

บทที่ 2

วิทยาศาสตร์และเทคโนโลยี

1. นิยามและความหมายของวิทยาศาสตร์ และ เทคโนโลยี
2. ประวัติศาสตร์และวิวัฒนาการของวิทยาศาสตร์และเทคโนโลยี
3. สถานภาพของวิทยาศาสตร์ และ เทคโนโลยีของประเทศไทย
4. อนาคตของวิทยาศาสตร์ และ เทคโนโลยีของประเทศไทยกับ
ความเจริญก้าวหน้าของชาติ

อันดับความสามารถในการแข่งขันของประเทศไทย

สถาบันนานาชาติที่ทำหน้าที่ในการจัด
อันดับความสามารถในการแข่งขันของประเทศต่าง ๆ

International Institute for
Management Development (IMD)

(67 ประเทศ : ปี 2567)

World Economic Forum (WEF)

(141 ประเทศ : ปี 2562)

World bank (183 ประเทศ : ปี 2553)



International Institute for Management Development (IMD)

สำนักงานใหญ่ อยู่ที่เมืองโลซานน์
ประเทศสวิตเซอร์แลนด์

จัดทำ **The World Competitiveness
Yearbook (WCY)**

**IMD
World
Competitiveness
Booklet
2023**



IMD / World Competitiveness
Center



Computing the Rankings

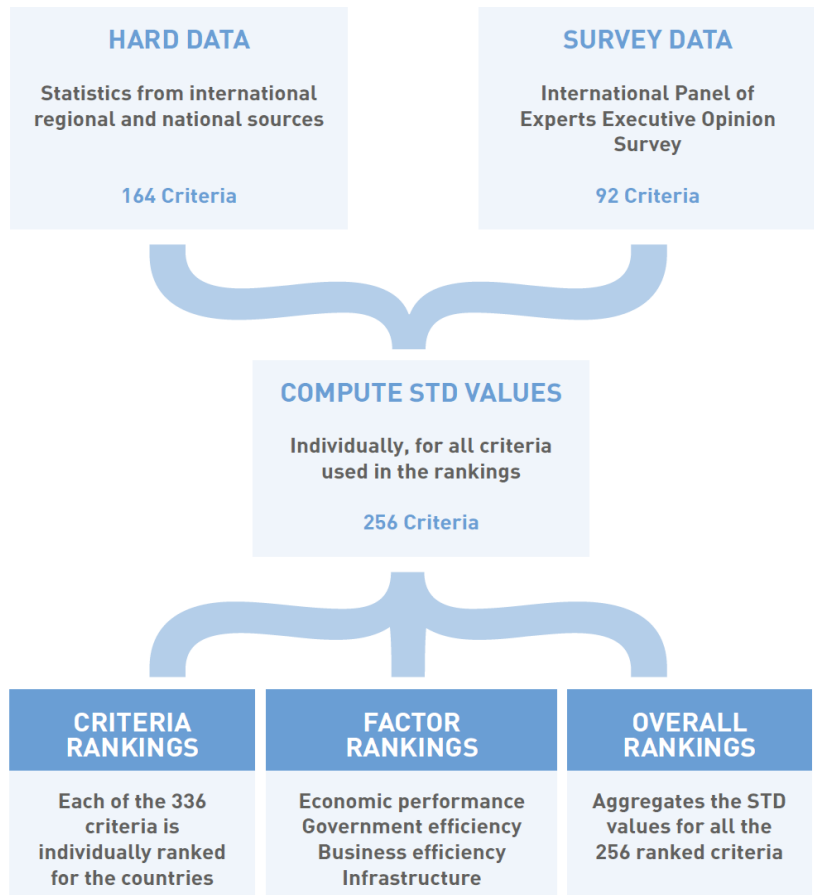
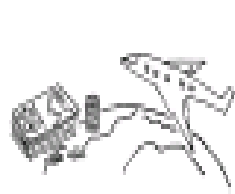


TABLE 2 • The Breakdown of Competitiveness Factors



Economic Performance

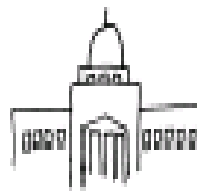
Domestic Economy

International Trade

International
Investment

Employment

Prices



**Government
Efficiency**

Public Finance

Fiscal Policy

Institutional Framework

Business Legislation

Societal Framework



Business Efficiency

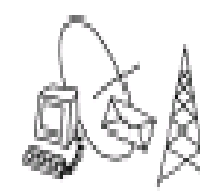
Productivity

Labor Market

Finance

Management Practices

Attitudes and Values



Infrastructure

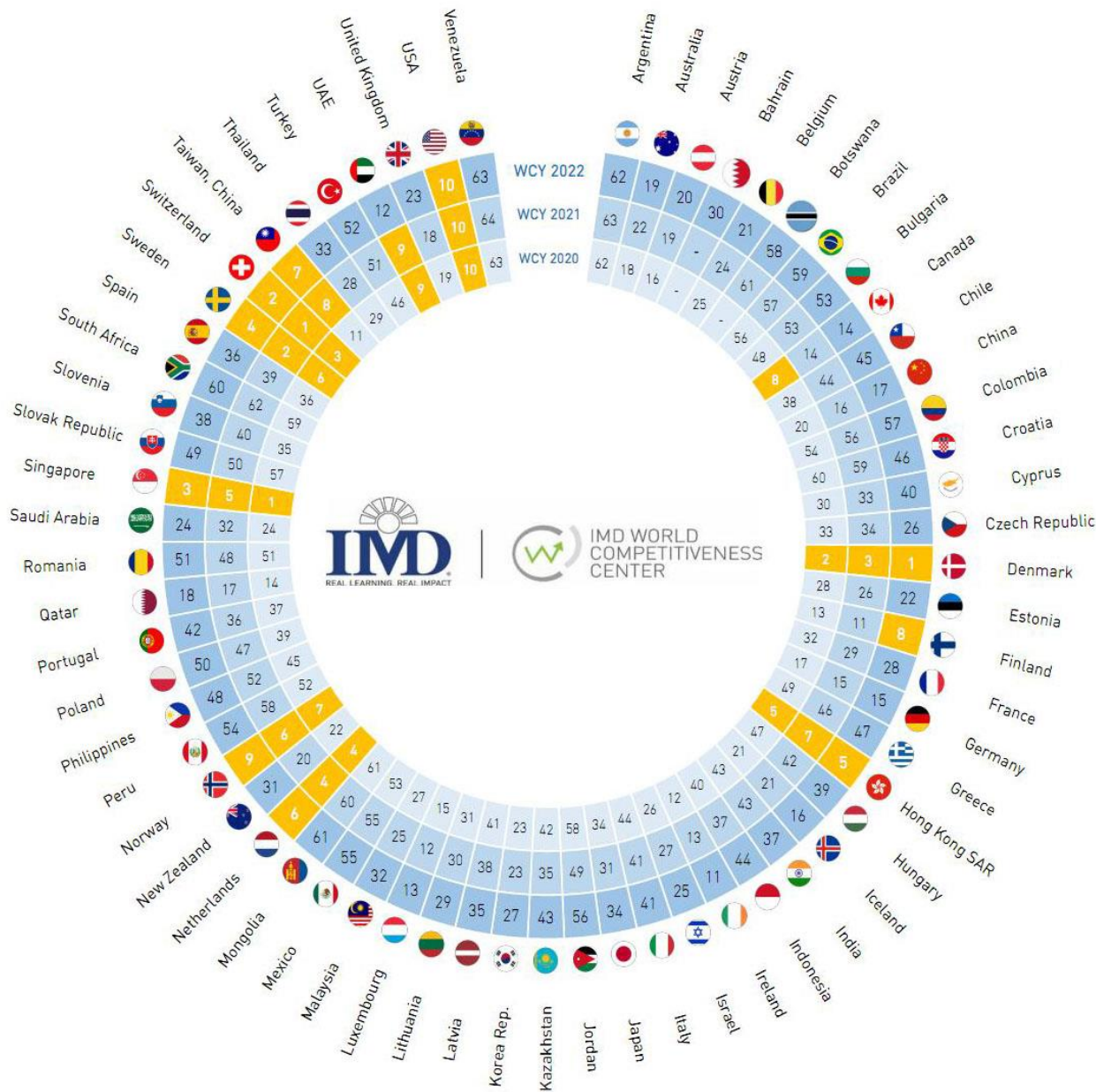
Basic Infrastructure

Technological
Infrastructure

Scientific Infrastructure

Health and Environment

Education



อันดับ
ความสามารถ
ในการแข่งขัน
ของประเทศ
ต่าง ๆ
ที่จัดโดย IMD
ประจำปี 2565

ที่มา : IMD 2022

อันดับความสามารถในการแข่งขันของประเทศต่าง ๆ ที่จัดโดย IMD ประจำปี 2566

1	Denmark
2	Ireland
3	Switzerland
4	Singapore
5	Netherlands
6	Taiwan, China
7	Hong Kong SAR
8	Sweden
9	USA
10	UAE
11	Finland
12	Qatar
13	Belgium
14	Norway
15	Canada
16	Iceland
17	Saudi Arabia
18	Czech Republic
19	Australia
20	Luxembourg
21	China
22	Germany

23	Israel
24	Austria
25	Bahrain
26	Estonia
27	Malaysia
28	Korea Rep.
29	United Kingdom
30	Thailand
31	New Zealand
32	Lithuania
33	France
34	Indonesia
35	Japan
36	Spain
37	Kazakhstan
38	Kuwait
39	Portugal
40	India
41	Italy
42	Slovenia
43	Poland
44	Chile

45	Cyprus
46	Hungary
47	Turkey
48	Romania
49	Greece
50	Croatia
51	Latvia
52	Philippines
53	Slovak Republic
54	Jordan
55	Peru
56	Mexico
57	Bulgaria
58	Colombia
59	Botswana
60	Brazil
61	South Africa
62	Mongolia
63	Argentina
64	Venezuela

อันดับความสามารถในการแข่งขันของประเทศต่าง ๆ ที่จัดโดย IMD ประจำปี 2567

2024 COMPETITIVENESS RANKING

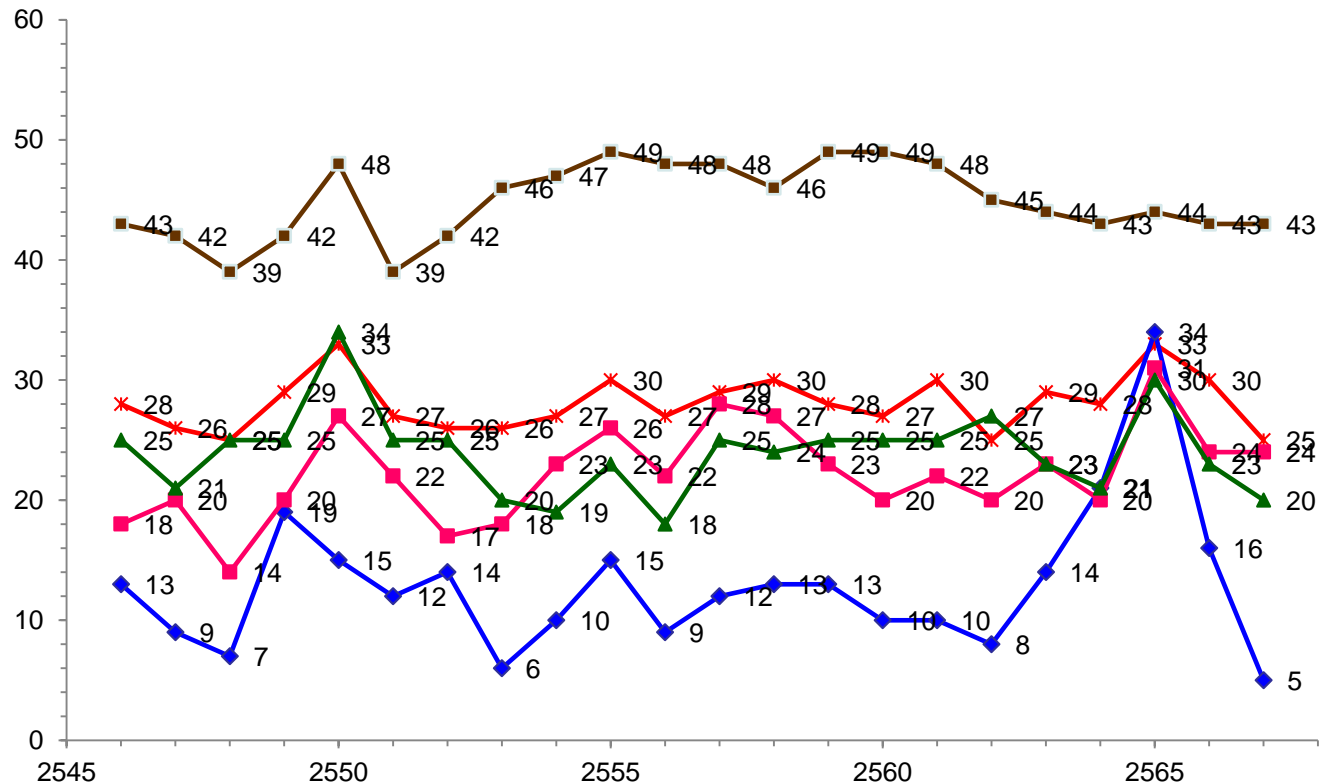
		Score	
01	Singapore	100.00	↗ 3
02	Switzerland	97.66	↗ 1
03	Denmark	97.07	↗ 2
04	Ireland	91.86	↗ 2
05	Hong Kong SAR	91.49	↗ 2
06	Sweden	90.30	↗ 2
07	UAE	89.75	↗ 3
08	Taiwan (Chinese Taipei)	88.90	↗ 2
09	Netherlands	86.94	↗ 4
10	Norway	86.22	↗ 4
11	Qatar	85.33	↗ 1
12	USA	83.48	↗ 3
13	Australia	81.66	↗ 6
14	China	81.04	↗ 7
15	Finland	80.26	↗ 4
16	Saudi Arabia	79.83	↗ 1
17	Iceland	76.93	↗ 1
18	Belgium	77.87	↗ 5
19	Canada	77.69	↗ 4
20	Korea Rep.	76.92	↗ 8
21	Bahrain	75.27	↗ 4
22	Israel	74.98	↗ 1
23	Luxembourg	73.70	↗ 3
24	Germany	72.74	↗ 2
25	Thailand	72.61	↗ 5
26	Austria	72.13	↗ 2
27	Indonesia	71.62	↗ 7
28	United Kingdom	70.82	↗ 1
29	Czech Republic	70.21	↗ 11
30	Lithuania	69.89	↗ 2

31	France	69.67	↗ 2
32	New Zealand	68.18	↗ 1
33	Estonia	68.17	↗ 7
34	Malaysia	68.13	↗ 7
35	Kazakhstan	68.03	↗ 2
36	Portugal	66.16	↗ 3
37	Kuwait	65.03	↗ 1
38	Japan	64.98	↗ 3
39	India	62.88	↗ 1
40	Spain	62.78	↗ 4
41	Poland	61.65	↗ 2
42	Italy	61.43	↗ 1
43	Cyprus	60.95	↗ 2
44	Chile	59.71	-
45	Latvia	59.13	↗ 6
46	Slovenia	57.99	↗ 4
47	Greece	56.83	↗ 2
48	Jordan	55.51	↗ 6
49	Puerto Rico	54.85	-
50	Romania	53.47	↗ 2
51	Croatia	52.83	↗ 1
52	Philippines	52.64	-
53	Turkey	52.39	↗ 6
54	Hungary	52.10	↗ 8
55	Botswana	50.31	↗ 4
56	Mexico	49.88	-
57	Colombia	47.37	↗ 1
58	Bulgaria	47.35	↗ 1
59	Slovak Republic	46.94	↗ 6
60	South Africa	46.33	↗ 1
61	Mongolia	46.30	↗ 1
62	Brazil	43.77	↗ 2
63	Peru	43.44	↗ 8
64	Nigeria	39.81	-
65	Ghana	39.25	-
66	Argentina	35.89	↗ 3
67	Venezuela	28.85	↗ 3

ที่มา : IMD 2024

อันดับความสามารถในการแข่งขันของประเทศไทย

ปี 2546 - 2567



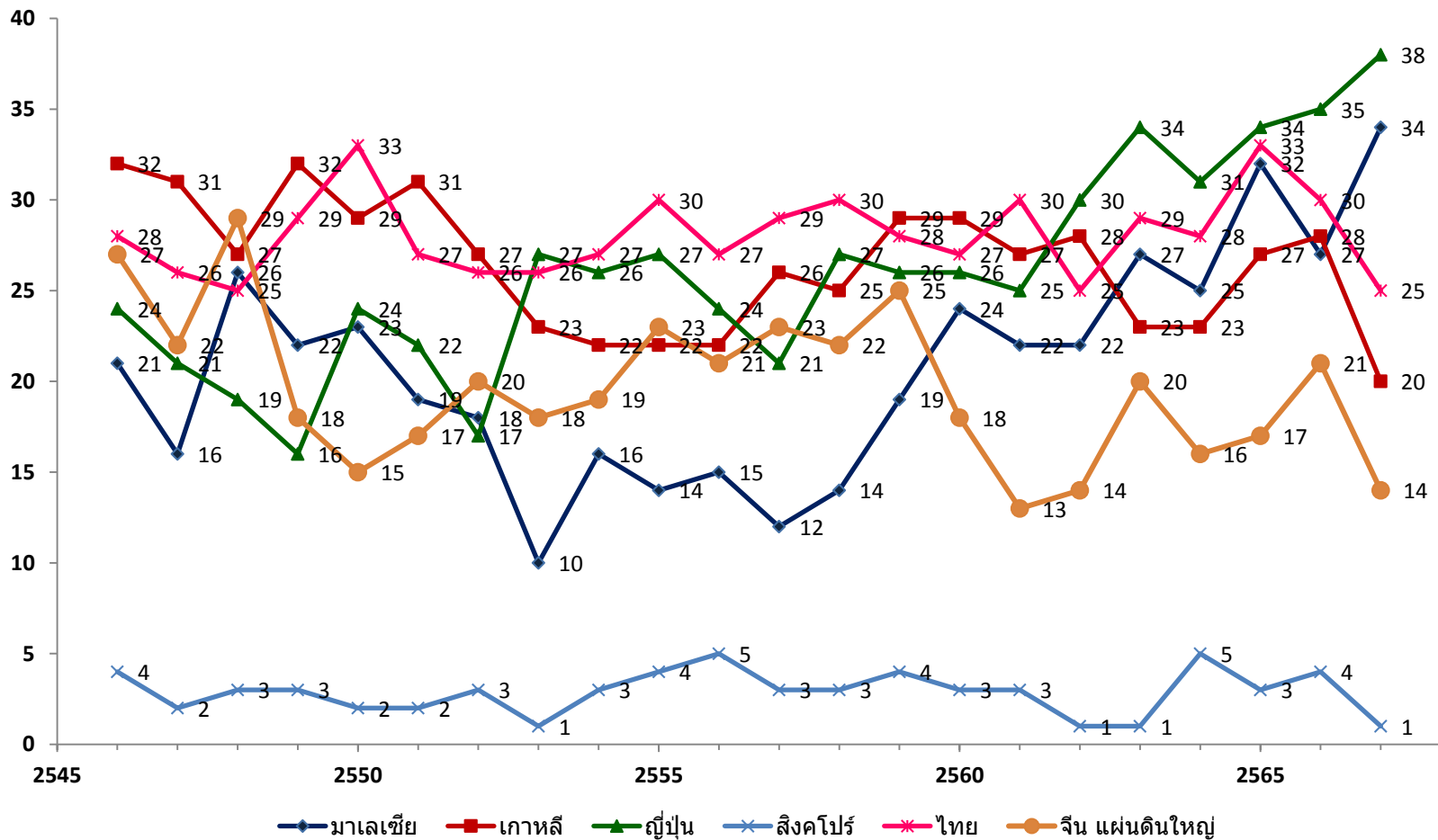
2546-48 : 51 ประเทศ 2549-50 : 53 ประเทศ 2551 : 55 ประเทศ, 2552 : 57 ประเทศ
 2553-54 : 58 ประเทศ 2555 : 59 ประเทศ 2556-57 : 60 ประเทศ 2558-59 : 61 ประเทศ
 2560-63, 65 : 63 ประเทศ 2564, 66 : 64 ประเทศ 2567 : 67 ประเทศ

อันดับความสามารถในการแข่งขันของประเทศไทยจำแนกตามปัจจัยหลัก โดย IMD ปี 2546 - 2567

	ปัจจัยหลัก				อันดับ โดยรวม	จำนวน ประเทศ
	สมรรถนะทางเศรษฐกิจ	ประสิทธิภาพของภาครัฐ	ประสิทธิภาพของภาคธุรกิจ	โครงสร้างพื้นฐาน		
2546	13	18	25	43	28	51
2547	9	20	21	42	26	51
2548	7	14	25	39	25	51
2549	19	20	25	42	29	53
2550	15	27	34	48	33	55
2551	12	22	25	39	27	55
2552	14	17	25	42	26	57
2553	6	18	20	46	26	58
2554	10	23	19	47	27	59
2555	15	26	23	49	30	59
2556	9	22	18	48	27	60
2557	12	28	25	48	29	60
2558	13	27	24	46	30	61
2559	13	23	25	49	28	61
2560	10	20	25	49	27	63
2561	10	22	25	48	30	63
2562	8	20	27	45	25	63
2563	14	23	23	44	29	63
2564	21	20	21	43	28	64
2565	34	31	30	44	33	63
2566	16	24	23	43	30	64
2567	5	24	20	43	25	67

อันดับความสามารถในการแข่งขันของประเทศต่าง ๆ

โดยรวม ปี 2546 - 2567



ที่มา : IMD

THAILAND

CHALLENGES IN 2023

- Rising cost of living and unbalanced growth.
- Political uncertainty following the General Election 2023.
- Handling of geopolitical risks.
- Awareness and capability to cope with cyber security threats.
- Insufficient skilled labor in the service sectors.

SINGAPORE

CHALLENGES IN 2023

- Navigate the challenges posed by the slowing global economy amidst tightening financial conditions and rising protectionism.
- Help businesses and households cope with elevated costs and inflationary pressures.
- Ensure that businesses and workers continue to upgrade their capabilities for Singapore to stay competitive and seize new opportunities.

MALAYSIA

CHALLENGES IN 2023

- Strengthen talent development through Demand-Driven Labor Market model to ensure industry-ready workforce.
- Embrace a digital-first mindset and enhance digital technology across various sectors.
- Boost productivity and competitiveness through regulatory reforms for ease of doing business at national and sub-national levels.
- Enhance environmentally sustainable development for better quality of life.

THAILAND

CHALLENGES IN 2024

- Continued rising cost of living and concern over household debt.
- Capability to capture value from the emergence of generative AI.
- SMEs' awareness of and ability to handle international regulations on low carbon footprint.
- Handling of geopolitical risks.
- Awareness of and capability to cope with cybersecurity threats.

SINGAPORE

CHALLENGES IN 2024

- Navigate challenges posed by an uncertain external environment amidst heightened geopolitical tensions.
- Enhance Singapore's economic competitiveness amidst resource constraints.
- Seize opportunities and manage disruptions from new technologies, such as Artificial Intelligence, by supporting workers in reskilling and businesses in transformation.

MALAYSIA

CHALLENGES IN 2024

- Increase investment in R&D to boost business resilience.
- Optimise the labour market to maximise workforce productivity.
- Update policies and regulations to improve global competitiveness.
- Leverage advanced technologies to accelerate productivity growth.
- Mitigate increasing costs through strategic productivity enhancements.

CHINA - MAINLAND

CHALLENGES IN 2023

- Maintain stable economic growth and increase employment.
- Expand domestic demand through effective investment and by boosting consumption.
- Promote in-depth integration of digital and real economy to facilitate high-quality development.
- Deepen reform and open up to boost market vitality.
- Enhance doing business environment and restore confidence in the private economy.

KOREA

CHALLENGES IN 2023

- Boost export performance in the face of a global economic slowdown.
- Internalize the cost increase resulting from efforts to restore and diversify the supply chain.
- While pursuing fiscal soundness, strengthen safety nets for vulnerable groups and struggling businesses.
- Enhance global policy coordination with like-minded countries.
- Provide support for startups to ensure their growth is not hindered by liquidity constraints.

JAPAN

CHALLENGES IN 2023

- Activate a new form of capitalism.
- Promote focused investment such as in human capital, Generation X, and digital experience.
- Incorporate the resolution of social issues into the growth strategy.
- Strengthen diplomacy and economic, energy and food security.
- Put public finances on a sound footing.

CHINA - MAINLAND

CHALLENGES IN 2024

- Mitigate negative impacts of global economic slowdown.
- Stabilize employment and boost household income.
- Deepen reforms and open up to boost market vitality.
- Resolve local debt governmental risk to enhance fiscal sustainability.
- Stimulate innovation to drive high-quality development.

KOREA

CHALLENGES IN 2024

- Maintaining a competitive advantage in the high tech sector.
- Securing the government's financial stability.
- Sustaining supply chain stabilization and diversification.
- Enhancing the resilience to external economic shocks.
- Continuing efforts to stabilize inflation.

JAPAN

CHALLENGES IN 2024

- Boost productivity by investing in people, startups, and innovation.
- Promote labor market reforms via reskilling, career flexibility, and mobility.
- Address the issue of a shrinking and ageing population.
- Rebuild fiscal buffers and strengthen the fiscal framework.
- Transition towards a Green Economy.

What is the IMD World Digital Competitiveness Ranking?

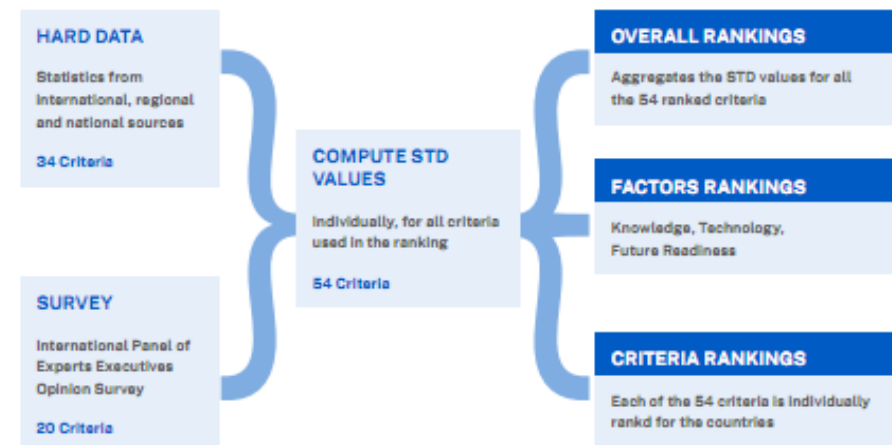
IMD World Digital Competitiveness Ranking 2023



Digital Competitiveness Factors and Sub-factors



Computing the Rankings



ที่มา : IMD 2023

Background Statistics

0.0.1 [B]	Exchange Rate National currency per US\$ (average)
0.0.2 [B]	Population - market size Estimates in millions
0.0.3 [B]	GDP per capita US\$ per capita

Factor I: Knowledge

1.1 Talent

1.1.1	Educational assessment PISA - Math PISA survey of 15-year olds
1.1.2 [S]	International experience International experience of senior managers is generally significant
1.1.3 [S]	Foreign highly-skilled personnel Foreign highly-skilled personnel are attracted to your country's business environment
1.1.4 [S]	Management of cities Management of cities supports business development
1.1.5 [S]	Digital/Technological skills Digital/Technological skills are readily available
1.1.6	Net flow of international students Tertiary-level international students inbound minus students outbound (per 1000 people)

1.2 Training & education

1.2.1 [S]	Employee training Employee training is a high priority in companies
1.2.2	Total public expenditure on education Percentage of GDP
1.2.3	Higher education achievement Percentage of population that has attained at least tertiary education for persons 25-34
1.2.4	Pupil-teacher ratio (tertiary education) Number of pupils per teacher
1.2.5	Graduates in Sciences % of graduates in ICT, Engineering, Math & Natural Sciences
1.2.6	Women with degrees Share of women who have a degree in the population 25-65

1.3 Scientific concentration

1.3.1	Total expenditure on R&D (%) Percentage of GDP
1.3.2	Total R&D personnel per capita Full-time work equivalent (FTE) per 1000 people
1.3.3	Female researchers % of total (headcount FT&PT)
1.3.4	R&D productivity by publication No. of scientific articles over R&D expenditure (as % GDP)
1.3.5	Scientific and technical employment % of total employment
1.3.6	High-tech patent grants % of all patents granted by applicant's origin (average 2017-2019)
1.3.7	Robots in Education and R&D number of robots

Factor II: Technology

2.1 Regulatory framework

2.1.1	Starting a business Distance to Frontier
2.1.2	Enforcing contracts Distance to Frontier
2.1.3 [S]	Immigration laws Immigration laws do not prevent your company from employing foreign labor
2.1.4 [S]	Development & application of technology Development and application of technology are supported by the legal environment
2.1.5 [S]	Scientific research legislation Laws relating to scientific research do encourage innovation
2.1.6 [S]	Intellectual property rights Intellectual property rights are adequately enforced

2.2 Capital

2.2.1	IT & media stock market capitalization % of total stock market capitalization
2.2.2 [S]	Funding for technological development Funding for technological development is readily available
2.2.3 [S]	Banking and financial services Banking and financial services do support business activities efficiently
2.2.4	Country credit rating Index (0-60) of three country credit ratings: Fitch, Moody's and S&P
2.2.5 [S]	Venture capital Venture capital is easily available for business
2.2.6	Investment in Telecommunications Percentage of GDP

2.3 Technological framework

2.3.1 [S]	Communications technology Communications technology (voice and data) meets business requirements
2.3.2	Mobile Broadband subscribers 4G & 5G market, % of mobile market
2.3.3	Wireless broadband Penetration rate (per 100 people)
2.3.4	Internet users Number of internet users per 1000 people
2.3.5	Internet bandwidth speed Average speed
2.3.6	High-tech exports (%) Percentage of GDP

Factor III: Future Readiness

3.1 Adaptive attitudes

3.1.1	E-Participation Use of online services that facilitate public's interaction with government
3.1.2	Internet retailing US\$ Per '000 People
3.1.3	Tablet possession % households
3.1.4	Smartphone possession % households
3.1.5 [S]	Attitudes toward globalization Attitudes toward globalization are generally positive in your society

3.2 Business agility

3.2.1 [S]	Opportunities and threats Companies are very good at responding quickly to opportunities and threats
3.2.2	World robots distribution Percentage share of world robots
3.2.3 [S]	Agility of companies Companies are agile
3.2.4 [S]	Use of big data and analytics Companies are very good at using big data and analytics to support decision-making
3.2.5 [S]	Knowledge transfer Knowledge transfer is highly developed between companies and universities
3.2.6	Entrepreneurial fear of failure % indicating that fear of failure would prevent them from setting up a business

3.3 IT integration

3.3.1	E-Government Provision of online government services to promote access and inclusion of citizens
3.3.2 [S]	Public-private partnerships Public and private sector ventures are supporting technological development
3.3.3 [S]	Cyber security Cyber security is being adequately addressed by corporations
3.3.4	Software piracy % of unlicensed software installation
3.3.5	Government cyber security capacity The government's capability to mitigate harm from cyber security threats
3.3.6	Privacy protection by law content Extent of the legal framework to protect Internet users' privacy

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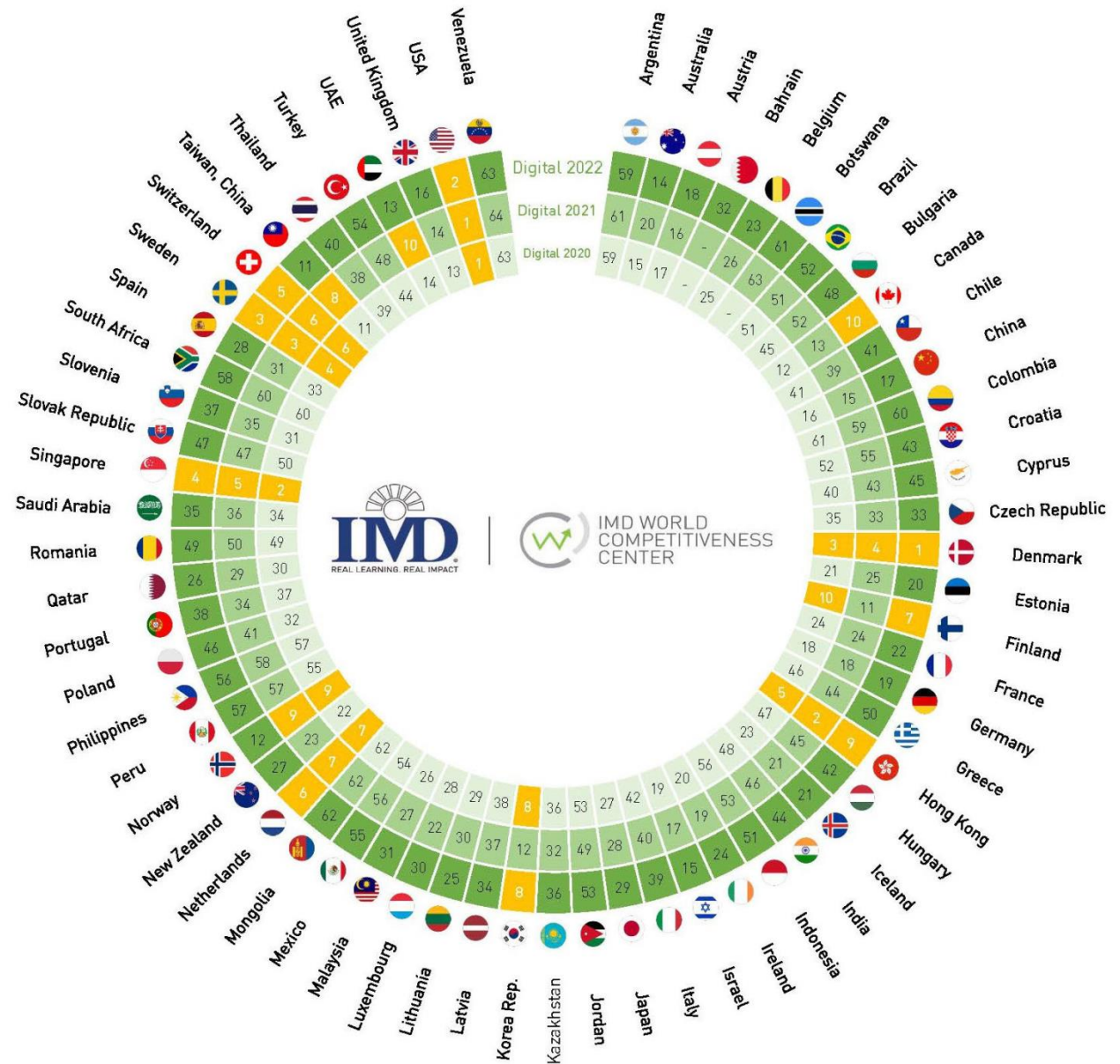
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Digital Competitiveness Ranking 2020, 2021, 2022



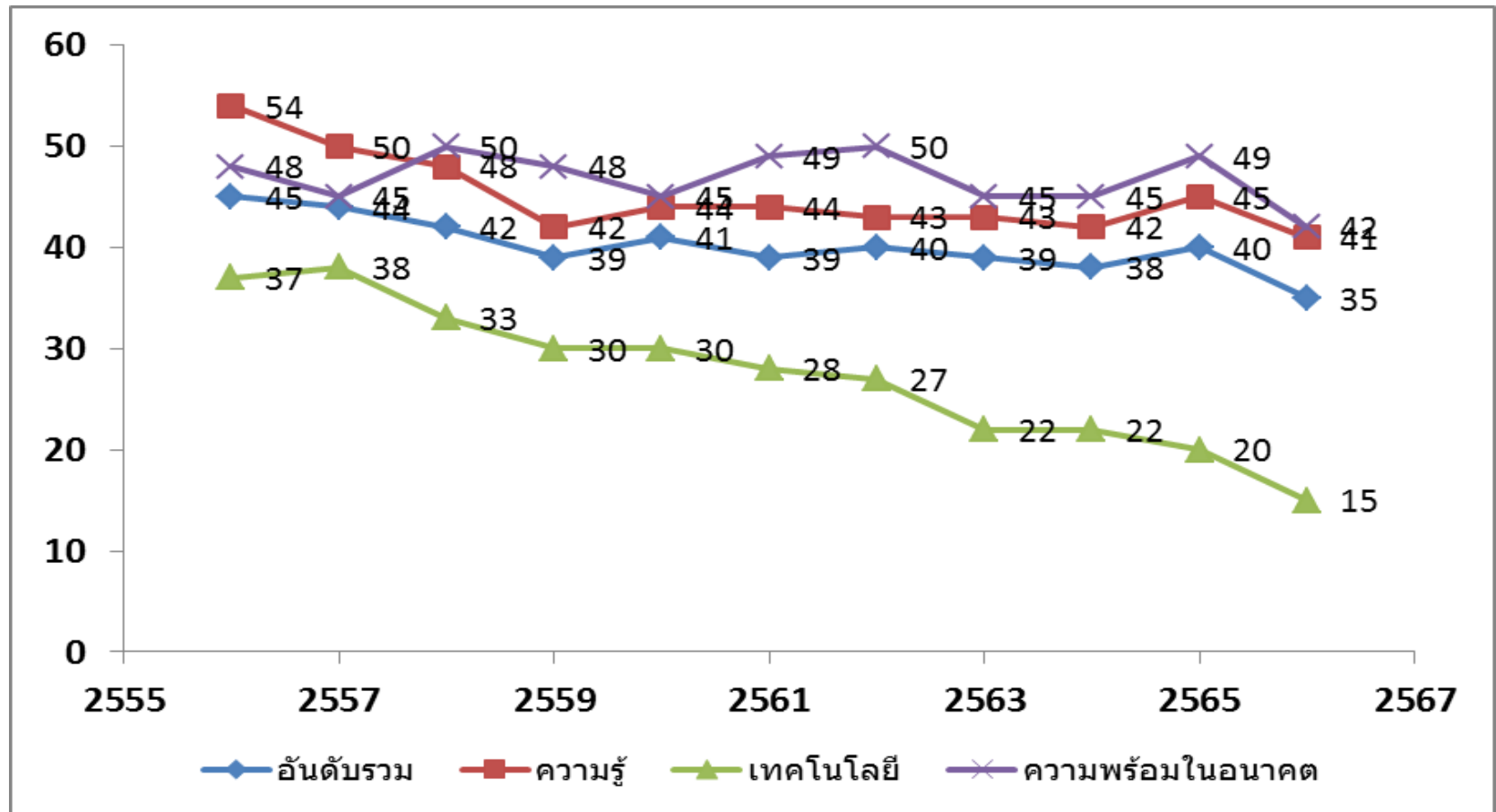
ที่มา : IMD 2022

Digital Competitiveness Ranking 2023

			Score		
01	USA	<div></div>	100.00	↗	1
02	Netherlands	<div></div>	98.10	↗	4
03	Singapore	<div></div>	97.40	↗	1
04	Denmark	<div></div>	96.93	↘	3
05	Switzerland	<div></div>	96.24	-	
06	Korea Rep.	<div></div>	94.80	↗	2
07	Sweden	<div></div>	94.12	↘	4
08	Finland	<div></div>	94.05	↘	1
09	Taiwan, China	<div></div>	93.73	↗	2
10	Hong Kong SAR	<div></div>	93.64	↘	1
11	Canada	<div></div>	91.98	↘	1
12	UAE	<div></div>	88.86	↗	1
13	Israel	<div></div>	87.70	↗	2
14	Norway	<div></div>	85.96	↘	2
15	Belgium	<div></div>	85.95	↗	8
16	Australia	<div></div>	85.28	↘	2
17	Iceland	<div></div>	84.94	↗	4
18	Estonia	<div></div>	84.77	↗	2
19	China	<div></div>	84.41	↘	2
20	United Kingdom	<div></div>	83.12	↘	4
21	Ireland	<div></div>	81.48	↗	3
22	Austria	<div></div>	81.10	↘	4
23	Germany	<div></div>	80.86	↘	4
24	Czech Republic	<div></div>	79.42	↗	9
25	New Zealand	<div></div>	79.08	↗	2
26	Luxembourg	<div></div>	78.73	↗	4
27	France	<div></div>	78.65	↘	5
28	Lithuania	<div></div>	77.23	↘	3
29	Qatar	<div></div>	77.01	↘	3
30	Saudi Arabia	<div></div>	76.99	↗	5

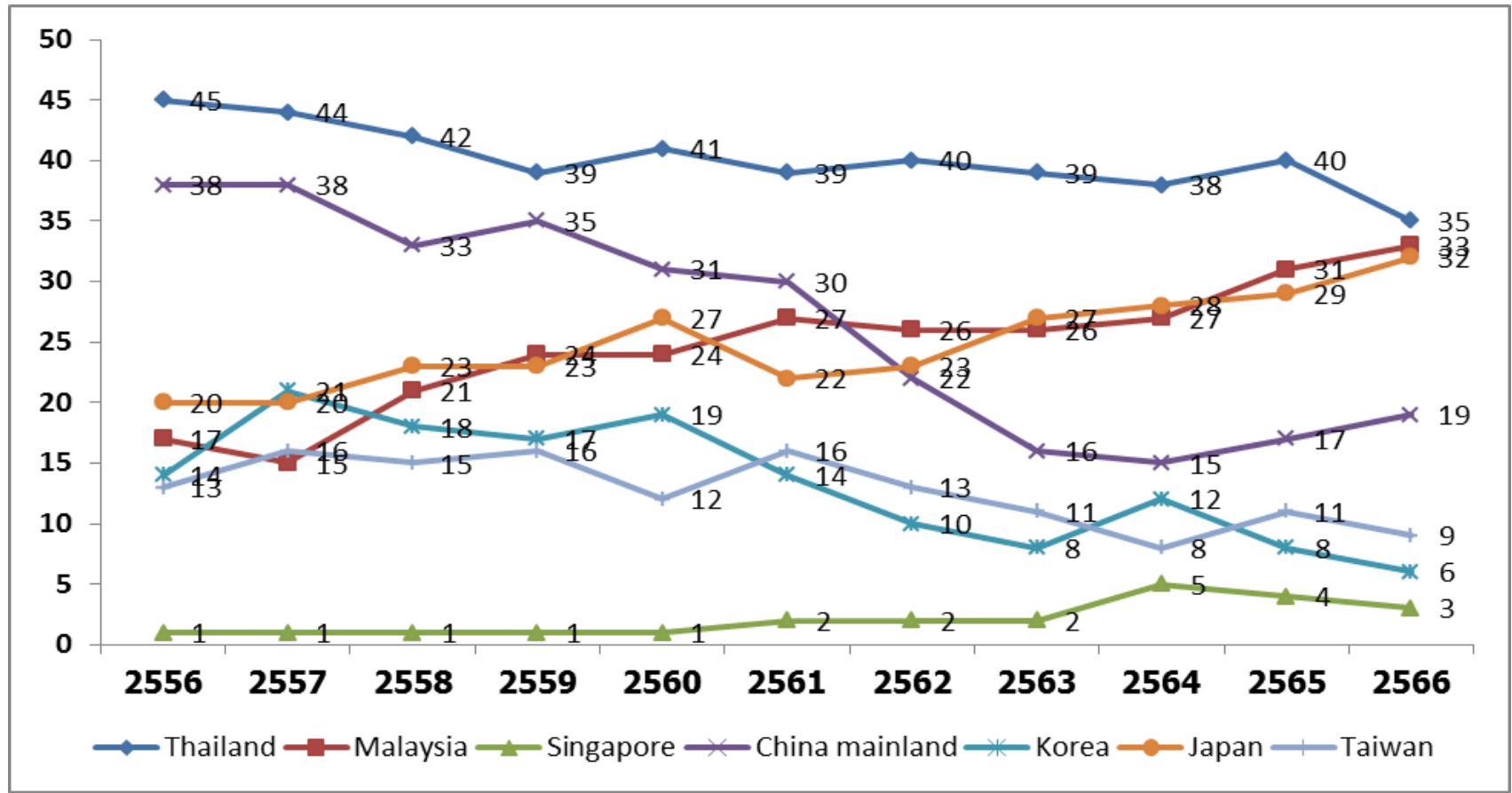
			Score		
31	Spain	<div></div>	76.62	↘	3
32	Japan	<div></div>	75.43	↘	3
33	Malaysia	<div></div>	75.31	↘	2
34	Kazakhstan	<div></div>	71.84	↗	2
35	Thailand	<div></div>	70.53	↗	5
36	Portugal	<div></div>	69.78	↗	2
37	Slovenia	<div></div>	69.14	-	
38	Bahrain	<div></div>	69.06	↘	6
39	Poland	<div></div>	66.53	↗	7
40	Latvia	<div></div>	66.36	↘	6
41	Kuwait	<div></div>	65.14	-	
42	Chile	<div></div>	64.84	↘	1
43	Italy	<div></div>	64.39	↘	4
44	Croatia	<div></div>	62.01	↘	1
45	Indonesia	<div></div>	60.36	↗	6
46	Slovak Republic	<div></div>	58.31	↗	1
47	Hungary	<div></div>	58.25	↘	5
48	Romania	<div></div>	58.25	↗	1
49	India	<div></div>	57.74	↘	5
50	Jordan	<div></div>	56.88	↗	3
51	Cyprus	<div></div>	54.77	↘	6
52	Greece	<div></div>	54.70	↘	2
53	Turkey	<div></div>	54.27	↗	1
54	Mexico	<div></div>	51.26	↗	1
55	Bulgaria	<div></div>	50.66	↘	7
56	Peru	<div></div>	50.17	↗	1
57	Brazil	<div></div>	49.70	↘	5
58	South Africa	<div></div>	48.61	-	
59	Philippines	<div></div>	48.31	↘	3
60	Botswana	<div></div>	47.51	↗	1
61	Argentina	<div></div>	46.33	↘	2
62	Colombia	<div></div>	45.09	↘	2
63	Mongolia	<div></div>	43.03	↘	1
64	Venezuela	<div></div>	22.55	↘	1

อันดับความสามารถในการแข่งขันทางดิจิทัล ของประเทศไทย ปี 2556-2566



ที่มา : IMD

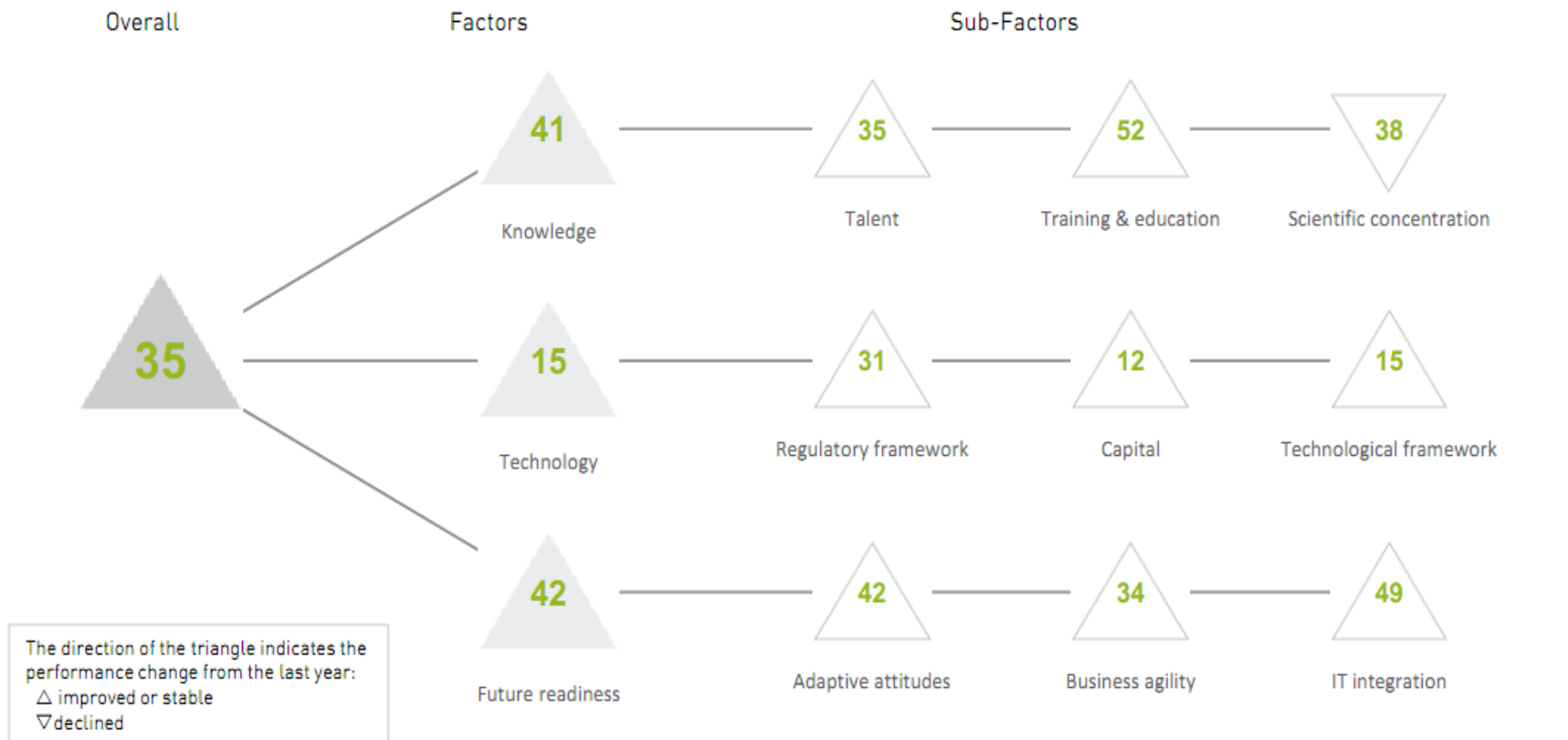
อันดับความสามารถในการแข่งขันทางดิจิทัล ของประเทศต่างๆ ปี 2556-2566



ที่มา : IMD

THAILAND

OVERALL PERFORMANCE [64 countries]



ที่มา : IMD 2023

THAILAND

2022

- Overall Top Strengths
- ▷ Overall Top Weaknesses

KNOWLEDGE

Sub-Factors	2018	2019	2020	2021	2022
Talent	42	40	36	39	37
Training & education	44	50	55	56	57
Scientific concentration	45	35	37	36	36

Talent	Rank
Educational assessment PISA - Math	46
International experience	19
Foreign highly-skilled personnel	25
Management of cities	29
Digital/Technological skills	45
Net flow of international students	40

Training & education	Rank
Employee training	20
Total public expenditure on education	50
Higher education achievement	45
▷ Pupil-teacher ratio (tertiary education)	55
Graduates in Sciences	37
Women with degrees	48

Scientific concentration	Rank
Total expenditure on R&D (%)	33
Total R&D personnel per capita	39
► Female researchers	06
R&D productivity by publication	30
▷ Scientific and technical employment	55
High-tech patent grants	31
Robots in Education and R&D	17

TECHNOLOGY

Sub-Factors	2018	2019	2020	2021	2022
Regulatory framework	34	33	31	29	34
Capital	28	21	17	19	20
Technological framework	23	29	25	22	18

Regulatory framework	Rank
Starting a business	26
Enforcing contracts	28
Immigration laws	32
Development & application of tech.	39
Scientific research legislation	39
Intellectual property rights	43

Capital	Rank
IT & media stock market capitalization	17
Funding for technological development	40
Banking and financial services	23
Country credit rating	41
Venture capital	32
► Investment in Telecommunications	07

Technological framework	Rank
Communications technology	15
Mobile Broadband subscribers	25
Wireless broadband	27
Internet users	44
► Internet bandwidth speed	14
► High-tech exports (%)	11

FUTURE READINESS

Sub-Factors	2018	2019	2020	2021	2022
Adaptive attitudes	55	58	53	53	52
Business agility	34	30	44	34	41
IT integration	55	51	43	43	50

Adaptive attitudes	Rank
E-Participation	40
Internet retailing	50
▷ Tablet possession	57
Smartphone possession	39
Attitudes toward globalization	14

Business agility	Rank
Opportunities and threats	27
► World robots distribution	11
Agility of companies	37
Use of big data and analytics	28
Knowledge transfer	33
Entrepreneurial fear of failure	50

IT integration	Rank
E-Government	49
Public-private partnerships	26
Cyber security	38
▷ Software piracy	56
▷ Government cyber security capacity	57
Privacy protection by law content	43

THAILAND

2023

- Overall Top Strengths
- ▷ Overall Top Weaknesses

KNOWLEDGE

Sub-Factors	2019	2020	2021	2022	2023
Talent	40	36	39	37	35
Training & education	50	55	56	57	52
Scientific concentration	35	37	36	36	38

Talent	Rank
Educational assessment PISA - Math	46
International experience	23
Foreign highly skilled personnel	19
Management of cities	19
Digital/Technological skills	36
Net flow of international students	41

Training & education	Rank
Employee training	20
Total public expenditure on education	51
Higher education achievement	46
▷ Pupil-teacher ratio (tertiary education)	54
Graduates in Sciences	38
Women with degrees	48

Scientific concentration	Rank
Total expenditure on R&D (%)	34
Total R&D personnel per capita	44
Female researchers	14
R&D productivity by publication	30
▷ Scientific and technical employment	57
High-tech patent grants	31
Robots in Education and R&D	13

TECHNOLOGY

Sub-Factors	2019	2020	2021	2022	2023
Regulatory framework	33	31	29	34	31
Capital	21	17	19	20	12
Technological framework	29	25	22	18	15

Regulatory framework	Rank
Starting a business	26
Enforcing contracts	28
Immigration laws	18
Development & application of tech.	30
Scientific research legislation	34
Intellectual property rights	35

Capital	Rank
IT & media stock market capitalization	12
Funding for technological development	26
Banking and financial services	19
Country credit rating	41
Venture capital	23
► Investment in Telecommunications	05

Technological framework	Rank
Communications technology	15
Mobile broadband subscribers	28
Wireless broadband	30
Internet users	45
► Internet bandwidth speed	05
► High-tech exports (%)	11

FUTURE READINESS

Sub-Factors	2019	2020	2021	2022	2023
Adaptive attitudes	58	53	53	52	42
Business agility	30	44	34	41	34
IT integration	51	43	43	50	49

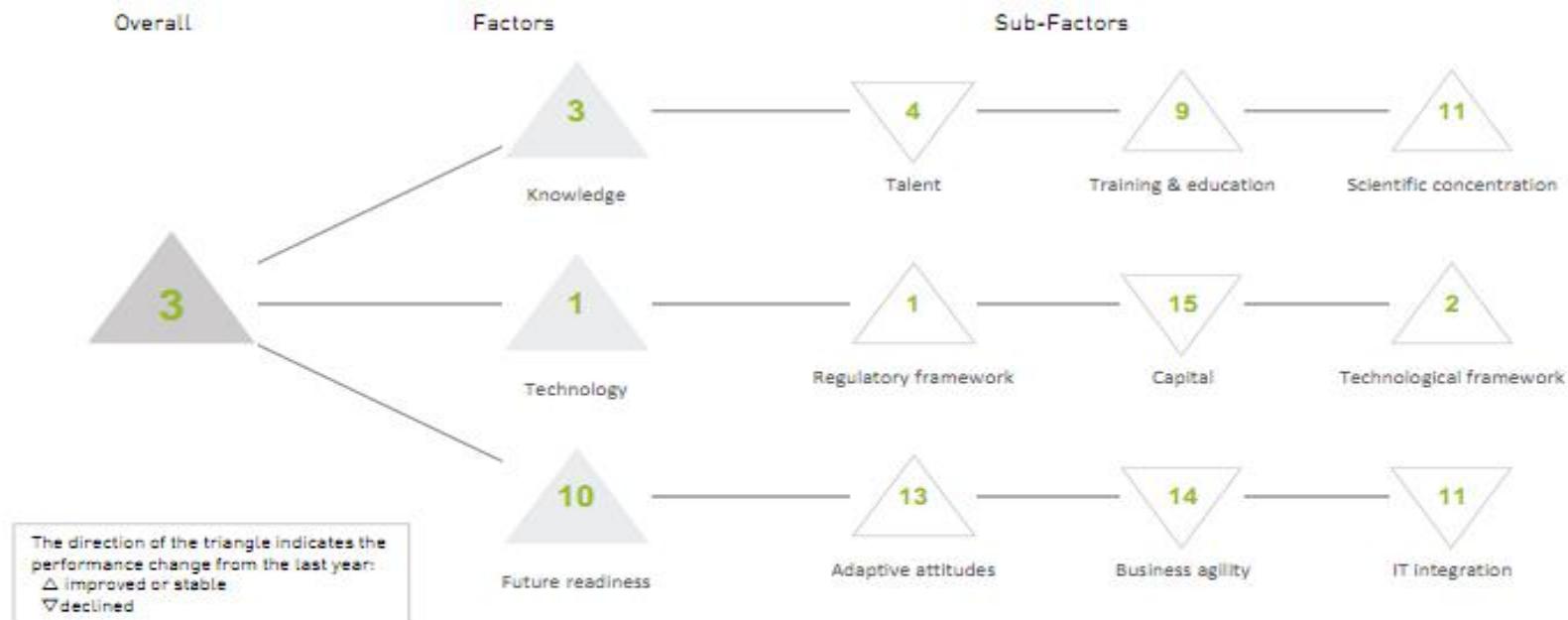
Adaptive attitudes	Rank
E-Participation	17
Internet retailing	40
▷ Tablet possession	57
Smartphone possession	30
► Attitudes toward globalization	10

Business agility	Rank
Opportunities and threats	29
► World robots distribution	11
Agility of companies	30
Use of big data and analytics	25
Knowledge transfer	24
Entrepreneurial fear of failure	51

IT integration	Rank
E-Government	48
Public-private partnerships	18
Cyber security	38
▷ Software piracy	56
▷ Government cyber security capacity	58
Privacy protection by law content	43

SINGAPORE

OVERALL PERFORMANCE (64 countries)



OVERALL & FACTORS - 5 years

	2019	2020	2021	2022	2023
OVERALL	02	02	05	04	03
Knowledge	03	02	04	05	03
Technology	01	01	03	01	01
Future readiness	11	12	11	10	10

SINGAPORE 2022

- Overall Top Strengths
- ▷ Overall Top Weaknesses

KNOWLEDGE

Sub-Factors	2018	2019	2020	2021	2022
Talent	01	01	01	02	03
Training & education	01	04	07	13	09
Scientific concentration	19	22	10	11	11

Talent	Rank
Educational assessment PISA - Math	02
International experience	05
Foreign highly-skilled personnel	05
Management of cities	04
Digital/Technological skills	09
Net flow of international students	07

Training & education	Rank
Employee training	24
▷ Total public expenditure on education	62
► Higher education achievement	02
Pupil-teacher ratio (tertiary education)	25
Graduates in Sciences	04
Women with degrees	-

Scientific concentration	Rank
Total expenditure on R&D (%)	20
Total R&D personnel per capita	14
▷ Female researchers	42
R&D productivity by publication	39
Scientific and technical employment	27
► High-tech patent grants	01
Robots in Education and R&D	29

TECHNOLOGY

Sub-Factors	2018	2019	2020	2021	2022
Regulatory framework	02	02	01	05	01
Capital	08	08	11	14	11
Technological framework	01	01	01	02	02

Regulatory framework	Rank
Starting a business	03
► Enforcing contracts	01
▷ Immigration laws	43
Development & application of tech.	08
Scientific research legislation	04
Intellectual property rights	07

Capital	Rank
IT & media stock market capitalization	31
Funding for technological development	02
Banking and financial services	05
► Country credit rating	01
Venture capital	06
▷ Investment in Telecommunications	55

Technological framework	Rank
Communications technology	09
Mobile Broadband subscribers	19
Wireless broadband	12
Internet users	24
► Internet bandwidth speed	01
High-tech exports (%)	04

FUTURE READINESS

Sub-Factors	2018	2019	2020	2021	2022
Adaptive attitudes	20	19	20	11	17
Business agility	18	06	11	12	09
IT integration	03	04	03	07	08

Adaptive attitudes	Rank
E-Participation	06
Internet retailing	26
Tablet possession	20
Smartphone possession	26
Attitudes toward globalization	07

Business agility	Rank
Opportunities and threats	15
World robots distribution	14
Agility of companies	10
Use of big data and analytics	11
Knowledge transfer	06
Entrepreneurial fear of failure	-

IT integration	Rank
E-Government	11
Public-private partnerships	02
Cyber security	06
Software piracy	17
Government cyber security capacity	10
▷ Privacy protection by law content	50

SINGAPORE

2023

- Overall Top Strengths
- ▷ Overall Top Weaknesses

KNOWLEDGE

Sub-Factors	2019	2020	2021	2022	2023
Talent	01	01	02	03	04
Training & education	04	07	13	09	09
Scientific concentration	22	10	11	11	11

Talent	Rank
Educational assessment PISA - Math	02
International experience	11
Foreign highly skilled personnel	06
Management of cities	06
Digital/Technological skills	12
Net flow of international students	07

Training & education	Rank
Employee training	27
▷ Total public expenditure on education	62
► Higher education achievement	02
Pupil-teacher ratio (tertiary education)	26
Graduates in Sciences	03
Women with degrees	-

Scientific concentration	Rank
Total expenditure on R&D (%)	18
Total R&D personnel per capita	15
▷ Female researchers	45
R&D productivity by publication	42
Scientific and technical employment	22
► High-tech patent grants	01
Robots in Education and R&D	30

TECHNOLOGY

Sub-Factors	2019	2020	2021	2022	2023
Regulatory framework	02	01	05	01	01
Capital	08	11	14	11	15
Technological framework	01	01	02	02	02

Regulatory framework	Rank
Starting a business	03
► Enforcing contracts	01
▷ Immigration laws	49
Development & application of tech.	11
Scientific research legislation	08
Intellectual property rights	09

Capital	Rank
IT & media stock market capitalization	28
Funding for technological development	04
Banking and financial services	06
► Country credit rating	01
Venture capital	10
▷ Investment in Telecommunications	58

Technological framework	Rank
Communications technology	23
Mobile broadband subscribers	22
Wireless broadband	06
Internet users	25
► Internet bandwidth speed	01
High-tech exports (%)	03

FUTURE READINESS

Sub-Factors	2019	2020	2021	2022	2023
Adaptive attitudes	19	20	11	17	13
Business agility	06	11	12	09	14
IT integration	04	03	07	08	11

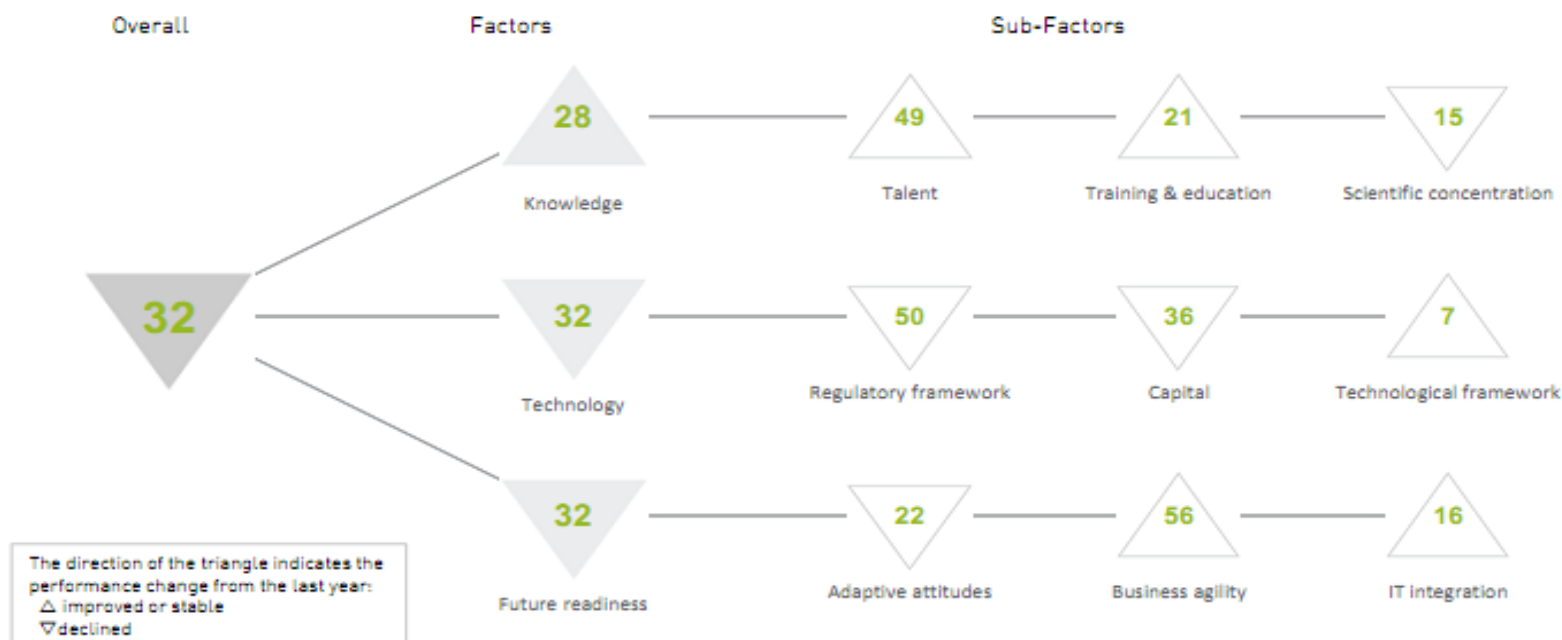
Adaptive attitudes	Rank
E-Participation	03
Internet retailing	24
Tablet possession	15
Smartphone possession	38
Attitudes toward globalization	13

Business agility	Rank
Opportunities and threats	16
World robots distribution	14
Agility of companies	24
Use of big data and analytics	11
Knowledge transfer	05
Entrepreneurial fear of failure	-

IT integration	Rank
E-Government	12
Public-private partnerships	08
Cyber security	08
Software piracy	17
Government cyber security capacity	10
▷ Privacy protection by law content	50

JAPAN

OVERALL PERFORMANCE (64 countries)



OVERALL & FACTORS - 5 years

	2019	2020	2021	2022	2023
OVERALL	23	27	28	29	32
Knowledge	25	22	25	28	28
Technology	24	26	30	30	32
Future readiness	24	26	27	28	32

JAPAN

2022

- Overall Top Strengths
- ▷ Overall Top Weaknesses

KNOWLEDGE

Sub-Factors	2018	2019	2020	2021	2022
Talent	36	46	46	47	50
Training & education	14	19	18	21	21
Scientific concentration	12	11	11	13	14

Talent	Rank	Training & education	Rank	Scientific concentration	Rank
Educational assessment PISA - Math	05	Employee training	30	Total expenditure on R&D (%)	07
▷ International experience	63	Total public expenditure on education	54	Total R&D personnel per capita	18
Foreign highly-skilled personnel	54	Higher education achievement	08	Female researchers	55
Management of cities	16	► Pupil-teacher ratio (tertiary education)	01	R&D productivity by publication	16
▷ Digital/Technological skills	62	Graduates in Sciences	42	Scientific and technical employment	39
Net flow of international students	25	Women with degrees	08	High-tech patent grants	06
				► Robots in Education and R&D	04

TECHNOLOGY

Sub-Factors	2018	2019	2020	2021	2022
Regulatory framework	40	42	44	48	47
Capital	33	37	33	37	32
Technological framework	04	02	05	08	08

Regulatory framework	Rank	Capital	Rank	Technological framework	Rank
Starting a business	43	IT & media stock market capitalization	10	Communications technology	42
Enforcing contracts	35	Funding for technological development	41	Mobile Broadband subscribers	22
Immigration laws	61	Banking and financial services	35	► Wireless broadband	02
Development & application of tech.	41	Country credit rating	28	Internet users	19
Scientific research legislation	49	Venture capital	34	Internet bandwidth speed	19
Intellectual property rights	34	Investment in Telecommunications	32	High-tech exports (%)	24

FUTURE READINESS

Sub-Factors	2018	2019	2020	2021	2022
Adaptive attitudes	13	15	19	18	20
Business agility	55	41	56	53	62
IT integration	15	18	23	23	18

Adaptive attitudes	Rank	Business agility	Rank	IT integration	Rank
E-Participation	04	▷ Opportunities and threats	63	E-Government	14
Internet retailing	16	► World robots distribution	02	Public-private partnerships	41
Tablet possession	24	▷ Agility of companies	63	Cyber security	45
Smartphone possession	10	▷ Use of big data and analytics	63	► Software piracy	02
Attitudes toward globalization	48	Knowledge transfer	49	Government cyber security capacity	23
		Entrepreneurial fear of failure	35	Privacy protection by law content	11

JAPAN

2023

- Overall Top Strengths
- ▷ Overall Top Weaknesses

KNOWLEDGE

Sub-Factors	2019	2020	2021	2022	2023
Talent	46	46	47	50	49
Training & education	19	18	21	21	21
Scientific concentration	11	11	13	14	15

Talent	Rank	Training & education	Rank	Scientific concentration	Rank
Educational assessment PISA - Math	05	Employee training	35	Total expenditure on R&D (%)	06
▷ International experience	64	Total public expenditure on education	53	Total R&D personnel per capita	20
Foreign highly skilled personnel	54	Higher education achievement	06	Female researchers	57
Management of cities	09	► Pupil-teacher ratio (tertiary education)	03	R&D productivity by publication	16
▷ Digital/Technological skills	63	Graduates in Sciences	39	Scientific and technical employment	39
Net flow of international students	27	Women with degrees	06	High-tech patent grants	06
				Robots in Education and R&D	06

TECHNOLOGY

Sub-Factors	2019	2020	2021	2022	2023
Regulatory framework	42	44	48	47	50
Capital	37	33	37	32	36
Technological framework	02	05	08	08	07

Regulatory framework	Rank	Capital	Rank	Technological framework	Rank
Starting a business	44	IT & media stock market capitalization	10	Communications technology	26
Enforcing contracts	35	Funding for technological development	43	Mobile broadband subscribers	19
Immigration laws	62	Banking and financial services	42	► Wireless broadband	02
Development & application of tech.	49	Country credit rating	30	Internet users	20
Scientific research legislation	48	Venture capital	39	Internet bandwidth speed	11
Intellectual property rights	34	Investment in Telecommunications	44	High-tech exports (%)	24

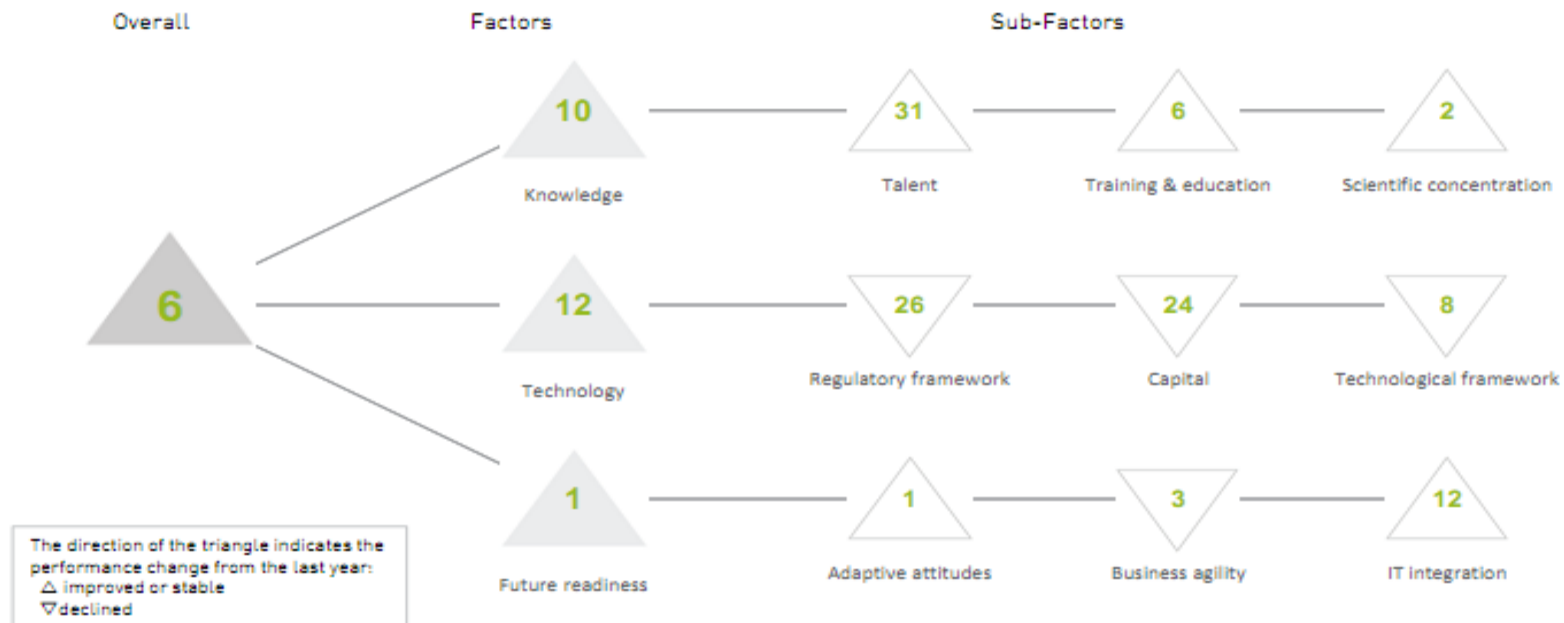
FUTURE READINESS

Sub-Factors	2019	2020	2021	2022	2023
Adaptive attitudes	15	19	18	20	22
Business agility	41	56	53	62	56
IT integration	18	23	23	18	16

Adaptive attitudes	Rank	Business agility	Rank	IT integration	Rank
► E-Participation	01	▷ Opportunities and threats	62	E-Government	14
Internet retailing	17	► World robots distribution	02	Public-private partnerships	41
Tablet possession	32	▷ Agility of companies	64	Cyber security	43
Smartphone possession	55	▷ Use of big data and analytics	64	► Software piracy	02
Attitudes toward globalization	46	Knowledge transfer	43	Government cyber security capacity	24
		Entrepreneurial fear of failure	36	Privacy protection by law content	11

KOREA REP.

OVERALL PERFORMANCE (64 countries)



OVERALL & FACTORS - 5 years

	2019	2020	2021	2022	2023
OVERALL	10	08	12	08	06
Knowledge	11	10	15	16	10
Technology	17	12	13	13	12
Future readiness	04	03	05	02	01

KOREA REP.

2022

- Overall Top Strengths
- ▷ Overall Top Weaknesses

KNOWLEDGE

Sub-Factors	2018	2019	2020	2021	2022
Talent	26	30	21	26	33
Training & education	08	05	11	16	16
Scientific concentration	07	06	04	03	03

Talent	Rank
Educational assessment PISA - Math	06
▷ International experience	59
▷ Foreign highly-skilled personnel	49
Management of cities	07
Digital/Technological skills	46
Net flow of international students	38

Training & education	Rank
Employee training	34
Total public expenditure on education	42
Higher education achievement	04
Pupil-teacher ratio (tertiary education)	30
Graduates in Sciences	11
Women with degrees	20

Scientific concentration	Rank
► Total expenditure on R&D (%)	02
Total R&D personnel per capita	03
▷ Female researchers	53
R&D productivity by publication	26
Scientific and technical employment	33
High-tech patent grants	04
Robots in Education and R&D	07

TECHNOLOGY

Sub-Factors	2018	2019	2020	2021	2022
Regulatory framework	27	26	26	23	23
Capital	44	29	25	16	15
Technological framework	02	07	03	07	07

Regulatory framework	Rank
Starting a business	19
► Enforcing contracts	02
Immigration laws	29
▷ Development & application of tech.	48
Scientific research legislation	31
Intellectual property rights	37

Capital	Rank
IT & media stock market capitalization	04
Funding for technological development	30
▷ Banking and financial services	47
Country credit rating	17
Venture capital	35
Investment in Telecommunications	15

Technological framework	Rank
Communications technology	12
Mobile Broadband subscribers	15
Wireless broadband	25
Internet users	08
Internet bandwidth speed	12
High-tech exports (%)	06

FUTURE READINESS

Sub-Factors	2018	2019	2020	2021	2022
Adaptive attitudes	03	04	01	02	01
Business agility	47	05	03	05	02
IT integration	20	21	15	16	14

Adaptive attitudes	Rank
► E-Participation	01
► Internet retailing	01
Tablet possession	26
Smartphone possession	04
Attitudes toward globalization	11

Business agility	Rank
Opportunities and threats	35
World robots distribution	03
Agility of companies	16
Use of big data and analytics	34
Knowledge transfer	30
► Entrepreneurial fear of failure	02

IT integration	Rank
E-Government	02
Public-private partnerships	46
Cyber security	28
Software piracy	20
Government cyber security capacity	06
Privacy protection by law content	33

KOREA REP.

2023

- Overall Top Strengths
- ▷ Overall Top Weaknesses

KNOWLEDGE

Sub-Factors	2019	2020	2021	2022	2023
Talent	30	21	26	33	31
Training & education	05	11	16	16	06
Scientific concentration	06	04	03	03	02

Talent	Rank	Training & education	Rank	Scientific concentration	Rank
Educational assessment PISA - Math	06	Employee training	23	► Total expenditure on R&D (%)	02
▷ International experience	51	Total public expenditure on education	26	Total R&D personnel per capita	04
Foreign highly skilled personnel	47	Higher education achievement	04	▷ Female researchers	55
Management of cities	08	Pupil-teacher ratio (tertiary education)	25	R&D productivity by publication	26
▷ Digital/Technological skills	48	Graduates in Sciences	09	Scientific and technical employment	31
Net flow of international students	37	Women with degrees	21	High-tech patent grants	03
				Robots in Education and R&D	04

TECHNOLOGY

Sub-Factors	2019	2020	2021	2022	2023
Regulatory framework	26	26	23	23	26
Capital	29	25	16	15	24
Technological framework	07	03	07	07	08

Regulatory framework	Rank	Capital	Rank	Technological framework	Rank
Starting a business	19	IT & media stock market capitalization	03	Communications technology	11
► Enforcing contracts	02	Funding for technological development	36	Mobile broadband subscribers	12
Immigration laws	46	▷ Banking and financial services	50	Wireless broadband	28
▷ Development & application of tech.	52	Country credit rating	16	Internet users	09
Scientific research legislation	32	Venture capital	44	Internet bandwidth speed	15
Intellectual property rights	28	Investment in Telecommunications	23	High-tech exports (%)	06

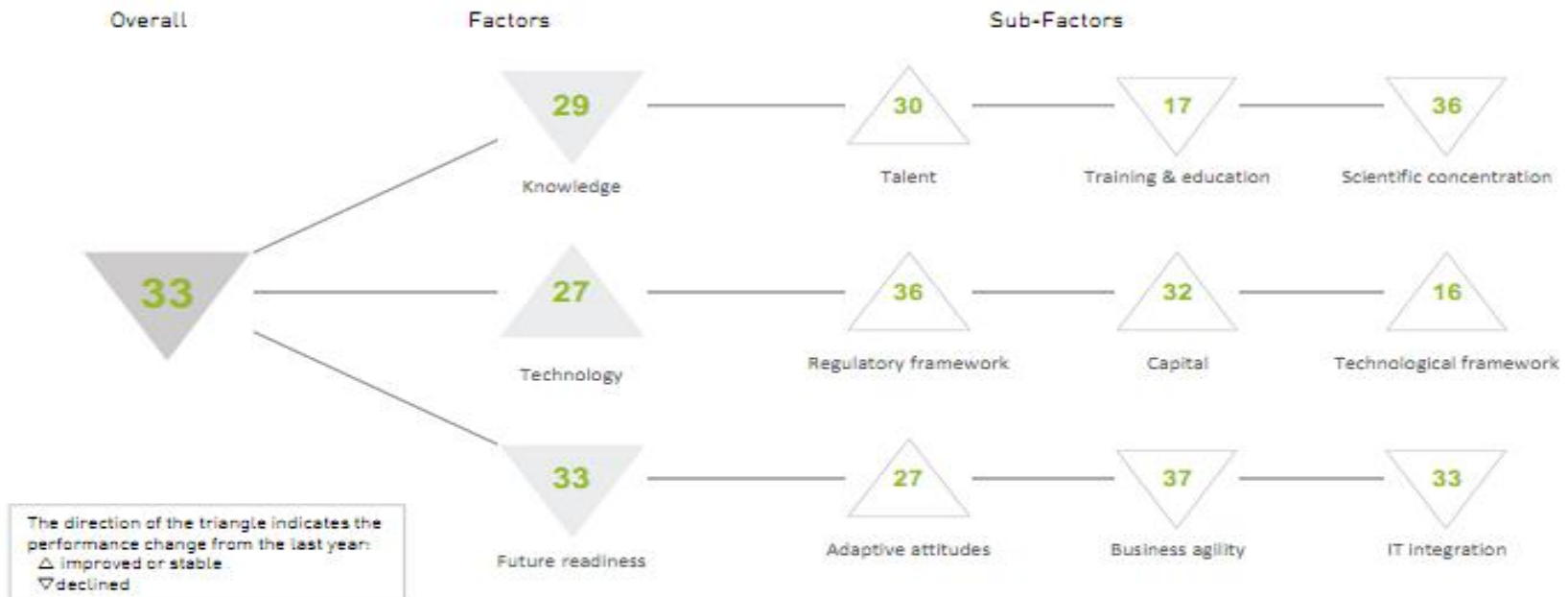
FUTURE READINESS

Sub-Factors	2019	2020	2021	2022	2023
Adaptive attitudes	04	01	02	01	01
Business agility	05	03	05	02	03
IT integration	21	15	16	14	12

Adaptive attitudes	Rank	Business agility	Rank	IT integration	Rank
E-Participation	09	Opportunities and threats	43	E-Government	03
► Internet retailing	02	► World robots distribution	03	Public-private partnerships	40
Tablet possession	21	Agility of companies	28	Cyber security	24
Smartphone possession	06	Use of big data and analytics	31	Software piracy	20
Attitudes toward globalization	07	Knowledge transfer	26	Government cyber security capacity	06
		► Entrepreneurial fear of failure	02	Privacy protection by law content	33

MALAYSIA

OVERALL PERFORMANCE (64 countries)



OVERALL & FACTORS - 5 years

	2019	2020	2021	2022	2023
OVERALL	26	26	27	31	33
Knowledge	19	19	22	25	29
Technology	19	20	26	29	27
Future readiness	28	32	29	31	33

MALAYSIA 2022

- Overall Top Strengths
- ▷ Overall Top Weaknesses

KNOWLEDGE

Sub-Factors	2018	2019	2020	2021	2022
Talent	24	22	30	30	36
Training & education	10	11	08	09	10
Scientific concentration	30	27	26	32	35

Talent	Rank
Educational assessment PISA - Math	41
International experience	31
Foreign highly-skilled personnel	31
Management of cities	33
Digital/Technological skills	37
Net flow of international students	33

Training & education	Rank
Employee training	40
Total public expenditure on education	41
Higher education achievement	40
Pupil-teacher ratio (tertiary education)	26
► Graduates in Sciences	02
► Women with degrees	04

Scientific concentration	Rank
Total expenditure on R&D (%)	40
Total R&D personnel per capita	38
► Female researchers	07
R&D productivity by publication	22
▷ Scientific and technical employment	46
High-tech patent grants	45
Robots in Education and R&D	26

TECHNOLOGY

Sub-Factors	2018	2019	2020	2021	2022
Regulatory framework	29	29	35	35	40
Capital	12	14	18	31	33
Technological framework	32	20	15	15	16

Regulatory framework	Rank
▷ Starting a business	51
Enforcing contracts	27
Immigration laws	46
Development & application of tech.	31
Scientific research legislation	34
Intellectual property rights	44

Capital	Rank
IT & media stock market capitalization	18
Funding for technological development	31
Banking and financial services	36
Country credit rating	38
Venture capital	33
Investment in Telecommunications	27

Technological framework	Rank
▷ Communications technology	49
Mobile Broadband subscribers	26
Wireless broadband	22
Internet users	26
Internet bandwidth speed	35
► High-tech exports (%)	05

FUTURE READINESS

Sub-Factors	2018	2019	2020	2021	2022
Adaptive attitudes	30	30	30	29	30
Business agility	15	17	30	27	35
IT integration	35	33	33	31	31

Adaptive attitudes	Rank
E-Participation	27
▷ Internet retailing	46
Tablet possession	30
Smartphone possession	08
Attitudes toward globalization	37

Business agility	Rank
Opportunities and threats	40
World robots distribution	22
Agility of companies	42
Use of big data and analytics	29
Knowledge transfer	27
Entrepreneurial fear of failure	26

IT integration	Rank
E-Government	41
Public-private partnerships	20
Cyber security	33
Software piracy	45
► Government cyber security capacity	05
▷ Privacy protection by law content	55

MALAYSIA

2023

- Overall Top Strengths
- ▷ Overall Top Weaknesses

KNOWLEDGE

Sub-Factors	2019	2020	2021	2022	2023
Talent	22	30	30	36	30
Training & education	11	08	09	10	17
Scientific concentration	27	26	32	35	36

Talent	Rank	Training & education	Rank	Scientific concentration	Rank
Educational assessment PISA - Math	41	Employee training	39	Total expenditure on R&D (%)	40
International experience	34	Total public expenditure on education	44	Total R&D personnel per capita	43
Foreign highly skilled personnel	27	Higher education achievement	37	► Female researchers	07
Management of cities	16	Pupil-teacher ratio (tertiary education)	33	R&D productivity by publication	23
Digital/Technological skills	25	► Graduates in Sciences	02	▷ Scientific and technical employment	49
Net flow of international students	30	► Women with degrees	04	▷ High-tech patent grants	49
				Robots in Education and R&D	29

TECHNOLOGY

Sub-Factors	2019	2020	2021	2022	2023
Regulatory framework	29	35	35	40	36
Capital	14	18	31	33	32
Technological framework	20	15	15	16	16

Regulatory framework	Rank	Capital	Rank	Technological framework	Rank
▷ Starting a business	52	IT & media stock market capitalization	17	Communications technology	42
Enforcing contracts	27	Funding for technological development	28	Mobile broadband subscribers	29
Immigration laws	33	Banking and financial services	21	Wireless broadband	27
Development & application of tech.	27	Country credit rating	39	Internet users	27
Scientific research legislation	31	Venture capital	28	Internet bandwidth speed	36
Intellectual property rights	30	Investment in Telecommunications	40	► High-tech exports (%)	05

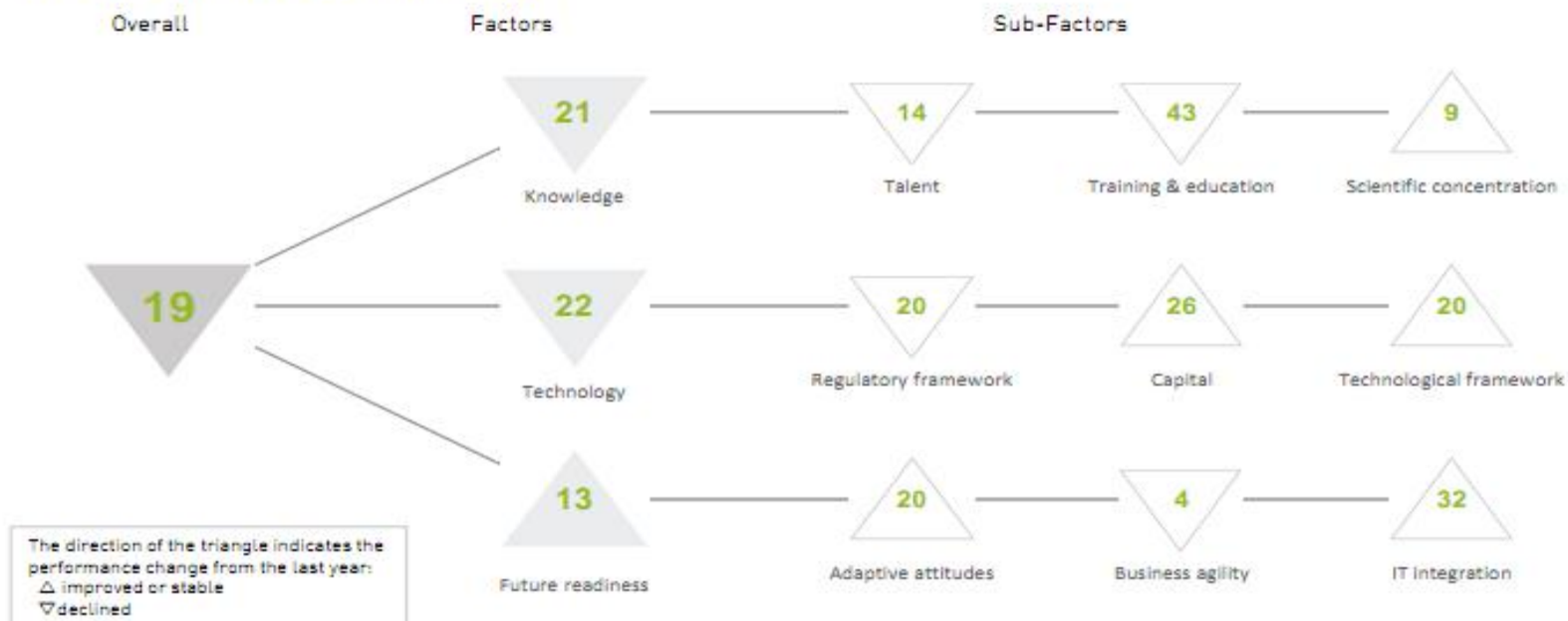
FUTURE READINESS

Sub-Factors	2019	2020	2021	2022	2023
Adaptive attitudes	30	30	29	30	27
Business agility	17	30	27	35	37
IT integration	33	33	31	31	33

Adaptive attitudes	Rank	Business agility	Rank	IT integration	Rank
E-Participation	42	Opportunities and threats	39	E-Government	46
▷ Internet retailing	48	World robots distribution	22	Public-private partnerships	22
Tablet possession	24	Agility of companies	38	Cyber security	35
Smartphone possession	08	Use of big data and analytics	32	Software piracy	45
Attitudes toward globalization	32	Knowledge transfer	36	► Government cyber security capacity	05
		Entrepreneurial fear of failure	26	▷ Privacy protection by law content	56

CHINA

OVERALL PERFORMANCE (64 countries)



OVERALL & FACTORS - 5 years

	2019	2020	2021	2022	2023
OVERALL	22	16	15	17	19
Knowledge	18	08	06	17	21
Technology	26	27	20	18	22
Future readiness	21	18	17	15	13

CHINA 2022

- Overall Top Strengths
- ▷ Overall Top Weaknesses

KNOWLEDGE

Sub-Factors	2018	2019	2020	2021	2022
Talent	18	19	13	12	12
Training & education	46	37	40	35	33
Scientific concentration	21	09	02	01	09

Talent	Rank
► Educational assessment PISA - Math	01
International experience	47
Foreign highly-skilled personnel	35
Management of cities	08
Digital/Technological skills	12
Net flow of international students	46

Training & education	Rank
► Employee training	11
▷ Total public expenditure on education	53
Higher education achievement	16
Pupil-teacher ratio (tertiary education)	40
Graduates in Sciences	-
Women with degrees	-

Scientific concentration	Rank
Total expenditure on R&D (%)	14
Total R&D personnel per capita	36
▷ Female researchers	51
► R&D productivity by publication	01
Scientific and technical employment	49
High-tech patent grants	07
▷ Robots in Education and R&D	01

TECHNOLOGY

Sub-Factors	2018	2019	2020	2021	2022
Regulatory framework	26	20	18	15	16
Capital	30	32	31	27	27
Technological framework	40	32	32	28	24

Regulatory framework	Rank
Starting a business	16
Enforcing contracts	05
Immigration laws	36
Development & application of tech.	16
Scientific research legislation	19
Intellectual property rights	36

Capital	Rank
IT & media stock market capitalization	24
Funding for technological development	17
Banking and financial services	40
Country credit rating	26
Venture capital	31
Investment in Telecommunications	34

Technological framework	Rank
Communications technology	11
Mobile Broadband subscribers	05
Wireless broadband	20
▷ Internet users	53
Internet bandwidth speed	33
High-tech exports (%)	08

FUTURE READINESS

Sub-Factors	2018	2019	2020	2021	2022
Adaptive attitudes	23	24	17	19	22
Business agility	19	01	04	03	03
IT integration	41	41	35	32	32

Adaptive attitudes	Rank
E-Participation	09
Internet retailing	25
Tablet possession	38
Smartphone possession	43
Attitudes toward globalization	12

Business agility	Rank
Opportunities and threats	13
► World robots distribution	01
Agility of companies	22
Use of big data and analytics	05
Knowledge transfer	20
Entrepreneurial fear of failure	25

IT integration	Rank
E-Government	40
Public-private partnerships	06
Cyber security	10
▷ Software piracy	56
► Government cyber security capacity	03
▷ Privacy protection by law content	59

CHINA 2023

- Overall Top Strengths
- ▷ Overall Top Weaknesses

KNOWLEDGE

Sub-Factors	2019	2020	2021	2022	2023
Talent	19	13	12	12	14
Training & education	37	40	35	33	43
Scientific concentration	09	02	01	09	09

Talent	Rank
► Educational assessment PISA - Math	01
International experience	39
Foreign highly skilled personnel	39
Management of cities	07
Digital/Technological skills	13
Net flow of international students	50

Training & education	Rank
Employee training	18
▷ Total public expenditure on education	54
Higher education achievement	12
Pupil-teacher ratio (tertiary education)	45
Graduates in Sciences	-
▷ Women with degrees	54

Scientific concentration	Rank
Total expenditure on R&D (%)	15
Total R&D personnel per capita	40
Female researchers	53
► R&D productivity by publication	01
Scientific and technical employment	52
High-tech patent grants	05
► Robots in Education and R&D	01

TECHNOLOGY

Sub-Factors	2019	2020	2021	2022	2023
Regulatory framework	20	18	15	16	20
Capital	32	31	27	27	26
Technological framework	32	32	28	24	20

Regulatory framework	Rank
Starting a business	16
Enforcing contracts	05
Immigration laws	40
Development & application of tech.	24
Scientific research legislation	20
Intellectual property rights	36

Capital	Rank
IT & media stock market capitalization	22
Funding for technological development	17
Banking and financial services	37
Country credit rating	29
Venture capital	29
Investment in Telecommunications	29

Technological framework	Rank
Communications technology	14
Mobile broadband subscribers	08
Wireless broadband	18
▷ Internet users	54
Internet bandwidth speed	18
High-tech exports (%)	09

FUTURE READINESS

Sub-Factors	2019	2020	2021	2022	2023
Adaptive attitudes	24	17	19	22	20
Business agility	01	04	03	03	04
IT integration	41	35	32	32	32

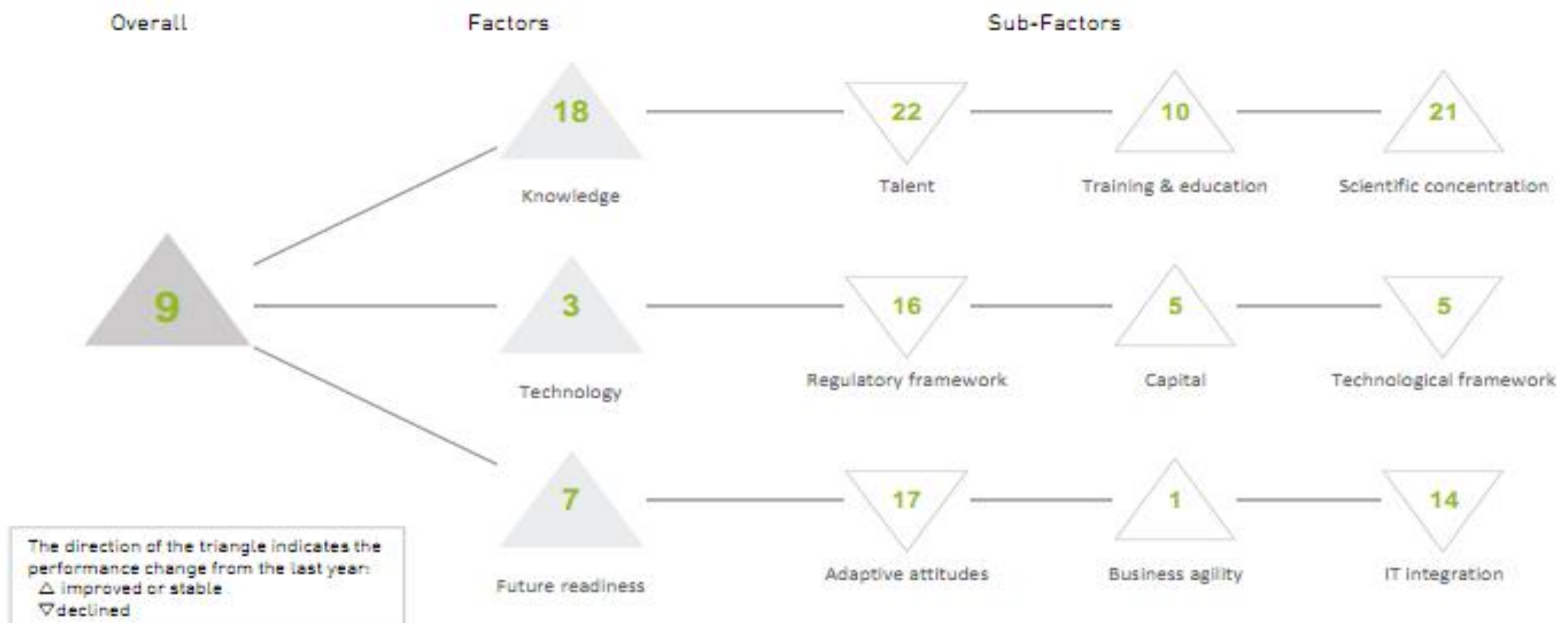
Adaptive attitudes	Rank
E-Participation	13
Internet retailing	22
Tablet possession	38
Smartphone possession	46
Attitudes toward globalization	08

Business agility	Rank
Opportunities and threats	25
► World robots distribution	01
Agility of companies	29
Use of big data and analytics	16
Knowledge transfer	28
Entrepreneurial fear of failure	25

IT integration	Rank
E-Government	38
Public-private partnerships	12
Cyber security	09
▷ Software piracy	56
► Government cyber security capacity	03
▷ Privacy protection by law content	60

TAIWAN, CHINA

OVERALL PERFORMANCE [64 countries]



OVERALL & FACTORS - 5 years

	2019	2020	2021	2022	2023
OVERALL	13	11	08	11	09
Knowledge	17	18	16	18	18
Technology	09	05	02	06	03
Future readiness	12	08	07	08	07

TAIWAN, CHINA

2022

- Overall Top Strengths
- ▷ Overall Top Weaknesses

KNOWLEDGE

Sub-Factors	2018	2019	2020	2021	2022
Talent	25	21	18	17	21
Training & education	25	20	21	12	11
Scientific concentration	13	15	18	19	21

Talent	Rank
Educational assessment PISA - Math	04
International experience	27
Foreign highly-skilled personnel	43
Management of cities	18
Digital/Technological skills	33
Net flow of international students	11

Training & education	Rank
Employee training	06
▷ Total public expenditure on education	52
Higher education achievement	03
▷ Pupil-teacher ratio (tertiary education)	50
Graduates in Sciences	05
Women with degrees	18

Scientific concentration	Rank
Total expenditure on R&D (%)	03
► Total R&D personnel per capita	01
▷ Female researchers	52
R&D productivity by publication	33
▷ Scientific and technical employment	45
High-tech patent grants	20
Robots in Education and R&D	19

TECHNOLOGY

Sub-Factors	2018	2019	2020	2021	2022
Regulatory framework	21	23	16	16	14
Capital	13	12	08	02	09
Technological framework	10	04	04	04	04

Regulatory framework	Rank
Starting a business	10
Enforcing contracts	11
Immigration laws	34
Development & application of tech.	17
Scientific research legislation	10
Intellectual property rights	19

Capital	Rank
► IT & media stock market capitalization	01
Funding for technological development	16
Banking and financial services	10
Country credit rating	16
Venture capital	13
▷ Investment in Telecommunications	57

Technological framework	Rank
Communications technology	22
► Mobile Broadband subscribers	01
Wireless broadband	13
Internet users	21
Internet bandwidth speed	20
► High-tech exports (%)	03

FUTURE READINESS

Sub-Factors	2018	2019	2020	2021	2022
Adaptive attitudes	28	14	14	13	13
Business agility	13	03	01	02	05
IT integration	23	24	17	15	13

Adaptive attitudes	Rank
E-Participation	-
Internet retailing	22
Tablet possession	25
Smartphone possession	05
Attitudes toward globalization	05

Business agility	Rank
Opportunities and threats	05
World robots distribution	07
Agility of companies	03
► Use of big data and analytics	02
Knowledge transfer	10
Entrepreneurial fear of failure	18

IT integration	Rank
E-Government	-
Public-private partnerships	13
Cyber security	09
Software piracy	25
Government cyber security capacity	09
Privacy protection by law content	40

TAIWAN, CHINA

2023

- Overall Top Strengths
- ▷ Overall Top Weaknesses

KNOWLEDGE

Sub-Factors	2019	2020	2021	2022	2023
Talent	21	18	17	21	22
Training & education	20	21	12	11	10
Scientific concentration	15	18	19	21	21

Talent	Rank	Training & education	Rank	Scientific concentration	Rank
Educational assessment PISA - Math	04	Employee training	07	Total expenditure on R&D (%)	03
International experience	40	▷ Total public expenditure on education	52	► Total R&D personnel per capita	01
Foreign highly skilled personnel	44	▷ Higher education achievement	03	▷ Female researchers	54
Management of cities	17	▷ Pupil-teacher ratio (tertiary education)	50	R&D productivity by publication	32
Digital/Technological skills	32	Graduates in Sciences	07	▷ Scientific and technical employment	47
Net flow of international students	13	Women with degrees	08	High-tech patent grants	20
				Robots in Education and R&D	19

TECHNOLOGY

Sub-Factors	2019	2020	2021	2022	2023
Regulatory framework	23	16	16	14	16
Capital	12	08	02	09	05
Technological framework	04	04	04	04	05

Regulatory framework	Rank	Capital	Rank	Technological framework	Rank
Starting a business	10	► IT & media stock market capitalization	01	Communications technology	19
Enforcing contracts	11	Funding for technological development	18	► Mobile broadband subscribers	01
Immigration laws	31	Banking and financial services	14	Wireless broadband	10
Development & application of tech.	25	Country credit rating	15	Internet users	22
Scientific research legislation	16	Venture capital	19	Internet bandwidth speed	13
Intellectual property rights	20	▷ Investment in Telecommunications	46	High-tech exports (%)	04

FUTURE READINESS

Sub-Factors	2019	2020	2021	2022	2023
Adaptive attitudes	14	14	13	13	17
Business agility	03	01	02	05	01
IT integration	24	17	15	13	14

Adaptive attitudes	Rank	Business agility	Rank	IT integration	Rank
E-Participation	-	Opportunities and threats	05	E-Government	-
Internet retailing	26	World robots distribution	07	Public-private partnerships	13
Tablet possession	20	► Agility of companies	01	Cyber security	19
Smartphone possession	07	► Use of big data and analytics	01	Software piracy	25
Attitudes toward globalization	06	Knowledge transfer	12	Government cyber security capacity	09
		Entrepreneurial fear of failure	18	Privacy protection by law content	40

WORLD TALENT RANKING 2023

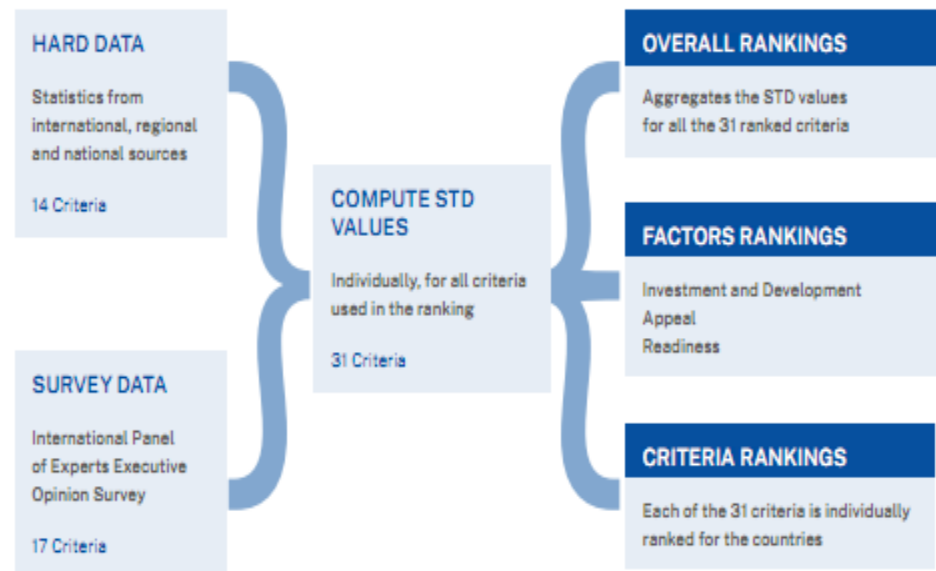
IMD World Talent Ranking 2023



World Talent Ranking Factors



Computing the Rankings



อันดับความสามารถด้านบุคลากร และอันดับของแต่ละปัจจัยหลักของประเทศต่าง ๆ ปี 2565



The IMD World Talent Ranking
Assesses the extent to which nations develop, attract and retain talent for enterprises operating in those economies

Investment & Development
Appeal
Readiness

อันดับความสามารถด้านบุคลากร และอันดับของแต่ละปัจจัยหลักของประเทศต่าง ๆ ปี 2566

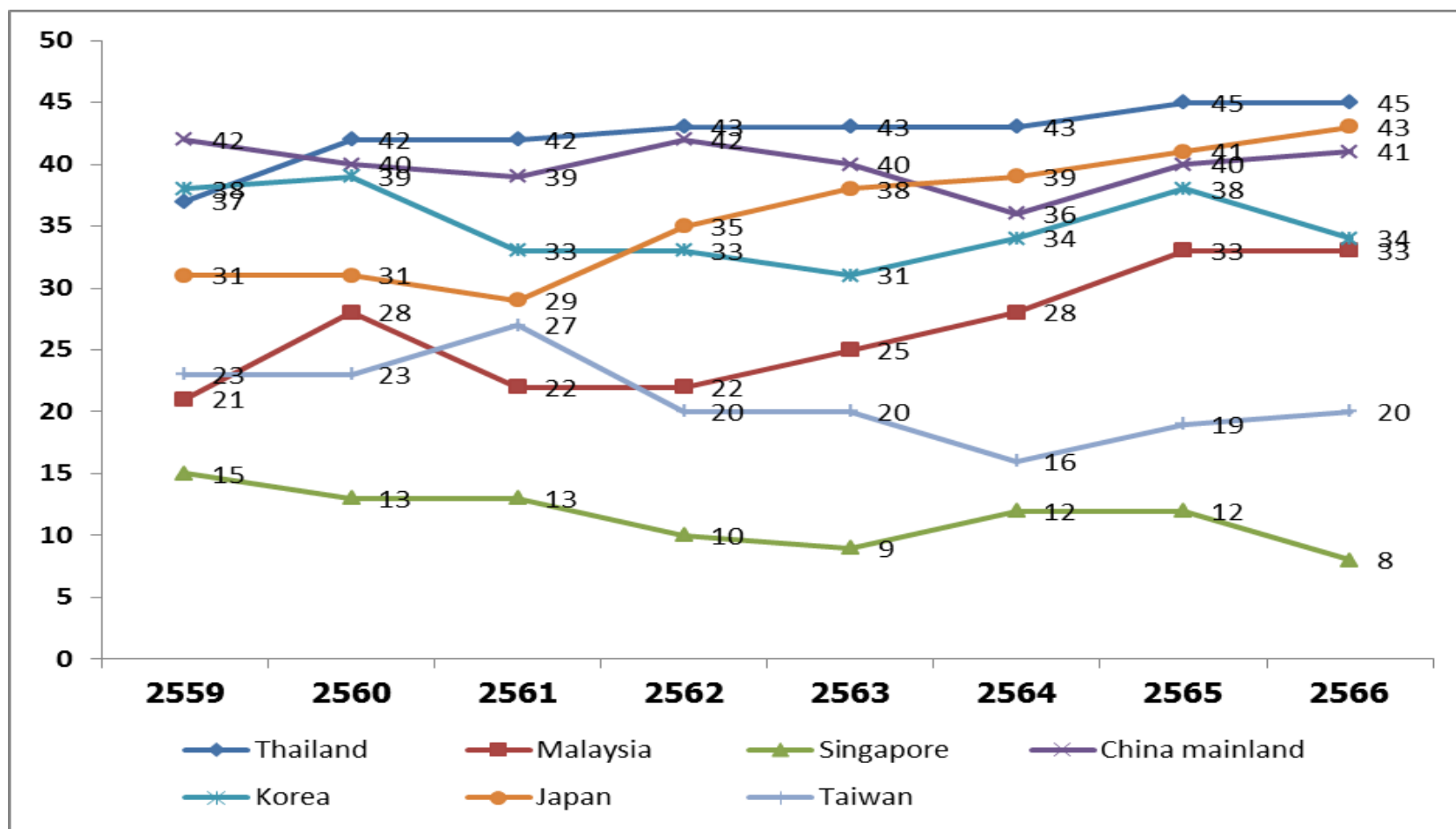
2023 TALENT RANKING

			Score	
01	Switzerland		100.00	-
02	Luxembourg		84.39	↗ 5
03	Iceland		84.33	-
04	Belgium		83.75	↗ 9
05	Netherlands		83.34	↗ 4
06	Finland		80.55	-
07	Denmark		80.53	↗ 2
08	Singapore		79.95	↗ 4
09	Austria		79.93	↗ 1
10	Sweden		79.93	↗ 8
11	Norway		78.90	↗ 7
12	Germany		78.45	↗ 2
13	Canada		76.73	↗ 2
14	Ireland		76.27	↗ 1
15	USA		74.55	↗ 1
16	Hong Kong SAR		74.35	↗ 2
17	Estonia		73.95	-
18	Australia		73.12	-
19	Israel		71.05	↗ 1
20	Taiwan, China		70.32	↗ 1
21	Czech Republic		69.49	↗ 8
22	UAE		67.92	↗ 1
23	Lithuania		66.77	↗ 3
24	France		66.25	↗ 1
25	Portugal		64.64	↗ 1
26	Slovenia		63.82	↗ 1
27	Bahrain		63.60	↗ 8
28	Kuwait		63.19	-
29	Cyprus		62.94	↗ 7
30	Qatar		62.72	↗ 4

2023 TALENT RANKING

			Score	
31	New Zealand		62.57	-
32	Spain		62.15	-
33	Malaysia		62.03	-
34	Korea Rep.		61.95	↗ 4
35	United Kingdom		60.52	↗ 7
36	Saudi Arabia		60.41	↗ 6
37	Greece		58.88	-
38	Kazakhstan		58.57	↗ 1
39	Latvia		57.53	↗ 12
40	Botswana		57.11	↗ 3
41	China		56.28	↗ 1
42	Italy		56.10	↗ 6
43	Japan		55.72	↗ 2
44	Poland		54.94	↗ 6
45	Thailand		54.31	-
46	Croatia		52.20	↗ 4
47	Indonesia		51.13	↗ 4
48	Hungary		49.45	↗ 4
49	Turkey		49.44	↗ 4
50	Chile		49.02	↗ 3
51	Slovak Republic		48.75	↗ 3
52	Jordan		48.55	↗ 3
53	Romania		45.87	↗ 2
54	Argentina		44.24	↗ 2
55	Peru		41.88	↗ 9
56	India		41.75	↗ 4
57	Colombia		40.90	↗ 4
58	Bulgaria		39.99	↗ 1
59	Mexico		37.31	↗ 1
60	Philippines		35.81	↗ 6
61	South Africa		34.34	↗ 1
62	Venezuela		31.85	↗ 1
63	Brazil		31.57	↗ 6
64	Mongolia		23.18	↗ 2

การจัดอันดับความสามารถด้านบุคลากร ของประเทศต่าง ๆ โดยรวม ปี 2559-2566



ที่มา : IMD



THAILAND

OVERALL PERFORMANCE (64 countries)

- Overall top strengths
- ▷ Overall top weaknesses

Rank 2023

45

Overall

47

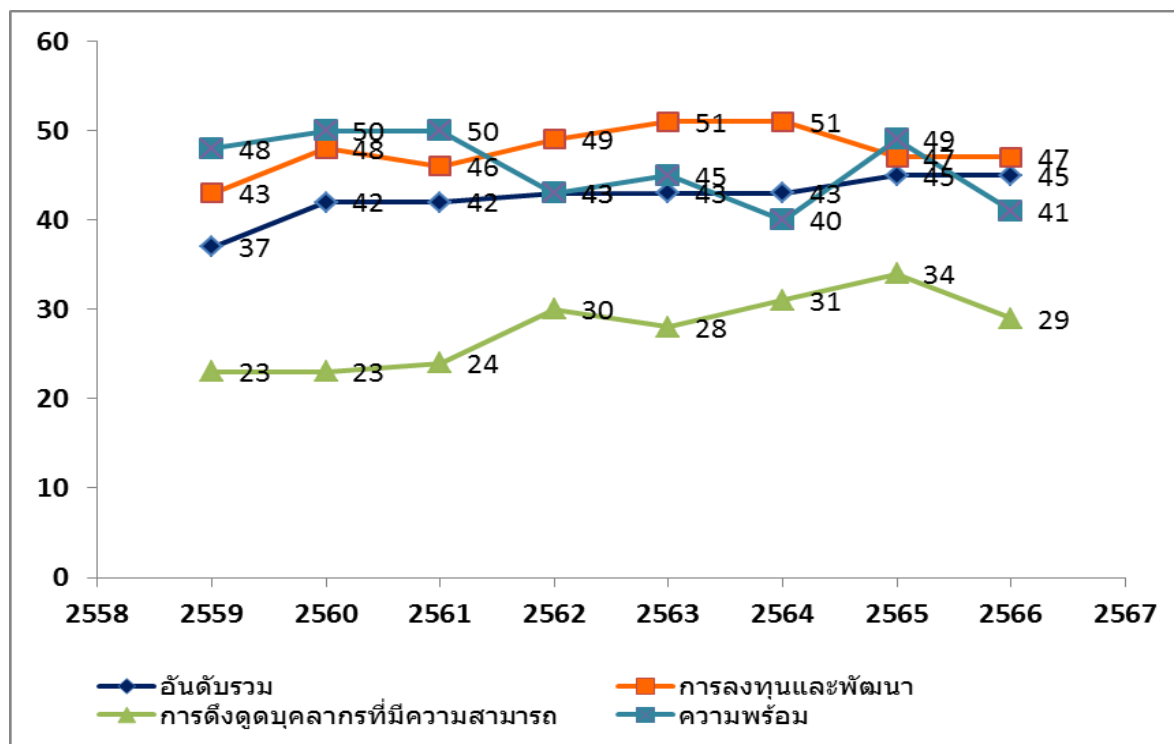
Investment & Development

29

Appeal

41

Readiness



ที่มา : IMD 2023

THAILAND 2022

- Overall top strengths
- ▷ Overall top weaknesses

INVESTMENT & DEVELOPMENT

		Value	2022 Rank
▷ Total public expenditure on education	Percentage of GDP	3.7 %	50
▷ Total public exp. on education per student	Spending per enrolled pupil/student, all levels	1,078 US\$	54
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	14.00 ratio	29
▷ Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	21.59 ratio	57
Apprenticeships	are sufficiently implemented	5.47 Survey [0..10]	27
► Employee training	is a high priority in companies	6.44 Survey [0..10]	20
Female labor force	Percentage of total labor force	45.77 %	33
► Health infrastructure	meets the needs of society	7.39 Survey [0..10]	19

APPEAL

		Value	2022 Rank
Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	84.90 index	42
Attracting and retaining talents	is a priority in companies	6.81 Survey [0..10]	32
Worker motivation	in companies is high	6.30 Survey [0..10]	21
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	5.21 Survey [0..10]	28
Quality of life	is high	6.36 Survey [0..10]	38
Foreign highly-skilled personnel	are attracted to your country's business environment	5.90 Survey [0..10]	25
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	12,681 US\$	45
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	193,546 US\$	23
► Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	1.90 %	11
Justice	is fairly administered	5.78 Survey [0..10]	34
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	27.32 micrograms	52

READINESS

		Value	2022 Rank
Labor force growth	Percentage change	0.40 %	37
► Skilled labor	is readily available	5.88 Survey [0..10]	21
Finance skills	are readily available	5.82 Survey [0..10]	39
► International experience	of senior managers is generally significant	5.96 Survey [0..10]	19
Competent senior managers	are readily available	6.04 Survey [0..10]	25
Primary and secondary education	meets the needs of a competitive economy	5.56 Survey [0..10]	43
Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	22.06 %	38
University education	meets the needs of a competitive economy	5.78 Survey [0..10]	41
Management education	meets the needs of the business community	6.22 Survey [0..10]	37
Language skills	are meeting the needs of enterprises	4.97 Survey [0..10]	50
▷ Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	0.38 number	54
Educational assessment - PISA	PISA survey of 15-year olds	412 Average	49

o

- Overall top strengths
- ▷ Overall top weaknesses

THAILAND 2023

Investment & Development

		Value	2023 Rank
► Total public expenditure on education	Percentage of GDP	3.6 %	51
▷ Total public exp. on education per student	Spending per enrolled pupil/student, all levels	1,600 US\$	52
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	14.37 ratio	32
▷ Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	22.86 ratio	58
Apprenticeships	are sufficiently implemented	5.77 Survey [0..10]	21
Employee training	is a high priority in companies	6.67 Survey [0..10]	20
Female labor force	Percentage of total labor force	46.32 %	32
► Health infrastructure	meets the needs of society	7.91 Survey [0..10]	8

Appeal

		Value	2023 Rank
Cost-of-living index	Index of a basket of goods & services in the main city	71.72 index	31
Attracting and retaining talents	is a priority in companies	7.26 Survey [0..10]	26
► Worker motivation	in companies is high	6.79 Survey [0..10]	17
Brain drain	does not hinder competitiveness in your economy	5.67 Survey [0..10]	23
Quality of life	is high	6.98 Survey [0..10]	32
Foreign highly skilled personnel	are attracted to your country's business environment	6.16 Survey [0..10]	19
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	193,546 US\$	22
► Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	1.83 %	12
Justice	is fairly administered	5.91 Survey [0..10]	34
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	30.83 micrograms	56
Statutory minimum wage	Statutory gross monthly minimum wage	248.42 US\$	38

Readiness

		Value	2023 Rank
► Labor force growth	Percentage change	3.11 %	17
Skilled labor	is readily available	6.00 Survey [0..10]	24
Finance skills	are readily available	6.23 Survey [0..10]	33
International experience	of senior managers is generally significant	5.98 Survey [0..10]	23
Competent senior managers	are readily available	6.24 Survey [0..10]	23
Primary and secondary education	meets the needs of a competitive economy	6.26 Survey [0..10]	32
Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	22.06 %	38
University education	meets the needs of a competitive economy	6.34 Survey [0..10]	33
► Management education	meets the needs of the business community	7.07 Survey [0..10]	19
Language skills	are meeting the needs of enterprises	5.38 Survey [0..10]	47
▷ Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	0.38 number	54
Educational assessment - PISA	PISA survey of 15-year olds	412 Average	49



SINGAPORE

OVERALL PERFORMANCE (64 countries)

- Overall top strengths
- ▷ Overall top weaknesses

Rank 2023

8

Overall

31

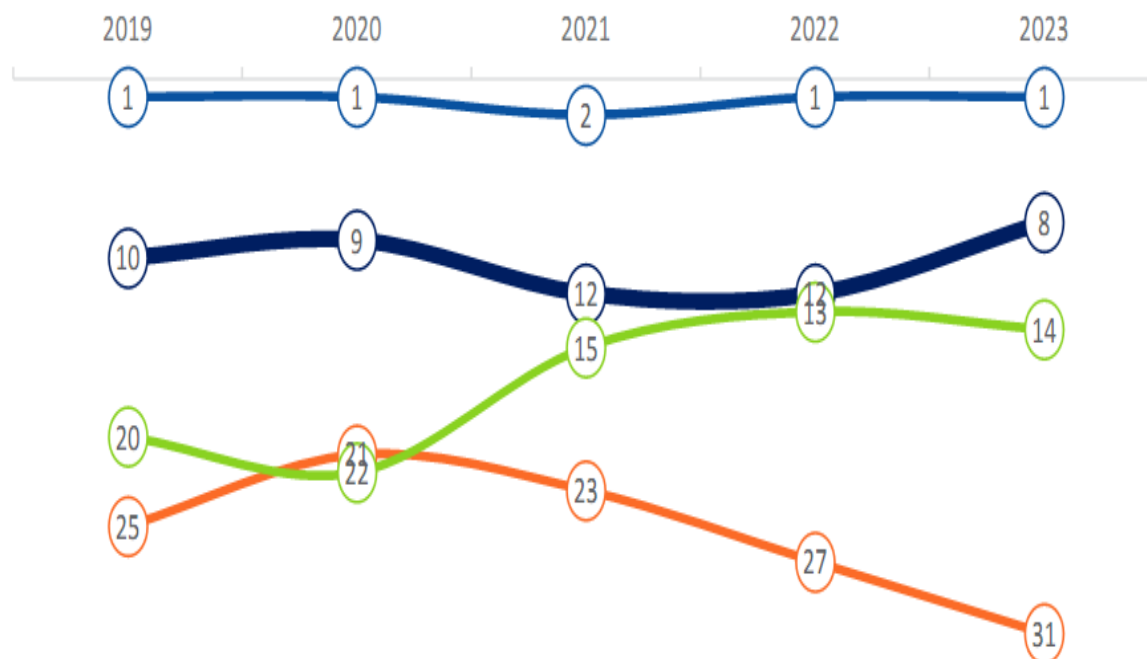
Investment & Development

14

Appeal

1

Readiness



ที่มา : IMD 2023

SINGAPORE 2022

- ▶ Overall top strengths
- ▷ Overall top weaknesses

INVESTMENT & DEVELOPMENT

		Value	2022 Rank
▷ Total public expenditure on education	Percentage of GDP	2.6 %	62
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	10,929 US\$	16
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	13.92 ratio	28
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	11.48 ratio	24
Apprenticeships	are sufficiently implemented	5.86 Survey [0..10]	13
Employee training	is a high priority in companies	6.36 Survey [0..10]	24
Female labor force	Percentage of total labor force	46.80 %	25
Health infrastructure	meets the needs of society	8.18 Survey [0..10]	8

APPEAL

		Value	2022 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	108.40 index	56
Attracting and retaining talents	is a priority in companies	7.36 Survey [0..10]	24
Worker motivation	in companies is high	6.11 Survey [0..10]	26
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	6.86 Survey [0..10]	8
Quality of life	is high	8.25 Survey [0..10]	14
Foreign highly-skilled personnel	are attracted to your country's business environment	7.61 Survey [0..10]	5
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	- US\$	-
▶ Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	298,777 US\$	4
Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	2.68 %	18
Justice	is fairly administered	8.14 Survey [0..10]	7
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	19.00 micrograms	40

READINESS

		Value	2022 Rank
▷ Labor force growth	Percentage change	-2.86 %	60
Skilled labor	is readily available	6.50 Survey [0..10]	8
Finance skills	are readily available	6.93 Survey [0..10]	12
International experience	of senior managers is generally significant	7.14 Survey [0..10]	5
Competent senior managers	are readily available	6.82 Survey [0..10]	8
▶ Primary and secondary education	meets the needs of a competitive economy	8.43 Survey [0..10]	4
▶ Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	36.27 %	3
University education	meets the needs of a competitive economy	7.93 Survey [0..10]	10
Management education	meets the needs of the business community	7.75 Survey [0..10]	7
Language skills	are meeting the needs of enterprises	8.25 Survey [0..10]	10
▶ Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	9.67 number	4
▶ Educational assessment - PISA	PISA survey of 15-year olds	556 Average	2

- Overall top strengths
- ▷ Overall top weaknesses

SINGAPORE 2023

Investment & Development

		Value	2023 Rank
▷ Total public expenditure on education	Percentage of GDP	2.3 %	62
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	10,929 US\$	18
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	13.92 ratio	28
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	11.48 ratio	26
Apprenticeships	are sufficiently implemented	5.83 Survey [0..10]	19
Employee training	is a high priority in companies	6.41 Survey [0..10]	27
Female labor force	Percentage of total labor force	46.70 %	29
Health infrastructure	meets the needs of society	7.52 Survey [0..10]	15

Appeal

		Value	2023 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city	99.87 index	57
▷ Attracting and retaining talents	is a priority in companies	6.78 Survey [0..10]	37
Worker motivation	in companies is high	6.10 Survey [0..10]	30
Brain drain	does not hinder competitiveness in your economy	6.81 Survey [0..10]	10
Quality of life	is high	7.66 Survey [0..10]	26
► Foreign highly skilled personnel	are attracted to your country's business environment	7.49 Survey [0..10]	6
► Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	298,777 US\$	4
Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	2.50 %	16
Justice	is fairly administered	7.61 Survey [0..10]	17
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	14.01 micrograms	27
Statutory minimum wage	Statutory gross monthly minimum wage	- US\$	-

Readiness

		Value	2023 Rank
Labor force growth	Percentage change	4.06 %	8
Skilled labor	is readily available	6.44 Survey [0..10]	15
Finance skills	are readily available	7.32 Survey [0..10]	9
International experience	of senior managers is generally significant	7.08 Survey [0..10]	11
Competent senior managers	are readily available	6.88 Survey [0..10]	6
Primary and secondary education	meets the needs of a competitive economy	7.66 Survey [0..10]	9
► Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	36.27 %	3
University education	meets the needs of a competitive economy	7.76 Survey [0..10]	9
Management education	meets the needs of the business community	7.22 Survey [0..10]	14
Language skills	are meeting the needs of enterprises	7.80 Survey [0..10]	14
► Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	9.67 number	4
► Educational assessment - PISA	PISA survey of 15-year olds	556 Average	2



JAPAN

OVERALL PERFORMANCE (64 countries)

- Overall top strengths
- ▷ Overall top weaknesses

Rank 2023

43

Overall

36

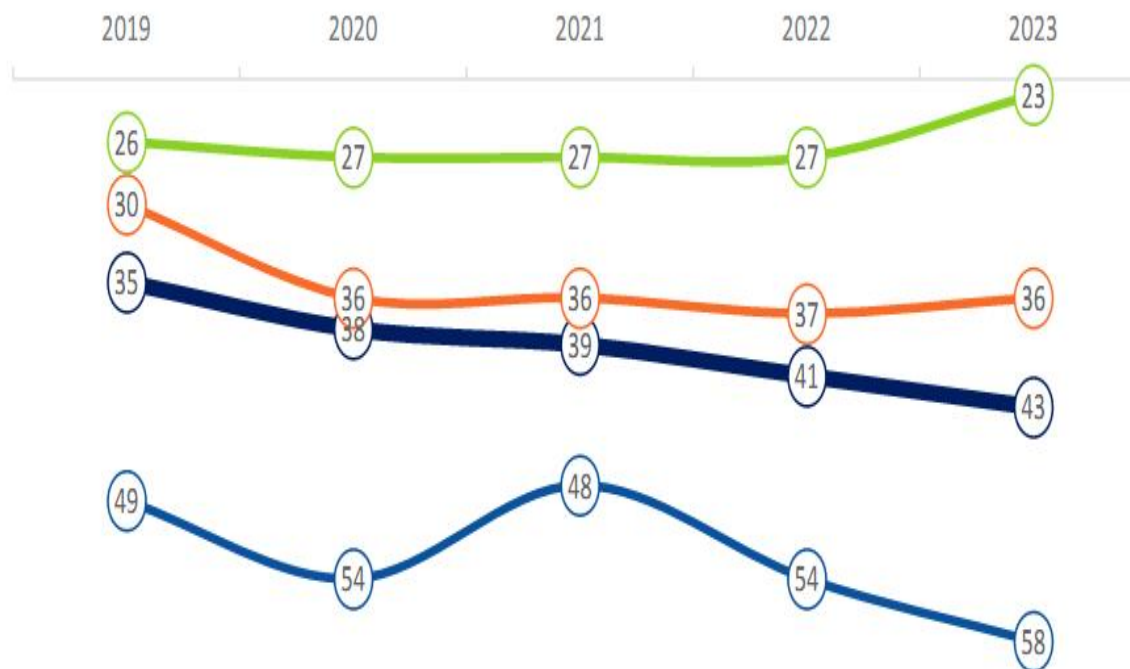
Investment & Development

23

Appeal

58

Readiness



ที่มา : IMD 2023

JAPAN 2022

- ▶ Overall top strengths
- ▷ Overall top weaknesses

INVESTMENT & DEVELOPMENT

		Value	2022 Rank
Total public expenditure on education	Percentage of GDP	3.4 %	54
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	7,984 US\$	25
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	15.62 ratio	37
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	12.02 ratio	33
Apprenticeships	are sufficiently implemented	5.62 Survey [0..10]	22
Employee training	is a high priority in companies	6.22 Survey [0..10]	30
Female labor force	Percentage of total labor force	44.59 %	38
Health infrastructure	meets the needs of society	6.49 Survey [0..10]	31

APPEAL

		Value	2022 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	116.90 index	59
▶ Attracting and retaining talents	is a priority in companies	8.13 Survey [0..10]	4
Worker motivation	in companies is high	5.84 Survey [0..10]	32
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	4.13 Survey [0..10]	43
Quality of life	is high	7.35 Survey [0..10]	30
Foreign highly-skilled personnel	are attracted to your country's business environment	3.64 Survey [0..10]	54
▶ Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	45,806 US\$	14
▶ Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	269,256 US\$	8
Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	6.01 %	36
▶ Justice	is fairly administered	7.64 Survey [0..10]	14
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	13.65 micrograms	25

READINESS

		Value	2022 Rank
Labor force growth	Percentage change	0.07 %	42
Skilled labor	is readily available	5.03 Survey [0..10]	36
Finance skills	are readily available	5.62 Survey [0..10]	43
▷ International experience	of senior managers is generally significant	3.01 Survey [0..10]	63
▷ Competent senior managers	are readily available	3.50 Survey [0..10]	61
Primary and secondary education	meets the needs of a competitive economy	6.11 Survey [0..10]	36
Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	21.77 %	39
University education	meets the needs of a competitive economy	4.38 Survey [0..10]	59
▷ Management education	meets the needs of the business community	4.18 Survey [0..10]	60
▷ Language skills	are meeting the needs of enterprises	3.11 Survey [0..10]	62
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	1.61 number	46
▶ Educational assessment - PISA	PISA survey of 15-year olds	520 Average	5

- Overall top strengths
- ▷ Overall top weaknesses

JAPAN 2023

Investment & Development

		Value	2023 Rank
Total public expenditure on education	Percentage of GDP	3.3 %	53
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	8,601 US\$	26
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	15.34 ratio	38
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	11.93 ratio	35
Apprenticeships	are sufficiently implemented	5.68 Survey [0..10]	23
Employee training	is a high priority in companies	6.18 Survey [0..10]	35
Female labor force	Percentage of total labor force	44.86 %	38
Health infrastructure	meets the needs of society	6.95 Survey [0..10]	21

Appeal

		Value	2023 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city	97.97 index	56
► Attracting and retaining talents	is a priority in companies	8.41 Survey [0..10]	4
Worker motivation	in companies is high	6.36 Survey [0..10]	24
Brain drain	does not hinder competitiveness in your economy	4.02 Survey [0..10]	44
Quality of life	is high	7.68 Survey [0..10]	24
Foreign highly skilled personnel	are attracted to your country's business environment	3.80 Survey [0..10]	54
► Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	269,256 US\$	7
Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	6.14 %	36
► Justice	is fairly administered	7.95 Survey [0..10]	11
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	12.95 micrograms	25
► Statutory minimum wage	Statutory gross monthly minimum wage	1,225.87 US\$	17

Readiness

		Value	2023 Rank
Labor force growth	Percentage change	-0.07 %	54
Skilled labor	is readily available	4.58 Survey [0..10]	46
Finance skills	are readily available	5.67 Survey [0..10]	43
▷ International experience	of senior managers is generally significant	3.18 Survey [0..10]	64
▷ Competent senior managers	are readily available	3.16 Survey [0..10]	62
Primary and secondary education	meets the needs of a competitive economy	6.44 Survey [0..10]	30
Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	21.77 %	39
University education	meets the needs of a competitive economy	4.83 Survey [0..10]	56
▷ Management education	meets the needs of the business community	4.65 Survey [0..10]	60
▷ Language skills	are meeting the needs of enterprises	3.51 Survey [0..10]	60
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	1.77 number	43
► Educational assessment - PISA	PISA survey of 15-year olds	520 Average	5



KOREA REP.

OVERALL PERFORMANCE (64 countries)

Rank 2023

34

Overall

22

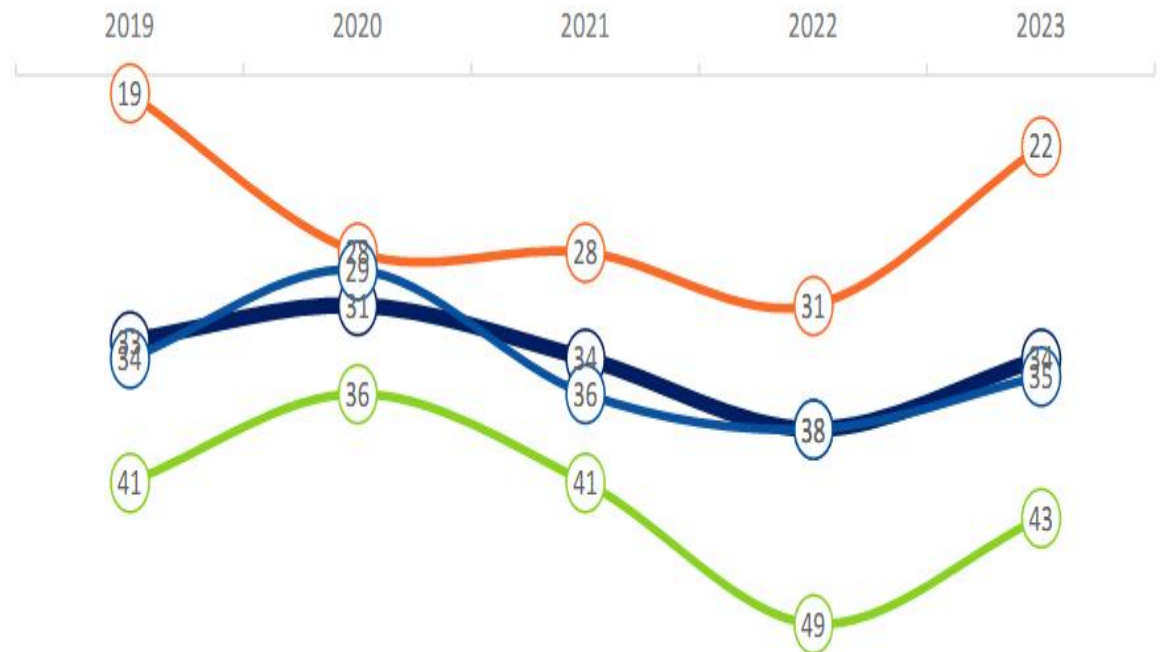
Investment &
Development

43

Appeal

35

Readiness



ที่มา : IMD 2023

KOREA REP. 2022

- ▶ Overall top strengths
- ▷ Overall top weaknesses

INVESTMENT & DEVELOPMENT

		Value	2022 Rank
Total public expenditure on education	Percentage of GDP	4.7 %	38
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	7,950 US\$	26
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	16.31 ratio	41
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	11.89 ratio	31
Apprenticeships	are sufficiently implemented	5.64 Survey [0..10]	21
Employee training	is a high priority in companies	6.10 Survey [0..10]	34
Female labor force	Percentage of total labor force	43.04 %	44
▶ Health infrastructure	meets the needs of society	7.66 Survey [0..10]	14

APPEAL

		Value	2022 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	104.60 Index	55
▶ Attracting and retaining talents	is a priority in companies	7.54 Survey [0..10]	18
▷ Worker motivation	In companies is high	4.94 Survey [0..10]	52
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	4.81 Survey [0..10]	33
Quality of life	is high	6.44 Survey [0..10]	36
Foreign highly-skilled personnel	are attracted to your country's business environment	4.15 Survey [0..10]	49
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	24,963 US\$	29
▶ Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	237,687 US\$	16
Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	5.24 %	31
Justice	is fairly administered	4.98 Survey [0..10]	42
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	27.45 micrograms	53

READINESS

		Value	2022 Rank
Labor force growth	Percentage change	1.06 %	29
Skilled labor	is readily available	4.58 Survey [0..10]	43
Finance skills	are readily available	5.60 Survey [0..10]	44
▷ International experience	of senior managers is generally significant	4.32 Survey [0..10]	59
▷ Competent senior managers	are readily available	3.85 Survey [0..10]	56
Primary and secondary education	meets the needs of a competitive economy	6.06 Survey [0..10]	37
▶ Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	30.18 %	9
University education	meets the needs of a competitive economy	5.21 Survey [0..10]	46
Management education	meets the needs of the business community	5.60 Survey [0..10]	46
Language skills	are meeting the needs of enterprises	5.60 Survey [0..10]	45
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	2.15 number	40
▶ Educational assessment - PISA	PISA survey of 15-year olds	520 Average	6

- Overall top strengths
- ▷ Overall top weaknesses

KOREA REP. 2023

Investment & Development

		Value	2023 Rank
Total public expenditure on education	Percentage of GDP	5.2 %	26
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	8,953 US\$	24
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	16.11 ratio	41
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	11.92 ratio	34
Apprenticeships	are sufficiently implemented	5.85 Survey [0..10]	18
Employee training	is a high priority in companies	6.57 Survey [0..10]	23
Female labor force	Percentage of total labor force	43.38 %	43
► Health infrastructure	meets the needs of society	7.54 Survey [0..10]	14

Appeal

		Value	2023 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city	91.64 index	53
► Attracting and retaining talents	is a priority in companies	7.69 Survey [0..10]	14
▷ Worker motivation	in companies is high	4.75 Survey [0..10]	58
Brain drain	does not hinder competitiveness in your economy	4.66 Survey [0..10]	36
Quality of life	is high	6.29 Survey [0..10]	42
Foreign highly skilled personnel	are attracted to your country's business environment	4.46 Survey [0..10]	47
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	237,687 US\$	15
Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	6.09 %	35
Justice	is fairly administered	5.04 Survey [0..10]	43
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	25.85 micrograms	53
► Statutory minimum wage	Statutory gross monthly minimum wage	1,482.40 US\$	14

Readiness

		Value	2023 Rank
Labor force growth	Percentage change	2.16 %	27
Skilled labor	is readily available	4.95 Survey [0..10]	41
Finance skills	are readily available	5.41 Survey [0..10]	51
▷ International experience	of senior managers is generally significant	4.84 Survey [0..10]	51
▷ Competent senior managers	are readily available	4.09 Survey [0..10]	55
Primary and secondary education	meets the needs of a competitive economy	5.82 Survey [0..10]	39
► Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	30.18 %	9
University education	meets the needs of a competitive economy	5.36 Survey [0..10]	49
Management education	meets the needs of the business community	5.53 Survey [0..10]	49
Language skills	are meeting the needs of enterprises	6.11 Survey [0..10]	42
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	2.15 number	40
► Educational assessment - PISA	PISA survey of 15-year olds	520 Average	6



MALAYSIA

OVERALL PERFORMANCE (64 countries)

Rank 2023

33

Overall

40

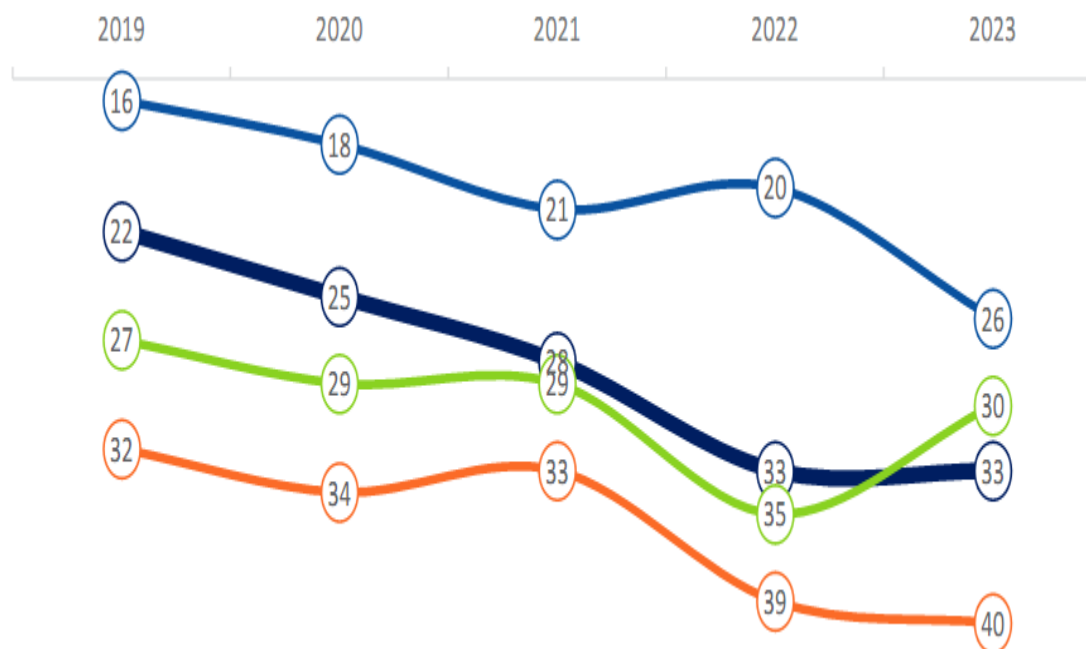
Investment &
Development

30

Appeal

26

Readiness



ที่มา : IMD 2023

MALAYSIA 2022

- Overall top strengths
- ▷ Overall top weaknesses

INVESTMENT & DEVELOPMENT

		Value	2022 Rank
Total public expenditure on education	Percentage of GDP	4.5 %	43
▷ Total public exp. on education per student	Spending per enrolled pupil/student, all levels	1,932 US\$	47
► Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	12.03 ratio	12
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	11.04 ratio	20
Apprenticeships	are sufficiently implemented	5.21 Survey [0..10]	33
Employee training	is a high priority in companies	5.83 Survey [0..10]	40
▷ Female labor force	Percentage of total labor force	39.02 %	54
Health infrastructure	meets the needs of society	6.71 Survey [0..10]	28

APPEAL

		Value	2022 Rank
► Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	65.00 index	14
▷ Attracting and retaining talents	is a priority in companies	6.22 Survey [0..10]	46
Worker motivation	in companies is high	5.31 Survey [0..10]	40
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	4.87 Survey [0..10]	32
▷ Quality of life	is high	5.62 Survey [0..10]	44
Foreign highly-skilled personnel	are attracted to your country's business environment	5.52 Survey [0..10]	31
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	13,564 US\$	42
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	117,688 US\$	43
► Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	2.75 %	20
Justice	is fairly administered	5.07 Survey [0..10]	39
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	16.55 micrograms	32

READINESS

		Value	2022 Rank
► Labor force growth	Percentage change	3.03 %	12
Skilled labor	is readily available	5.74 Survey [0..10]	29
Finance skills	are readily available	5.89 Survey [0..10]	38
International experience	of senior managers is generally significant	5.62 Survey [0..10]	31
Competent senior managers	are readily available	5.83 Survey [0..10]	29
Primary and secondary education	meets the needs of a competitive economy	5.67 Survey [0..10]	42
► Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	38.90 %	2
University education	meets the needs of a competitive economy	5.88 Survey [0..10]	40
Management education	meets the needs of the business community	5.87 Survey [0..10]	43
Language skills	are meeting the needs of enterprises	6.27 Survey [0..10]	35
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	2.74 number	32
▷ Educational assessment - PISA	PISA survey of 15-year olds	431 Average	43

- Overall top strengths
- ▷ Overall top weaknesses

MALAYSIA 2023

Investment & Development

		Value	2023 Rank
▷ Total public expenditure on education	Percentage of GDP	4.2 %	44
▷ Total public exp. on education per student	Spending per enrolled pupil/student, all levels	2,060 US\$	48
► Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	12.30 ratio	19
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	11.50 ratio	28
Apprenticeships	are sufficiently implemented	5.28 Survey [0..10]	29
Employee training	is a high priority in companies	5.71 Survey [0..10]	39
▷ Female labor force	Percentage of total labor force	39.05 %	55
Health infrastructure	meets the needs of society	6.81 Survey [0..10]	23

Appeal

		Value	2023 Rank
► Cost-of-living index	Index of a basket of goods & services in the main city	56.99 index	6
▷ Attracting and retaining talents	is a priority in companies	6.00 Survey [0..10]	52
Worker motivation	in companies is high	5.87 Survey [0..10]	34
Brain drain	does not hinder competitiveness in your economy	4.42 Survey [0..10]	39
Quality of life	is high	6.57 Survey [0..10]	38
Foreign highly skilled personnel	are attracted to your country's business environment	5.77 Survey [0..10]	27
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	117,688 US\$	42
► Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	1.75 %	11
Justice	is fairly administered	6.65 Survey [0..10]	26
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	16.29 micrograms	42
Statutory minimum wage	Statutory gross monthly minimum wage	340.83 US\$	34

Readiness

		Value	2023 Rank
▷ Labor force growth	Percentage change	0.83 %	48
Skilled labor	is readily available	5.57 Survey [0..10]	31
Finance skills	are readily available	6.29 Survey [0..10]	31
International experience	of senior managers is generally significant	5.56 Survey [0..10]	34
► Competent senior managers	are readily available	6.29 Survey [0..10]	22
Primary and secondary education	meets the needs of a competitive economy	6.16 Survey [0..10]	33
► Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	38.90 %	2
University education	meets the needs of a competitive economy	6.05 Survey [0..10]	39
Management education	meets the needs of the business community	6.21 Survey [0..10]	38
Language skills	are meeting the needs of enterprises	6.68 Survey [0..10]	32
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	2.75 number	32
Educational assessment - PISA	PISA survey of 15-year olds	431 Average	43

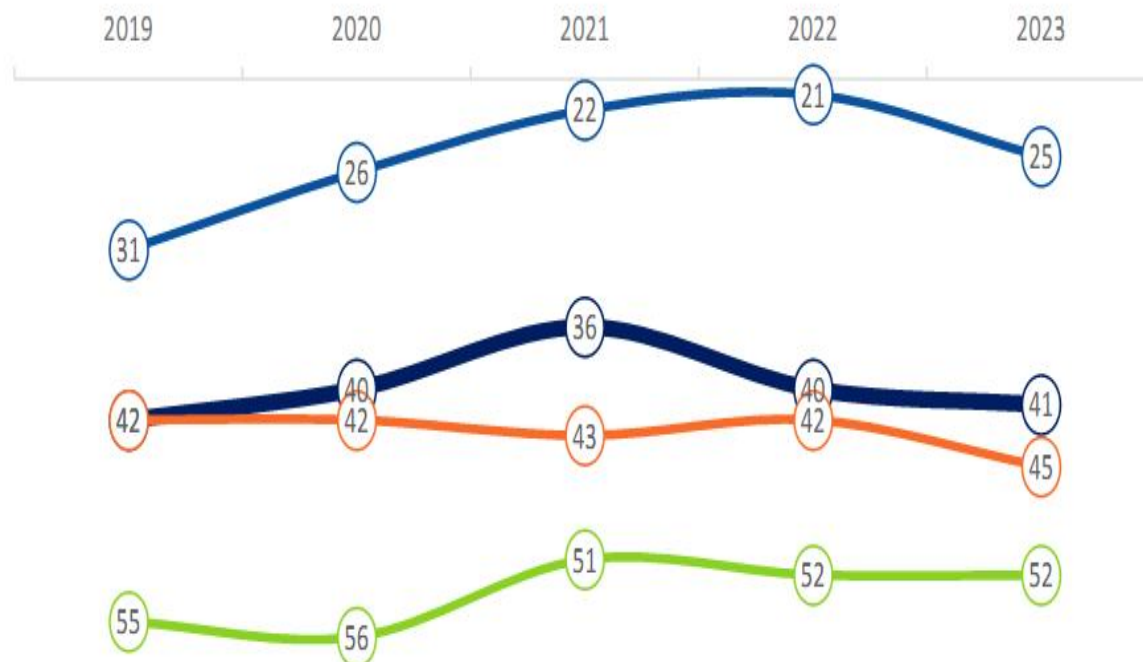
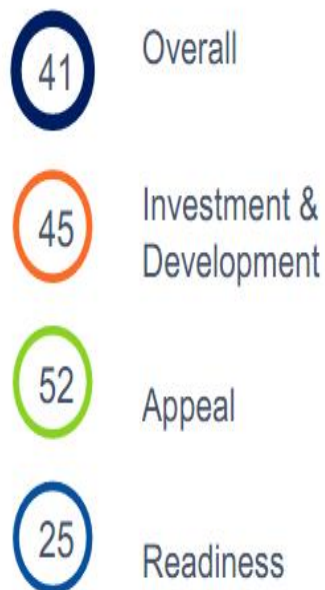


CHINA

OVERALL PERFORMANCE (64 countries)

- Overall top strengths
- ▷ Overall top weaknesses

Rank 2023



ที่มา : IMD 2023

CHINA MAINLAND 2022

- ▶ Overall top strengths
- ▷ Overall top weaknesses

INVESTMENT & DEVELOPMENT

		Value	2022 Rank
▷ Total public expenditure on education	Percentage of GDP	3.6 %	53
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	1,799 US\$	50
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	16.28 ratio	40
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	13.42 ratio	46
Apprenticeships	are sufficiently implemented	5.51 Survey [0..10]	25
Employee training	is a high priority in companies	7.01 Survey [0..10]	11
Female labor force	Percentage of total labor force	44.53 %	39
Health infrastructure	meets the needs of society	6.51 Survey [0..10]	30

APPEAL

		Value	2022 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	108.90 index	57
Attracting and retaining talents	is a priority in companies	7.03 Survey [0..10]	29
▶ Worker motivation	in companies is high	7.18 Survey [0..10]	10
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	4.78 Survey [0..10]	34
Quality of life	is high	6.95 Survey [0..10]	33
Foreign highly-skilled personnel	are attracted to your country's business environment	5.35 Survey [0..10]	35
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	11,684 US\$	49
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	152,385 US\$	36
▶ Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	1.14 %	6
Justice	is fairly administered	6.07 Survey [0..10]	30
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	47.73 micrograms	59

READINESS

		Value	2022 Rank
▷ Labor force growth	Percentage change	-0.75 %	51
▶ Skilled labor	is readily available	6.49 Survey [0..10]	9
Finance skills	are readily available	7.09 Survey [0..10]	10
International experience	of senior managers is generally significant	4.94 Survey [0..10]	47
Competent senior managers	are readily available	6.00 Survey [0..10]	26
▶ Primary and secondary education	meets the needs of a competitive economy	8.20 Survey [0..10]	7
Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	- %	-
University education	meets the needs of a competitive economy	7.38 Survey [0..10]	18
Management education	meets the needs of the business community	6.90 Survey [0..10]	23
Language skills	are meeting the needs of enterprises	6.23 Survey [0..10]	37
▷ Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	0.16 number	56
▶ Educational assessment - PISA	PISA survey of 15-year olds	579 Average	1

- Overall top strengths
- ▷ Overall top weaknesses

CHINA MAINLAND 2023

Investment & Development

		Value	2023 Rank
▷ Total public expenditure on education	Percentage of GDP	3.3 %	54
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	1,926 US\$	49
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	16.12 ratio	42
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	13.29 ratio	46
Apprenticeships	are sufficiently implemented	5.11 Survey [0..10]	34
Employee training	is a high priority in companies	6.73 Survey [0..10]	18
Female labor force	Percentage of total labor force	45.21 %	37
Health infrastructure	meets the needs of society	6.24 Survey [0..10]	32

Appeal

		Value	2023 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city	95.74 index	54
Attracting and retaining talents	is a priority in companies	7.08 Survey [0..10]	31
Worker motivation	in companies is high	6.81 Survey [0..10]	16
Brain drain	does not hinder competitiveness in your economy	4.93 Survey [0..10]	32
Quality of life	is high	6.74 Survey [0..10]	36
Foreign highly skilled personnel	are attracted to your country's business environment	5.04 Survey [0..10]	39
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	152,385 US\$	35
► Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	1.22 %	6
Justice	is fairly administered	6.06 Survey [0..10]	32
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	34.84 micrograms	58
Statutory minimum wage	Statutory gross monthly minimum wage	286.47 US\$	35

Readiness

		Value	2023 Rank
▷ Labor force growth	Percentage change	-0.47 %	58
► Skilled labor	is readily available	6.53 Survey [0..10]	10
Finance skills	are readily available	7.10 Survey [0..10]	12
International experience	of senior managers is generally significant	5.38 Survey [0..10]	39
Competent senior managers	are readily available	6.20 Survey [0..10]	25
► Primary and secondary education	meets the needs of a competitive economy	8.08 Survey [0..10]	5
Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	- %	-
► University education	meets the needs of a competitive economy	7.56 Survey [0..10]	11
Management education	meets the needs of the business community	6.84 Survey [0..10]	25
Language skills	are meeting the needs of enterprises	6.39 Survey [0..10]	35
▷ Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	0.16 number	56
► Educational assessment - PISA	PISA survey of 15-year olds	579 Average	1



TAIWAN, CHINA

OVERALL PERFORMANCE (64 countries)

Rank 2023

20

Overall

23

Investment &
Development

21

Appeal

19

Readiness



ที่มา : IMD 2023

TAIWAN, CHINA 2022

- ▶ Overall top strengths
- ▷ Overall top weaknesses

INVESTMENT & DEVELOPMENT

		Value	2022 Rank
▷ Total public expenditure on education	Percentage of GDP	3.6 %	52
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	5,722 US\$	34
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	12.10 ratio	15
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	12.10 ratio	34
▶ Apprenticeships	are sufficiently implemented	6.35 Survey [0..10]	7
▶ Employee training	is a high priority in companies	7.32 Survey [0..10]	6
Female labor force	Percentage of total labor force	44.67 %	37
▶ Health infrastructure	meets the needs of society	8.58 Survey [0..10]	4

APPEAL

		Value	2022 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	92.10 index	50
Attracting and retaining talents	is a priority in companies	7.06 Survey [0..10]	27
▶ Worker motivation	in companies is high	7.54 Survey [0..10]	5
▷ Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	4.20 Survey [0..10]	40
Quality of life	is high	7.72 Survey [0..10]	28
▷ Foreign highly-skilled personnel	are attracted to your country's business environment	4.88 Survey [0..10]	43
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	26,500 US\$	28
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	183,102 US\$	24
Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	2.55 %	17
Justice	is fairly administered	6.53 Survey [0..10]	25
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	16.20 micrograms	31

READINESS

		Value	2022 Rank
▷ Labor force growth	Percentage change	-0.38 %	46
Skilled labor	is readily available	6.05 Survey [0..10]	19
Finance skills	are readily available	6.86 Survey [0..10]	14
International experience	of senior managers is generally significant	5.70 Survey [0..10]	27
Competent senior managers	are readily available	6.17 Survey [0..10]	21
Primary and secondary education	meets the needs of a competitive economy	8.00 Survey [0..10]	8
▶ Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	32.36 %	7
University education	meets the needs of a competitive economy	7.60 Survey [0..10]	14
Management education	meets the needs of the business community	7.45 Survey [0..10]	10
Language skills	are meeting the needs of enterprises	6.43 Survey [0..10]	31
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	3.86 number	26
Educational assessment - PISA	PISA survey of 15-year olds	516 Average	8

- Overall top strengths
- ▷ Overall top weaknesses

TAIWAN, CHINA 2023

Investment & Development

		Value	2023 Rank
▷ Total public expenditure on education	Percentage of GDP	3.5 %	52
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	6,540 US\$	31
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	12.10 ratio	15
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	11.80 ratio	30
Apprenticeships	are sufficiently implemented	6.29 Survey [0..10]	11
► Employee training	is a high priority in companies	7.21 Survey [0..10]	7
Female labor force	Percentage of total labor force	44.70 %	40
► Health infrastructure	meets the needs of society	8.58 Survey [0..10]	2

Appeal

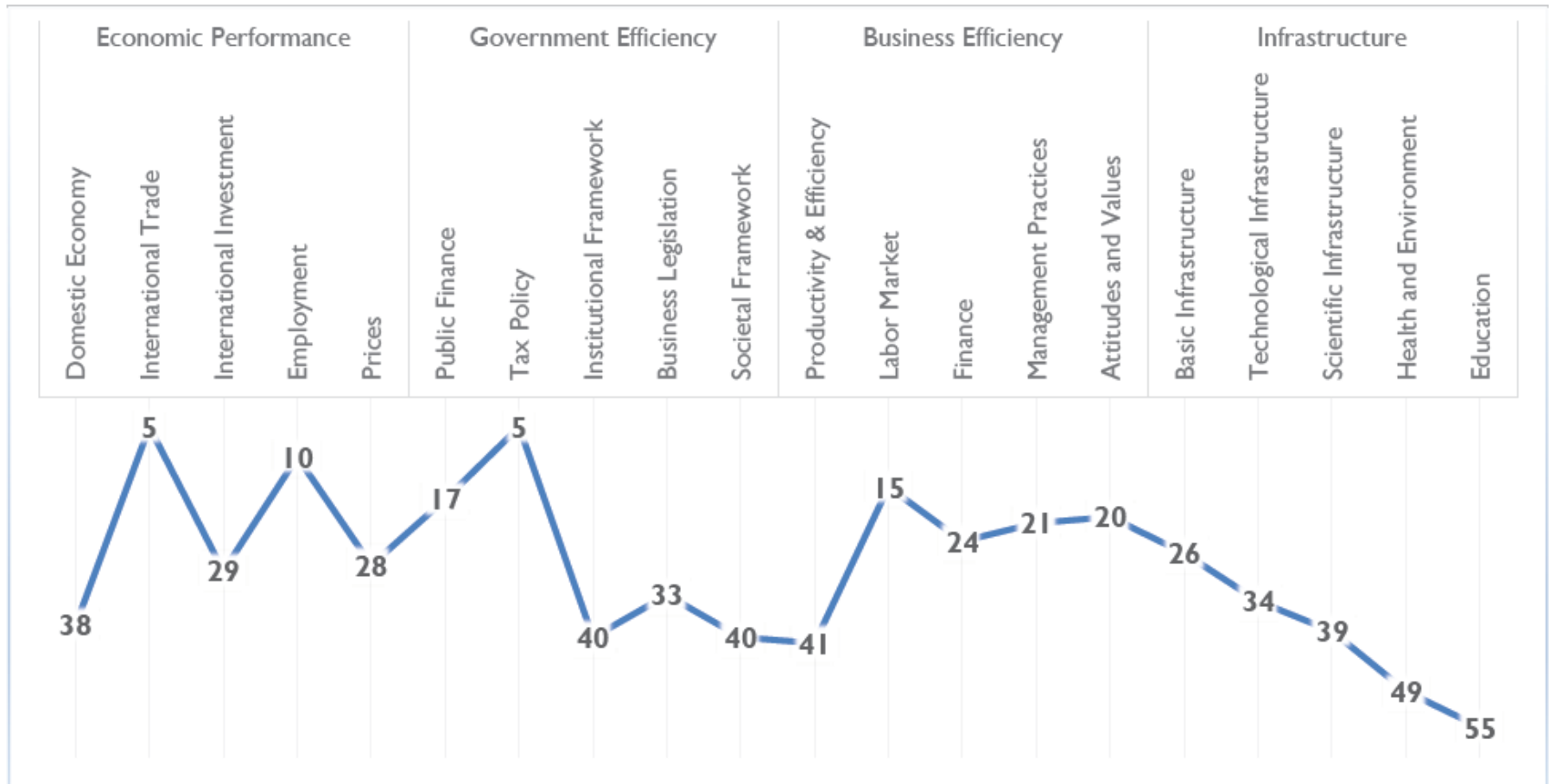
		Value	2023 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city	83.02 index	48
Attracting and retaining talents	is a priority in companies	7.27 Survey [0..10]	25
► Worker motivation	in companies is high	7.49 Survey [0..10]	4
▷ Brain drain	does not hinder competitiveness in your economy	4.11 Survey [0..10]	41
Quality of life	is high	7.81 Survey [0..10]	21
▷ Foreign highly skilled personnel	are attracted to your country's business environment	4.72 Survey [0..10]	44
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	183,102 US\$	23
Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	2.44 %	15
Justice	is fairly administered	6.50 Survey [0..10]	27
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	14.10 micrograms	28
Statutory minimum wage	Statutory gross monthly minimum wage	- US\$	-

Readiness

		Value	2023 Rank
▷ Labor force growth	Percentage change	-0.55 %	59
Skilled labor	is readily available	5.83 Survey [0..10]	29
Finance skills	are readily available	6.74 Survey [0..10]	20
International experience	of senior managers is generally significant	5.35 Survey [0..10]	40
Competent senior managers	are readily available	5.93 Survey [0..10]	26
Primary and secondary education	meets the needs of a competitive economy	7.14 Survey [0..10]	16
► Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	31.46 %	7
University education	meets the needs of a competitive economy	7.26 Survey [0..10]	20
Management education	meets the needs of the business community	7.28 Survey [0..10]	12
Language skills	are meeting the needs of enterprises	6.15 Survey [0..10]	41
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	3.86 number	26
► Educational assessment - PISA	PISA survey of 15-year olds	516 Average	8

อันดับความสามารถในการแข่งขันของประเทศไทย ในปี 2563 จำแนกตามปัจจัยหลักในแต่ละหมวด

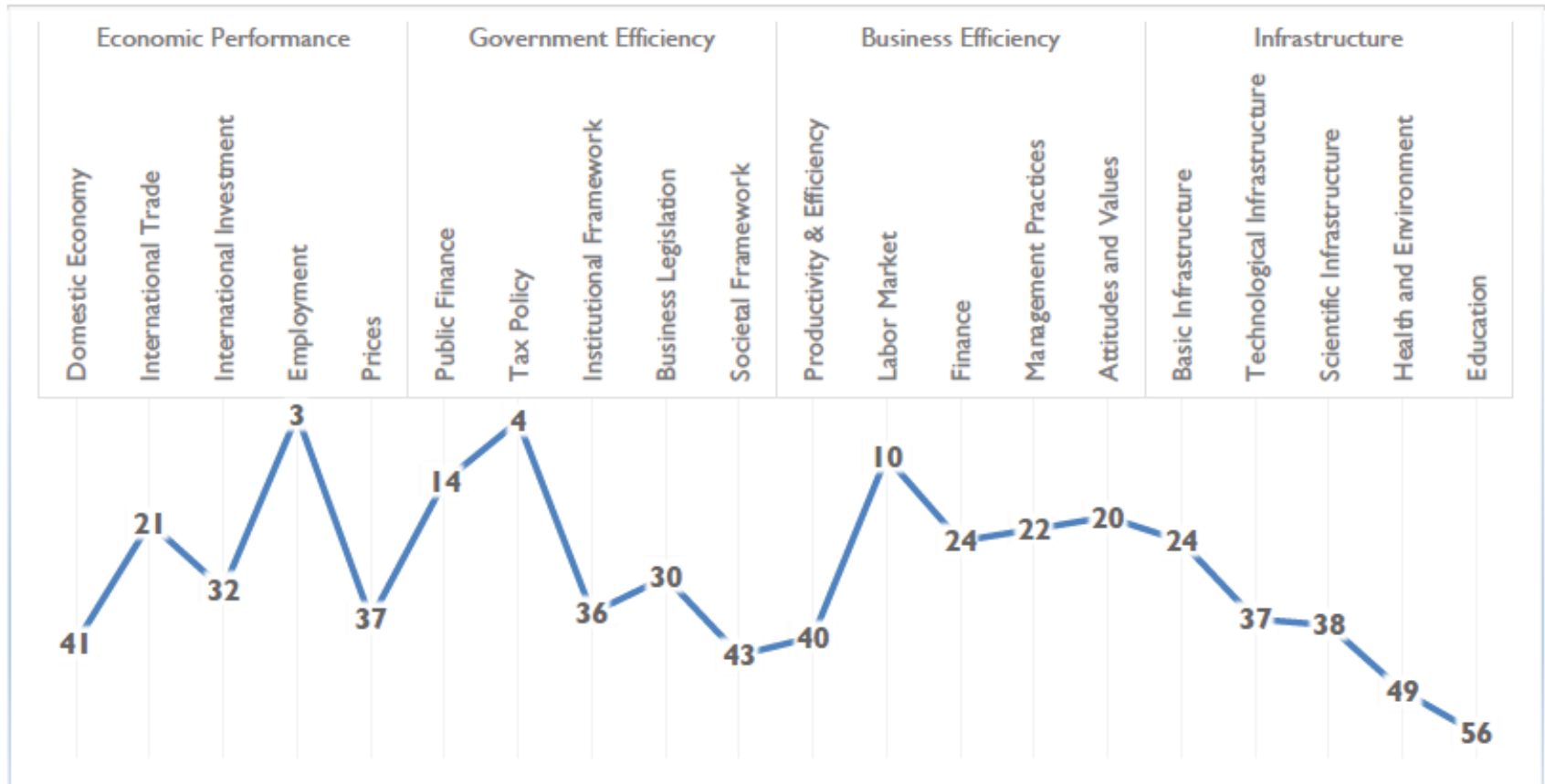
COMPETITIVENESS LANDSCAPE



ที่มา : IMD

อันดับความสามารถในการแข่งขันของประเทศไทย ในปี 2564 จำแนกตามปัจจัยหลักในแต่ละหมวด

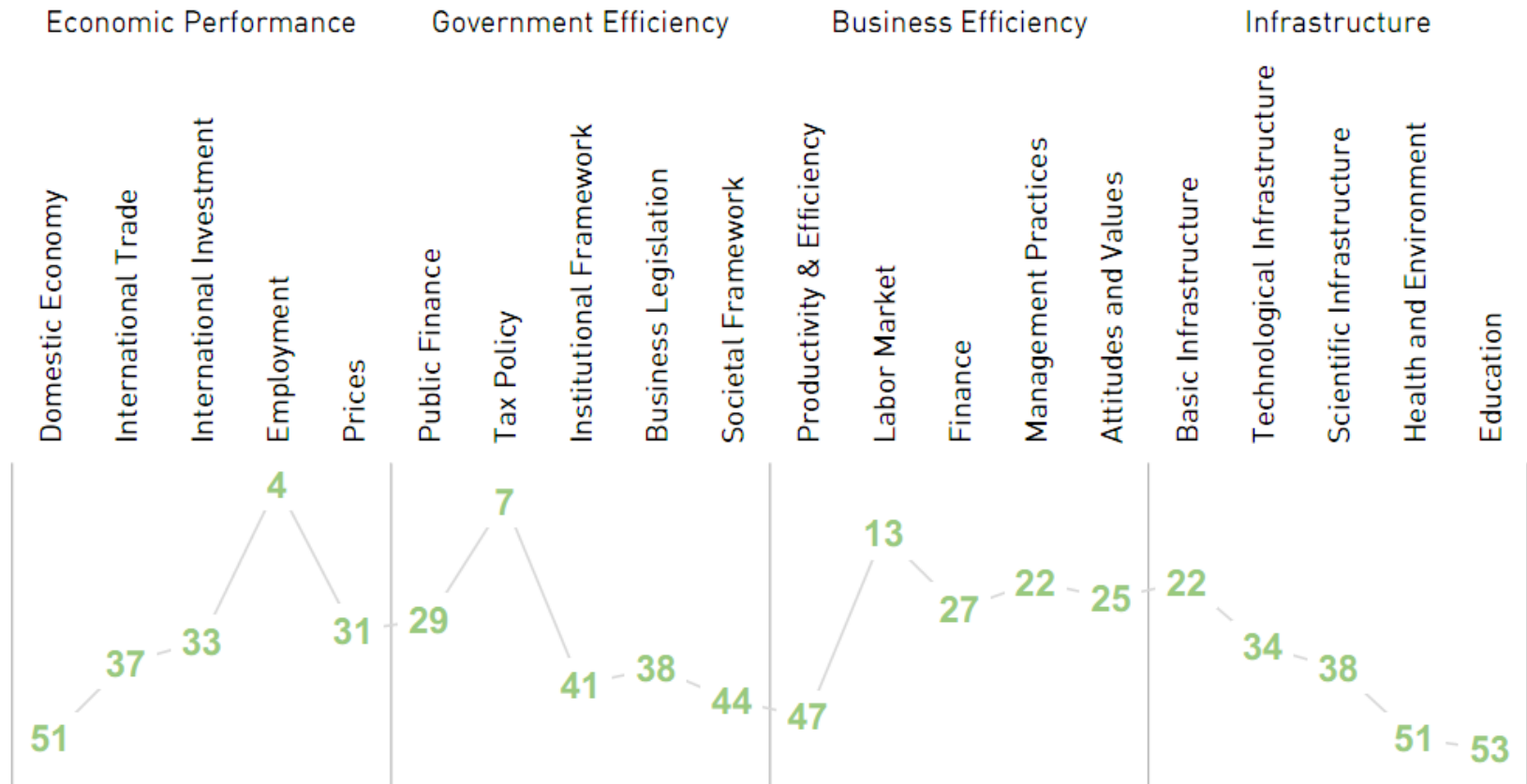
COMPETITIVENESS LANDSCAPE



ที่มา : IMD

อันดับความสามารถในการแข่งขันของประเทศไทย ในปี 2565 จำแนกตามปัจจัยหลักในแต่ละหมวด

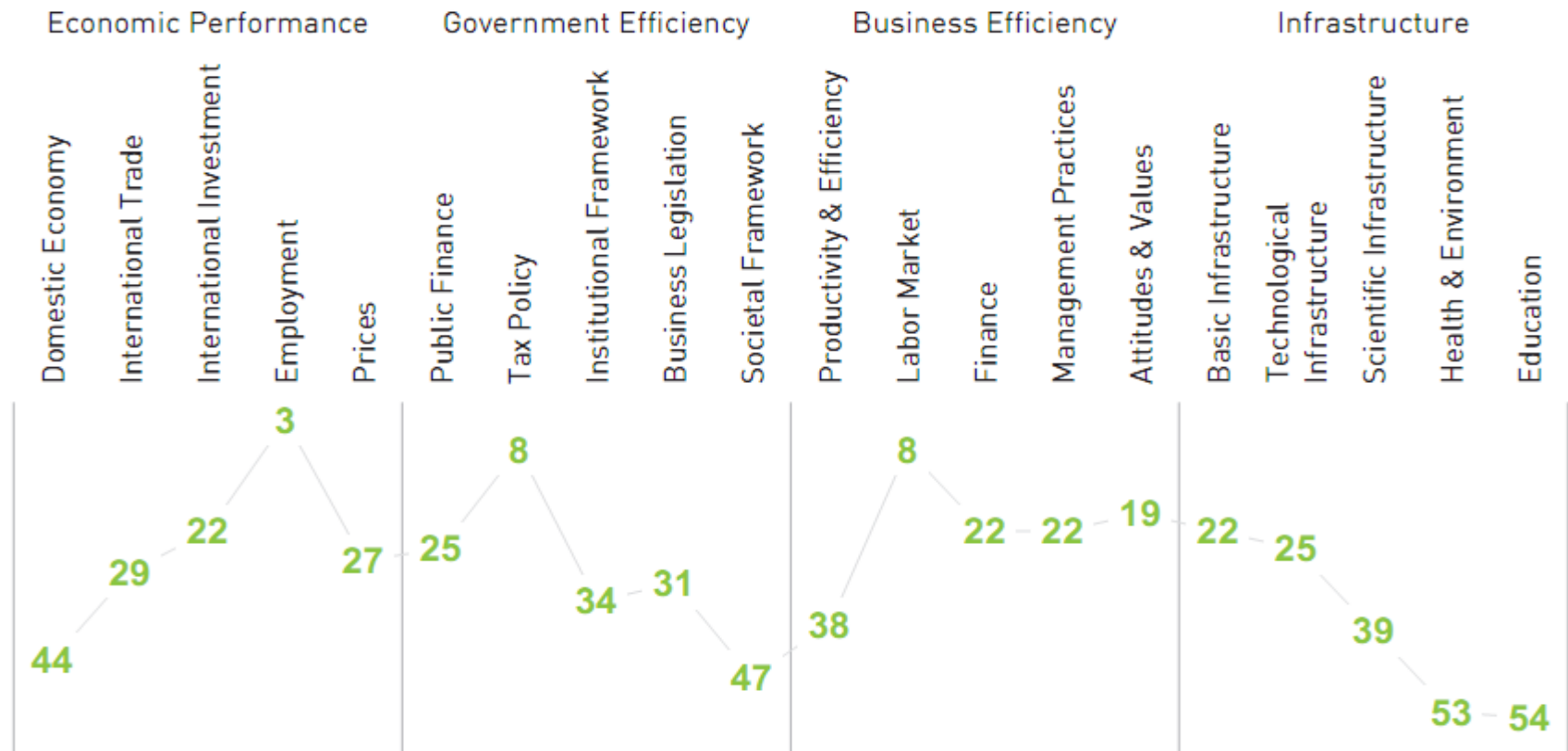
COMPETITIVENESS LANDSCAPE



ที่มา : IMD 2022

อันดับความสามารถในการแข่งขันของประเทศไทย ในปี 2566 จำแนกตามปัจจัยหลักในแต่ละหมวด

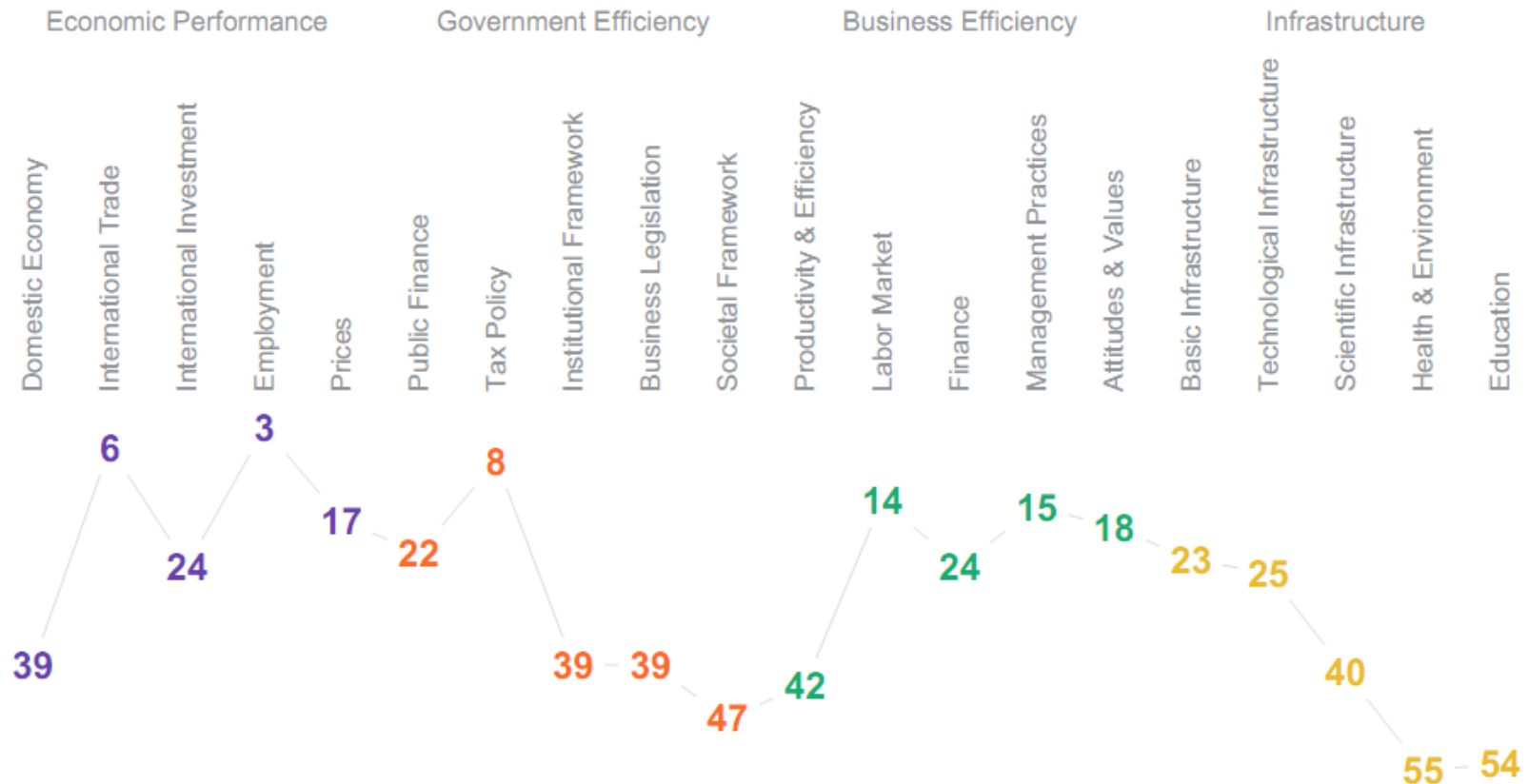
COMPETITIVENESS LANDSCAPE



ที่มา : IMD 2023

อันดับความสามารถในการแข่งขันของประเทศไทย ในปี 2567 จำแนกตามปัจจัยหลักในแต่ละหมวด

COMPETITIVENESS LANDSCAPE



ที่มา : IMD 2024

2023

4.1 Basic Infrastructure

4.1.01 [B] Land area	Square kilometers ('000)
4.1.02 Arable area	Square meters per capita
4.1.03 Water resources	Total internal renewable per capita in cubic meters
4.1.04 [S] Access to water	Access to water is adequately ensured and managed
4.1.05 [S] Management of cities	Management of cities supports business development
4.1.06 [B] Population - market size	Estimates in millions
4.1.07 Population - growth	Percentage change
4.1.08 [B] Dependent Population	Percentage of total population
4.1.09 Dependency ratio	Population under 15 & over 64 years old, divided by active population (15-64 years)
4.1.10 Roads	Density of the network, km roads/square km land area
4.1.11 Railroads	Density of the network, km per square km
4.1.12 [B] Air transportation	Number of passengers carried by main companies, thousands
4.1.13 [S] Quality of air transportation	Quality of air transportation encourages business development
4.1.14 [S] Distribution infrastructure	The distribution infrastructure of goods and services is generally efficient
4.1.15 [S] Energy infrastructure	Energy infrastructure is adequate and efficient
4.1.16 [B] Total indigenous energy production	Millions MTOE
4.1.17 Total indigenous energy production (%)	Percentage of total requirements in tons of oil equivalent
4.1.18 [B] Total final energy consumption	Millions MTOE
4.1.19 [B] Total final energy consumption per capita	MTOE per capita
4.1.20 Electricity costs for industrial clients	US\$ per kwh

4.1 Basic Infrastructure

4.1.01 [B] Land area	Square kilometers ('000)
4.1.02 Arable area	Square meters per capita
4.1.03 Water resources	Total internal renewable per capita in cubic meters
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4.1.19 [B] Total final energy consumption per capita	MTOE per capita
4.1.20 Electricity costs for industrial clients	US\$ per kwh

2023

4.2 Technological Infrastructure

4.2.01 Investment in telecommunications	Percentage of GDP
4.2.02 Mobile broadband subscribers	4G & 5G market, % of mobile market
4.2.03 Mobile telephone costs	Monthly blended average revenue per user US\$
4.2.04 [S] Communications technology	Communications technology (voice and data) meets business requirements
4.2.05 Secure internet servers	Worldwide share/ Source: Computer Industry Almanac
4.2.06 Internet users	Number of internet users per 1000 people/ Source: Computer Industry Almanac
4.2.07 Broadband subscribers	Number of subscribers per 1000 inhabitants
4.2.08 Internet bandwidth speed	Average speed (Mbps)
4.2.09 [S] Digital/Technological skills	Digital/technological skills are readily available
4.2.10 [S] Qualified engineers	Qualified engineers are available in your labor market
4.2.11 [S] Public-private partnerships	Public and private sector ventures are supporting technological development
4.2.12 [S] Development and application of technology	Development and application of technology are supported by the legal environment
4.2.13 [S] Funding for technological development	Funding for technological development is readily available
4.2.14 High-tech exports (\$)	US\$ millions
4.2.15 High-tech exports (%)	Percentage of manufactured exports
4.2.16 ICT Service Exports (%)	Percentage of Service Exports
4.2.17 [S] Cyber security	Cyber security is being adequately addressed by corporations

4.2 Technological Infrastructure

4.2.01 Investment in telecommunications	Percentage of GDP
4.2.02 Mobile broadband subscribers	5G market, % of mobile market
4.2.03 Mobile telephone costs	Monthly blended average revenue per user US\$
4.2.04 [S] Communications technology	Communications technology (voice and data) meets business requirements
4.2.05 Secure internet servers	The number of distinct, publicly-trusted TLS/SSL certificates found in the Netcraft Secure Server Survey.
4.2.06 Internet users	Number of internet users per 1000 people
4.2.07 Broadband subscribers	Number of subscribers per 1000 inhabitants
4.2.08 Internet bandwidth speed	Average speed (Mbps)
4.2.09 [S] Digital/Technological skills	Digital/technological skills are readily available
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4.2.16 ICT Service Exports (%)	Percentage of Service Exports
4.2.17 [S] Cyber security	Cyber security is being adequately addressed by corporations

4.3 Scientific Infrastructure

4.3.01 Total expenditure on R&D (\$)	US\$ millions
4.3.02 Total expenditure on R&D (%)	Percentage of GDP
4.3.03 [B] Total expenditure on R&D per capita (\$)	US\$ per capita
4.3.04 Business expenditure on R&D (\$)	US\$ millions
4.3.05 Business expenditure on R&D (%)	Percentage of GDP
4.3.06 Total R&D personnel	Full-time work equivalent (FTE thousands)
4.3.07 Total R&D personnel per capita	Full-time work equivalent (FTE) per 1000 people
4.3.08 [B] Total R&D personnel in business enterprise	Full-time work equivalent (FTE thousands)
4.3.09 [B] Total R&D personnel in business per capita	Full-time work equivalent (FTE) per 1000 people
4.3.10 Researchers in R&D per capita	Full-time work equivalent (FTE) per 1000 people
4.3.11 Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences
4.3.12 Scientific articles	Scientific articles published by origin of author
4.3.13 [B] Nobel prizes	Awarded in physics, chemistry, physiology or medicine, & economics since 1950
4.3.14 Nobel prizes per capita	Awarded in physics, chemistry, etc and economics since 1950 per million people
4.3.15 Patent applications	Number of applications filed by applicant's origin
4.3.16 Patent applications per capita	Number of applications filed by applicant's origin, per 100,000 inhabitants
4.3.17 Patents grants	Number of patents granted by applicant's origin (average 2017-2019)
4.3.18 Number of patents in force	By applicant's origin, per 100,000 inhabitants
4.3.19 Medium- and high-tech value added	Proportion of total manufacturing value added, expressed as a percentage
4.3.20 [S] Scientific research legislation	Laws relating to scientific research do encourage innovation
4.3.21 [S] Intellectual property rights	Intellectual property rights are adequately enforced
4.3.22 [S] Knowledge transfer	Knowledge transfer is highly developed between companies and universities

4.3 Scientific Infrastructure

4.3.01 Total expenditure on R&D (\$)	US\$ millions
4.3.02 Total expenditure on R&D (%)	Percentage of GDP
4.3.03 [B] Total expenditure on R&D per capita (\$)	US\$ per capita
4.3.04 Business expenditure on R&D (\$)	US\$ millions
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4.3.06 Total R&D personnel	Full-time work equivalent (FTE thousands)
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4.3.09 [B] Total R&D personnel in business per capita	Full-time work equivalent (FTE) per 1000 people
4.3.10 Researchers in R&D per capita	Full-time work equivalent (FTE) per 1000 people
4.3.11 Graduates in sciences	Percentage of total % of graduates in ICT, Engineering, Math & Natural Sciences
4.3.12 Scientific articles	Scientific articles published by origin of author
4.3.13 [B] Nobel prizes	Awarded in physics, chemistry, physiology or medicine and economics since 1950
4.3.14 Nobel prizes per capita	Awarded in physics, chemistry, etc and economics since 1950 per million people
4.3.15 Patent applications	Number of applications filed by applicant's origin
4.3.16 Patent applications per capita	Number of applications filed by applicant's origin, per 100,000 inhabitants
4.3.17 Patents grants	Number of patents granted by applicant's origin (average 2018-2020)
4.3.18 Number of patents in force	By applicant's origin, per 100,000 inhabitants
4.3.19 Medium-and high-tech value added	Proportion of total manufacturing value added, expressed as a percentage
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4.3.21 [S] Intellectual property rights	Intellectual property rights are adequately enforced
4.3.22 [S] Knowledge transfer	Knowledge transfer is highly developed between companies and universities

4.4 Health and Environment

4.4.01 Total health expenditure	Percentage of GDP
4.4.02 [B] Total health expenditure per capita	US\$ per capita
4.4.03 [B] Public expenditure on health (%)	Percentage of total health expenditure
4.4.04 [S] Health infrastructure	Health infrastructure meets the needs of society
4.4.05 Universal health care coverage index	Index (0-100) measuring coverage of essential health services
4.4.06 Life expectancy at birth	Average estimate
4.4.07 [B] Healthy life expectancy	Average estimate
4.4.08 [B] Infant mortality	Under five mortality rate per 1000 live births
4.4.09 Medical assistance	Number of inhabitants per physician and per nurse
4.4.10 [B] Urban population	Percentage of total population
4.4.11 Human development index	Combines economic - social - educational indicators Source: HDR
4.4.12 Energy intensity	Total energy consumed for each 1000 US\$ of GDP in MTOE
4.4.13 Safely treated waste water	Percentage of waste water
4.4.14 Water use efficiency	US\$ per cubic metre
4.4.15 [B] CO2 emissions	Metric tons of carbon dioxide
4.4.16 CO2 emissions intensity	CO2 industrial emissions in metric tons per one million US\$ of GDP
4.4.17 Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre
4.4.18 Renewable energies (%)	Share of renewables in total energy requirements, %
4.4.19 Forest area growth	Five year percentage change of hectares
4.4.20 [B] Total biocapacity	Global hectares per capita of biologically productive space
4.4.21 [B] Ecological footprint	Global hectares per person
4.4.22 Ecological balance (reserve/deficit)	Total biocapacity minus total footprint in global hectare per capita
4.4.23 Environment-related technologies	Development of environment-related technologies, % inventions worldwide
4.4.24 Environmental agreements	Multilateral agreements on hazardous waste, proportion fulfilled
4.4.25 [S] Sustainable development	Sustainable development is a priority in companies
4.4.26 [S] Pollution problems	Pollution problems do not seriously affect your economy
4.4.27 [S] Environmental laws	Environmental laws and compliance do not hinder the competitiveness of businesses
4.4.28 [S] Quality of life	Quality of life is high

[S] Survey data

[B] Background data

4.4 Health and Environment

4.4.01 Total health expenditure	Percentage of GDP
4.4.02 [B] Total health expenditure per capita	US\$ per capita
4.4.03 [B] Public expenditure on health (%)	Percentage of total health expenditure
4.4.04 [S] Health infrastructure	Health infrastructure meets the needs of society
4.4.05 Universal health care coverage index	Index (0-100) measuring coverage of essential health services
4.4.06 Life expectancy at birth	Average estimate
4.4.07 [B] Healthy life expectancy	Average estimate
4.4.08 [B] Infant mortality	Under five mortality rate per 1000 live births
4.4.09 Medical assistance	Number of inhabitants per physician and per nurse
4.4.10 [B] Urban population	Percentage of total population
4.4.11 Human development index	Combines economic-social-educational indicators/ Source: HDR
4.4.12 Energy intensity	Total energy consumed for each 1000 US\$ of GDP in MTOE
4.4.13 Safely treated waste water	Percentage of waste water
4.4.14 Water use efficiency	US\$ per cubic meter
4.4.15 [B] CO2 emissions	Metric tons of carbon dioxide
4.4.16 CO2 emissions intensity	CO2 industrial emissions in metric tons per one million US\$ of GDP
4.4.17 Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre
4.4.18 Renewable energies (%)	Share of renewables in total energy requirements, %
4.4.19 Forest area growth	Five year percentage change of hectares
4.4.20 [B] Total biocapacity	Global hectares per capita of biologically productive space
4.4.21 [B] Ecological footprint	Global hectares per person
4.4.22 Ecological balance (reserve/deficit)	Total biocapacity minus total footprint in global hectare per capita
4.4.23 Environment-related technologies	Development of environment-related technologies, % inventions worldwide
4.4.24 Environmental agreements	Multilateral agreements on hazardous waste, proportion fulfilled
4.4.25 [S] Sustainable development	Sustainable development is a priority in companies
4.4.26 [S] Pollution problems	Pollution problems do not seriously affect your economy
4.4.27 [S] Environmental laws	Environmental laws and compliance do not hinder the competitiveness of businesses
4.4.28 [S] Quality of life	Quality of life is high

2023

4.5 Education

4.5.01 Total public expenditure on education	Percentage of GDP
4.5.02 [B] Total public exp. on education per capita	US\$ per capita
4.5.03 Total public expenditure on education per student	Spending per enrolled pupil/student, all levels
4.5.04 Pupil-teacher ratio (primary education)	Ratio of students to teaching staff
4.5.05 Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff
4.5.06 Secondary school enrollment	Percentage of relevant age group receiving full-time education
4.5.07 Higher education achievement	% of population that has attained at least tertiary education for persons 25-34
4.5.08 Women with degrees	Share of women who have a degree in the population 25-65
4.5.09 Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants
4.5.10 [B] Student mobility outbound	National tertiary-level students studying abroad per 1000 inhabitants
4.5.11 Educational assessment - PISA	PISA survey of 15-year olds
4.5.12 [B] Students who are not low achievers - PISA	% of students who are not low achievers in maths, sciences and reading
4.5.13 [B] English proficiency - TOEFL	TOEFL scores
4.5.14 [S] Primary and secondary education	Primary and secondary education meets the needs of a competitive economy
4.5.15 [S] University education	University education meets the needs of a competitive economy
4.5.16 [S] Management education	Management education meets the needs of the business community
4.5.17 University education index	Country score calculated from Times Higher Education university ranking
4.5.18 Illiteracy	Adult (over 15 years) illiteracy rate as a percentage of population
4.5.19 [S] Language skills	Language skills are meeting the needs of enterprises

=Hard Statistics

[S]=Survey Data

[B]=Background Data

ที่มา : IMD 2023

4.5 Education

4.5.01 Total public expenditure on education	Percentage of GDP
4.5.02 [B] Total public exp. on education per capita	US\$ per capita
4.5.03 Total public expenditure on education per student	Spending per enrolled pupil/student, all levels
4.5.04 Pupil-teacher ratio (primary education)	Ratio of students to teaching staff
4.5.05 Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff
4.5.06 Secondary school enrollment	Percentage of relevant age group receiving full-time education
4.5.07 Higher education achievement	Percentage of population that has attained at least tertiary education for persons 25-34
4.5.08 Women with degrees	Share of women who have a degree in the population 25-65
4.5.09 Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants
4.5.10 [B] Student mobility outbound	National tertiary-level students studying abroad per 1000 inhabitants
4.5.11 Educational assessment-PISA	PISA survey of 15-year olds
4.5.12 [B] Students who are not low achievers-PISA	% of students who are not low achievers in maths, sciences and reading
4.5.13 [B] English proficiency-TOEFL	TOEFL scores
4.5.14 [S] Primary and secondary education	Primary and secondary education meets the needs of a competitive economy
4.5.15 [S] University education	University education meets the needs of a competitive economy
4.5.16 [S] Management education	Management education meets the needs of the business community
4.5.17 University education index	Country score calculated from Times Higher Education university ranking
4.5.18 Illiteracy	Adult (over 15 years) illiteracy rate as a percentage of population
4.5.19 [S] Language skills	Language skills are meeting the needs of enterprises

[S] Survey data

[B] Background data

ที่มา : IMD 2024

Criteria Excluded from Profiles

The below criteria represent all ranked data that are excluded from the analysis of an economy's evolution, strengths and weaknesses highlighted in the National Competitiveness Profiles. These criteria were excluded because the economy has little control over influencing them, for example, due to a size factor such as arable land, or when there is a very limited impact on competitiveness. The background data are not taken into consideration nor do they appear in any of the profile pages, as they are not used in any calculations to determine the rankings.

- 4.1.02 Arable area
- 4.1.03 Water resources
- 4.1.10 Roads
- 4.1.11 Railroads
- 4.1.17 Total indigenous energy production (%)
- 4.2.01 Investment in Telecommunications
- 4.2.02 Mobile broadband subscribers
- 4.2.03 Mobile telephone costs
- 4.2.05 Secure internet servers
- 4.2.07 Broadband subscribers
- 4.2.08 Internet bandwidth speed
- 4.2.14 High-tech exports (\$)
- 4.2.16 ICT service exports
- 4.3.01 Total expenditure on R&D (\$)
- 4.3.04 Business expenditure on R&D (\$)
- 4.3.06 Total R&D personnel
- 4.3.11 Graduates in Sciences
- 4.3.12 Scientific articles
- 4.3.14 Nobel prizes per capita
- 4.3.15 Patent applications
- 4.3.17 Patent grants
- 4.4.16 CO2 emissions intensity
- 4.4.19 Forest area growth
- 4.4.22 Ecological balance (reserve/deficit)
- 4.4.23 Environment-related technologies
- 4.4.24 Environmental agreements
- 4.5.06 Secondary school enrollment
- 4.5.11 Educational assessment - PISA
- 4.5.18 Illiteracy

INFRASTRUCTURE ของประเทศไทย ปี 2565

STRENGTHS

WEAKNESSES

Infrastructure	Rank	Infrastructure	Rank
4.2.01 Investment in Telecommunications	7	4.2.16 ICT service exports	60
4.1.09 Dependency ratio	8	4.4.12 Energy intensity	60
4.2.15 High-tech exports (%)	11	4.5.06 Secondary school enrollment	59
4.2.08 Internet bandwidth speed	14	4.4.13 Safely treated waste water	58
4.2.04 Communication technology	15	4.4.09 Medical assistance	58
4.2.03 Mobile Telephone costs	17	4.4.01 Total health expenditure	58
4.4.04 Health infrastructure	19	4.5.05 Pupil-teacher ratio (secondary education)	57
4.1.15 Energy infrastructure	19	4.4.14 Water use efficiency	57
4.4.18 Renewable energy (%)	20	4.2.07 Broadband subscribers	56
4.4.25 Sustainable development	20	4.3.18 Number of patents in force	56

INFRASTRUCTURE ของประเทศไทย ปี 2566

INFRASTRUCTURE

STRENGTHS	Rank	WEAKNESSES	Rank
4.2.08 Internet bandwidth speed	05	4.4.09 Medical assistance	61
4.2.01 Investment in Telecommunications	05	4.2.16 ICT service exports	60
4.4.04 Health infrastructure	08	4.4.13 Safely treated waste water	59
4.2.15 High-tech exports (%)	11	4.4.12 Energy intensity	59
4.1.09 Dependency ratio	12	4.5.05 Pupil-teacher ratio (secondary education)	58
4.2.03 Mobile telephone costs	15	4.5.06 Secondary school enrollment	58
4.1.15 Energy infrastructure	15	4.4.14 Water use efficiency	57
4.4.25 Sustainable development	15	4.4.01 Total health expenditure	57
4.2.04 Communications technology	15	4.4.17 Exposure to particle pollution	56
4.2.11 Public-private partnerships	18	4.3.18 Number of patents in force	56

INFRASTRUCTURE ของประเทศไทย ปี 2567

INFRASTRUCTURE

STRENGTHS	Rank	WEAKNESSES	Rank
4.2.08 Internet bandwidth speed	08	4.2.16 ICT service exports	63
4.2.01 Investment in Telecommunications	08	4.5.05 Pupil-teacher ratio (secondary education)	61
4.4.25 Sustainable development	14	4.4.12 Energy intensity	61
4.1.09 Dependency ratio	14	4.4.13 Safely treated waste water	60
4.2.03 Mobile telephone costs	16	4.4.09 Medical assistance	60
4.1.15 Energy infrastructure	16	4.4.14 Water use efficiency	60
4.2.04 Communications technology	17	4.4.01 Total health expenditure	57
4.2.15 High-tech exports (%)	18	4.4.17 Exposure to particle pollution	57
4.2.02 Mobile broadband subscribers	18	4.3.16 Patent applications per capita	56
4.4.04 Health infrastructure	20	4.2.07 Broadband subscribers	55

INFRASTRUCTURE ของประเทศไทยปี 2565

STRENGTHS

Infrastructure	Rank
4.2.07 Broadband subscribers	1
4.4.23 Environment-related technologies	2
4.4.06 Life expectancy at birth	2
4.3.18 Number of patents in force	3
4.3.16 Patent applications per capita	4
4.4.25 Sustainable development	4
4.3.05 Business expenditure on R&D (%)	5
4.5.12 Students who are not low achievers -PISA	5
4.3.02 Total expenditure on R&D (%)	7
4.4.01 Total health expenditure	7

WEAKNESSES

Infrastructure	Rank
4.1.09 Dependency ratio	63
4.2.09 Digital/Technological skills	62
4.5.19 Language skills	62
4.2.03 Mobile Telephone costs	60
4.5.16 Management education	60
4.5.15 University education	59
4.2.10 Qualified engineers	56
4.2.16 ICT service exports	56
4.5.01 Total public expenditure on education	53
4.1.07 Population - growth	52

INFRASTRUCTURE ของประเทศไทยปี 2566

INFRASTRUCTURE

STRENGTHS	Rank	WEAKNESSES	Rank
4.4.23 Environment-related technologies	02	4.1.09 Dependency ratio	64
4.2.07 Broadband subscribers	02	4.2.09 Digital/Technological skills	63
4.4.25 Sustainable development	02	4.5.19 Language skills	60
4.4.06 Life expectancy at birth	02	4.5.16 Management education	60
4.3.18 Number of patents in force	04	4.2.03 Mobile telephone costs	59
4.3.16 Patent applications per capita	04	4.1.07 Population - growth	57
4.3.05 Business expenditure on R&D (%)	05	4.5.15 University education	56
4.5.12 Students who are not low achievers - PISA	05	4.2.10 Qualified engineers	54
4.1.04 Access to water	05	4.5.01 Total public expenditure on education	53
4.1.13 Quality of air transportation	05	4.1.20 Electricity costs for industrial clients	51

INFRASTRUCTURE ของประเทศไทยปี 2567

INFRASTRUCTURE

STRENGTHS

Rank

4.2.07 Broadband subscribers	01
4.4.06 Life expectancy at birth	01
4.4.23 Environment-related technologies	02
4.2.02 Mobile broadband subscribers	03
4.4.25 Sustainable development	03
4.5.12 Students who are not low achievers - PISA	03
4.3.16 Patent applications per capita	04
4.3.18 Number of patents in force	04
4.5.06 Secondary school enrollment	04
4.3.05 Business expenditure on R&D (%)	05

WEAKNESSES

Rank

4.2.09 Digital/Technological skills	67
4.5.19 Language skills	66
4.1.09 Dependency ratio	66
4.1.07 Population - growth	63
4.2.10 Qualified engineers	62
4.5.16 Management education	59
4.5.15 University education	58
4.5.01 Total public expenditure on education	56
4.3.22 Knowledge transfer	56
4.2.03 Mobile telephone costs	54

INFRASTRUCTURE ของประเทศเกาหลี ปี 2565

STRENGTHS

Infrastructure	Rank
4.3.10 Researchers in R&D per capita	1
4.3.05 Business expenditure on R&D (%)	2
4.3.02 Total expenditure on R&D (%)	2
4.3.16 Patent applications per capita	2
4.3.07 Total R&D personnel per capita	3
4.4.05 Universal health coverage index	3
4.4.23 Environment-related technologies	4
4.5.07 Higher education achievement	4
4.3.18 Number of patents in force	4
4.4.06 Life expectancy at birth	4

WEAKNESSES

Infrastructure	Rank
4.4.24 Environmental agreements	55
4.4.18 Renewable energy (%)	55
4.2.03 Mobile Telephone costs	54
4.4.17 Exposure to particle pollution	53
4.4.27 Environmental laws	50
4.1.07 Population - growth	50
4.2.12 Development and application of technology	48
4.4.19 Forest area growth	48
4.5.15 University education	46
4.5.16 Management education	46

INFRASTRUCTURE ของประเทศไทย ปี 2566

INFRASTRUCTURE

STRENGTHS	Rank	WEAKNESSES	Rank
4.3.10 Researchers in R&D per capita	01	4.4.24 Environmental agreements	58
4.3.05 Business expenditure on R&D (%)	02	4.2.03 Mobile telephone costs	56
4.3.02 Total expenditure on R&D (%)	02	4.4.18 Renewable energies (%)	55
4.3.16 Patent applications per capita	02	4.4.17 Exposure to particle pollution	53
4.3.18 Number of patents in force	03	4.1.07 Population - growth	53
4.4.05 Universal health coverage index	03	4.2.12 Development & application of tech.	52
4.4.23 Environment-related technologies	04	4.4.26 Pollution problems	50
4.3.19 Medium- and high-tech value added	04	4.5.16 Management education	49
4.3.07 Total R&D personnel per capita	04	4.5.15 University education	49
4.5.07 Higher education achievement	04	4.4.19 Forest area growth	49

INFRASTRUCTURE ของประเทศไทย ปี 2567

INFRASTRUCTURE

STRENGTHS	Rank	WEAKNESSES	Rank
4.3.10 Researchers in R&D per capita	01	4.4.24 Environmental agreements	59
4.3.02 Total expenditure on R&D (%)	02	4.1.07 Population - growth	58
4.3.05 Business expenditure on R&D (%)	02	4.4.18 Renewable energies (%)	57
4.3.16 Patent applications per capita	02	4.2.03 Mobile telephone costs	57
4.3.18 Number of patents in force	03	4.4.17 Exposure to particle pollution	54
4.1.14 Distribution infrastructure	03	4.4.19 Forest area growth	51
4.4.05 Universal health coverage index	03	4.5.16 Management education	46
4.4.23 Environment-related technologies	04	4.5.15 University education	46
4.5.07 Higher education achievement	04	4.2.12 Development & application of tech.	43
4.1.05 Management of cities	04	4.2.05 Secure internet servers	43

INFRASTRUCTURE ของสาธารณรัฐประชาชนจีน ปี 2565

STRENGTHS

Infrastructure	Rank
4.5.13 Students who are not low achievers -PISA	1
4.4.23 Environment-related technologies	3
4.5.17 University education index	3
4.4.19 Forest area growth	3
4.2.10 Qualified engineers	4
4.2.11 Public-private partnerships	6
4.5.14 Primary and secondary education	7
4.1.05 Management of cities	8
4.2.15 High-tech exports (%)	8
4.1.15 Energy infrastructure	9

WEAKNESSES

Infrastructure	Rank
4.4.17 Exposure to particle pollution	59
4.5.09 Student mobility inbound	55
4.4.11 Human development index	55
4.4.12 Energy intensity	54
4.2.06 Internet users	53
4.5.01 Total public expenditure on education	52
4.2.05 Secure internet servers	51
4.5.03 Total public exp. on education per student	50
4.4.01 Total health expenditure	50
4.4.09 Medical assistance	46

INFRASTRUCTURE ของสาธารณรัฐประชาชนจีน ปี 2566

INFRASTRUCTURE

STRENGTHS	Rank	WEAKNESSES	Rank
4.5.12 Students who are not low achievers - PISA	01	4.4.17 Exposure to particle pollution	58
4.4.23 Environment-related technologies	03	4.5.09 Student mobility inbound	56
4.5.17 University education index	03	4.5.08 Women with degrees	54
4.4.19 Forest area growth	03	4.2.06 Internet users	54
4.2.10 Qualified engineers	04	4.5.01 Total public expenditure on education	54
4.5.14 Primary and secondary education	05	4.4.11 Human development index	52
4.1.05 Management of cities	07	4.2.05 Secure internet servers	51
4.4.24 Environmental agreements	07	4.4.01 Total health expenditure	51
4.2.02 Mobile broadband subscribers	08	4.4.12 Energy intensity	50
4.1.15 Energy infrastructure	08	4.5.03 Total public exp. on education per student	49

INFRASTRUCTURE ของสาธารณรัฐประชาชนจีน ปี 2567

INFRASTRUCTURE

STRENGTHS

Rank

4.4.23 Environment-related technologies	01
4.5.12 Students who are not low achievers - PISA	01
4.5.17 University education index	03
4.4.19 Forest area growth	03
4.2.02 Mobile broadband subscribers	04
4.2.11 Public-private partnerships	07
4.5.14 Primary and secondary education	07
4.4.24 Environmental agreements	07
4.1.05 Management of cities	08
4.2.10 Qualified engineers	08

WEAKNESSES

Rank

4.4.17 Exposure to particle pollution	59
4.1.07 Population - growth	59
4.5.09 Student mobility inbound	58
4.2.06 Internet users	57
4.5.08 Women with degrees	56
4.4.01 Total health expenditure	55
4.5.01 Total public expenditure on education	54
4.4.11 Human development index	53
4.2.05 Secure internet servers	51
4.4.12 Energy intensity	51

INFRASTRUCTURE ของประเทศมาเลเซีย ปี 2565

STRENGTHS

Infrastructure	Rank
4.3.11 Graduates in Science	2
4.5.08 Women with degrees	4
4.2.15 High-tech exports (%)	5
4.1.09 Dependency ratio	11
4.1.20 Electricity costs for industrial clients	13
4.5.04 Pupil-teacher ratio (primary education)	14
4.4.24 Environmental agreements	17
4.2.11 Public-private partnerships	20
4.2.03 Mobile Telephone costs	21
4.5.05 Pupil-teacher ratio (secondary education)	21

WEAKNESSES

Infrastructure	Rank
4.5.06 Secondary school enrollment	60
4.4.12 Energy intensity	59
4.4.01 Total health expenditure	57
4.4.19 Forest area growth	57
4.4.09 Medical assistance	54
4.2.07 Broadband subscribers	52
4.4.18 Renewable energy (%)	52
4.5.03 Total public exp. on education per student	49
4.4.11 Human development index	49
4.2.04 Communication technology	49

INFRASTRUCTURE ของประเทศมาเลเซีย ปี 2566

INFRASTRUCTURE

STRENGTHS	Rank	WEAKNESSES	Rank
4.3.11 Graduates in Sciences	02	4.4.01 Total health expenditure	60
4.5.08 Women with degrees	04	4.5.06 Secondary school enrollment	59
4.2.15 High-tech exports (%)	05	4.4.19 Forest area growth	58
4.1.09 Dependency ratio	07	4.4.12 Energy intensity	57
4.4.24 Environmental agreements	10	4.2.07 Broadband subscribers	54
4.1.20 Electricity costs for industrial clients	16	4.4.18 Renewable energies (%)	53
4.2.16 ICT service exports	16	4.4.09 Medical assistance	50
4.1.05 Management of cities	16	4.4.11 Human development index	49
4.4.27 Environmental laws	18	4.5.03 Total public exp. on education per student	48
4.5.04 Pupil-teacher ratio (primary education)	19	4.3.16 Patent applications per capita	46

INFRASTRUCTURE ของประเทศมาเลเซีย ปี 2567

INFRASTRUCTURE

STRENGTHS	Rank	WEAKNESSES	Rank
4.3.11 Graduates in Sciences	01	4.4.01 Total health expenditure	59
4.1.09 Dependency ratio	07	4.4.12 Energy intensity	58
4.2.06 Internet users	10	4.4.19 Forest area growth	58
4.4.24 Environmental agreements	10	4.4.18 Renewable energies (%)	55
4.2.15 High-tech exports (%)	10	4.2.07 Broadband subscribers	54
4.1.20 Electricity costs for industrial clients	15	4.4.09 Medical assistance	53
4.1.07 Population - growth	18	4.3.21 Intellectual property rights	50
4.5.04 Pupil-teacher ratio (primary education)	21	4.4.11 Human development index	49
4.4.04 Health infrastructure	22	4.5.03 Total public exp. on education per student	48
4.5.08 Women with degrees	23	4.5.16 Management education	48

INFRASTRUCTURE ของประเทศสิงคโปร์ปี 2565

STRENGTHS

Infrastructure	Rank
4.3.19 Medium- and high-tech value added	1
4.2.08 Internet bandwidth speed	1
4.4.13 Safely treated waste water	1
4.5.07 Higher education achievement	2
4.2.11 Public-private partnerships	2
4.5.12 Students who are not low achievers -PISA	2
4.2.13 Funding for technological development	2
4.5.06 Secondary school enrollment	2
4.4.06 Life expectancy at birth	3
4.2.15 High-tech exports (%)	4

WEAKNESSES

Infrastructure	Rank
4.1.07 Population growth	63
4.4.19 Forest area growth	61
4.5.01 Total public expenditure on education	61
4.4.18 Renewable energy (%)	58
4.1.20 Electricity costs for industrial clients	55
4.2.01 Investment in Telecommunications	55
4.4.01 Total health expenditure	54
4.2.06 Internet users	41
4.4.17 Exposure to particle pollution	40
4.2.03 Mobile Telephone costs	39

INFRASTRUCTURE ของประเทศสิงคโปร์ปี 2566

INFRASTRUCTURE

STRENGTHS	Rank	WEAKNESSES	Rank
4.3.19 Medium- and high-tech value added	01	4.4.19 Forest area growth	62
4.2.08 Internet bandwidth speed	01	4.5.01 Total public expenditure on education	62
4.4.13 Safely treated waste water	01	4.2.01 Investment in Telecommunications	58
4.5.07 Higher education achievement	02	4.4.18 Renewable energies (%)	58
4.5.12 Students who are not low achievers - PISA	02	4.1.20 Electricity costs for industrial clients	55
4.2.15 High-tech exports (%)	03	4.4.01 Total health expenditure	49
4.3.11 Graduates in Sciences	03	4.2.16 ICT service exports	43
4.1.07 Population - growth	04	4.2.03 Mobile telephone costs	38
4.5.09 Student mobility inbound	04	4.5.17 University education index	38
4.2.05 Secure internet servers	04	4.4.23 Environment-related technologies	25

INFRASTRUCTURE ของประเทศสิงคโปร์ปี 2567

INFRASTRUCTURE

STRENGTHS

Rank

4.2.11 Public-private partnerships	01
4.2.12 Development & application of tech.	01
4.2.13 Funding for technological development	01
4.1.05 Management of cities	01
4.3.20 Scientific research legislation	01
4.1.13 Quality of air transportation	01
4.2.10 Qualified engineers	01
4.4.13 Safely treated waste water	01
4.1.07 Population - growth	02
4.3.19 Medium- and high-tech value added	02

WEAKNESSES

Rank

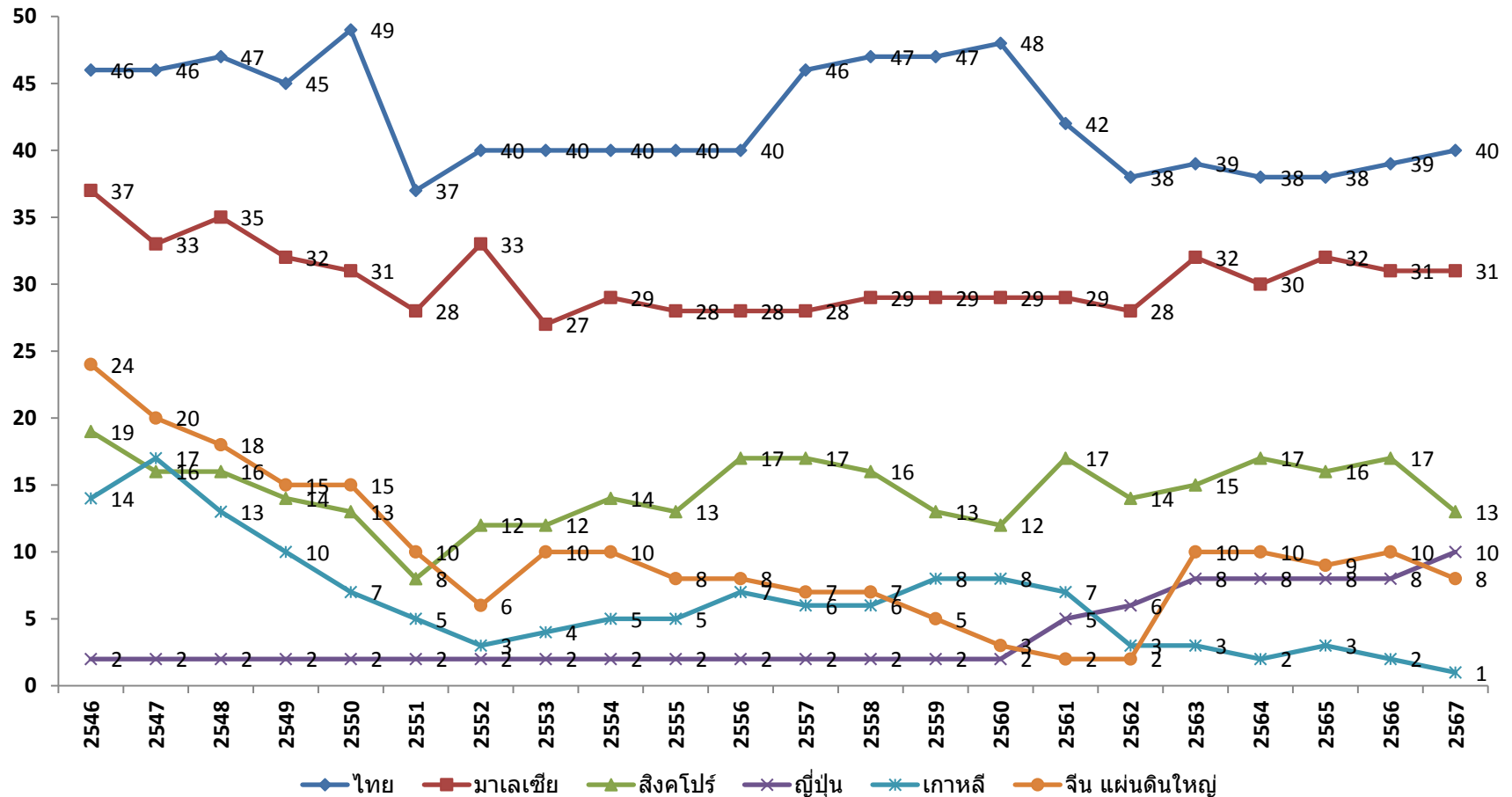
4.4.19 Forest area growth	65
4.5.01 Total public expenditure on education	65
4.2.01 Investment in Telecommunications	60
4.4.18 Renewable energies (%)	60
4.1.20 Electricity costs for industrial clients	54
4.4.01 Total health expenditure	54
4.2.03 Mobile telephone costs	50
4.5.08 Women with degrees	41
4.2.16 ICT service exports	40
4.2.02 Mobile broadband subscribers	26

**อันดับความสามารถในการแข่งขันด้านโครงสร้างพื้นฐานทาง
วิทยาศาสตร์ และโครงสร้างพื้นฐานทางเทคโนโลยี
ของประเทศไทย ปี 2546 -2567**

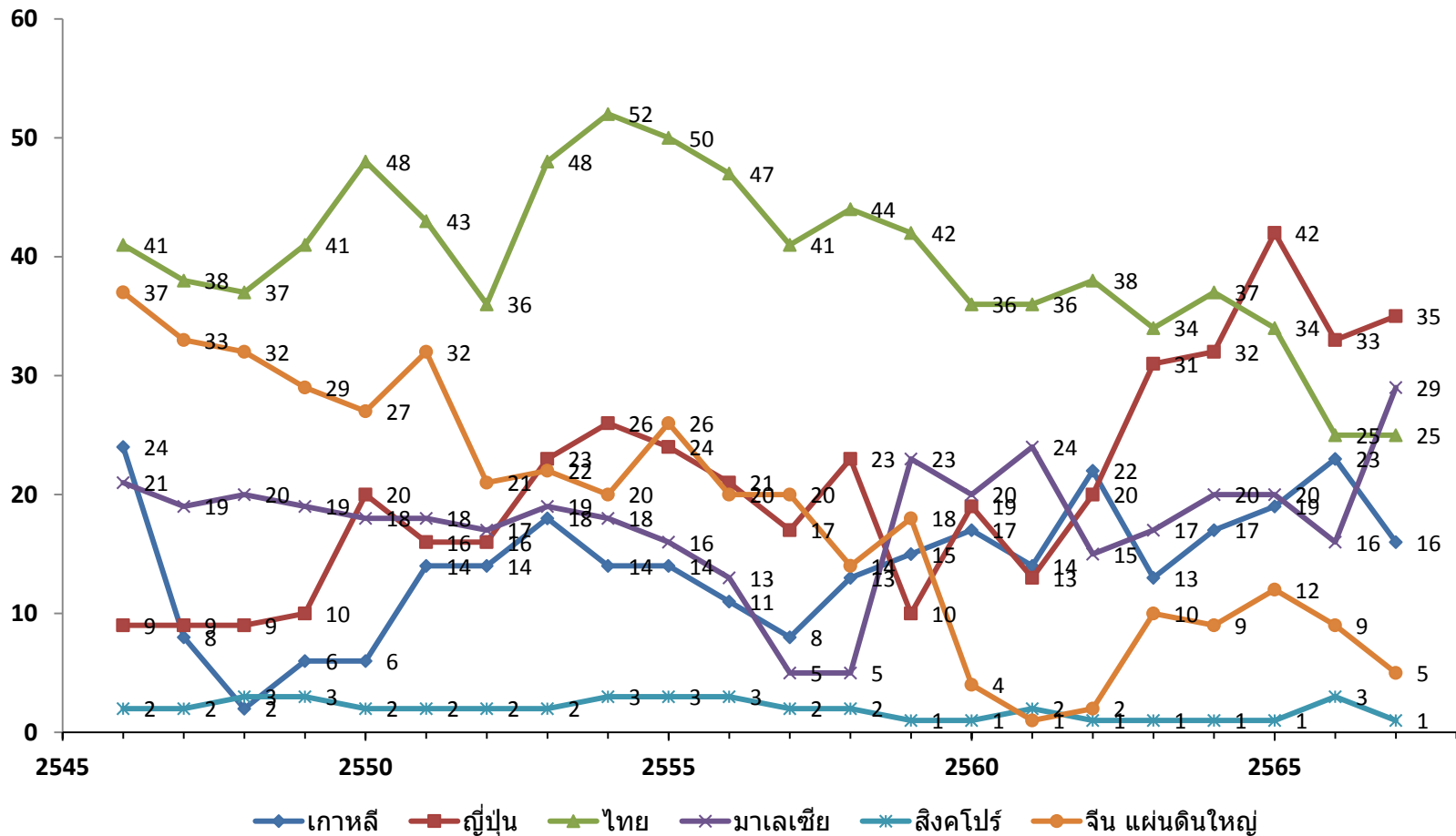
ปี	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556
วิทยาศาสตร์	46	46	47	45	49	37	40	40	40	40	40
เทคโนโลยี	41	38	37	41	48	43	36	48	52	50	47
จำนวน ประเทศ	51	51	51	53	55	55	57	58	59	59	60
ปี	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567
วิทยาศาสตร์	46	47	47	48	42	38	34	38	38	39	40
เทคโนโลยี	41	44	42	36	36	38	39	37	34	25	25
จำนวน ประเทศ	60	61	61	63	63	63	63	64	63	64	67

ที่มา : IMD

อันดับความสามารถในการแข่งขันด้านโครงสร้างพื้นฐาน ทางวิทยาศาสตร์ของประเทศต่าง ๆ โดยรวม ปี 2546 - 2567



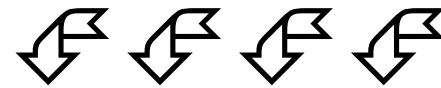
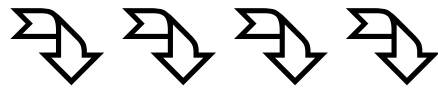
อันดับความสามารถในการแข่งขันด้านโครงสร้างพื้นฐาน ทางเทคโนโลยีของประเทศต่าง ๆ โดยรวม ปี 2546-2567



ที่มา : IMD

เทคโนโลยีกับการพัฒนาประเทศ

ความสำคัญของเทคโนโลยีต่อการพัฒนาประเทศ



ผู้ใดครองเทคโนโลยี

ผู้นั้นครองเศรษฐกิจ

ผู้ใดครองเทคโนโลยี

ผู้นั้นครองอำนาจ