University Ranking Analysis (2014-2024)

Global University Trends:

A Decade of Rankings and Performance

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Data Source

- Dataset from CWUR (Center for World University Rankings).
- 11,000 data points for universities worldwide.
- Metrics included:
  - World Rank: Overall global rank.
  - Institution and location: name and country.
  - National, Education, Employability, Faculty and Research Rank.
  - Score (Not used in this Project)
- Data Cleaning: Cleaning and Converted All rank data to numeric .

WORLD UNIVERSITY RANKINGS

2014 - 2024

	World Rank	Institution	Location	Year	National Rank	Education Rank	Employability Rank	Faculty Rank	Research Rank	Score
0	1	Harvard University	USA	2014	1.0	1.0	1.0	1.0	1.0	100.00
1	2	Stanford University	USA	2014	2.0	11.0	2.0	4.0	4.0	99.09
2	3	Massachusetts Institute of Technology	USA	2014	3.0	3.0	11.0	2.0	6.0	98.69
3	4	University of Cambridge	United Kingdom	2014	1.0	2.0	10.0	5.0	10.0	97.64
4	5	University of Oxford	United Kingdom	2014	2.0	7.0	12.0	10.0	11.0	97.51
...	...	...	...	...	...	...	...	...	...	...
10995	996	Institut national de la recherche scientifique	Canada	2024	27.0	551.0	1001.0	284.0	949.0	70.50
10996	997	North Dakota State University	USA	2024	209.0	273.0	923.0	284.0	968.0	70.50
10997	998	Federal University of Bahia	Brazil	2024	21.0	551.0	1001.0	284.0	951.0	70.50
10998	999	Medical University of Lodz	Poland	2024	11.0	551.0	1001.0	284.0	950.0	70.50
10999	1000	Northeast Agricultural University	China	2024	162.0	551.0	1001.0	284.0	955.0	70.50

11000 rows × 10 columns

Problems in the data

World Rank	Institution	Location	National Rank	Education Rank	Employability Rank	Faculty Rank	Research Rank	Score
1 Top 0.1%	Harvard University	USA	1	1	1	1	1	100
2 Top 0.1%	Massachusetts Institute of Technology	USA	2	4	12	2	12	96.8
133 Top 0.7%	Nanyang Technological University	Singapore	2	-	830	-	67	80.7
134 Top 0.7%	University of Barcelona	Spain	1	-	62			

World Rank	Institution	Location	National Rank	Quality of Education	Alumni Employment	Quality of Faculty	Research Output	Quality Publications	Influence	Citations	Score
1	Harvard University	USA	1	2	1	1	1	1	1	1	100
2	Stanford University	USA	2	10	3	2	10	4	3	2	96.7
3	Massachusetts Institute of Technology	USA	3	3	11	3	30	15	2	6	95.1
150	University of Padua	Italy	3	553	> 1000	-	96	110	144	80	79.7
151	Oregon Health & Science University	USA	64	-	> 1000	172	295	208	111	108	79.7
152	Autonomous University of	Spain	2	-	> 1000	153	131	135	206	187	79.6

152	Western University (The University of Western Ontario)	Canada	7	355+	49	210+					
153	Kobe University	Japan	11	22	362	96	349	259	283	318	307	49.18
154	University of Basel	Switzerland	5	77	222	66	168	113	134	141	426	49.17
155	University of Hong Kong	Hong Kong	1	272	116	210+	98	195	176	118	481	49.10
156	Indiana University-Purdue University Indianapolis	USA	69	355+	424	210+	195	351	134	121	57	49.08

Hypotheses

1- Research and employability ranks are the primary elements of global university rankings.

2- The rankings of the world's top universities are relatively stable and exhibit minimal change over time.

3- Universities in developing countries, unlike those in developed countries, are showing an upward trend in global rankings.
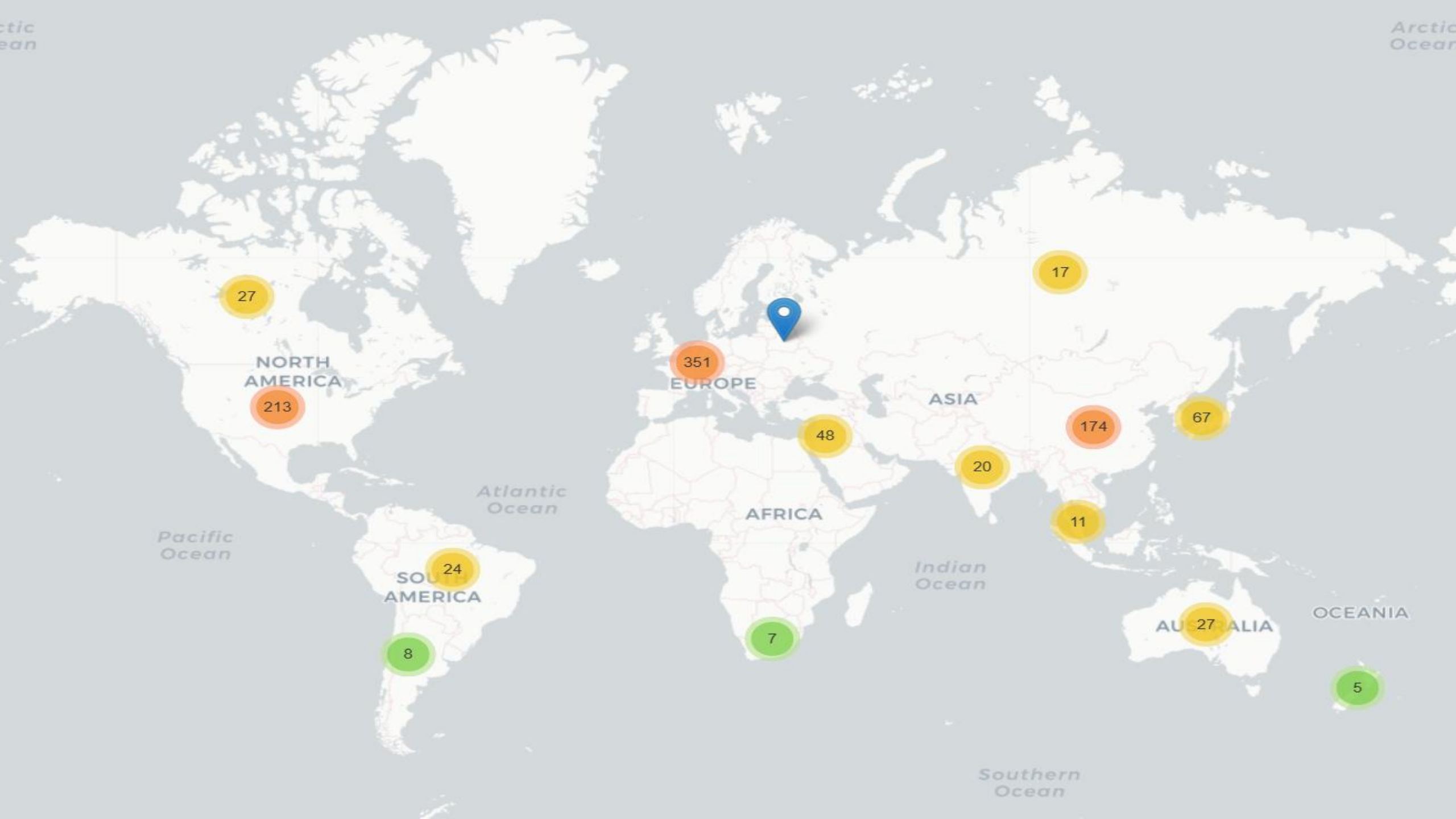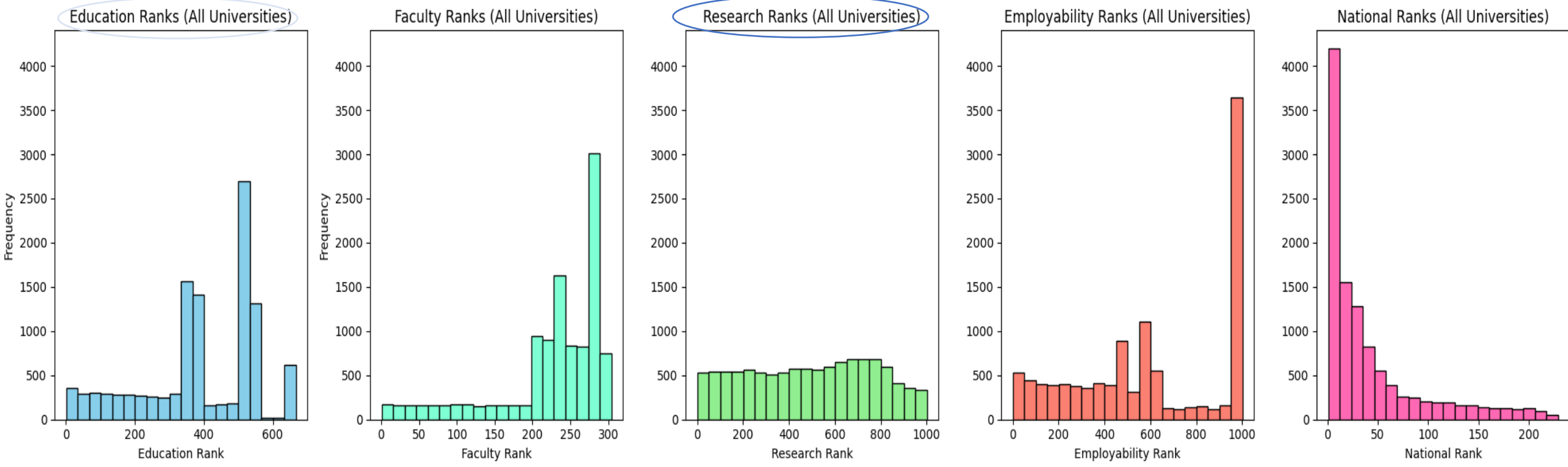
Research Rank and then Faculty Rank are key drivers of World Rank.

Education Rank and Employability Rank moderately influencing other metrics.

National Rank has weak correlations with other variables.

Education and Faculty Ranks Concentrate in Moderate Ranges, Reflecting Mid-Level Quality Across Many Universities

Research Ranks Are Evenly Distributed, While Employability and National Ranks Are Skewed Values.

High Correlations Indicate Similarity in Research, Education, and Partially Faculty Rankings.
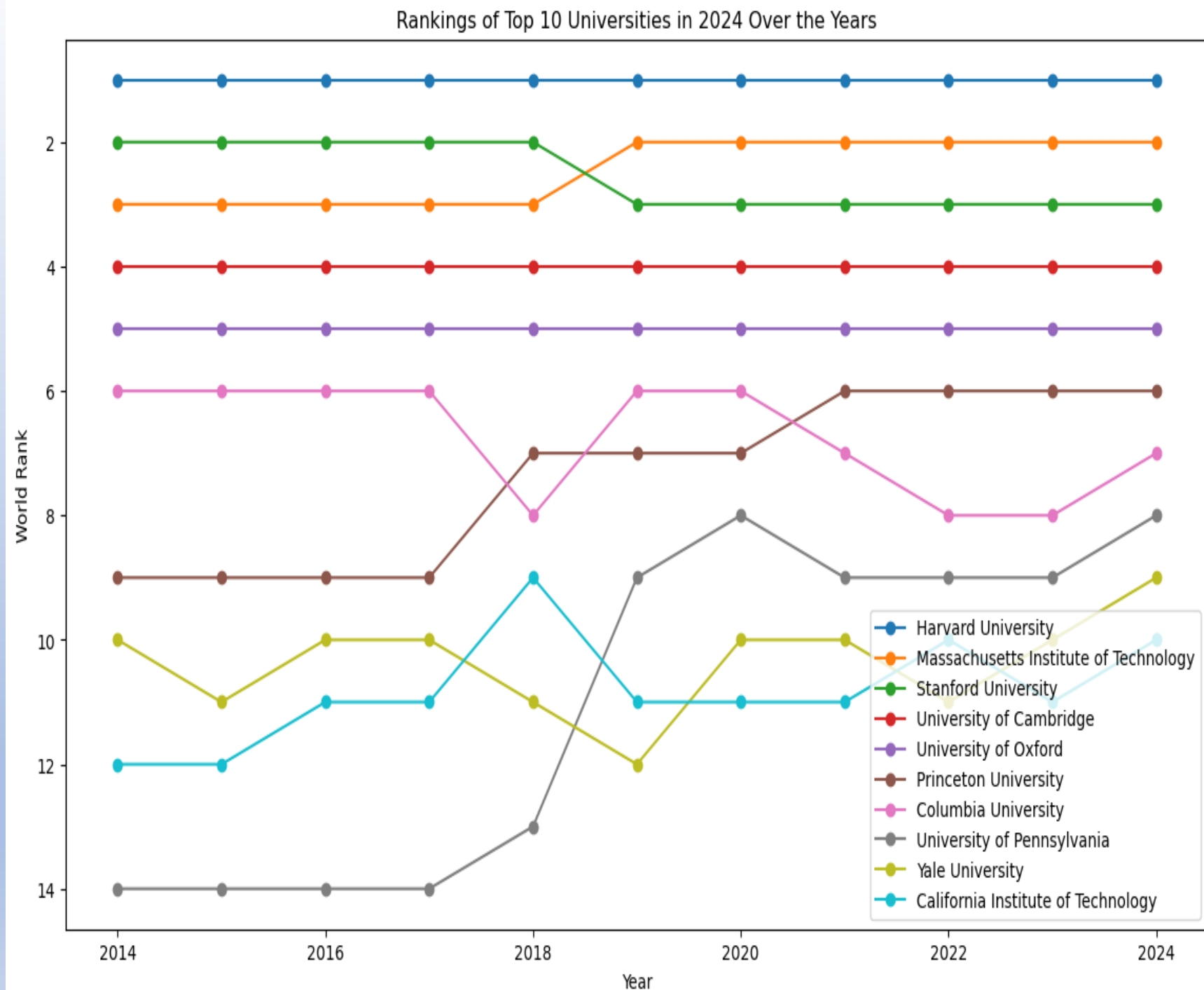
Low Correlation in Employability Reflects Its Distinct Distribution from.

Research Strongly Impacts World Rank, Faculty and Education Show Moderate Influence, While Employability and National Ranks Show Low Influence.

Top 5 universities stayed stable in rankings from 2014 to 2024.

Rankings for universities in 6th to 10th place shifted between 6th and 14th.

Overall, top university rankings have stayed mostly steady over the years.

Rankings of Top 10 Universities in 2024 Over the Years

Legend:
- Harvard University
- Massachusetts Institute of Technology
- Stanford University
- University of Cambridge
- University of Oxford
- Princeton University
- Columbia University
- University of Pennsylvania
- Yale University
- California Institute of Technology

Top 20 Universities Analysis:
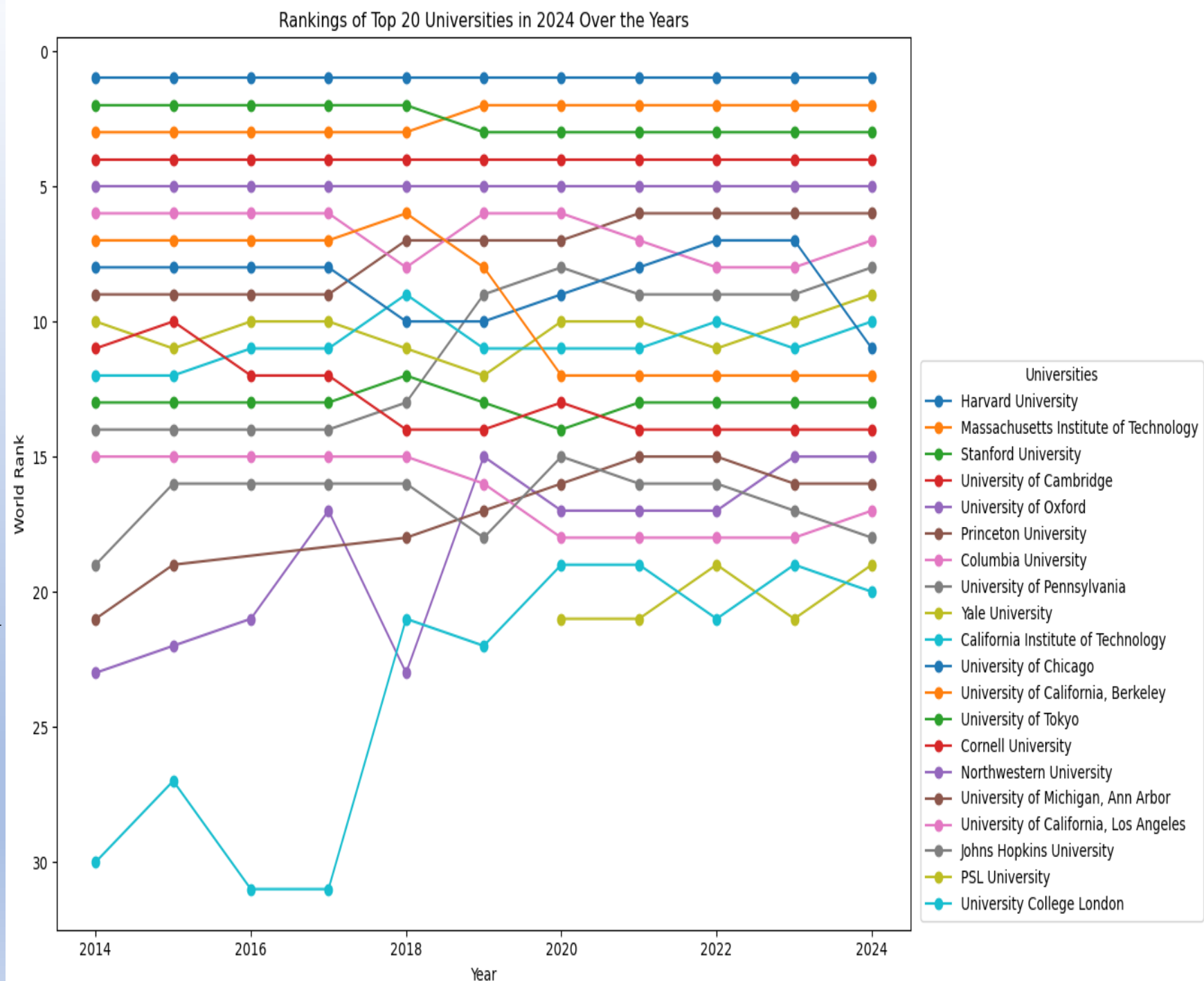 Minimal changes in the top 5
  positions over the years

  Significant shifts between the 5th
  and 20th positions

  Some universities have moved
  from the 30th to the top 20

Notable Inclusion:
  PSL University of France entered
  the top rankings post-2020

 Formally established as a
  university in 2019

Top 1000 University Counts in Top 5 Countries Over Year

The USA and China dominate the spider plot with the largest areas.

China has grown quickly in recent years, expanding outward on the plot.

Japan, Germany, and the UK have smaller, stable areas, showing steady representation.

The plot highlights the USA's lead in rankings, with China closing the gap quickly.
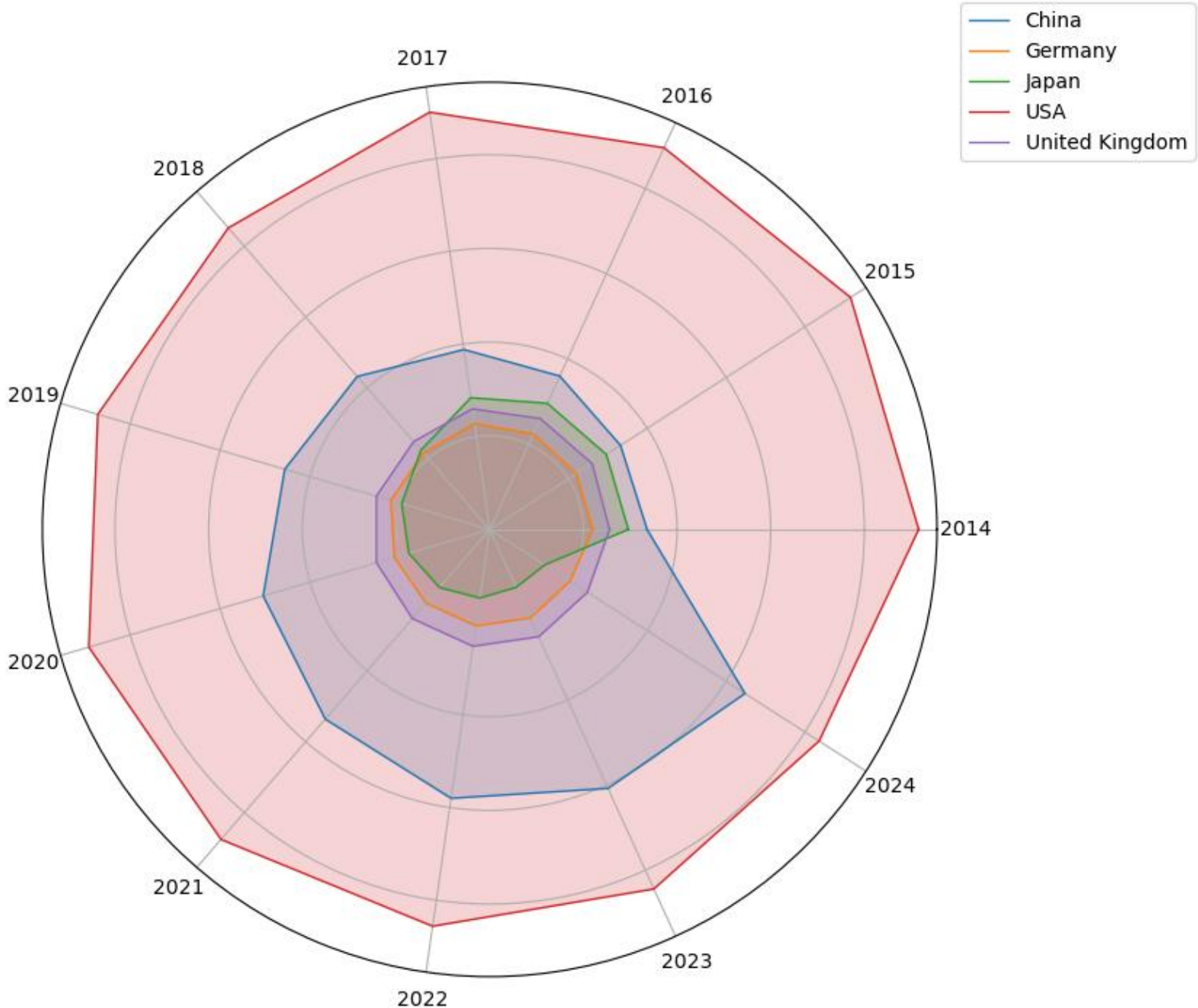
Top 1000 University Counts in Top 11 Countries Over Year

The top 11 universities remained from the same countries,
although the ranks between 3rd and 11th shifted over the years.

Notable:
Canada dropped out of the top 10 in 2024, allowing Australia, previously ranked 11th, to enter the top 10 for the first time in a decade

Top 1000 University Counts in Top 20 Countries Over Year
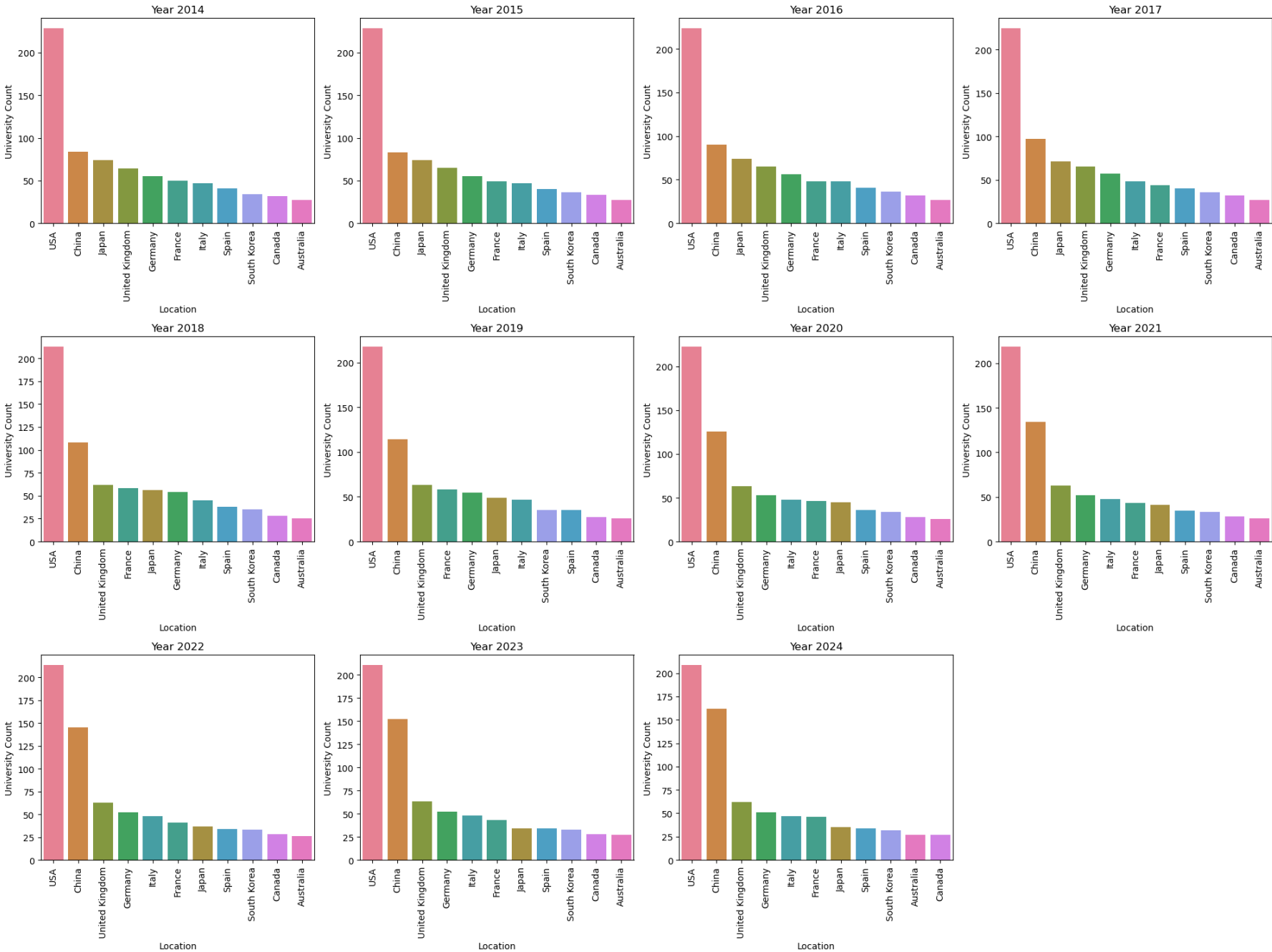
Iran
entered the top 20 countries
in 2018
and has stayed there since.
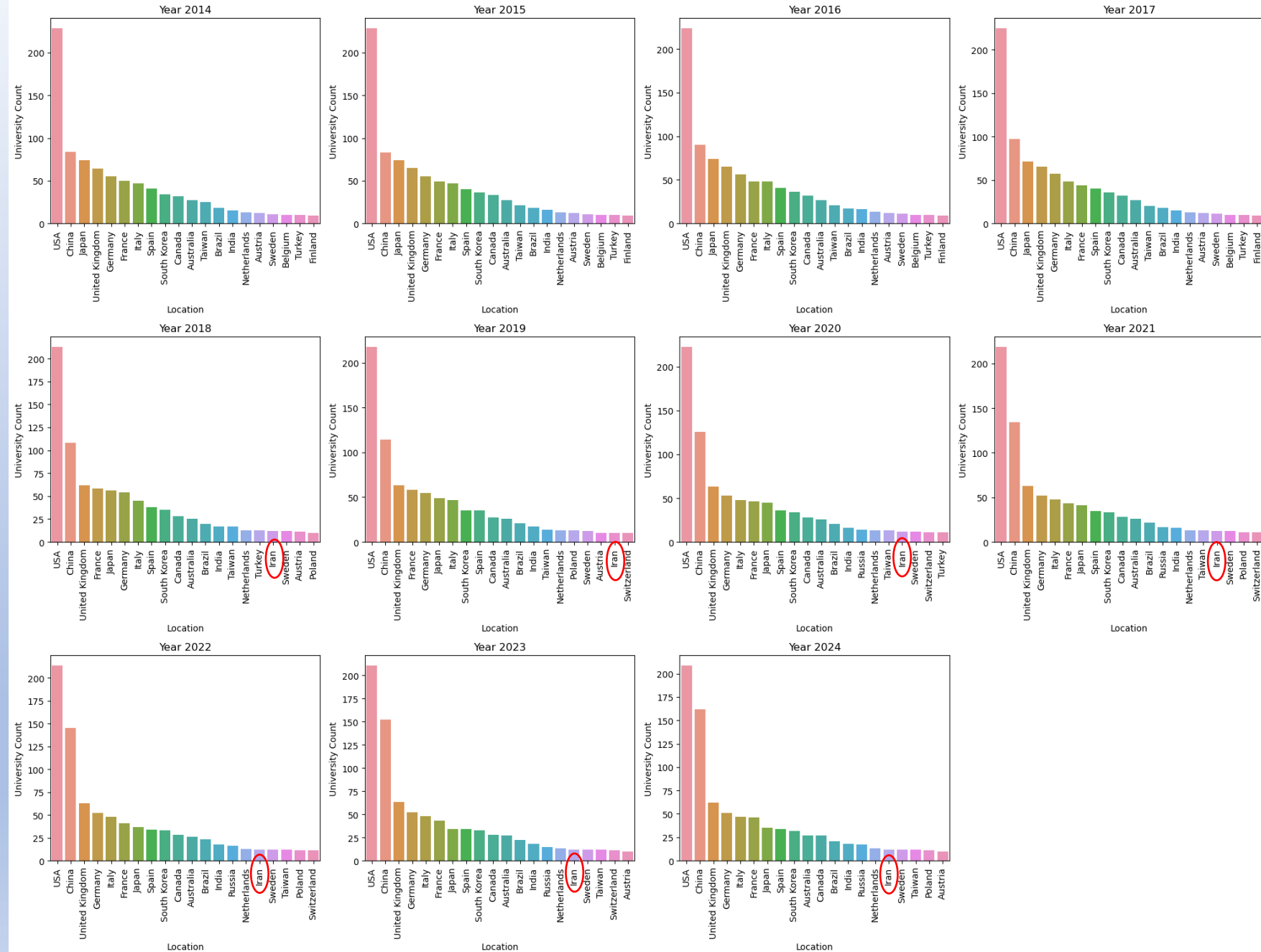
Russia leads with a remarkable 467% growth in university representation.

Croatia follows with 100% growth.

China, Malaysia, Singapore, and Iran also see strong gains in global rankings.
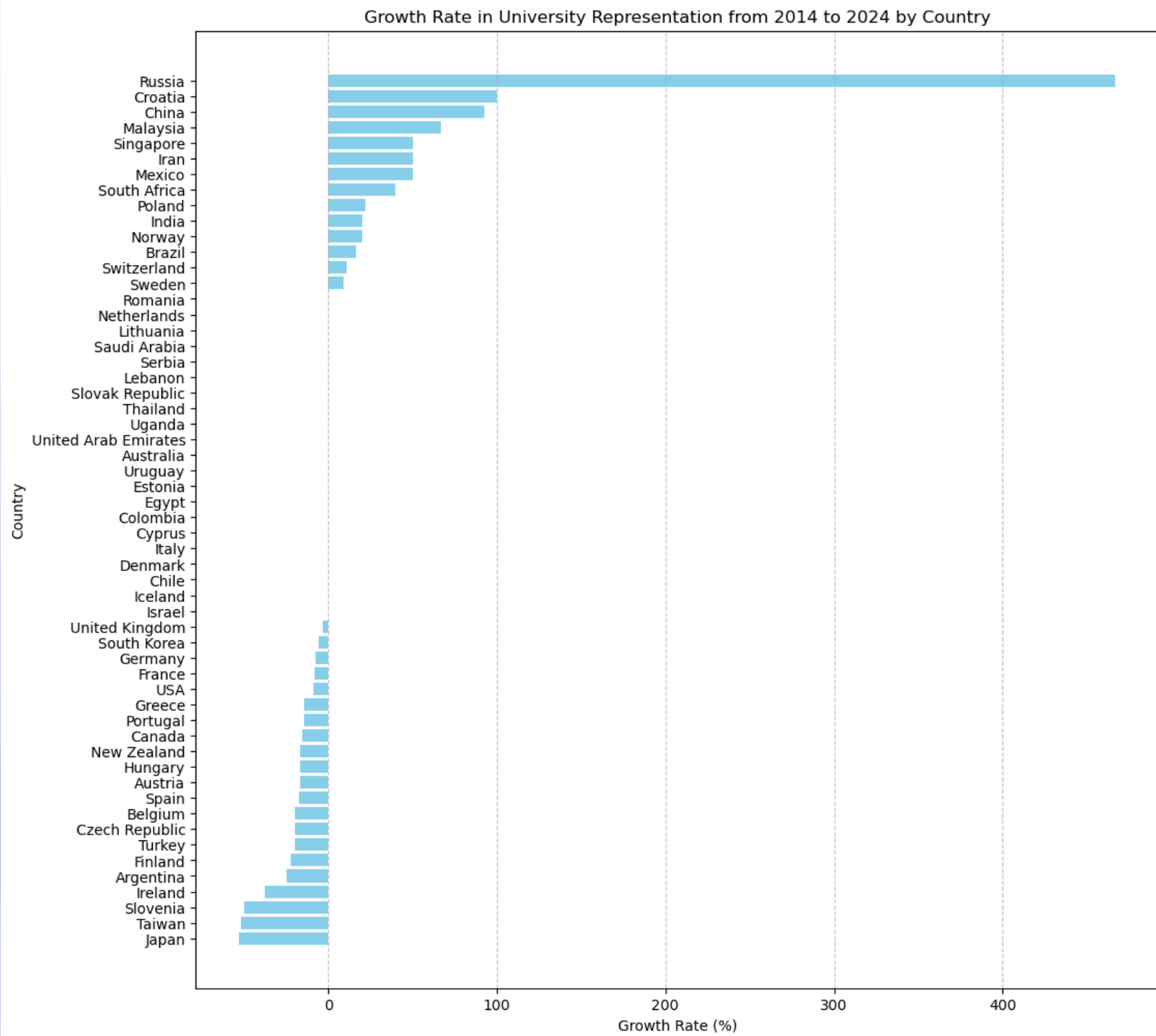
Japan, Taiwan, and Slovenia experience sharp declines

Growth Rate in University Representation from 2014 to 2024 by Country

Table
confirms
the information of the
previous slides.

University Counts by Location and Year

Location	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Argentina	4	3	3	3	3	3	3	3	3	3	3
Armenia	0	0	0	0	0	0	1	1	1	1	1
Australia	27	27	27	27	25	26	26	26	26	27	27
Austria	12	12	12	12	11	10	10	10	10	10	10
Belarus	0	0	0	0	0	1	1	1	1	1	1
Belgium	10	10	10	10	9	9	9	9	9	9	8
Brazil	18	18	17	18	20	21	21	22	23	22	21
Bulgaria	1	1	1	1	1	1	1	1	1	1	0
Canada	32	33	32	32	28	27	28	28	28	28	27
Chile	4	4	4	4	4	4	4	4	4	4	4
China	84	83	90	97	108	114	126	134	145	152	162
Colombia	2	2	2	2	3	2	2	2	2	2	2
Croatia	1	1	1	1	2	2	2	2	2	2	2
Cyprus	1	1	1	1	1	1	1	1	1	1	1
Czech Republic	5	5	4	4	5	4	4	4	4	4	4
Denmark	5	5	5	5	5	5	5	5	5	5	5
Egypt	4	4	4	4	4	4	4	4	4	4	4
Estonia	1	1	1	1	1	1	1	1	1	1	1
Ethiopia	0	0	0	0	0	0	0	0	0	1	1
Finland	9	9	9	9	9	8	8	8	8	7	7
France	50	49	48	44	58	58	46	43	41	43	46
Georgia	0	0	0	0	0	0	1	1	1	1	0
Germany	55	55	56	57	54	55	53	52	52	52	51
Greece	7	7	7	7	6	6	6	6	6	6	6
Hong Kong	6	6	6	6	6	6	0	0	0	0	0
Hungary	6	6	6	6	6	5	5	5	5	5	5
Iceland	1	1	1	1	1	1	1	1	1	1	1
India	15	16	16	15	17	17	16	16	18	18	18
Iran	8	8	8	8	12	10	12	12	12	12	12
Ireland	8	8	8	8	7	6	5	5	5	5	5
Israel	7	7	7	7	7	7	7	7	7	7	7
Italy	47	47	48	48	45	47	48	48	48	48	47
Japan	74	74	74	71	56	49	45	41	37	34	35
Lebanon	1	1	1	1	1	1	1	1	1	1	1
Lithuania	1	1	1	1	1	1	1	1	1	1	1
Luxembourg	0	0	0	0	0	1	1	1	1	1	1
Macau	0	0	0	1	1	1	0	0	0	0	0
Malaysia	3	3	3	3	5	5	5	5	5	5	5
Mexico	2	2	2	2	4	4	5	5	5	4	3
Morocco	0	0	0	0	0	0	0	1	1	1	0
Netherlands	13	13	13	13	13	13	13	13	13	13	13
New Zealand	6	6	6	6	5	6	5	5	5	5	5
Nigeria	0	0	0	0	1	0	0	0	0	0	0
Norway	5	5	5	5	5	6	6	6	6	6	6
Pakistan	0	0	1	1	3	3	2	2	2	2	2
Poland	9	9	9	7	10	13	10	11	11	10	11
Portugal	7	7	6	6	6	6	6	6	6	6	6
Puerto Rico	1	1	1	1	0	0	0	0	0	0	0
Qatar	0	0	0	0	0	0	0	1	1	1	1
Romania	1	2	2	2	3	3	3	2	2	2	1
Russia	3	5	5	5	5	7	14	17	16	15	17
Saudi Arabia	4	4	3	3	4	4	4	4	4	4	4
Serbia	1	1	1	1	1	1	1	1	1	1	1
Singapore	2	2	2	2	2	2	2	2	2	3	3
Slovak Republic	1	1	1	1	1	1	1	1	1	1	1
Slovenia	2	2	2	2	2	1	1	1	1	1	1
South Africa	5	5	5	6	7	7	7	7	7	7	7
South Korea	34	36	36	36	35	35	34	33	33	33	32
Spain	41	40	41	40	38	35	36	35	34	34	34
Sweden	11	11	11	11	12	12	12	12	12	12	12
Switzerland	9	9	9	9	9	10	11	11	11	11	10
Taiwan	25	21	21	20	17	14	13	13	12	12	12
Thailand	3	3	3	3	4	3	3	3	3	3	3
Tunisia	0	0	0	0	1	1	1	1	1	1	1
Turkey	10	10	10	10	13	10	11	11	11	10	8
USA	229	229	224	225	213	218	223	219	214	211	209
Uganda	1	1	1	1	1	1	1	1	1	1	1
United Arab Emirates	1	1	1	1	0	1	1	1	1	1	1
United Kingdom	64	65	65	65	62	63	63	63	63	63	62
Uruguay	1	1	1	1	1	1	1	1	1	1	1

China shows a significant upward trend from 2014 to 2024

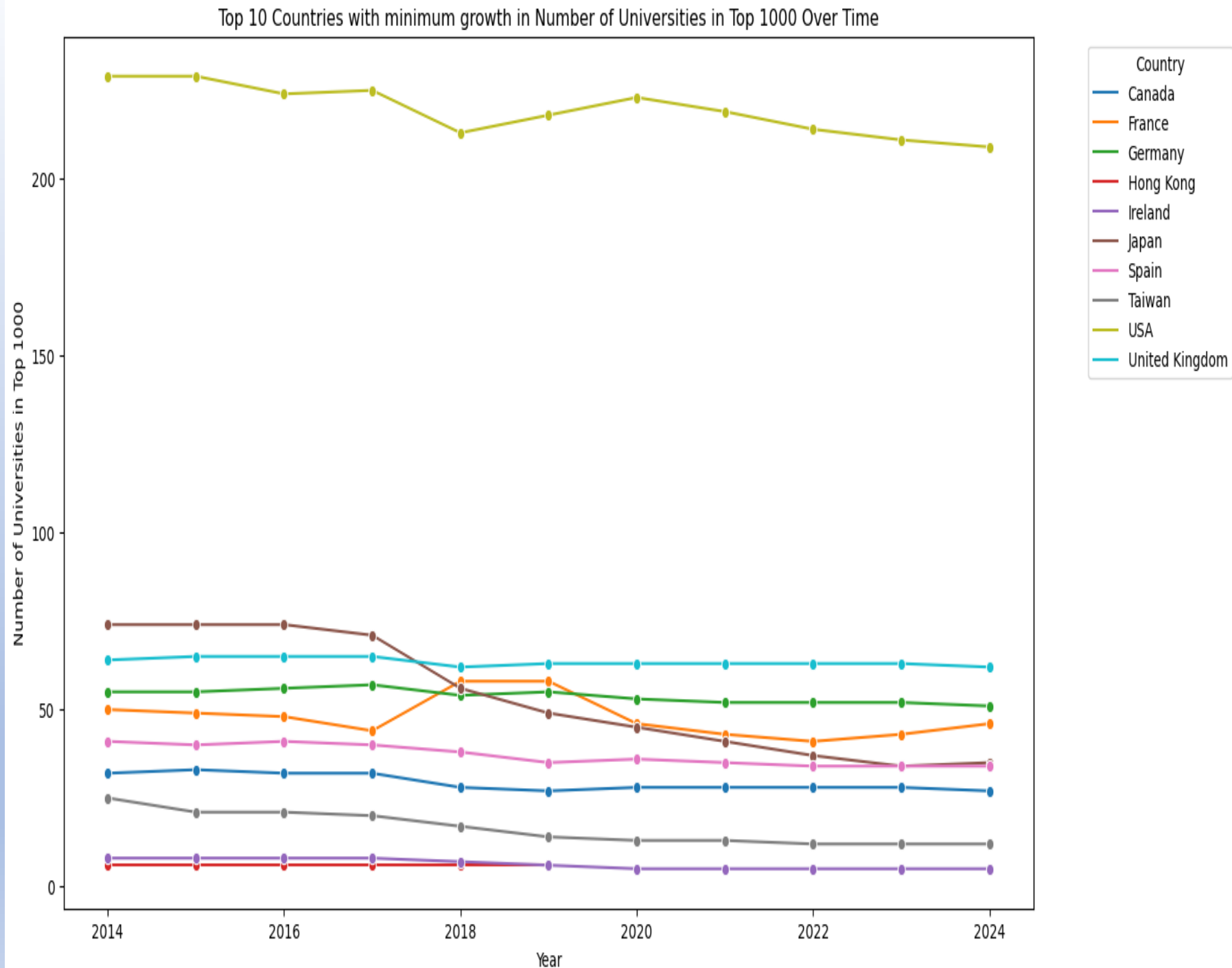9 of 10 universities are in the developing countries

Top 10 Growing Countries in Number of Universities in Top 1000 Over Time
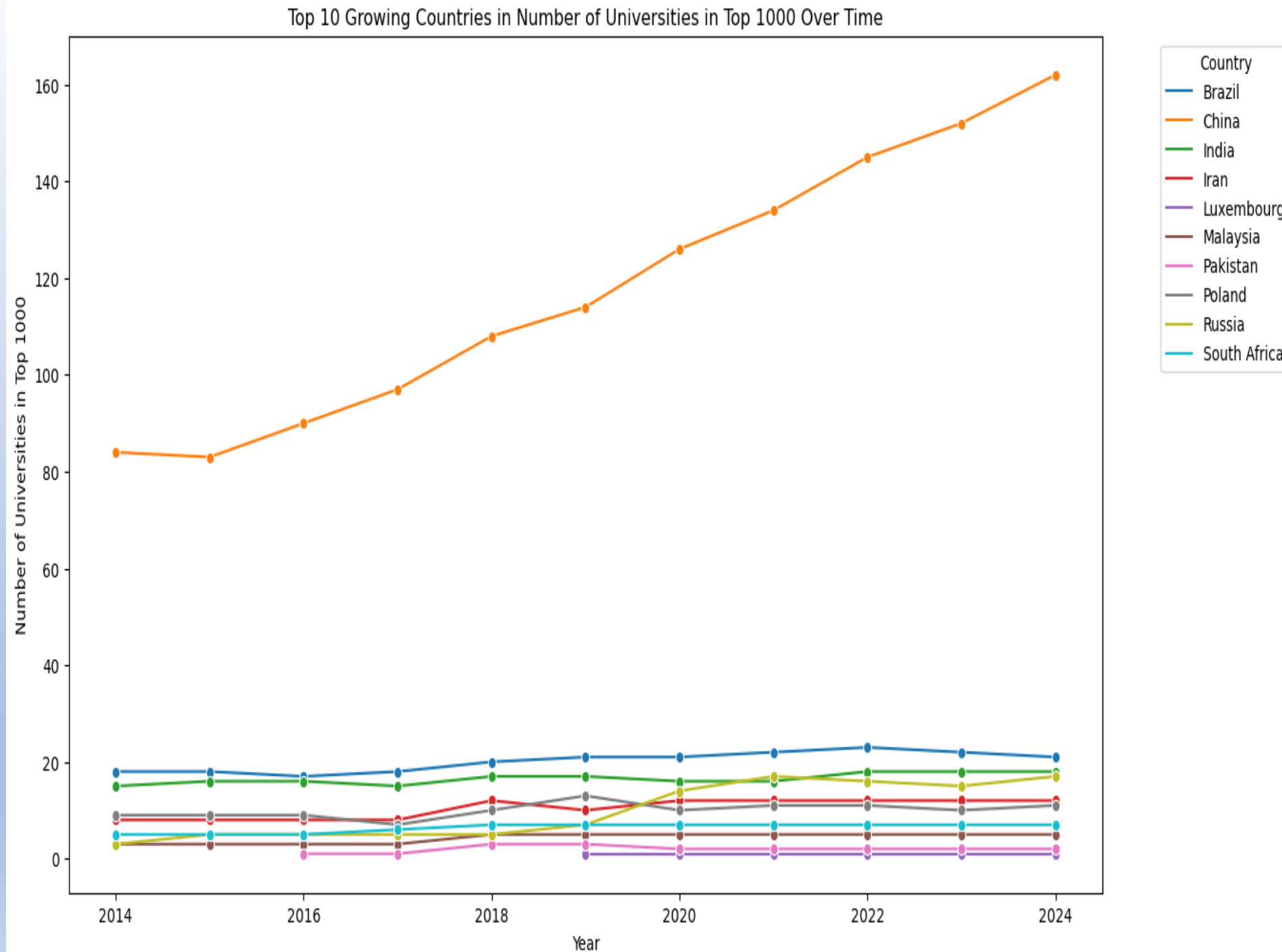
The USA
shows minimal growth.

Japan's
decline and lack of growth
are evident.

All top universities are
in developed countries

Top 10 Countries with minimum growth in Number of Universities in Top 1000 Over Time

Conclusions

- **Research and Faculty Quality as Key Factors in Global University Rankings**

  ➢ Research and Faculty Quality Boost Global Rankings

  ➢ Top Universities Lead in Research and Faculty

  ➢ Employability and National RANK Play Smaller Roles in Rankings

Hypothesis :1- Research and employability ranks are the primary elements of global university rankings.

√   ✕

Conclusions

• **Dynamic Shifts in Top University Rankings**

  ➢ Minimal changes in the top 5 university rankings.

  ➢ Positions 6 to 20 Show Intense Competition.

  ➢ Global Rankings Show Stability at the Top universities.

  √ Hypothesis : 2- The rankings of the world's top universities are relatively stable and exhibit minimal change over time.

Conclusions

- **Developing Countries Boost Growth in University Rankings**

  Universities in developing nations are climbing rapidly in global rankings, with countries like China, Malaysia, and Iran leading the way.

- **Stability and Decline Among Developed Nations Signal Regional Shifts in Academic Influence**
- While developed countries like the USA and UK maintain stable rankings, Japan shows a decline, indicating a shift in regional influence as rising economies continue to gain ground.

√ Hypothesis : 3- Universities in developing countries, unlike those in developed countries, are showing an upward trend in global rankings.

Future Directions

- **Expand Ranking Analysis**
  - Compare multiple ranking systems - THE (Times Higher Education World University Rankings), QS(Quacquarelli Symonds World University Rankings), ARWU(or Shanghai Rankings) - to identify patterns and provide a more comprehensive view of university performance.

- **Examine Economic and Institutional Factors**
  - Investigate the impact of factors how GDP(Gross domestic product) , education spending, and research funding on rankings.

- **University Type Matters: Public vs. Private and Research vs. Teaching Institutions**
  - Analyze how different types of universities perform in global rankings.
  - Public and Private Institutions May Influence Different Ranking Metrics.
  - Research-Focused and Teaching-Focused Universities May Influence Rankings in Distinct Ways