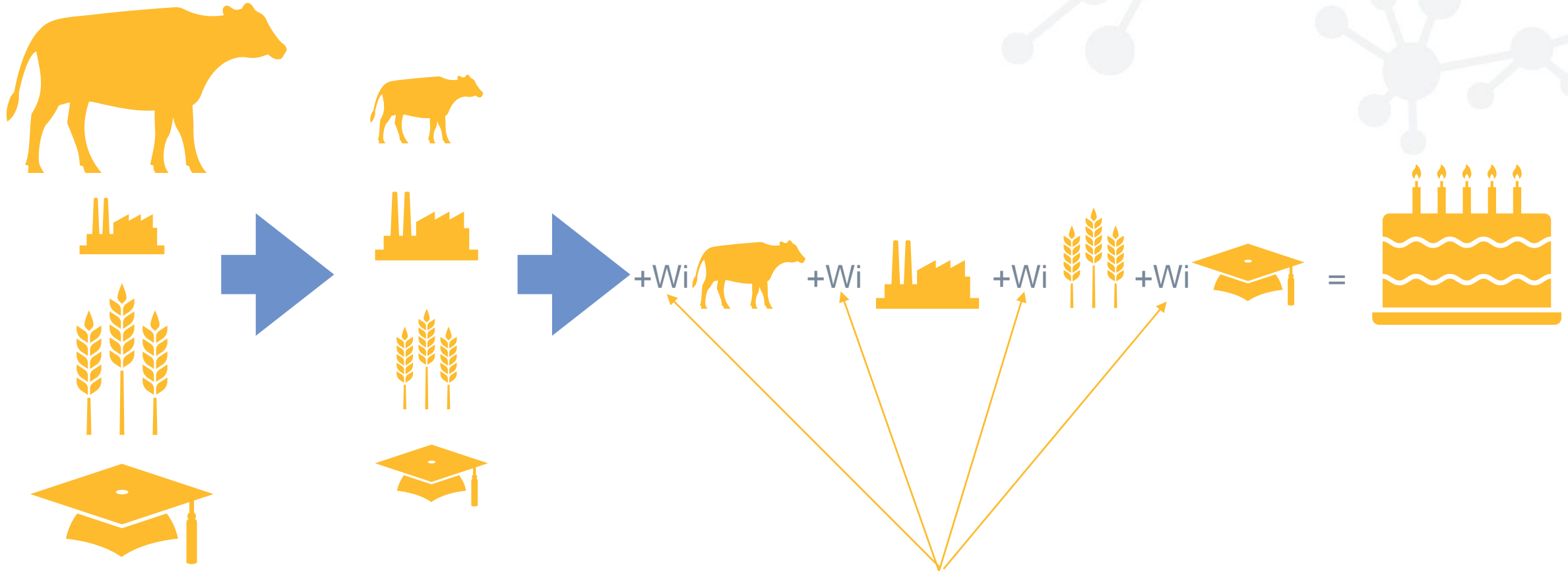
Показники напрямку:  
 1 – індекс промислової продукції, відсотків до відповідного періоду попереднього року;  
 2 - Обсяг реалізованої промислової продукції у розрахунку на одну особу населення, гривень;  
 3 - індекс обсягу сільськогосподарського виробництва, відсотків до відповідного періоду попереднього року;  
 4 - Обсяг виробництва продукції сільського господарства у розрахунку на одну особу сільського населення (у постійних цінах), гривень;  
 5 - Індекс будівельної продукції, відсотків до відповідного періоду попереднього року;  
 6 - Обсяг виконаних будівельних робіт у розрахунку на одну особу населення, гривень;  
 7 - Індекс споживчих цін, відсотків до грудня попереднього року.

Регіони	Місце регіону за напрямом			Динаміка	
	III кв. 2017 р.	III кв. 2018 р.		1	2
Полтавська	6	1	+5	12	2
Дніпропетровська	1	2	-1	8	1
Черкаська	23	3	+20	13	8
Вінницька	10	4	+6	20	10
Київська	12	5	+7	14	6
Хмельницька	17	6	+11	22	15
Сумська	9	7	+2	2	12
Запорізька	3	8	-5	6	3
м. Київ	4	9	-5	21	7
Миколаївська	11	10	+1	11	11
Кіровоградська	7	11	-4	16	17
Харківська	2	12	-10	15	5
Івано-Франківська	19	13	+6	1	9
Чернігівська	16	14	+2	18	16
Херсонська	14	15	-1	17	20
Донецька	15	16	-1	10	4
Одеська	8	17	-9	23	21
Львівська	13	18	-5	9	13
Житомирська	5	19	-14	19	14
Рівненська	20	20	-	24	18
Тернопільська	21	21	-	7	22
Чернівецька	18	22	-4	3	24
Волинська	22	23	-1	4	19
Луганська	25	24	+1	25	25
Закарпатська	24	25	-1	5	23

- According to the amalgamation process
  - Based on indicators on coverage of territory and population by OTHs

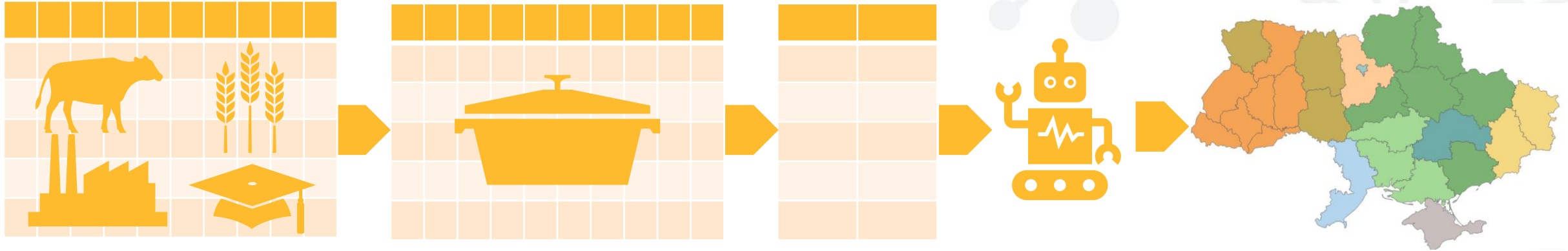


# Our way: Principal Component Analysis (PCA)



PCA weights which are **objective**

# Our methodology



- Sustainable Development Goals (SDGs): about 170 indicators, highly comparable across countries
- Collected by UNDP from official sources, reference year = 2015
- Problem: not standardised

- Step 1: “STANDARDIZATION”
  - Make indicators comparable for the following “cooking”

- Step 2: “REDUCTION OF DIMENSIONALITY”
  - From 170 indicators to 6, which explain 80% of the total variance
  - This statistical technique called PRINCIPAL COMPONENT ANALYSIS (PCA)

- Step 3: “UNSUPERVISED CLUSTERING”
  - Automatically identifying the number of relevant groups (“clusters”) of regions based on PCA
  - Standard machine learning technique called K-MEANS CLUSTERING

## Next steps

<p>Obtain new typologie based on RCI</p>	<p><b>Replicate the SDG clustering with consensus indicators</b></p> <p><b>Collect RCI indicators (KMU N° 1029)</b></p> <p><b>Reproduce the statistical analysis with the set of RCI indicators</b></p> <p><b>Try to get 2018 data</b></p>
<p>Use of typology</p>	<p><b>Describe findings and methodology of SDG and RCI clustering</b></p> <p><b>Share with policy experts to fine-tune SSRD by type of oblasts</b></p>



## Relevant SDGs for Objective 1: Increasing competitiveness of the regions

GOAL	Indicator	Indicator code	ISER analysis	Average	SD
				Competitiveness of regions	Competitiveness of regions
Goal 8. Decent work and economic growth	8.3.1. Employment rate among those aged 15-70, %	IND8.3.1	X	7,67	1,16
Goal 9. Industry, innovation and infrastructure	9.3.2. Share of public roads with a hard surface, %	IND9.3.2	X	7,44	1,68
Goal 8. Decent work and economic growth	8.1.4. Share on innovation expenditure in GRP, %	IND8.1.4		7,22	1,58
Goal 8. Decent work and economic growth	8.4.1. Share of youth not in employment, education or professional training in the total number of population aged 15–24, %	IND8.4.1		7,00	1,81
Goal 8. Decent work and economic growth	8.6.1. Share of persons employed by SMEs in total employed population aged 15-70, %	IND8.6.1		7,00	1,58
Goal 8. Decent work and economic growth	8.2.1. Share of investment into machinery, equipment and inventory in the structure of asset investment, %	IND8.2.1	X	6,78	2,19
Goal 8. Decent work and economic growth	8.2.2. GRP per one employed person, UAH thousand	IND8.2.2	X	6,78	1,39
Goal 17. Partnership for sustainable development	17.3.1. Number of projects of public–private partnership, inter alia concession and property lease in oblasts as of end of period, units	IND17.3.1.	X	6,67	1,05
Goal 8. Decent work and economic growth	8.6.2. Share of sold products (goods, services) of SMEs, % of total volume of sold products	IND8.6.2	X	6,44	1,83
Goal 9. Industry, innovation and infrastructure	9.5.2. Share of sales of innovative products which is new for the market in industrial scope, %	IND9.5.2	X	6,44	3,41
...	...	...	...	...	...

## Relevant SDGs for Objective 2: Decreasing disparities

GOAL	Indicator	Indicator code	ISER analysis	Average	SD
				Reducing disparities	Reducing disparities
Goal 9. Industry, innovation and infrastructure	9.3.2. Share of public roads with a hard surface, %	IND9.3.2	X	6,44	3,06
Goal 8. Decent work and economic growth	8.6.1. Share of persons employed by SMEs in total employed population aged 15-70, %	IND8.6.1		6,22	2,31
Goal 8. Decent work and economic growth	8.4.1. Share of youth not in employment, education or professional training in the total number of population aged 15–24, %	IND8.4.1		5,67	2,72
Goal 9. Industry, innovation and infrastructure	9.6.1. Population coverage with Internet services, subscribers per 100 persons	IND9.6.1	X	5,56	3,16
Goal 7. Affordable and clean energy	7.2.1 Renewable energy share in the total final energy consumption	IND7.2.1	X	5,50	
Goal 9. Industry, innovation and infrastructure	9.5.2. Share of sales of innovative products which is new for the market in industrial scope, %	IND9.5.2	X	5,44	4,34
Goal 8. Decent work and economic growth	8.3.1. Employment rate among those aged 15-70, %	IND8.3.1	X	5,33	2,92
Goal 8. Decent work and economic growth	8.6.2. Share of sold products (goods, services) of SMEs, % of total volume of sold products	IND8.6.2	X	5,22	2,76
Goal 8. Decent work and economic growth	8.2.2. GRP per one employed person, UAH thousand	IND8.2.2	X	5,00	2,43
...	...	...	...	...	...

## Relevant SDGs for Objective 3: Strong institutions

GOAL	Indicator	Indicator code	ISER analysis	Average	SD
				Strong institutions	Strong institutions
Goal 11. Sustainable development of cities and communities	11.2.1. Share of cities and communities that have approved and implemented regional development strategies and action plans for their implementation developed with public participation, %	IND11.2.1	X	7,67	1,48
Goal 16. Peace, justice and strong institutions	16.3.1. Share of the pooled entrepreneurs who trust courts, %	IND16.3.1		6,00	1,77
Goal 17. Partnership for sustainable development	17.3.1. Number of projects of public-private partnership, inter alia concession and property lease in oblasts as of end of period, units	IND17.3.1.	X	5,89	1,64
Goal 17. Partnership for sustainable development	17.1.2. Net foreign direct investment in oblast (equities and bonds), USD per person of population per year	IND17.1.2	X	5,11	1,73
Goal 7. Affordable and clean energy	7.2.1 Renewable energy share in the total final energy consumption	IND7.2.1	X	5,00	
Goal 9. Industry, innovation and infrastructure	9.3.2. Share of public roads with a hard surface, %	IND9.3.2	X	4,89	2,36
...	...	...	...	...	...

*This indicator is not available!!*

## Results so far



See maps

# Interpretation of clusters: Objective 1

Cluster 1: Kievska, Poltavvska, Mykolayivska	Low proportion of Young NEET, low productivity, large number of PPP in Poltava
Cluster 2: Chernihivska, Cherkasska, Kirovohradska, Khersonska, Vinnytska, Zaporyzhska	Lower share of public roads with hard Surface, high proportion of young NEET (not employed, in education or training), high capital investment (machinery, equipment..), low share of high-tech exports, higher share of rural schools connected to internet
Cluster 3: Dnipropetrovska, Kharkivska	Higher employment rate, High share of innovation expenditure in GRP (Dnipropetrovsk), low proportion of young NEET, high share of persons employed by SMEs, high R&D expenditure
Cluster 4: Volynska, Lvivska, Ternopilska, Zhytomirska, Sumska, Odesska  (very heterogenous cluster wrt disparities' indicators)	Lower share of public roads with hard surface, Low share of innovation expenditure in GRP, low number of PPP, high share of innovative products new for the market in Sumy and Zhytomir, high rate of internet coverage, high share of high-tech exports, low rate of rural schools connected to the internet (especially for Lviv!)
Cluster 5: Donetska, Luhanska	Strong decrease of GRP, low productivity, low proportion of products sold by SME, low share of capital investment in GRP, low rate of internet coverage, low share of high-tech exports, low R&D expenditure
Cluster 6: City of Kyiv	Higher employment rate, high productivity (GRP per employed), high share of capital investment in GRP, very high share of FDI, high rate of internet coverage
Cluster 7: Rivenska, Khmelnytska, Chernivetska, Ivano-Frankivska, Zakarpatska	Low share of innovation expenditure in GRP, low share of persons employed by SMEs, low capital investment (machinery, equipment..), low productivity, low number of PPP, low rate of internet coverage, low R&D expenditure

## Interpretation of clusters: Objective 2

Cluster 1: Volynsk, Chernihivska, Cherkasska, Vinnytska, Zaporozhska, Luhanska	Lower share of public roads with hard surface, high proportion of young NEET (not employed, in education or training)
Cluster 2: City of Kyiv	high rate of internet coverage, Higher employment rate, very high productivity
Cluster 3: Lvivska, Kyivska, Poltavska, Dnipropetrovska, Mykolayivska	high share of persons employed by SMEs,
Cluster 4: Rivenska, Khmelnytska, Chernivetska, Ivano-Frankivska, Zakarpatska, Kirovohradska, Khersonska	low share of persons employed by SMEs, low rate of internet coverage, high proportion of products sold by SME, low productivity
Cluster 5: Zhytomirska, Sumska,	Lower share of public roads with hard Surface, low productivity
Cluster 6: Donetsk, Ternopilska,,	high share of persons employed by SMEs, low rate of internet coverage, low employment rate, very low proportion of products sold by SME
Cluster 7: Odesska, Kharkivska	high share of persons employed by SMEs, Low proportion of Young NEET, high rate of internet coverage

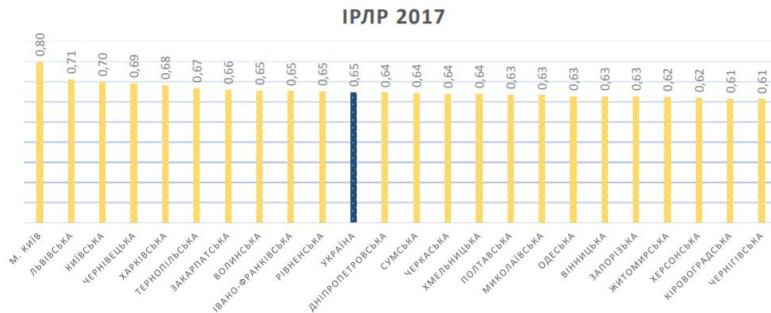
# Interpretation of clusters: Objective 3

Cluster 1: Volynsk, Vinnytska, Sumska	Lower share of public roads with hard surface
Cluster 2: Rivenska, Ivano-Frankivska, Zakarpatska	Low proportion of entrepreneurs who trust courts, low number of PPP, low criminality, low share of persons employed by SMEs, high proportion of population satisfied with public services, high proportion of entrepreneurs who report absence of hindrance from public authorities
Cluster 3: Kyivska, Poltavska,	large number of PPP (Poltava), high share of persons employed by SMEs, low proportion of population satisfied with public services
Cluster 4: City of Kyiv	Low proportion of entrepreneurs who trust courts, very high FDI per person, high criminality, low proportion of population satisfied with public services
Cluster 5: Chernihivska, Kirovohradska, Khersonska, Mykolayivska, Odessa	High proportion of entrepreneurs who trust courts, low proportion of population satisfied with public services
Cluster 6: Lvivska, Khmelnytska, Cherkasska, Kharkivska, Dnipropetrovska, Donetska	
Cluster 7: Zaporyzhska	large number of PPP, high criminality, low proportion of entrepreneurs who report absence of hindrance from public authorities
Cluster 8: Ternopilska, Luhanska, Chernivetska, Zhytomirska	High proportion of entrepreneurs who trust courts, low number of PPP , low criminality

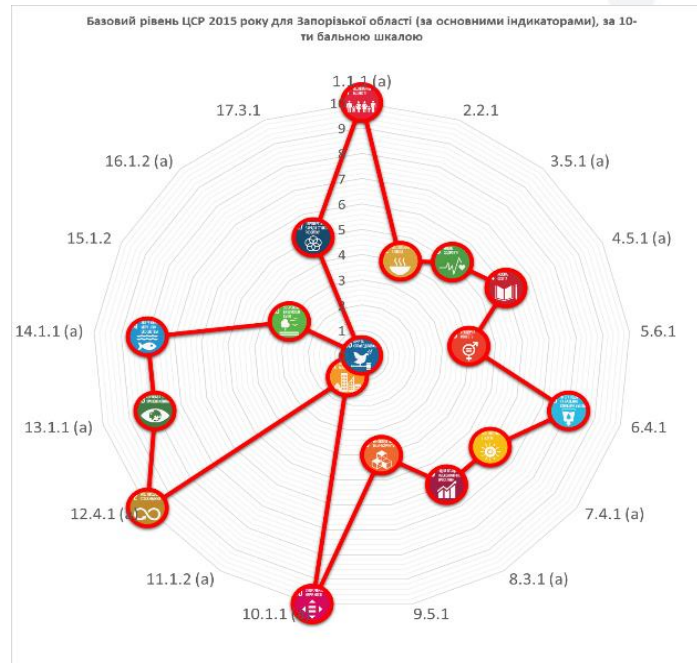
## Human Development Index

Міністерство регіонального розвитку, будівництва та житлово-комунального господарства України  
ДИРЕКТОРАТ РЕГІОНАЛЬНОГО РОЗВИТКУ

ІНДЕКС РЕГІОНАЛЬНОГО ЛЮДСЬКОГО РОЗВИТКУ  
2017 рік



## Human Development Index

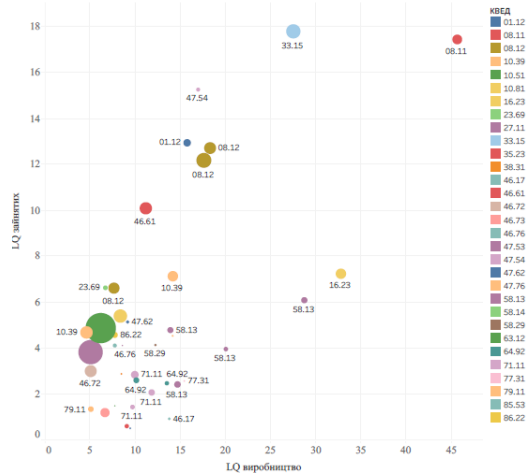


## Public expenditure p.c. on transport 2014-2017



## Industrial specialisation

Фігура 2. LQ виробництва топ 25% та LQ к-ть зайнятих, Вінницька, Запорізька, Кіровоградська and 3 more область 2017





- The statistical analysis makes sense 😊, but selection of relevant SDG indicators largely overlaps for competitiveness and (decreasing of) disparities
- Should be complemented with the analysis of other sources: *HDI, other SDGs, public expenditure, industrial specialisation*
- Policy choices should determine whether (1) concentrate resources in most competitive regions (2) rise the level of less competitive regions (3) fine-tune the strategies to the particularities of each oblast
- Policy instruments should target:
  - *Institutional factors (trust in courts, “red tape”, criminality)*
  - *Input/infrastructure factors (roads, internet coverage)*
  - *Business processes (creation of innovative SMEs, PPP, capital investment, employment of young people)*
  - *In order to reach outcomes (productivity, employment, high-tech exports)*
- Indicators for the SSRD 2021-2027 should differentiate input/process/outcome indicators
- Targets for the SSRD 2021-2027 should be established for each cluster of oblasts, not in general



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W I T H E U R O P E

# BACKUP