

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)

(63 ประเทศ : ปี2565)

World Economic Forum (WEF)

(139 ประเทศ : ปี2553)

World bank (183 ประเทศ : ปี2553)



International Institute for Management Development (IMD)

สำนักงานใหญ่ อยู่ที่เมืองโลซานน์ ประเทศสวิตเซอร์แลนด์

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

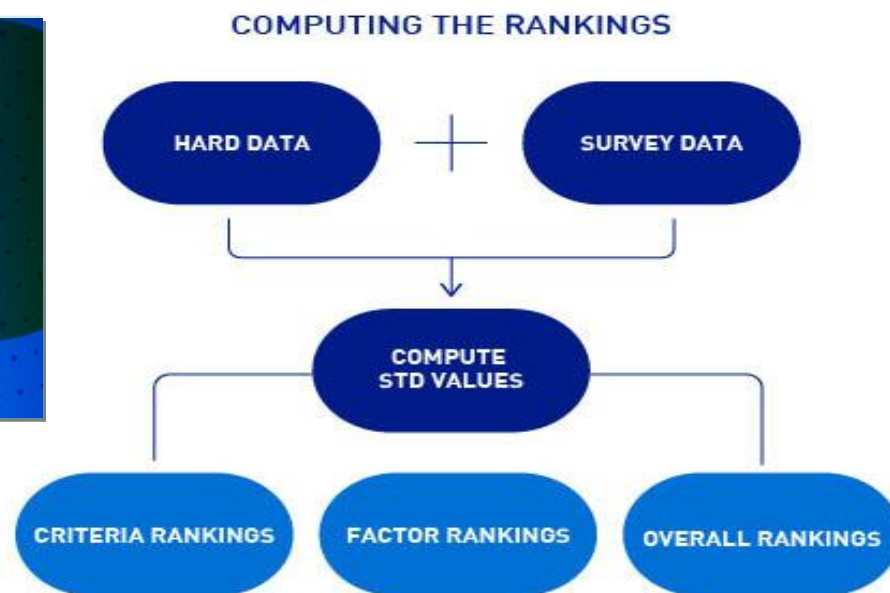

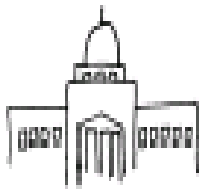

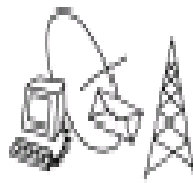


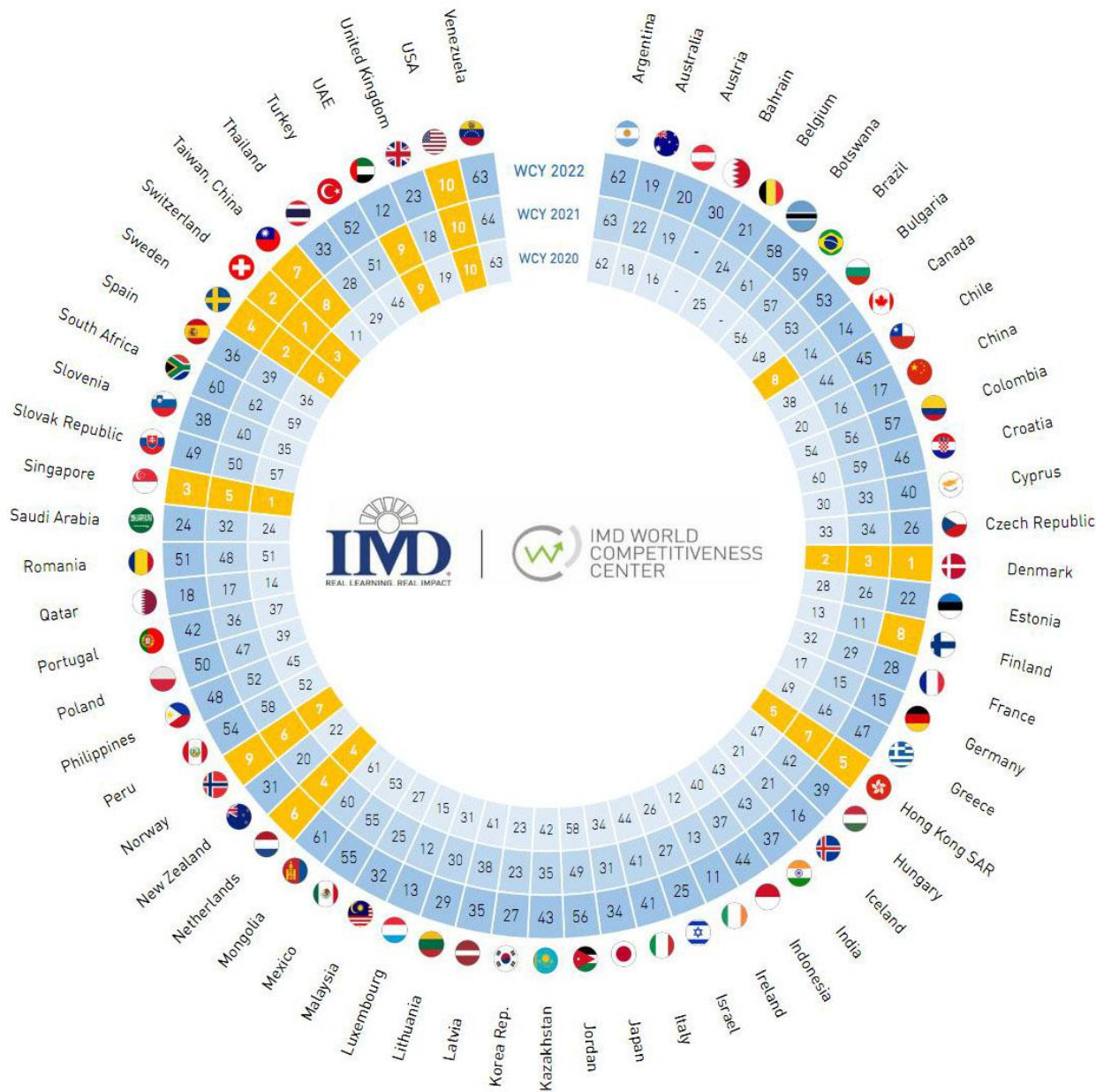
TABLE 2 • The Breakdown of Competitiveness Factors

			
Economic Performance	Government Efficiency	Business Efficiency	Infrastructure
Domestic Economy	Public Finance	Productivity	Basic Infrastructure
International Trade	Fiscal Policy	Labor Market	Technological Infrastructure
International Investment	Institutional Framework	Finance	Scientific Infrastructure
Employment	Business Legislation	Management Practices	Health and Environment
Prices	Societal Framework	Attitudes and Values	Education

อันดับความสามารถในการแข่งขันของ ประเทศต่าง ๆ ที่จัดโดย IMD ประจำปี 2564

 Switzerland 1 st of 64	 Sweden 2 nd of 64	 Luxembourg 12 th of 64	 Ireland 13 th of 64	 Korea Rep. 23 rd of 64	 Belgium 24 th of 64	 Kazakhstan 35 th of 64	 Portugal 36 th of 64	 Bulgaria 53 rd of 64	 Ukraine 54 th of 64
 Denmark 3 rd of 64	 Netherlands 4 th of 64	 Canada 14 th of 64	 Germany 15 th of 64	 Malaysia 25 th of 64	 Estonia 26 th of 64	 Indonesia 37 th of 64	 Latvia 38 th of 64	 Mexico 55 th of 64	 Colombia 56 th of 64
 Singapore 5 th of 64	 Norway 6 th of 64	 China 16 th of 64	 Qatar 17 th of 64	 Israel 27 th of 64	 Thailand 28 th of 64	 Spain 39 th of 64	 Slovenia 40 th of 64	 Brazil 57 th of 64	 Peru 58 th of 64
 Hong Kong SAR 7 th of 64	 Taiwan, China 8 th of 64	 United Kingdom 18 th of 64	 Austria 19 th of 64	 France 29 th of 64	 Lithuania 30 th of 64	 Italy 41 st of 64	 Hungary 42 nd of 64	 Croatia 59 th of 64 View Profile	 Mongolia 60 th of 64 View Profile
 UAE 9 th of 64	 New Zealand 20 th of 64	 Japan 31 st of 64	 Saudi Arabia 32 nd of 64	 Russia 45 th of 64	 Greece 46 th of 64	 India 43 rd of 64	 Chile 44 th of 64	 Botswana 61 st of 64 View Profile	 Argentina 63 rd of 64 View Profile
 USA 10 th of 64	 Finland 11 th of 64	 Iceland 21 st of 64	 Australia 22 nd of 64	 Cyprus 33 rd of 64	 Czech Republic 34 th of 64	 Poland 47 th of 64 View Profile	 Romania 48 th of 64 View Profile	 South Africa 62 nd of 64	 Venezuela 64 th of 64
						 Jordan 49 th of 64 View Profile	 Slovak Republic 50 th of 64 View Profile		
						 Turkey 51 st of 64	 Philippines 52 nd of 64		

ที่มา : IMD 2021

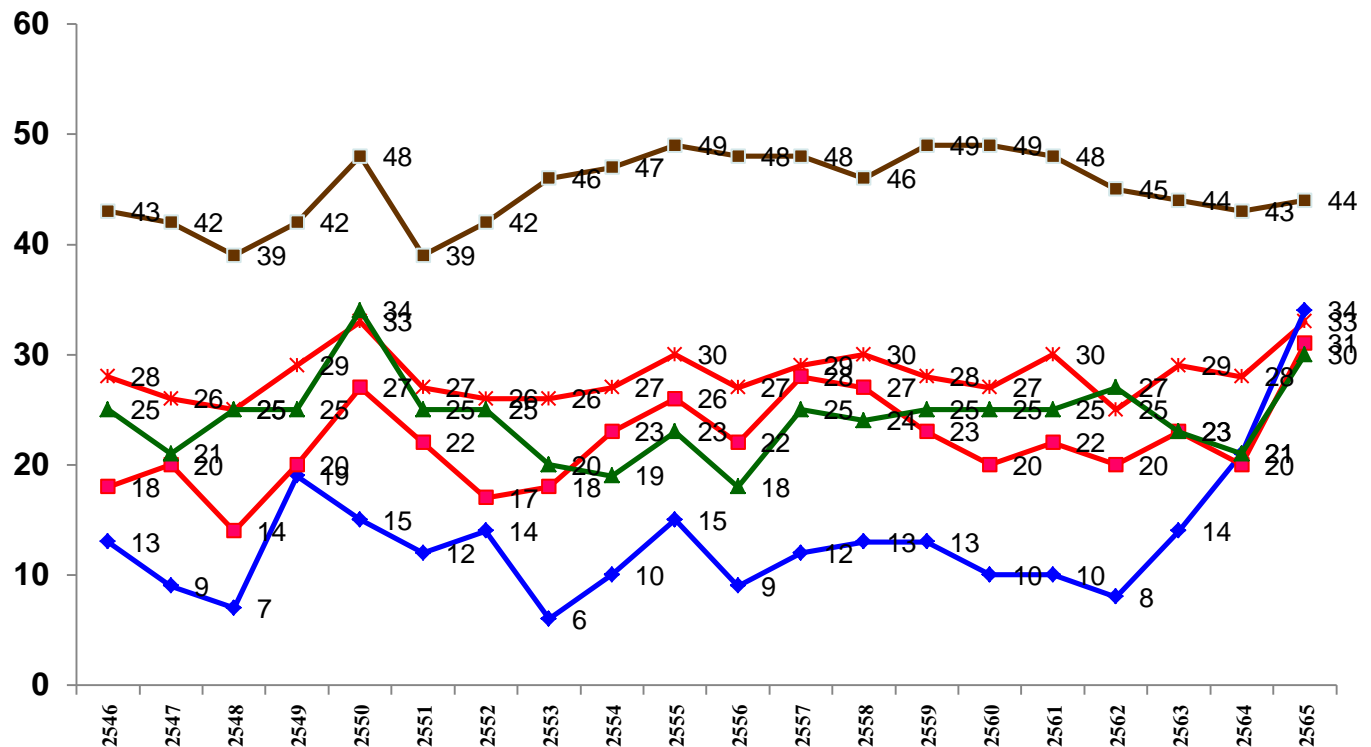


อันดับ
ความสามารถ
ในการแข่งขัน
ของประเทศ
ต่าง ๆ
ที่จัดโดย IMD
ประจำปี 2565

ที่มา : IMD 2022

อันดับความสามารถในการแข่งขันของประเทศไทย

ปี 2546 - 2565



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 : 63 ประเทศ 2564 : 64 ประเทศ 2565 : 63 ประเทศ

ที่มา : IMD

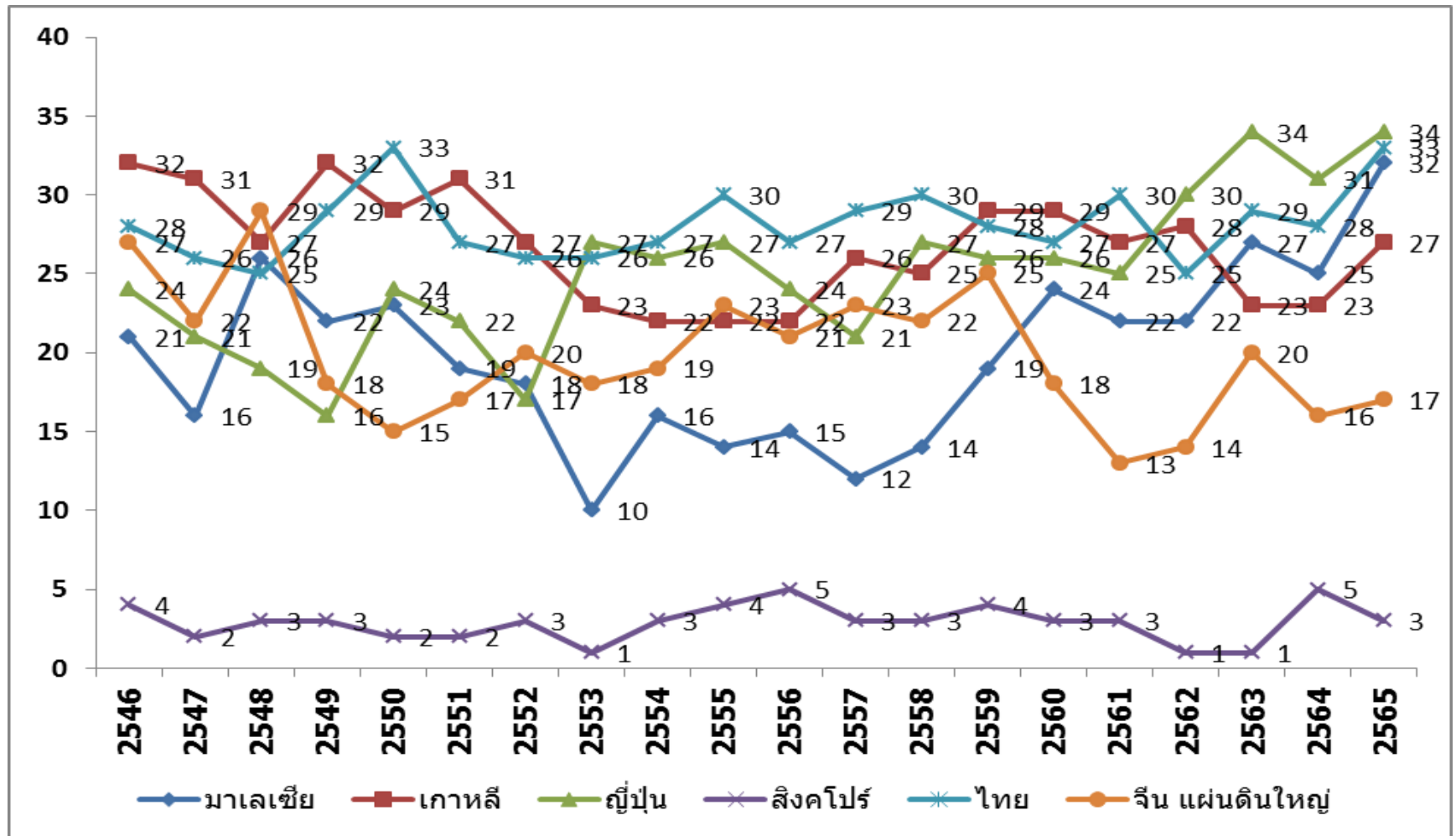
อันดับความสามารถในการแข่งขันของประเทศไทย

จำแนกตามปัจจัยหลัก โดย IMD ปี 2546 - 2565

	ปัจจัยหลัก				อันดับโดยรวม	จำนวนประเทศ
	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

อันดับความสามารถในการแข่งขันของประเทศต่าง ๆ

โดยรวม ปี 2546 - 2565



ที่มา : IMD

THAILAND

CHALLENGES IN 2021

- Short-term measures for economic recovery and social supports.
- Digital transformation and digitalization of the public sector.
- Handling conflict driven by divisive opinion and generation gap.
- Public-private partnership in handling the crisis.
- National crisis capacity improvement especially crisis communication.

SINGAPORE

CHALLENGES IN 2021

- Help businesses transform and capture growth opportunities amidst shifts in the global economic landscape.
- Spur job creation, and equip workers with the capabilities to secure jobs in growth sectors.
- Preserve core capabilities of firms in sectors severely affected by the COVID-19 pandemic.

MALAYSIA

CHALLENGES IN 2021

- Minimize the impact of COVID-19 on economic, social and environment through agile policies and regulations.
- Upskilling and reskilling are crucial to keep up with new and emerging job challenges and nurture a future-ready workforce.
- To inculcate digital-first mindset and increase the adoption of digital technology across the public sector.
- To increase productivity through measures enabling business environment e.g. to boost innovation, skills and institutional quality.
- Creating an ecosystem conducive to attracting investment.

CHINA - MAINLAND

CHALLENGES IN 2021

- Stimulate domestic consumption to promote high-quality socio-economic development.
- Strengthen anti-monopoly and prevent disorderly expansion of capital.
- Manage the economic and social uncertainty caused by COVID-19 pandemic.
- Promote international cooperation to meet the challenge of climate change.
- Address challenges posed by increasingly serious population ageing.

KOREA

CHALLENGES IN 2021

- Transformation of service industries: contact-free and digitalized.
- Return of inflation, interest rate hikes and increasing borrowing costs.
- Disparity between advanced economies and emerging markets due to unequal vaccination.
- Reshoring, near-shoring and supply chain disruption.
- Global corporate tax coordination.

JAPAN

CHALLENGES IN 2021

- Dealing with the pandemic and protecting the lives and livelihoods of the people.
- Developing human resources who will propel social reform and strengthening investment in intangible assets.
- Accelerating the investment and implementation of digitization to construct the 'New Normal Lifestyle'.
- Establishing a new global cooperation through stronger international cooperation and partnerships.
- Building a nation of multipolar partnerships and revitalizing local communities.

THAILAND

CHALLENGES IN 2022

- Revive economic vibrancy.
- Enhance public sector resiliency.
- Improve social inclusiveness.
- Drive for digital capabilities enhancement.
- Establish future oriented talent management.

SINGAPORE

CHALLENGES IN 2022

- Navigate challenges posed by external economic developments, including global supply chain disruptions as well as elevated energy and commodity prices.
- Support the economic recovery of sectors that continue to be affected by the COVID-19 pandemic.
- Help businesses transition towards a low-carbon future.
- Ensure that workers continuously develop new skills and sharpen existing ones to meet labour demand in growth sectors.

MALAYSIA

CHALLENGES IN 2022

- Expanding regulatory reforms initiatives to micro levels through public-private collaboration.
- Enhancing technological adoption to increase productivity at firm level.
- Accelerating talent development initiatives to keep up with new and emerging job challenges and nurture a future-ready workforce.
- Strengthening productivity and competitiveness through mindset change and creativity.

CHINA - MAINLAND

CHALLENGES IN 2022

- Manage the economic and social uncertainty caused by COVID-19 pandemic.
- Achieve socio-economic development goals by using macroeconomic policy mix.
- Expand domestic demand through effective investment and boosting consumption.
- Address ever growing geopolitical risks and governance crises globally.
- Build unified national market to enhance long-term economic prosperity.

KOREA

CHALLENGES IN 2022

- Promote digital and green transformation.
- Prepare for a new geopolitical era.
- Foster inclusive growth as the COVID-19 crisis recedes.
- Handle the inflation uncertainty and its economic impact.
- Integrate ESG practices into the economic system.

JAPAN

CHALLENGES IN 2022

- Achieve a new form of capitalism based on sustainability and human capital.
- Realize a virtuous cycle of growth and distribution.
- Promoting efforts to realize a science and technology nation.
- Resolve the issue of the rapidly aging population.
- Revitalize rural areas through a Vision for a Digital Garden City Nation.

What is the IMD World Competitiveness Ranking?



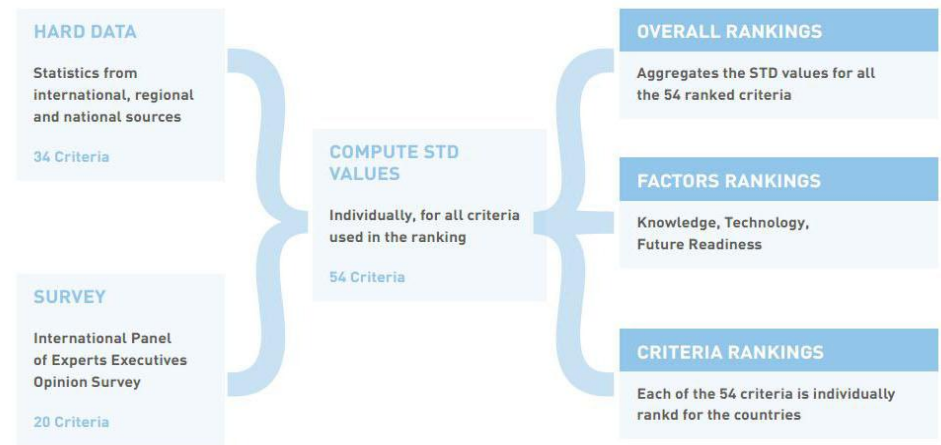
IMD WORLD DIGITAL COMPETITIVENESS RANKING 2022



Digital Competitiveness Factors and Sub-factors



Computing the Rankings



ที่มา : IMD

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

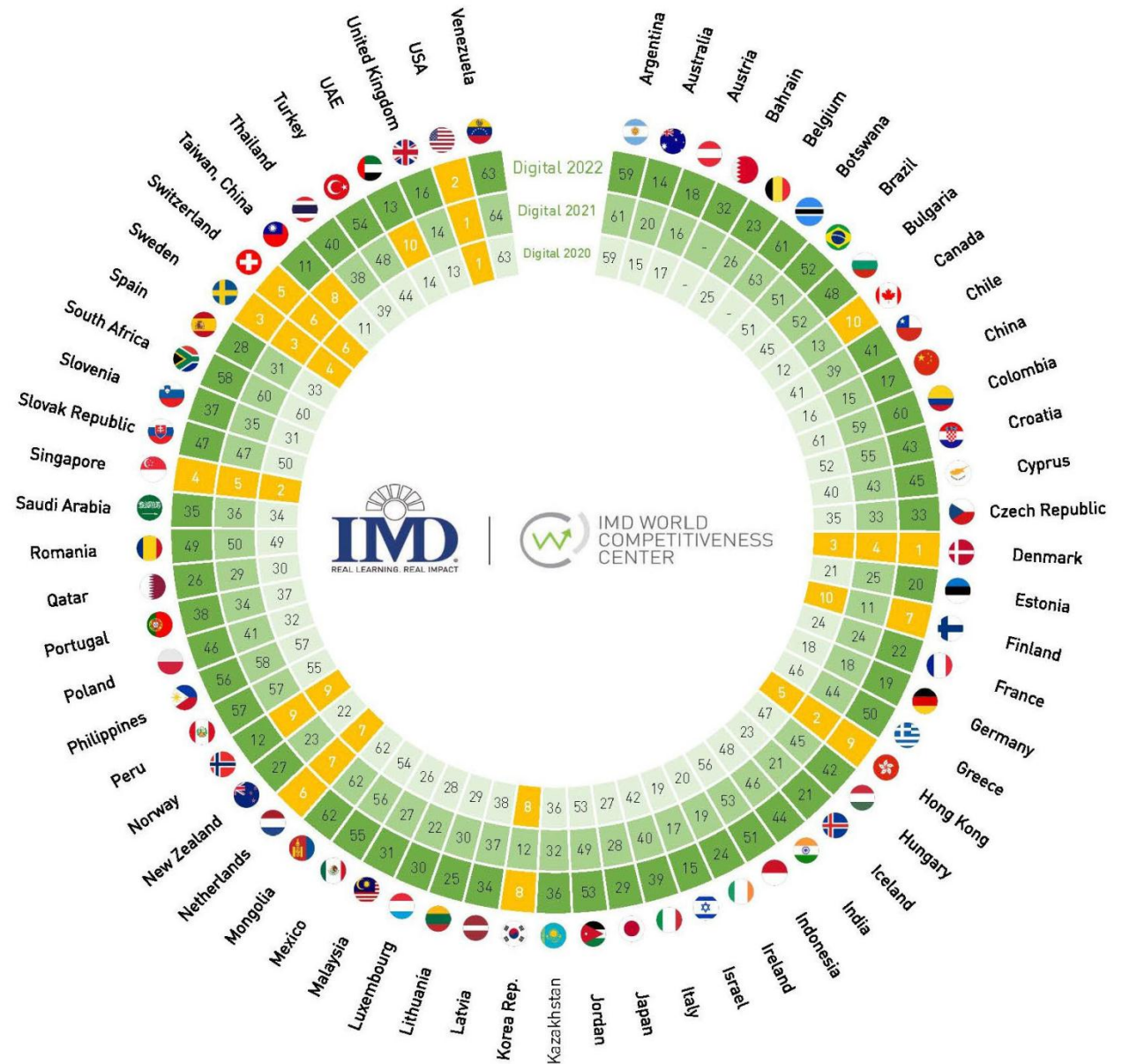
3.2 Business agility

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

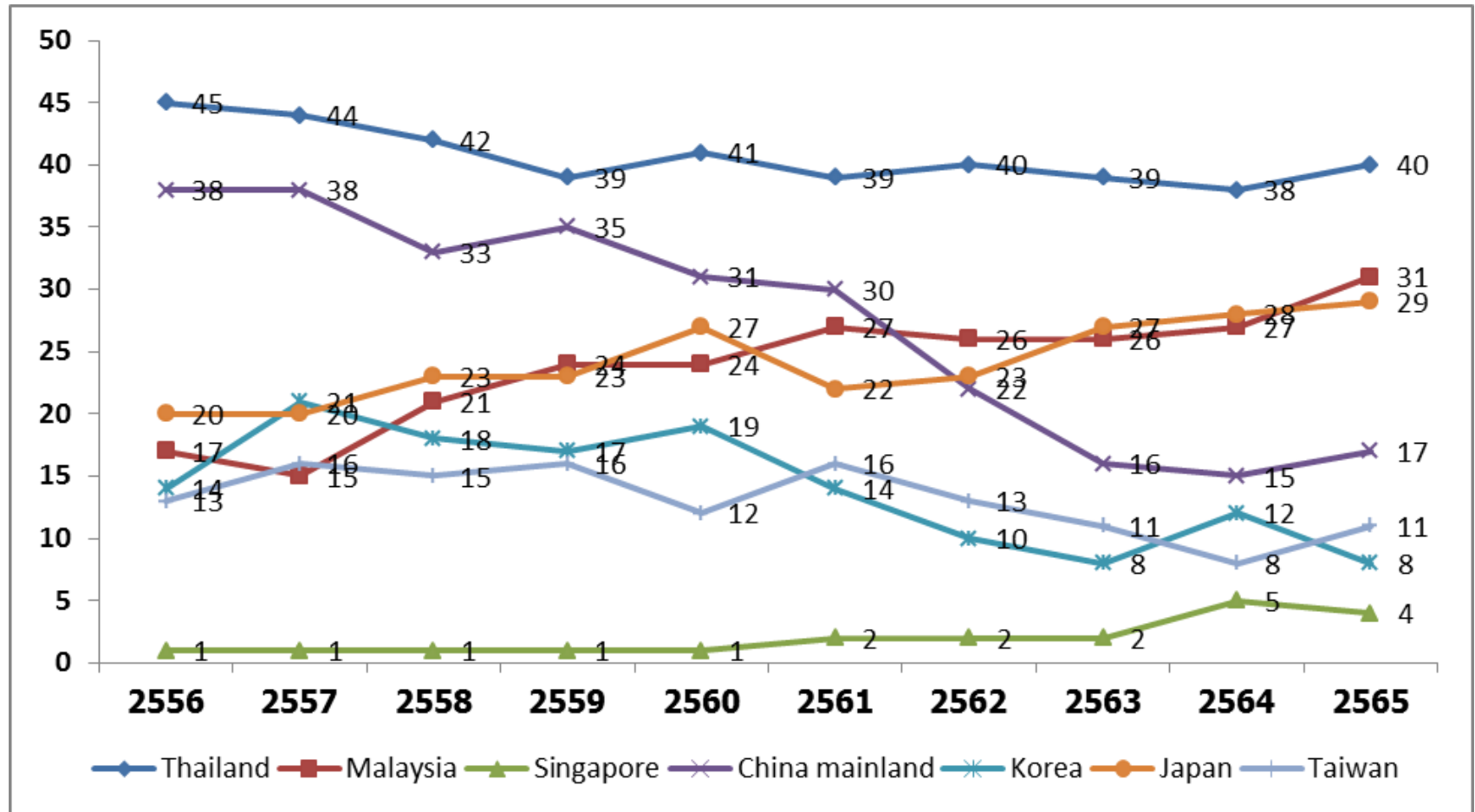
3.3.1	E-Government Provision of online government services to promote access and inclusion of citizens
3.3.2 [S]	Public-private partnerships Public and private sector ventures are supporting technological development
3.3.3 [S]	Cyber security Cyber security is being adequately addressed by corporations
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

Digital Competitiveness Ranking 2020, 2021, 2022



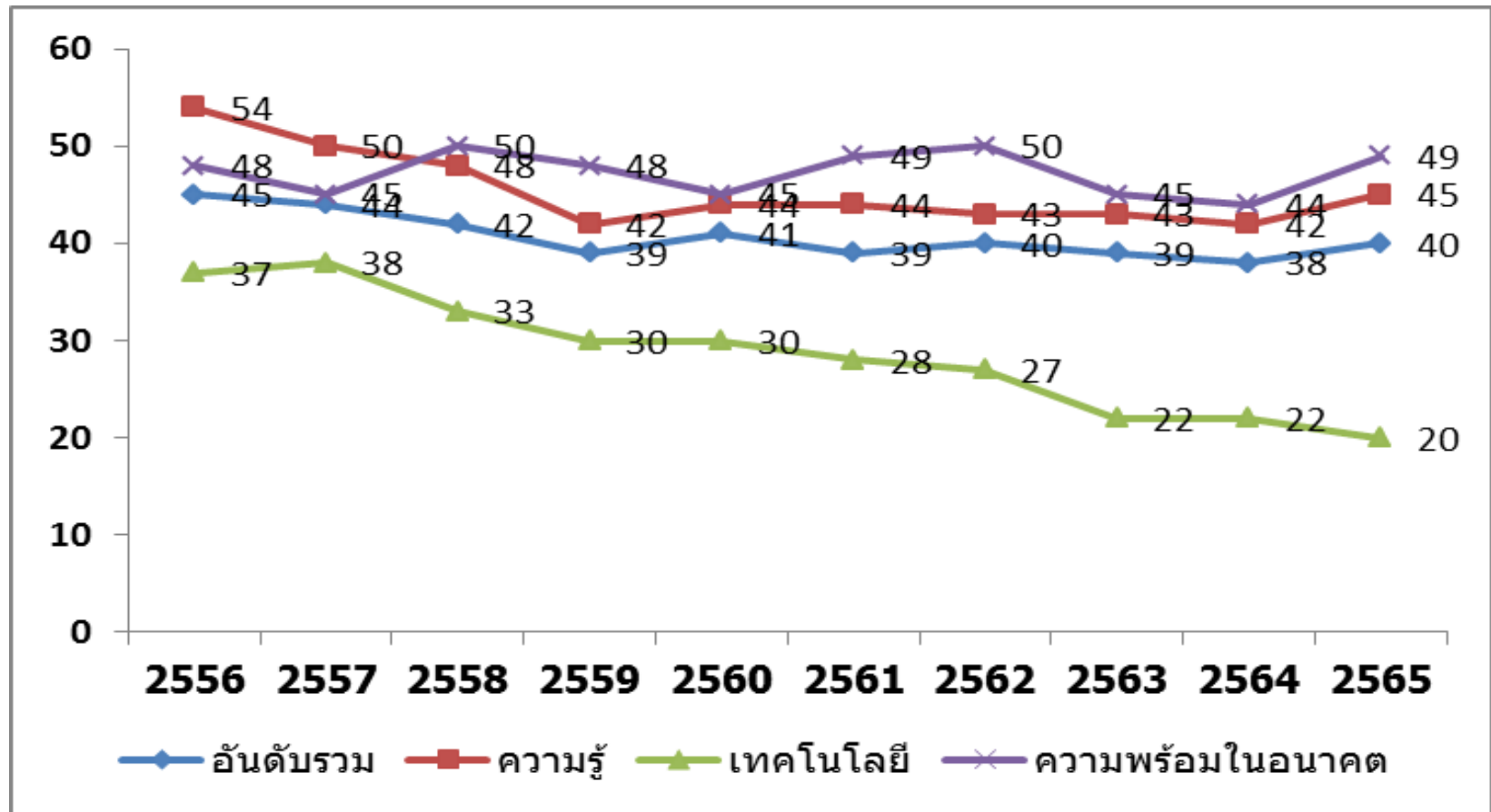
ที่มา : IMD 2022

อันดับความสามารถในการแข่งขันทางดิจิทัล ของประเทศต่าง ๆ โดยรวม ปี 2556-2565



ที่มา : IMD

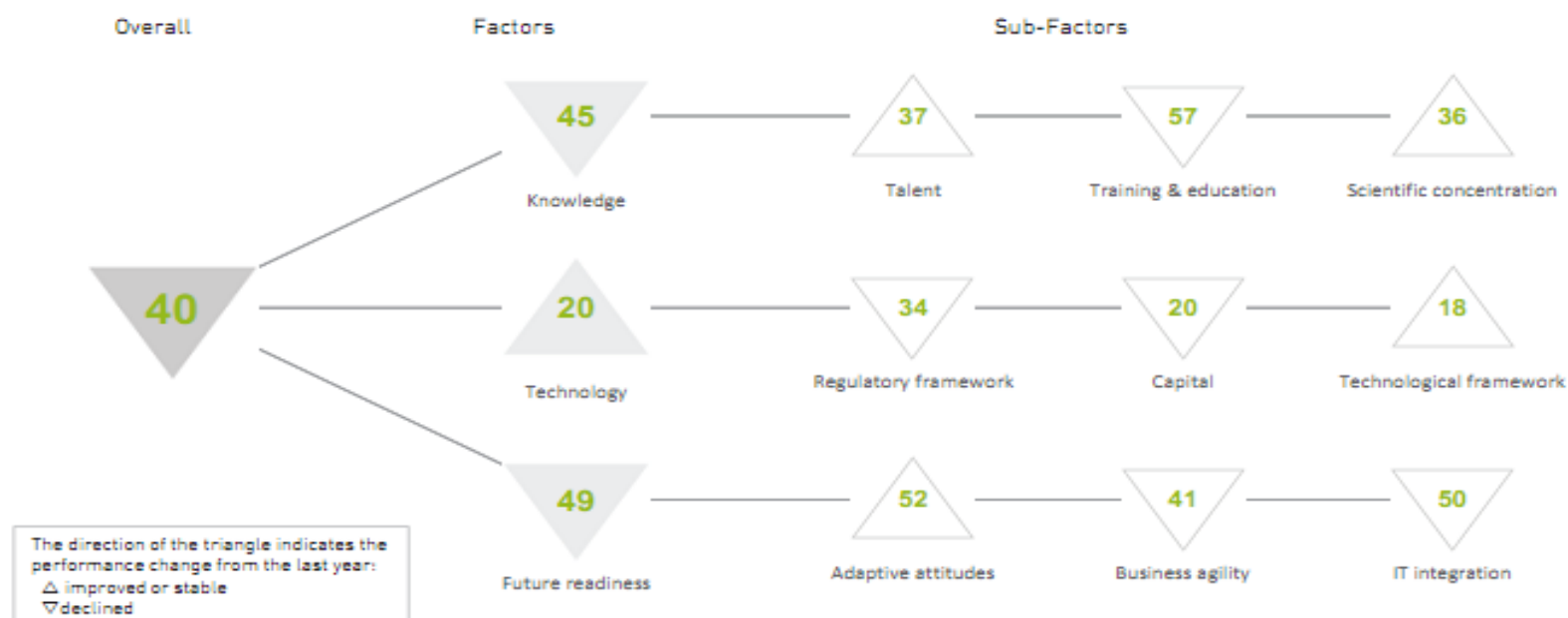
อันดับความสามารถในการแข่งขันทางดิจิทัล ของประเทศไทย ปี 2556-2565



ที่มา : IMD

THAILAND

OVERALL PERFORMANCE (63 countries)



OVERALL & FACTORS - 5 years

	2018	2019	2020	2021	2022
OVERALL	39	40	39	38	40
Knowledge	44	43	43	42	45
Technology	28	27	22	22	20
Future readiness	49	50	45	44	49

THAILAND

2019

- Overall top strengths
- ▷ Overall top weaknesses

KNOWLEDGE

Subfactors	2015	2016	2017	2018	2019
Talent	42	42	42	42	40
Training & education	54	44	47	44	50
Scientific concentration	44	41	43	45	35

Talent	Rank
Educational assessment PISA - Math	48
International experience	20
Foreign highly-skilled personnel	29
Management of cities	35
Digital/Technological skills	49
Net flow of international students	34

Training & education	Rank
Employee training	25
Total public expenditure on education	51
Higher education achievement	41
▷ Pupil-teacher ratio (tertiary education)	57
Graduates in Sciences	15
Women with degrees	45

Scientific concentration	Rank
Total expenditure on R&D (%)	37
Total R&D personnel per capita	39
► Female researchers	3
R&D productivity by publication	28
Scientific and technical employment	47
High-tech patent grants	49
Robots in Education and R&D	26

TECHNOLOGY

THAILAND

2019

Subfactors	2015	2016	2017	2018	2019
Regulatory framework	42	43	38	34	33
Capital	17	21	21	28	21
Technological framework	38	32	30	23	29

Regulatory framework	Rank
Starting a business	23
Enforcing contracts	29
Immigration laws	27
Development and application of technology	34
Scientific research legislation	37
Intellectual property rights	47

Capital	Rank
IT & media stock market capitalization	23
Funding for technological development	29
Banking and financial services	7
Country credit rating	41
Venture capital	22
Investment in Telecommunications	19

Technological framework	Rank
Communications technology	23
Mobile Broadband subscribers	4
Wireless broadband	22
Internet users	54
Internet bandwidth speed	32
High-tech exports (%)	9

FUTURE READINESS

Subfactors	2015	2016	2017	2018	2019
Adaptive attitudes	47	47	51	55	58
Business agility	40	34	32	34	30
IT integration	57	55	53	55	51

Adaptive attitudes	Rank
E-Participation	56
Internet retailing	54
Tablet possession	59
Smartphone possession	49
Attitudes toward globalization	18

Business agility	Rank
Opportunities and threats	33
World robots distribution	10
Agility of companies	41
Use of big data and analytics	37
Knowledge transfer	32

IT integration	Rank
E-Government	53
Public-private partnerships	20
Cyber security	30
Software piracy	56

THAILAND

2020

► Overall top strengths

▷ Overall top weaknesses

KNOWLEDGE

Subfactors	2016	2017	2018	2019	2020
Talent	42	42	42	40	36
Training & education	44	47	44	50	55
Scientific concentration	41	43	45	35	37

Talent	Rank
Educational assessment PISA - Math	48
International experience	15
Foreign highly-skilled personnel	16
Management of cities	27
Digital/Technological skills	45
Net flow of international students	35

Training & education	Rank
Employee training	25
▷ Total public expenditure on education	58
Higher education achievement	48
▷ Pupil-teacher ratio (tertiary education)	54
Graduates in Sciences	16
Women with degrees	47

Scientific concentration	Rank
Total expenditure on R&D (%)	37
Total R&D personnel per capita	40
► Female researchers	6
R&D productivity by publication	31
▷ Scientific and technical employment	54
High-tech patent grants	47
Robots in Education and R&D	21

ที่มา : IMD

2020

Subfactors	2016	2017	2018	2019	2020
Regulatory framework	43	38	34	33	31
Capital	21	21	28	21	17
Technological framework	32	30	23	29	25

Regulatory framework	Rank
Starting a business	27
Enforcing contracts	29
Immigration laws	23
Development & application of tech.	32
Scientific research legislation	28
Intellectual property rights	44

Capital	Rank
IT & media stock market capitalization	20
Funding for technological development	27
▶ Banking and financial services	9
Country credit rating	40
Venture capital	24
Investment in Telecommunications	14

Technological framework	Rank
Communications technology	24
▶ Mobile Broadband subscribers	10
Wireless broadband	23
Internet users	54
Internet bandwidth speed	20
▶ High-tech exports (%)	11

FUTURE READINESS

Subfactors	2016	2017	2018	2019	2020
Adaptive attitudes	47	51	55	58	53
Business agility	34	32	34	30	44
IT integration	55	53	55	51	43

Adaptive attitudes	Rank
E-Participation	42
Internet retailing	49
▷ Tablet possession	58
Smartphone possession	47
Attitudes toward globalization	12

Business agility	Rank
Opportunities and threats	38
▶ World robots distribution	11
Agility of companies	36
Use of big data and analytics	35
Knowledge transfer	29
Entrepreneurial fear of failure	53

IT integration	Rank
E-Government	49
Public-private partnerships	16
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▷ Software piracy	56

THAILAND

2021

- Overall top strengths
- ▷ Overall top weaknesses

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High-tech patent grants	42
Robots in Education and R&D	17

THAILAND

2021

TECHNOLOGY

Subfactors	2017	2018	2019	2020	2021
Regulatory framework	38	34	33	31	29
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Technological framework	30	23	29	25	22

Regulatory framework	Rank
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FUTURE READINESS

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Business agility	32	34	30	44	34
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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	Training & education	Rank	Scientific concentration	Rank
Educational assessment PISA - Math	46	Employee training	20	Total expenditure on R&D (%)	33
International experience	19	Total public expenditure on education	50	Total R&D personnel per capita	39
Foreign highly-skilled personnel	25	Higher education achievement	45	► Female researchers	06
Management of cities	29	▷ Pupil-teacher ratio (tertiary education)	55	R&D productivity by publication	30
Digital/Technological skills	45	Graduates in Sciences	37	▷ Scientific and technical employment	55
Net flow of international students	40	Women with degrees	48	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	Capital	Rank	Technological framework	Rank
Starting a business	26	IT & media stock market capitalization	17	Communications technology	15
Enforcing contracts	28	Funding for technological development	40	Mobile Broadband subscribers	25
Immigration laws	32	Banking and financial services	23	Wireless broadband	27
Development & application of tech.	39	Country credit rating	41	Internet users	44
Scientific research legislation	39	Venture capital	32	► Internet bandwidth speed	14
Intellectual property rights	43	► Investment in Telecommunications	07	► High-tech exports (%)	11

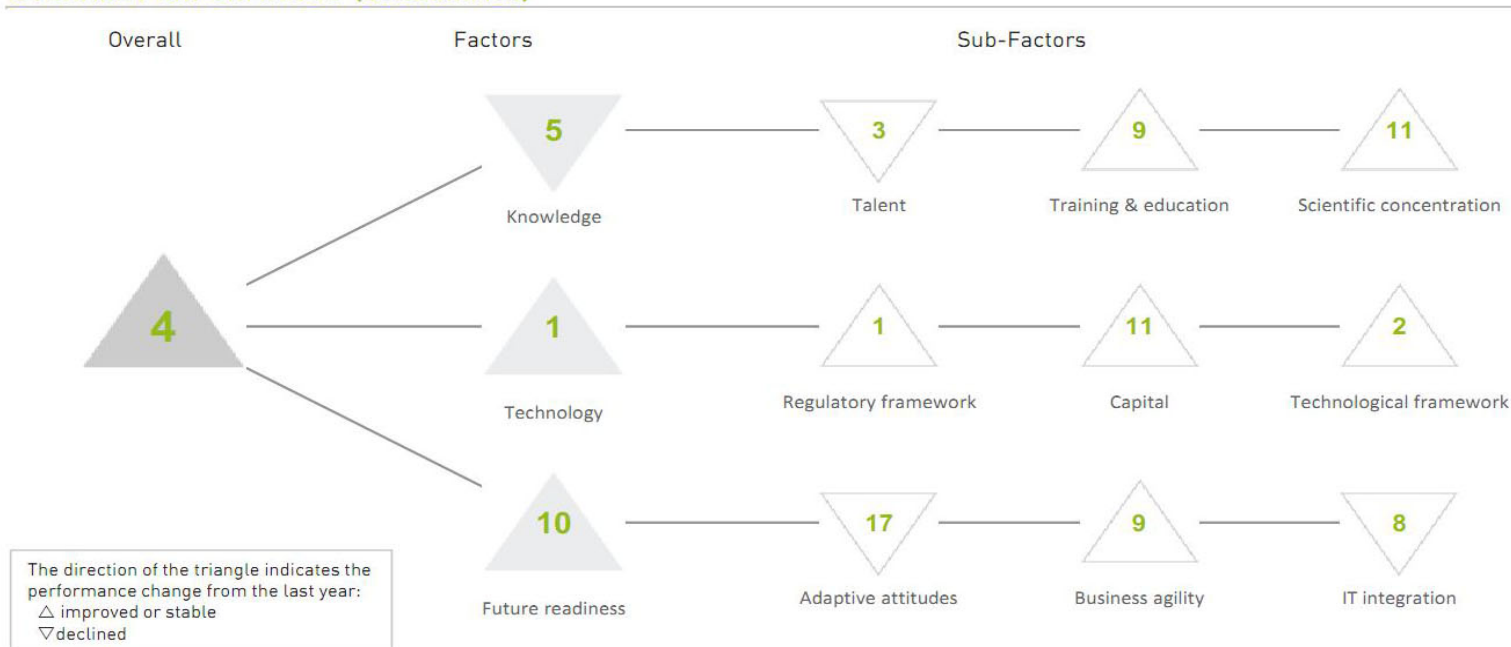
FUTURE READINESS

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	Business agility	Rank	IT integration	Rank
E-Participation	40	Opportunities and threats	27	E-Government	49
Internet retailing	50	► World robots distribution	11	Public-private partnerships	26
▷ Tablet possession	57	Agility of companies	37	Cyber security	38
Smartphone possession	39	Use of big data and analytics	28	▷ Software piracy	56
Attitudes toward globalization	14	Knowledge transfer	33	▷ Government cyber security capacity	57
		Entrepreneurial fear of failure	50	Privacy protection by law content	43

SINGAPORE

OVERALL PERFORMANCE (63 countries)



OVERALL & FACTORS - 5 years

	2018	2019	2020	2021	2022
OVERALL	02	02	02	05	04
Knowledge	01	03	02	04	05
Technology	01	01	01	03	01
Future readiness	15	11	12	11	10

- Overall top strengths
▷ Overall top weaknesses

KNOWLEDGE

Subfactors	2015	2016	2017	2018	2019
Talent	1	1	1	1	1
Training & education	5	9	9	1	4
Scientific concentration	13	11	8	19	22

Talent	Rank
► Educational assessment PISA - Math	1
International experience	9
Foreign highly-skilled personnel	2
► Management of cities	1
Digital/Technological skills	8
Net flow of international students	7

Training & education	Rank
Employee training	28
▷ Total public expenditure on education	60
Higher education achievement	2
Pupil-teacher ratio (tertiary education)	31
Graduates in Sciences	2
Women with degrees	-

Scientific concentration	Rank
Total expenditure on R&D (%)	18
Total R&D personnel per capita	13
▷ Female researchers	42
▷ R&D productivity by publication	44
▷ Scientific and technical employment	51
► High-tech patent grants	1
Robots in Education and R&D	32

TECHNOLOGY

Subfactors	2015	2016	2017	2018	2019
Regulatory framework	3	2	1	2	2
Capital	10	10	14	8	8
Technological framework	1	1	1	1	1

Regulatory framework	Rank
Starting a business	2
► Enforcing contracts	1
▷ Immigration laws	48
Development and application of technol	1
Scientific research legislation	1
Intellectual property rights	6

Capital	Rank
IT & media stock market capitalization	26
Funding for technological development	1
Banking and financial services	2
Country credit rating	1
Venture capital	5
Investment in Telecommunications	40

Technological framework	Rank
Communications technology	5
Mobile Broadband subscribers	1
Wireless broadband	5
Internet users	1
► Internet bandwidth speed	1
High-tech exports (%)	2

FUTURE READINESS

Subfactors	2015	2016	2017	2018	2019
Adaptive attitudes	12	11	11	20	19
Business agility	12	13	14	18	6
IT integration	1	1	1	3	4

Adaptive attitudes	Rank
E-Participation	13
Internet retailing	26
Tablet possession	15
Smartphone possession	32
Attitudes toward globalization	2

Business agility	Rank
Opportunities and threats	9
World robots distribution	15
Agility of companies	7
Use of big data and analytics	15
Knowledge transfer	5

IT integration	Rank
E-Government	7
Public-private partnerships	2
Cyber security	6
Software piracy	17

SINGAPORE

2020

- Overall top strengths
- ▷ Overall top weaknesses

KNOWLEDGE

Subfactors	2016	2017	2018	2019	2020
Talent	1	1	1	1	1
Training & education	9	9	1	4	7
Scientific concentration	11	8	19	22	10

Talent	Rank
Educational assessment PISA - Math	2
International experience	7
Foreign highly-skilled personnel	5
Management of cities	1
Digital/Technological skills	7
Net flow of international students	6

Training & education	Rank
Employee training	16
▷ Total public expenditure on education	61
Higher education achievement	2
Pupil-teacher ratio (tertiary education)	27
Graduates in Sciences	4
Women with degrees	-

Scientific concentration	Rank
Total expenditure on R&D (%)	20
Total R&D personnel per capita	13
▷ Female researchers	45
▷ R&D productivity by publication	41
Scientific and technical employment	11
► High-tech patent grants	1
Robots in Education and R&D	32

TECHNOLOGY

Subfactors	2016	2017	2018	2019	2020
Regulatory framework	2	1	2	2	1
Capital	10	14	8	8	11
Technological framework	1	1	1	1	1

Regulatory framework	Rank
Starting a business	3
► Enforcing contracts	1
▷ Immigration laws	48
Development & application of tech.	2
Scientific research legislation	2
Intellectual property rights	5

Capital	Rank
IT & media stock market capitalization	26
Funding for technological development	3
Banking and financial services	3
Country credit rating	1
Venture capital	7
▷ Investment in Telecommunications	41

Technological framework	Rank
Communications technology	8
► Mobile Broadband subscribers	1
Wireless broadband	7
Internet users	1
► Internet bandwidth speed	1
High-tech exports (%)	4

FUTURE READINESS

Subfactors	2016	2017	2018	2019	2020
Adaptive attitudes	11	11	20	19	20
Business agility	13	14	18	6	11
IT integration	1	1	3	4	3

Adaptive attitudes	Rank
E-Participation	6
Internet retailing	25
Tablet possession	23
Smartphone possession	31
Attitudes toward globalization	4

Business agility	Rank
Opportunities and threats	16
World robots distribution	15
Agility of companies	19
Use of big data and analytics	10
Knowledge transfer	4
Entrepreneurial fear of failure	-

IT integration	Rank
E-Government	11
Public-private partnerships	2
Cyber security	6
Software piracy	17

SINGAPORE 2021

- Overall top strengths
- ▷ Overall top weaknesses

KNOWLEDGE

Subfactors	2016	2017	2018	2019	2020
Talent	1	1	1	1	1
Training & education	9	9	1	4	7
Scientific concentration	11	8	19	22	10

Talent	Rank
Educational assessment PISA - Math	2
International experience	7
Foreign highly-skilled personnel	5
Management of cities	1
Digital/Technological skills	7
Net flow of international students	6

Training & education	Rank
Employee training	16
▷ Total public expenditure on education	61
Higher education achievement	2
Pupil-teacher ratio (tertiary education)	27
Graduates in Sciences	4
Women with degrees	-

Scientific concentration	Rank
Total expenditure on R&D (%)	20
Total R&D personnel per capita	13
▷ Female researchers	45
▷ R&D productivity by publication	41
Scientific and technical employment	11
► High-tech patent grants	1
Robots in Education and R&D	32

TECHNOLOGY

Subfactors	2016	2017	2018	2019	2020
Regulatory framework	2	1	2	2	1
Capital	10	14	8	8	11
Technological framework	1	1	1	1	1

Regulatory framework	Rank
Starting a business	3
► Enforcing contracts	1
▷ Immigration laws	48
Development & application of tech.	2
Scientific research legislation	2
Intellectual property rights	5

Capital	Rank
IT & media stock market capitalization	26
Funding for technological development	3
Banking and financial services	3
► Country credit rating	1
Venture capital	7
▷ Investment in Telecommunications	41

Technological framework	Rank
Communications technology	8
► Mobile Broadband subscribers	1
Wireless broadband	7
Internet users	1
► Internet bandwidth speed	1
High-tech exports (%)	4

FUTURE READINESS

Subfactors	2016	2017	2018	2019	2020
Adaptive attitudes	11	11	20	19	20
Business agility	13	14	18	6	11
IT integration	1	1	3	4	3

Adaptive attitudes	Rank
E-Participation	6
Internet retailing	25
Tablet possession	23
Smartphone possession	31
Attitudes toward globalization	4

Business agility	Rank
Opportunities and threats	16
World robots distribution	15
Agility of companies	19
Use of big data and analytics	10
Knowledge transfer	4
Entrepreneurial fear of failure	-

IT integration	Rank
E-Government	11
Public-private partnerships	2
Cyber security	6
Software piracy	17

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

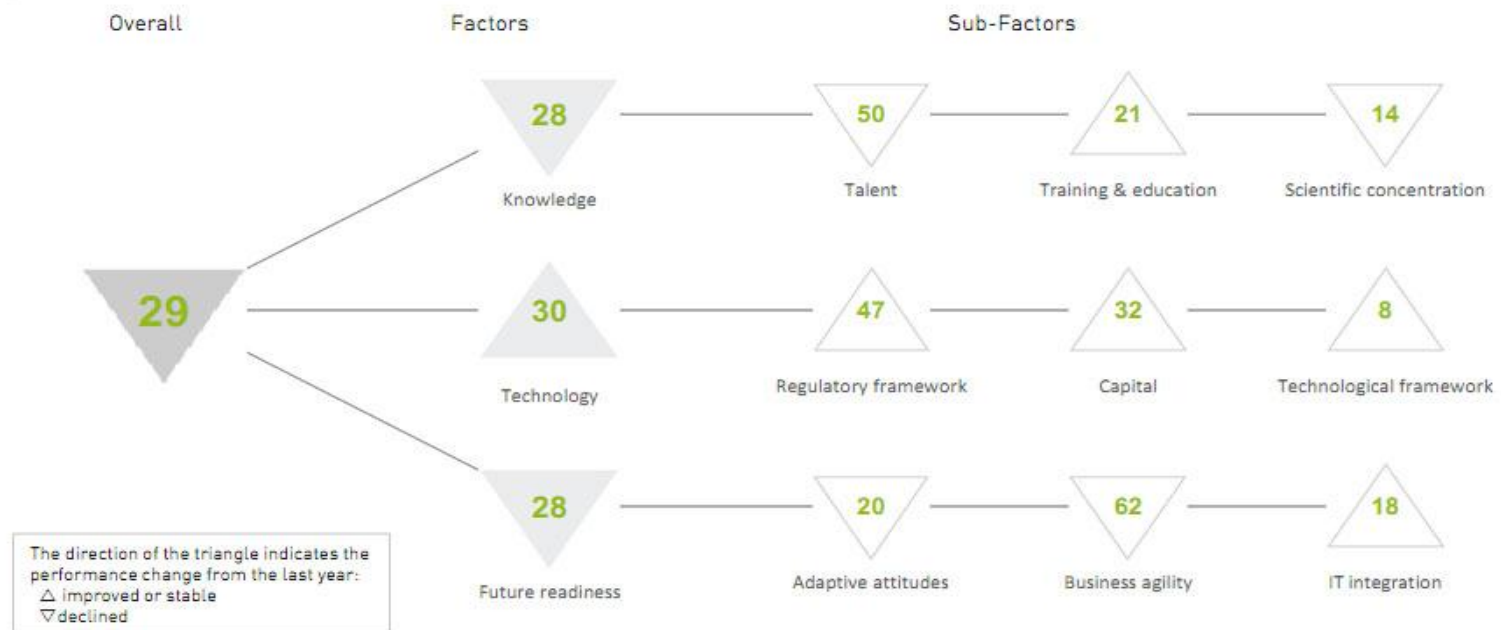
Adaptive attitudes	Rank
E-Participation	06
Internet retailing	26
Tablet possession	20
Smartphone possession	26
Attitudes toward globalization	07

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

JAPAN

OVERALL PERFORMANCE [63 countries]



OVERALL & FACTORS - 5 years

	2018	2019	2020	2021	2022
OVERALL	22	23	27	28	29
Knowledge	18	25	22	25	28
Technology	23	24	26	30	30
Future readiness	25	24	26	27	28

- Overall top strengths
- ▷ Overall top weaknesses

KNOWLEDGE

Subfactors	2015	2016	2017	2018	2019
Talent	31	30	41	36	46
Training & education	27	28	31	14	19
Scientific concentration	14	14	16	12	11

Talent	Rank
Educational assessment PISA - Math	4
▷ International experience	63
Foreign highly-skilled personnel	51
Management of cities	11
▷ Digital/Technological skills	60
Net flow of international students	25

Training & education	Rank
Employee training	15
Total public expenditure on education	55
Higher education achievement	6
▷ Pupil-teacher ratio (tertiary education)	1
Graduates in Sciences	42
Women with degrees	8

Scientific concentration	Rank
Total expenditure on R&D (%)	6
Total R&D personnel per capita	16
Female researchers	54
R&D productivity by publication	15
Scientific and technical employment	36
High-tech patent grants	4
Robots in Education and R&D	4

TECHNOLOGY

Subfactors	2015	2016	2017	2018	2019
Regulatory framework	39	37	37	40	42
Capital	26	29	33	33	37
Technological framework	3	3	6	4	2

Regulatory framework	Rank
Starting a business	42
Enforcing contracts	38
Immigration laws	56
Development and application of technol	37
Scientific research legislation	41
Intellectual property rights	31

Capital	Rank
IT & media stock market capitalization	17
Funding for technological development	32
Banking and financial services	45
Country credit rating	31
Venture capital	36
Investment in Telecommunications	57

Technological framework	Rank
Communications technology	36
► Mobile Broadband subscribers	1
► Wireless broadband	2
Internet users	5
Internet bandwidth speed	14
High-tech exports (%)	21

FUTURE READINESS

Subfactors	2015	2016	2017	2018	2019
Adaptive attitudes	13	15	14	13	15
Business agility	35	33	57	55	41
IT integration	10	15	18	15	18

Adaptive attitudes	Rank
E-Participation	5
Internet retailing	16
Tablet possession	24
Smartphone possession	19
Attitudes toward globalization	44

Business agility	Rank
▷ Opportunities and threats	63
► World robots distribution	2
▷ Agility of companies	63
▷ Use of big data and analytics	63
Knowledge transfer	45

IT integration	Rank
E-Government	10
Public-private partnerships	37
Cyber security	41
► Software piracy	2

- Overall top strengths
- ▷ Overall top weaknesses

KNOWLEDGE

Subfactors	2016	2017	2018	2019	2020
Talent	30	41	36	46	46
Training & education	28	31	14	19	18
Scientific concentration	14	16	12	11	11

Talent	Rank
Educational assessment PISA - Math	5
▷ International experience	63
Foreign highly-skilled personnel	54
Management of cities	14
▷ Digital/Technological skills	62
Net flow of international students	26

Training & education	Rank
Employee training	28
Total public expenditure on education	55
Higher education achievement	8
► Pupil-teacher ratio (tertiary education)	1
Graduates in Sciences	44
Women with degrees	8

Scientific concentration	Rank
Total expenditure on R&D (%)	6
Total R&D personnel per capita	18
Female researchers	56
R&D productivity by publication	16
Scientific and technical employment	37
High-tech patent grants	4
Robots in Education and R&D	4

TECHNOLOGY

Subfactors	2016	2017	2018	2019	2020
Regulatory framework	37	37	40	42	44
Capital	29	33	33	37	33
Technological framework	3	6	4	2	5

Regulatory framework	Rank
Starting a business	44
Enforcing contracts	36
Immigration laws	56
Development & application of tech.	45
Scientific research legislation	45
Intellectual property rights	33

Capital	Rank
IT & media stock market capitalization	9
Funding for technological development	39
Banking and financial services	40
Country credit rating	31
Venture capital	34
Investment in Telecommunications	52

Technological framework	Rank
Communications technology	35
► Mobile Broadband subscribers	1
► Wireless broadband	2
Internet users	5
Internet bandwidth speed	19
High-tech exports (%)	22

FUTURE READINESS

Subfactors	2016	2017	2018	2019	2020
Adaptive attitudes	15	14	13	15	19
Business agility	33	57	55	41	56
IT integration	15	18	15	18	23

Adaptive attitudes	Rank
E-Participation	4
Internet retailing	16
Tablet possession	21
Smartphone possession	21
Attitudes toward globalization	50

Business agility	Rank
▷ Opportunities and threats	63
► World robots distribution	2
▷ Agility of companies	63
▷ Use of big data and analytics	63
Knowledge transfer	45
Entrepreneurial fear of failure	32

IT integration	Rank
E-Government	14
Public-private partnerships	46
Cyber security	45
► Software piracy	2

JAPAN 2021

- Overall top strengths
- ▷ Overall top weaknesses

KNOWLEDGE

Subfactors	2017	2018	2019	2020	2021
Talent	41	36	46	46	47
Training & education	31	14	19	18	21
Scientific concentration	16	12	11	11	13

Talent	Rank
Educational assessment PISA - Math	5
▷ International experience	64
Foreign highly-skilled personnel	49
Management of cities	15
▷ Digital/Technological skills	62
Net flow of international students	26

Training & education	Rank
Employee training	27
Total public expenditure on education	57
Higher education achievement	8
► Pupil-teacher ratio (tertiary education)	1
Graduates in Sciences	44
Women with degrees	6

Scientific concentration	Rank
Total expenditure on R&D (%)	5
Total R&D personnel per capita	20
Female researchers	55
R&D productivity by publication	14
Scientific and technical employment	40
High-tech patent grants	5
► Robots in Education and R&D	4

TECHNOLOGY

Subfactors	2017	2018	2019	2020	2021
Regulatory framework	37	40	42	44	48
Capital	33	33	37	33	37
Technological framework	6	4	2	5	8

Regulatory framework	Rank
Starting a business	44
Enforcing contracts	36
Immigration laws	62
Development & application of tech.	49
Scientific research legislation	47
Intellectual property rights	27

Capital	Rank
IT & media stock market capitalization	10
Funding for technological development	36
Banking and financial services	36
Country credit rating	28
Venture capital	36
Investment in Telecommunications	53

Technological framework	Rank
Communications technology	37
Mobile Broadband subscribers	11
► Wireless broadband	2
Internet users	14
Internet bandwidth speed	17
High-tech exports (%)	24

FUTURE READINESS

Subfactors	2017	2018	2019	2020	2021
Adaptive attitudes	14	13	15	19	18
Business agility	57	55	41	56	53
IT integration	18	15	18	23	23

Adaptive attitudes	Rank
E-Participation	4
Internet retailing	15
Tablet possession	24
Smartphone possession	21
Attitudes toward globalization	46

Business agility	Rank
▷ Opportunities and threats	62
► World robots distribution	2
▷ Agility of companies	64
▷ Use of big data and analytics	63
Knowledge transfer	40
Entrepreneurial fear of failure	33

IT integration	Rank
E-Government	14
Public-private partnerships	42
Cyber security	44
► Software piracy	2

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

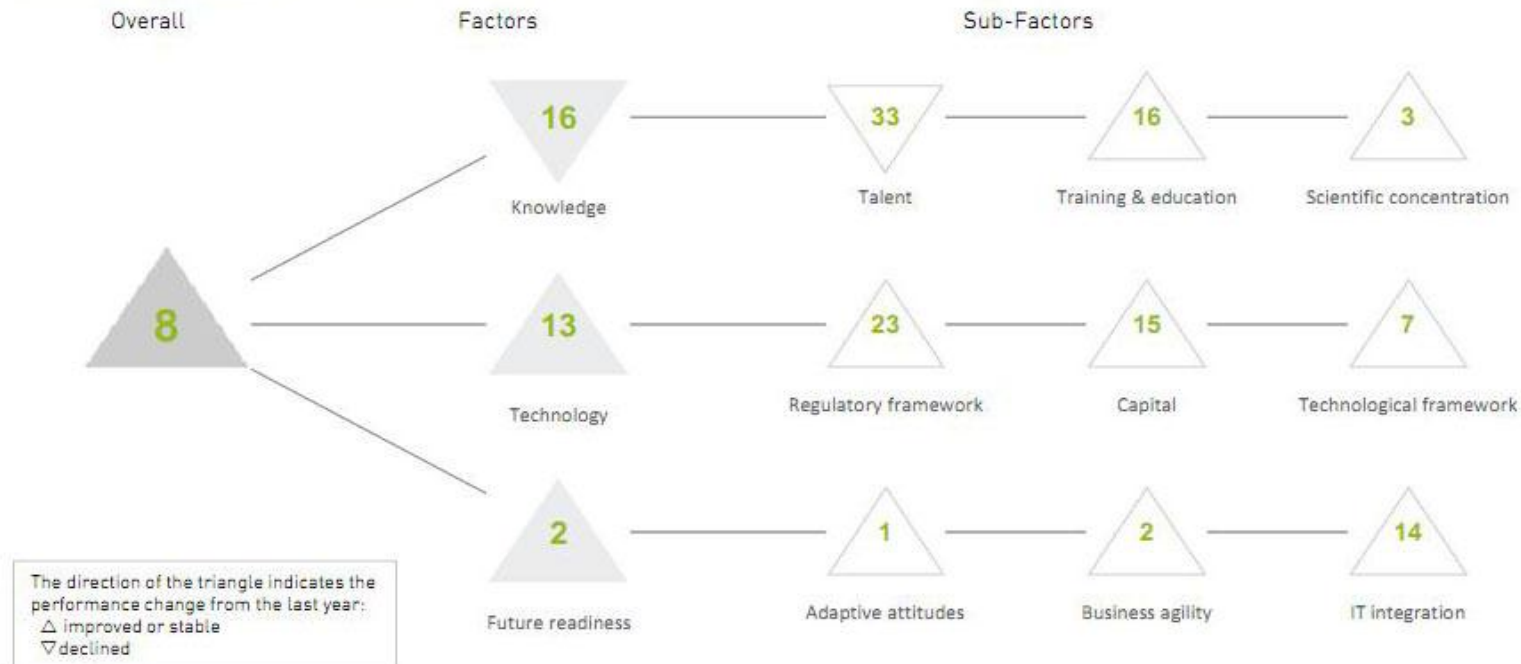
FUTURE READINESS

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

KOREA REP.

OVERALL PERFORMANCE (63 countries)



OVERALL & FACTORS - 5 years

	2018	2019	2020	2021	2022
OVERALL	14	10	08	12	08
Knowledge	11	11	10	15	16
Technology	17	17	12	13	13
Future readiness	17	04	03	05	02

ที่มา : IMD

- Overall top strengths
- ▷ Overall top weaknesses

KOREA REP.

2019

KNOWLEDGE

Subfactors	2015	2016	2017	2018	2019
Talent	23	27	25	26	30
Training & education	10	14	13	8	5
Scientific concentration	9	8	9	7	6

Talent	Rank
Educational assessment PISA - Math	6
▷ International experience	52
Foreign highly-skilled personnel	49
Management of cities	17
Digital/Technological skills	26
Net flow of international students	50

Training & education	Rank
Employee training	33
Total public expenditure on education	22
Higher education achievement	3
Pupil-teacher ratio (tertiary education)	34
Graduates in Sciences	9
Women with degrees	20

Scientific concentration	Rank
► Total expenditure on R&D (%)	1
Total R&D personnel per capita	5
▷ Female researchers	53
R&D productivity by publication	25
Scientific and technical employment	30
High-tech patent grants	3
Robots in Education and R&D	13

TECHNOLOGY

Subfactors	2015	2016	2017	2018	2019
Regulatory framework	23	28	28	27	26
Capital	32	35	41	44	29
Technological framework	2	2	2	2	7

Regulatory framework	Rank
Starting a business	7
▷ Enforcing contracts	2
▷ Immigration laws	61
▷ Development and application of techn	50
Scientific research legislation	34
Intellectual property rights	37

Capital	Rank
IT & media stock market capitalization	3
Funding for technological development	42
▷ Banking and financial services	54
Country credit rating	19
Venture capital	48
Investment in Telecommunications	46

Technological framework	Rank
Communications technology	12
Mobile Broadband subscribers	10
Wireless broadband	19
Internet users	16
▷ Internet bandwidth speed	2
High-tech exports (%)	19

FUTURE READINESS

Subfactors	2015	2016	2017	2018	2019
Adaptive attitudes	8	8	10	3	4
Business agility	38	43	48	47	5
IT integration	17	21	23	20	21

Adaptive attitudes	Rank
▷ E-Participation	1
▷ Internet retailing	1
Tablet possession	13
Smartphone possession	17
Attitudes toward globalization	19

Business agility	Rank
Opportunities and threats	43
World robots distribution	3
Agility of companies	28
Use of big data and analytics	40
Knowledge transfer	35

IT integration	Rank
E-Government	3
Public-private partnerships	41
Cyber security	23
Software piracy	20

- Overall top strengths
- ▷ Overall top weaknesses

KOREA REP.

2020

KNOWLEDGE

Subfactors	2016	2017	2018	2019	2020
Talent	27	25	26	30	21
Training & education	14	13	8	5	11
Scientific concentration	8	9	7	6	4

Talent	Rank
Educational assessment PISA - Math	6
International experience	39
▷ Foreign highly-skilled personnel	43
Management of cities	12
Digital/Technological skills	18
▷ Net flow of international students	49

Training & education	Rank
Employee training	15
Total public expenditure on education	36
Higher education achievement	4
Pupil-teacher ratio (tertiary education)	33
Graduates in Sciences	11
Women with degrees	20

Scientific concentration	Rank
► Total expenditure on R&D (%)	2
Total R&D personnel per capita	3
▷ Female researchers	54
R&D productivity by publication	26
Scientific and technical employment	34
High-tech patent grants	3
Robots in Education and R&D	13

TECHNOLOGY

Subfactors	2016	2017	2018	2019	2020
Regulatory framework	28	28	27	26	26
Capital	35	41	44	29	25
Technological framework	2	2	2	7	3

Regulatory framework	Rank
Starting a business	19
Enforcing contracts	2
Immigration laws	39
▷ Development & application of tech.	44
Scientific research legislation	31
Intellectual property rights	38

Capital	Rank
► IT & media stock market capitalization	2
Funding for technological development	38
▷ Banking and financial services	49
Country credit rating	19
Venture capital	41
Investment in Telecommunications	42

Technological framework	Rank
Communications technology	10
Mobile Broadband subscribers	10
Wireless broadband	20
Internet users	16
► Internet bandwidth speed	2
High-tech exports (%)	6

FUTURE READINESS

Subfactors	2016	2017	2018	2019	2020
Adaptive attitudes	8	10	3	4	1
Business agility	43	48	47	5	3
IT integration	21	23	20	21	15

Adaptive attitudes	Rank
► E-Participation	1
► Internet retailing	1
Tablet possession	20
Smartphone possession	16
Attitudes toward globalization	14

Business agility	Rank
Opportunities and threats	24
World robots distribution	3
Agility of companies	13
Use of big data and analytics	15
Knowledge transfer	30
Entrepreneurial fear of failure	15

IT integration	Rank
E-Government	2
Public-private partnerships	29
Cyber security	21
Software piracy	20

KOREA REP.

2021

- Overall top strengths
- ▷ Overall top weaknesses

KNOWLEDGE

Subfactors	2017	2018	2019	2020	2021
Talent	25	26	30	21	26
Training & education	13	8	5	11	16
Scientific concentration	9	7	6	4	3

Talent	Rank
Educational assessment PISA - Math	6
▷ International experience	52
▷ Foreign highly-skilled personnel	46
Management of cities	9
Digital/Technological skills	33
Net flow of international students	44

Training & education	Rank
Employee training	32
Total public expenditure on education	38
Higher education achievement	4
Pupil-teacher ratio (tertiary education)	33
Graduates in Sciences	11
Women with degrees	21

Scientific concentration	Rank
► Total expenditure on R&D (%)	2
Total R&D personnel per capita	3
▷ Female researchers	53
R&D productivity by publication	27
Scientific and technical employment	33
High-tech patent grants	3
Robots in Education and R&D	12

TECHNOLOGY

Subfactors	2017	2018	2019	2020	2021
Regulatory framework	28	27	26	26	23
Capital	41	44	29	25	16
Technological framework	2	2	7	3	7

Regulatory framework	Rank
Starting a business	19
► Enforcing contracts	2
Immigration laws	27
▷ Development & application of tech.	45
Scientific research legislation	30
Intellectual property rights	36

Capital	Rank
► IT & media stock market capitalization	2
Funding for technological development	34
Banking and financial services	42
Country credit rating	16
Venture capital	39
▷ Investment in Telecommunications	44

Technological framework	Rank
Communications technology	12
Mobile Broadband subscribers	10
Wireless broadband	21
Internet users	7
Internet bandwidth speed	12
High-tech exports (%)	7

FUTURE READINESS

Subfactors	2017	2018	2019	2020	2021
Adaptive attitudes	10	3	4	1	2
Business agility	48	47	5	3	5
IT integration	23	20	21	15	16

Adaptive attitudes	Rank
► E-Participation	1
► Internet retailing	2
Tablet possession	22
Smartphone possession	16
Attitudes toward globalization	17

Business agility	Rank
Opportunities and threats	20
World robots distribution	3
Agility of companies	18
Use of big data and analytics	26
Knowledge transfer	25
Entrepreneurial fear of failure	16

IT integration	Rank
E-Government	2
Public-private partnerships	38
Cyber security	23
Software piracy	20

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

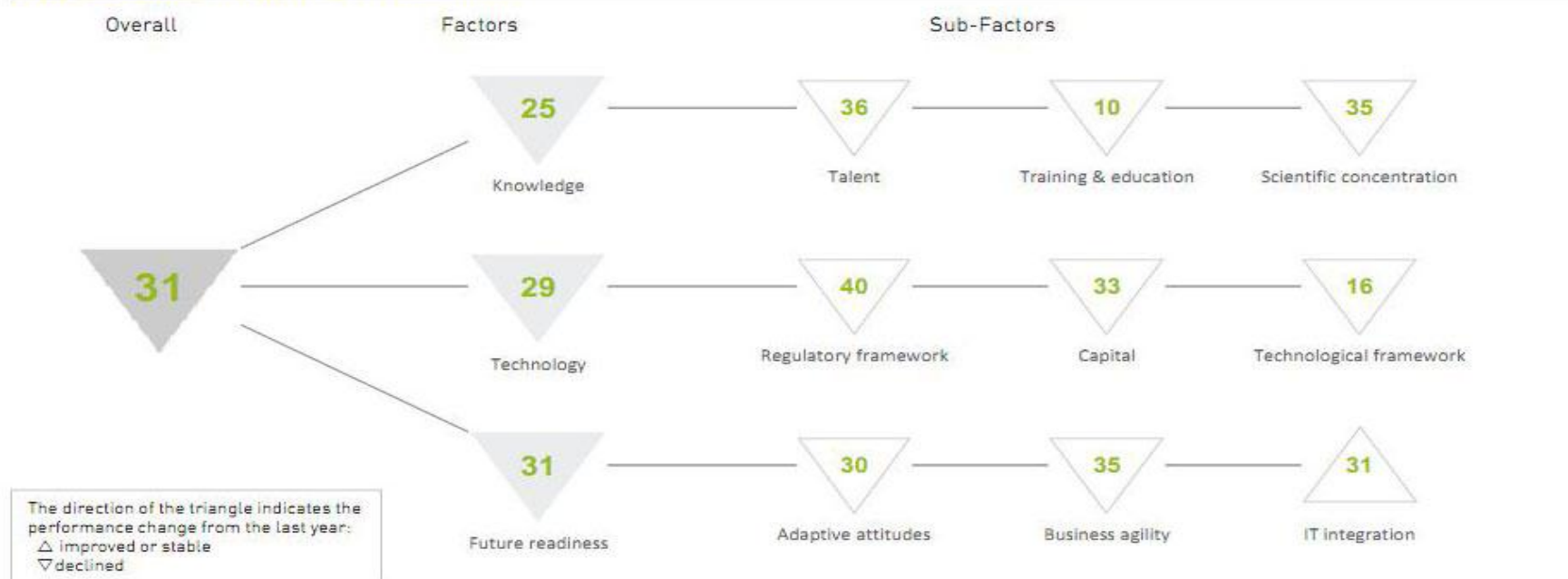
Adaptive attitudes	Rank
► E-Participation	01
► Internet retailing	01
Tablet possession	26
Smartphone possession	04
Attitudes toward globalization	11

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

MALAYSIA

OVERALL PERFORMANCE [63 countries]



OVERALL & FACTORS - 5 years

	2018	2019	2020	2021	2022
OVERALL	27	26	26	27	31
Knowledge	17	19	19	22	25
Technology	22	19	20	26	29
Future readiness	29	28	32	29	31

- Overall top strengths
- ▷ Overall top weaknesses

MALAYSIA

2019

KNOWLEDGE

Subfactors	2015	2016	2017	2018	2019
Talent	26	26	27	24	22
Training & education	17	11	3	10	11
Scientific concentration	28	27	26	30	27

Talent	Rank
► Educational assessment PISA - Math	41
International experience	12
Foreign highly-skilled personnel	16
Management of cities	20
Digital/Technological skills	21
Net flow of international students	23

Training & education	Rank
Employee training	18
Total public expenditure on education	33
Higher education achievement	37
Pupil-teacher ratio (tertiary education)	29
► Graduates in Sciences	6
► Women with degrees	4

Scientific concentration	Rank
Total expenditure on R&D (%)	24
Total R&D personnel per capita	36
Female researchers	10
R&D productivity by publication	27
► Scientific and technical employment	41
High-tech patent grants	18
Robots in Education and R&D	19

TECHNOLOGY

Subfactors	2015	2016	2017	2018	2019
Regulatory framework	21	21	30	29	29
Capital	7	7	9	12	14
Technological framework	17	21	19	32	20

Regulatory framework	Rank
► Starting a business	52
Enforcing contracts	28
Immigration laws	19
Development and application of techn	20
Scientific research legislation	25
Intellectual property rights	28

Capital	Rank
IT & media stock market capitalization	22
Funding for technological development	18
Banking and financial services	19
Country credit rating	36
Venture capital	20
► Investment in Telecommunications	6

Technological framework	Rank
Communications technology	38
Mobile Broadband subscribers	29
Wireless broadband	15
Internet users	41
Internet bandwidth speed	36
► High-tech exports (%)	4

FUTURE READINESS

Subfactors	2015	2016	2017	2018	2019
Adaptive attitudes	27	29	28	30	30
Business agility	15	17	12	15	17
IT integration	29	30	34	35	33

Adaptive attitudes	Rank
E-Participation	31
► Internet retailing	48
Tablet possession	26
Smartphone possession	27
Attitudes toward globalization	16

Business agility	Rank
Opportunities and threats	14
World robots distribution	22
Agility of companies	19
Use of big data and analytics	9
Knowledge transfer	20

IT integration	Rank
E-Government	40
► Public-private partnerships	9
Cyber security	20
► Software piracy	45

MALAYSIA

2020

- Overall top strengths
- ▷ Overall top weaknesses

KNOWLEDGE

Subfactors	2016	2017	2018	2019	2020
Talent	26	27	24	22	30
Training & education	11	3	10	11	8
Scientific concentration	27	26	30	27	26

Talent	Rank
Educational assessment PISA - Math	43
International experience	32
Foreign highly-skilled personnel	25
Management of cities	22
Digital/Technological skills	30
Net flow of international students	24

Training & education	Rank
Employee training	31
Total public expenditure on education	33
Higher education achievement	40
Pupil-teacher ratio (tertiary education)	28
► Graduates in Sciences	1
► Women with degrees	4

Scientific concentration	Rank
Total expenditure on R&D (%)	25
Total R&D personnel per capita	39
► Female researchers	11
R&D productivity by publication	28
▷ Scientific and technical employment	50
High-tech patent grants	19
Robots in Education and R&D	21

TECHNOLOGY

Subfactors	2016	2017	2018	2019	2020
Regulatory framework	21	30	29	29	35
Capital	7	9	12	14	18
Technological framework	21	19	32	20	15

Regulatory framework	Rank
▷ Starting a business	52
Enforcing contracts	28
▷ Immigration laws	44
Development & application of tech.	20
Scientific research legislation	26
Intellectual property rights	34

Capital	Rank
IT & media stock market capitalization	23
Funding for technological development	23
Banking and financial services	21
Country credit rating	36
Venture capital	30
► Investment in Telecommunications	8

Technological framework	Rank
Communications technology	42
Mobile Broadband subscribers	29
Wireless broadband	19
Internet users	41
Internet bandwidth speed	36
► High-tech exports (%)	3

FUTURE READINESS

Subfactors	2016	2017	2018	2019	2020
Adaptive attitudes	29	28	30	30	30
Business agility	17	12	15	17	30
IT integration	30	34	35	33	33

Adaptive attitudes	Rank
E-Participation	28
▷ Internet retailing	45
Tablet possession	27
Smartphone possession	26
Attitudes toward globalization	27

Business agility	Rank
Opportunities and threats	35
World robots distribution	22
Agility of companies	34
Use of big data and analytics	26
Knowledge transfer	25
Entrepreneurial fear of failure	36

IT integration	Rank
E-Government	41
Public-private partnerships	17
Cyber security	29
▷ Software piracy	45

- Overall top strengths
- ▷ Overall top weaknesses

MALAYSIA

2021

KNOWLEDGE

Subfactors	2017	2018	2019	2020	2021
Talent	27	24	22	30	30
Training & education	3	10	11	8	9
Scientific concentration	26	30	27	26	32

Talent	Rank
▷ Educational assessment PISA - Math	43
International experience	30
Foreign highly-skilled personnel	23
Management of cities	23
Digital/Technological skills	28
Net flow of international students	27

Training & education	Rank
Employee training	25
Total public expenditure on education	40
Higher education achievement	41
Pupil-teacher ratio (tertiary education)	28
► Graduates in Sciences	2
► Women with degrees	4

Scientific concentration	Rank
Total expenditure on R&D (%)	40
Total R&D personnel per capita	39
► Female researchers	7
R&D productivity by publication	19
▷ Scientific and technical employment	47
High-tech patent grants	32
Robots in Education and R&D	26

TECHNOLOGY

Subfactors	2017	2018	2019	2020	2021
Regulatory framework	30	29	29	35	35
Capital	9	12	14	18	31
Technological framework	19	32	20	15	15

Regulatory framework	Rank
▷ Starting a business	52
Enforcing contracts	28
Immigration laws	41
Development & application of tech.	23
Scientific research legislation	26
Intellectual property rights	28

Capital	Rank
IT & media stock market capitalization	25
Funding for technological development	28
Banking and financial services	27
Country credit rating	40
Venture capital	28
Investment in Telecommunications	26

Technological framework	Rank
Communications technology	43
Mobile Broadband subscribers	26
Wireless broadband	20
Internet users	40
Internet bandwidth speed	35
► High-tech exports (%)	4

FUTURE READINESS

Subfactors	2017	2018	2019	2020	2021
Adaptive attitudes	28	30	30	30	29
Business agility	12	15	17	30	27
IT integration	34	35	33	33	31

Adaptive attitudes	Rank
E-Participation	28
▷ Internet retailing	47
Tablet possession	28
Smartphone possession	26
Attitudes toward globalization	18

Business agility	Rank
Opportunities and threats	23
World robots distribution	22
Agility of companies	28
Use of big data and analytics	22
Knowledge transfer	26
Entrepreneurial fear of failure	37

IT integration	Rank
E-Government	41
► Public-private partnerships	17
Cyber security	27
▷ Software piracy	45

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

CHINA

OVERALL PERFORMANCE [63 countries]



OVERALL & FACTORS - 5 years

	2018	2019	2020	2021	2022
OVERALL	30	22	16	15	17
Knowledge	30	18	08	06	17
Technology	34	26	27	20	18
Future readiness	28	21	18	17	15

- Overall top strengths
▷ Overall top weaknesses

KNOWLEDGE

Subfactors	2015	2016	2017	2018	2019
Talent	18	21	23	18	19
Training & education	55	54	53	46	37
Scientific concentration	3	3	3	21	9

Talent	Rank
► Educational assessment PISA - Math	5
International experience	45
Foreign highly-skilled personnel	27
Management of cities	13
Digital/Technological skills	15
Net flow of international students	47

Training & education	Rank
Employee training	13
Total public expenditure on education	46
Higher education achievement	25
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	35
Female researchers	-
► R&D productivity by publication	1
▷ Scientific and technical employment	49
High-tech patent grants	14
► Robots in Education and R&D	1

TECHNOLOGY

Subfactors	2015	2016	2017	2018	2019
Regulatory framework	34	38	32	26	20
Capital	27	27	22	30	32
Technological framework	45	46	47	40	32

Regulatory framework	Rank
Starting a business	16
► Enforcing contracts	6
Immigration laws	36
Development and application of technology	24
Scientific research legislation	19
▷ Intellectual property rights	48

Capital	Rank
IT & media stock market capitalization	33
Funding for technological development	24
Banking and financial services	42
Country credit rating	27
Venture capital	38
Investment in Telecommunications	17

Technological framework	Rank
Communications technology	15
Mobile Broadband subscribers	35
Wireless broadband	30
▷ Internet users	56
Internet bandwidth speed	25
High-tech exports (%)	6

FUTURE READINESS

Subfactors	2015	2016	2017	2018	2019
Adaptive attitudes	38	36	32	23	24
Business agility	34	32	24	19	1
IT integration	49	50	44	41	41

Adaptive attitudes	Rank
E-Participation	28
Internet retailing	21
Tablet possession	31
Smartphone possession	16
Attitudes toward globalization	10

Business agility	Rank
► Opportunities and threats	19
World robots distribution	1
Agility of companies	25
Use of big data and analytics	12
Knowledge transfer	31

IT integration	Rank
▷ E-Government	50
Public-private partnerships	15
Cyber security	16
▷ Software piracy	56

- Overall top strengths
▷ Overall top weaknesses

KNOWLEDGE

Subfactors	2016	2017	2018	2019	2020
Talent	21	23	18	19	13
Training & education	54	53	46	37	40
Scientific concentration	3	3	21	9	2

Talent	Rank
► Educational assessment PISA - Math	1
▷ International experience	44
Foreign highly-skilled personnel	32
Management of cities	11
Digital/Technological skills	12
▷ Net flow of international students	46

Training & education	Rank
Employee training	19
▷ Total public expenditure on education	51
Higher education achievement	19
Pupil-teacher ratio (tertiary education)	38
Graduates in Sciences	-
Women with degrees	-

Scientific concentration	Rank
Total expenditure on R&D (%)	15
Total R&D personnel per capita	36
Female researchers	-
► R&D productivity by publication	1
► Scientific and technical employment	2
High-tech patent grants	9
► Robots in Education and R&D	1

TECHNOLOGY

Subfactors	2016	2017	2018	2019	2020
Regulatory framework	38	32	26	20	18
Capital	27	22	30	32	31
Technological framework	46	47	40	32	32

Regulatory framework	Rank
Starting a business	16
Enforcing contracts	5
Immigration laws	33
Development & application of tech.	23
Scientific research legislation	21
Intellectual property rights	42

Capital	Rank
IT & media stock market capitalization	22
Funding for technological development	20
Banking and financial services	43
Country credit rating	27
Venture capital	38
Investment in Telecommunications	36

Technological framework	Rank
Communications technology	16
Mobile Broadband subscribers	36
Wireless broadband	24
▷ Internet users	56
Internet bandwidth speed	25
High-tech exports (%)	7

FUTURE READINESS

Subfactors	2016	2017	2018	2019	2020
Adaptive attitudes	36	32	23	24	17
Business agility	32	24	19	1	4
IT integration	50	44	41	41	35

Adaptive attitudes	Rank
E-Participation	9
Internet retailing	19
Tablet possession	31
Smartphone possession	17
Attitudes toward globalization	8

Business agility	Rank
Opportunities and threats	11
► World robots distribution	1
Agility of companies	29
Use of big data and analytics	8
Knowledge transfer	24
Entrepreneurial fear of failure	35

IT integration	Rank
E-Government	40
Public-private partnerships	11
Cyber security	15
▷ Software piracy	56

- Overall top strengths
▷ Overall top weaknesses

KNOWLEDGE

Subfactors	2017	2018	2019	2020	2021
Talent	23	18	19	13	12
Training & education	53	46	37	40	35
Scientific concentration	3	21	9	2	1

Talent	Rank
► Educational assessment PISA - Math	1
▷ International experience	44
Foreign highly-skilled personnel	31
Management of cities	11
Digital/Technological skills	16
▷ Net flow of international students	48

Training & education	Rank
Employee training	13
▷ Total public expenditure on education	52
Higher education achievement	16
Pupil-teacher ratio (tertiary education)	41
Graduates in Sciences	-
Women with degrees	-

Scientific concentration	Rank
Total expenditure on R&D (%)	14
Total R&D personnel per capita	36
Female researchers	-
► R&D productivity by publication	1
► Scientific and technical employment	1
High-tech patent grants	8
► Robots in Education and R&D	1

TECHNOLOGY

Subfactors	2017	2018	2019	2020	2021
Regulatory framework	32	26	20	18	15
Capital	22	30	32	31	27
Technological framework	47	40	32	32	28

Regulatory framework	Rank
Starting a business	16
Enforcing contracts	5
Immigration laws	31
Development & application of tech.	16
Scientific research legislation	22
Intellectual property rights	35

Capital	Rank
IT & media stock market capitalization	24
Funding for technological development	16
Banking and financial services	33
Country credit rating	26
Venture capital	25
Investment in Telecommunications	37

Technological framework	Rank
Communications technology	13
Mobile Broadband subscribers	24
Wireless broadband	23
▷ Internet users	57
Internet bandwidth speed	25
High-tech exports (%)	8

FUTURE READINESS

Subfactors	2017	2018	2019	2020	2021
Adaptive attitudes	32	23	24	17	19
Business agility	24	19	1	4	3
IT integration	44	41	41	35	32

Adaptive attitudes	Rank
E-Participation	9
Internet retailing	22
Tablet possession	36
Smartphone possession	17
Attitudes toward globalization	11

Business agility	Rank
Opportunities and threats	31
► World robots distribution	1
Agility of companies	19
Use of big data and analytics	11
Knowledge transfer	23
Entrepreneurial fear of failure	36

IT integration	Rank
E-Government	40
Public-private partnerships	4
Cyber security	12
▷ Software piracy	56

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

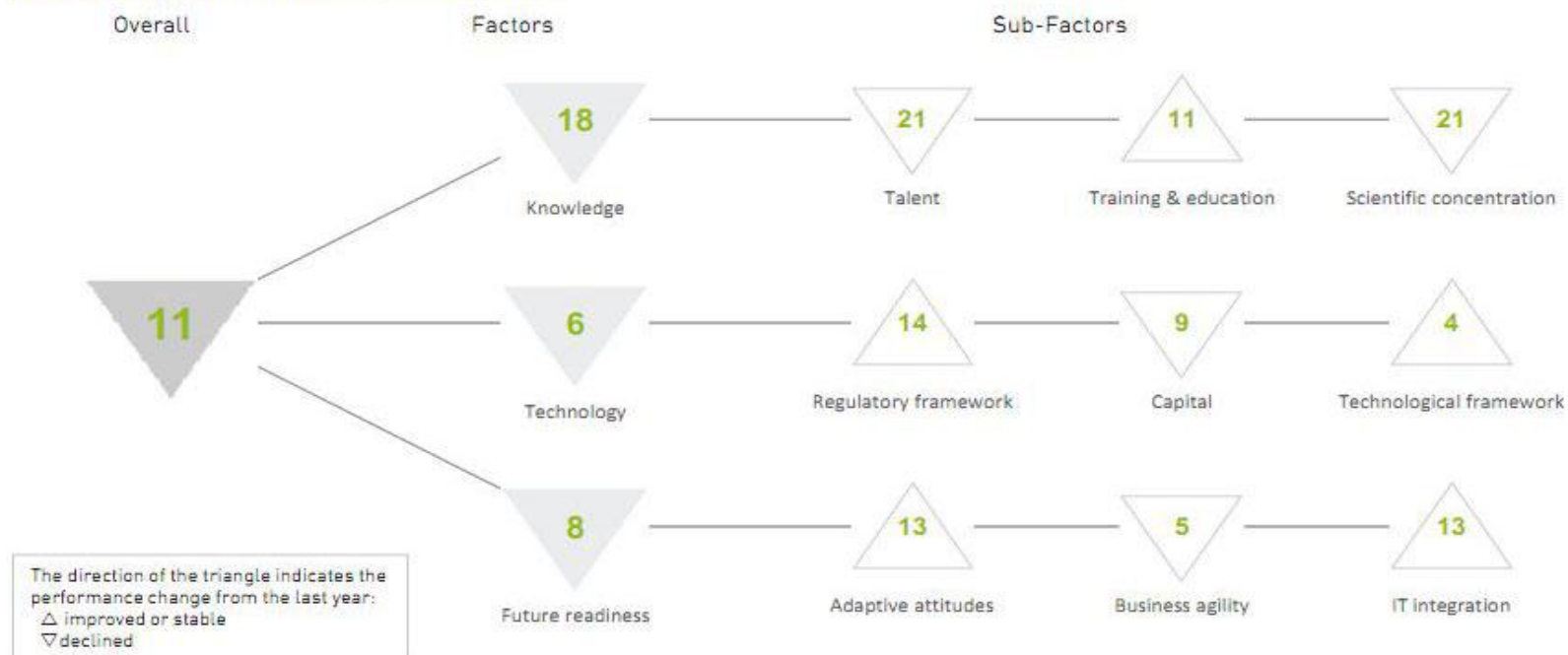
Adaptive attitudes	Rank
E-Participation	09
Internet retailing	25
Tablet possession	38
Smartphone possession	43
Attitudes toward globalization	12

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

TAIWAN, CHINA

OVERALL PERFORMANCE [63 countries]



OVERALL & FACTORS - 5 years

	2018	2019	2020	2021	2022
OVERALL	16	13	11	08	11
Knowledge	19	17	18	16	18
Technology	11	09	05	02	06
Future readiness	22	12	08	07	08

- Overall top strengths
- ▷ Overall top weaknesses

TAIWAN, CHINA

2019

KNOWLEDGE

Subfactors	2015	2016	2017	2018	2019
Talent	19	19	18	25	21
Training & education	22	23	28	25	20
Scientific concentration	19	19	17	13	15

Talent	Rank
Educational assessment PISA - Math	3
International experience	36
▷ Foreign highly-skilled personnel	48
Management of cities	24
Digital/Technological skills	27
Net flow of international students	12

Training & education	Rank
Employee training	14
▷ Total public expenditure on education	45
Higher education achievement	4
▷ Pupil-teacher ratio (tertiary education)	54
▷ Graduates in Sciences	3
Women with degrees	35

Scientific concentration	Rank
Total expenditure on R&D (%)	5
▷ Total R&D personnel per capita	2
▷ Female researchers	50
R&D productivity by publication	35
Scientific and technical employment	37
High-tech patent grants	17
Robots in Education and R&D	21

TECHNOLOGY

Subfactors	2015	2016	2017	2018	2019
Regulatory framework	22	25	24	21	23
Capital	6	6	8	13	12
Technological framework	4	6	4	10	4

Regulatory framework	Rank
Starting a business	11
Enforcing contracts	10
Immigration laws	39
Development and application of technology	36
Scientific research legislation	23
Intellectual property rights	24

Capital	Rank
▷ IT & media stock market capitalization	2
Funding for technological development	23
Banking and financial services	18
Country credit rating	22
Venture capital	27
▷ Investment in Telecommunications	45

Technological framework	Rank
Communications technology	24
▷ Mobile Broadband subscribers	1
Wireless broadband	16
Internet users	21
Internet bandwidth speed	18
▷ High-tech exports (%)	3

FUTURE READINESS

Subfactors	2015	2016	2017	2018	2019
Adaptive attitudes	19	19	19	28	14
Business agility	19	24	6	13	3
IT integration	23	24	22	23	24

Adaptive attitudes	Rank
E-Participation	-
Internet retailing	20
Tablet possession	27
Smartphone possession	4
Attitudes toward globalization	11

Business agility	Rank
Opportunities and threats	4
World robots distribution	7
Agility of companies	3
Use of big data and analytics	14
Knowledge transfer	19

IT integration	Rank
E-Government	-
Public-private partnerships	18
Cyber security	12
Software piracy	25

TAIWAN, CHINA

2020

- Overall top strengths
- ▷ Overall top weaknesses

KNOWLEDGE

Subfactors	2016	2017	2018	2019	2020
Talent	19	18	25	21	18
Training & education	23	28	25	20	21
Scientific concentration	19	17	13	15	18

Talent	Rank
Educational assessment PISA - Math	4
International experience	34
▷ Foreign highly-skilled personnel	47
Management of cities	18
Digital/Technological skills	25
Net flow of international students	11

Training & education	Rank
Employee training	12
▷ Total public expenditure on education	46
Higher education achievement	3
▷ Pupil-teacher ratio (tertiary education)	51
Graduates in Sciences	5
Women with degrees	33

Scientific concentration	Rank
Total expenditure on R&D (%)	4
► Total R&D personnel per capita	2
▷ Female researchers	53
R&D productivity by publication	37
▷ Scientific and technical employment	44
High-tech patent grants	17
Robots in Education and R&D	17

TECHNOLOGY

Subfactors	2016	2017	2018	2019	2020
Regulatory framework	25	24	21	23	16
Capital	6	8	13	12	8
Technological framework	6	4	10	4	4

Regulatory framework	Rank
Starting a business	10
Enforcing contracts	11
Immigration laws	28
Development & application of tech.	28
Scientific research legislation	19
Intellectual property rights	22

Capital	Rank
► IT & media stock market capitalization	1
Funding for technological development	18
Banking and financial services	16
Country credit rating	23
Venture capital	19
Investment in Telecommunications	37

Technological framework	Rank
Communications technology	22
► Mobile Broadband subscribers	1
Wireless broadband	14
Internet users	29
Internet bandwidth speed	5
High-tech exports (%)	5

FUTURE READINESS

Subfactors	2016	2017	2018	2019	2020
Adaptive attitudes	19	19	28	14	14
Business agility	24	6	13	3	1
IT integration	24	22	23	24	17

Adaptive attitudes	Rank
E-Participation	-
Internet retailing	21
Tablet possession	25
► Smartphone possession	2
Attitudes toward globalization	10

Business agility	Rank
Opportunities and threats	2
World robots distribution	7
► Agility of companies	1
Use of big data and analytics	5
Knowledge transfer	19
Entrepreneurial fear of failure	10

IT integration	Rank
E-Government	-
Public-private partnerships	15
Cyber security	8
Software piracy	25

- Overall top strengths
- ▷ Overall top weaknesses

TAIWAN, CHINA 2021

KNOWLEDGE

Subfactors	2017	2018	2019	2020	2021
Talent	18	25	21	18	17
Training & education	28	25	20	21	12
Scientific concentration	17	13	15	18	19

Talent	Rank
Educational assessment PISA - Math	4
International experience	27
Foreign highly-skilled personnel	38
Management of cities	19
Digital/Technological skills	25
Net flow of international students	11

Training & education	Rank
Employee training	5
▷ Total public expenditure on education	51
▷ Higher education achievement	3
▷ Pupil-teacher ratio (tertiary education)	53
Graduates in Sciences	5
Women with degrees	18

Scientific concentration	Rank
► Total expenditure on R&D (%)	3
► Total R&D personnel per capita	1
▷ Female researchers	52
R&D productivity by publication	36
▷ Scientific and technical employment	44
High-tech patent grants	17
Robots in Education and R&D	20

TECHNOLOGY

Subfactors	2017	2018	2019	2020	2021
Regulatory framework	24	21	23	16	16
Capital	8	13	12	8	2
Technological framework	4	10	4	4	4

Regulatory framework	Rank
Starting a business	10
Enforcing contracts	11
Immigration laws	29
Development & application of tech.	20
Scientific research legislation	16
Intellectual property rights	21

Capital	Rank
► IT & media stock market capitalization	1
Funding for technological development	17
Banking and financial services	13
Country credit rating	21
Venture capital	12
▷ Investment in Telecommunications	47

Technological framework	Rank
Communications technology	24
► Mobile Broadband subscribers	1
Wireless broadband	13
Internet users	20
Internet bandwidth speed	19
High-tech exports (%)	5

FUTURE READINESS

Subfactors	2017	2018	2019	2020	2021
Adaptive attitudes	19	28	14	14	13
Business agility	6	13	3	1	2
IT integration	22	23	24	17	15

Adaptive attitudes	Rank
E-Participation	-
Internet retailing	23
Tablet possession	25
Smartphone possession	3
Attitudes toward globalization	4

Business agility	Rank
Opportunities and threats	5
World robots distribution	7
Agility of companies	3
Use of big data and analytics	4
Knowledge transfer	11
Entrepreneurial fear of failure	11

IT integration	Rank
E-Government	-
Public-private partnerships	15
Cyber security	10
Software piracy	25

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

WORLD TALENT RANKING 2022

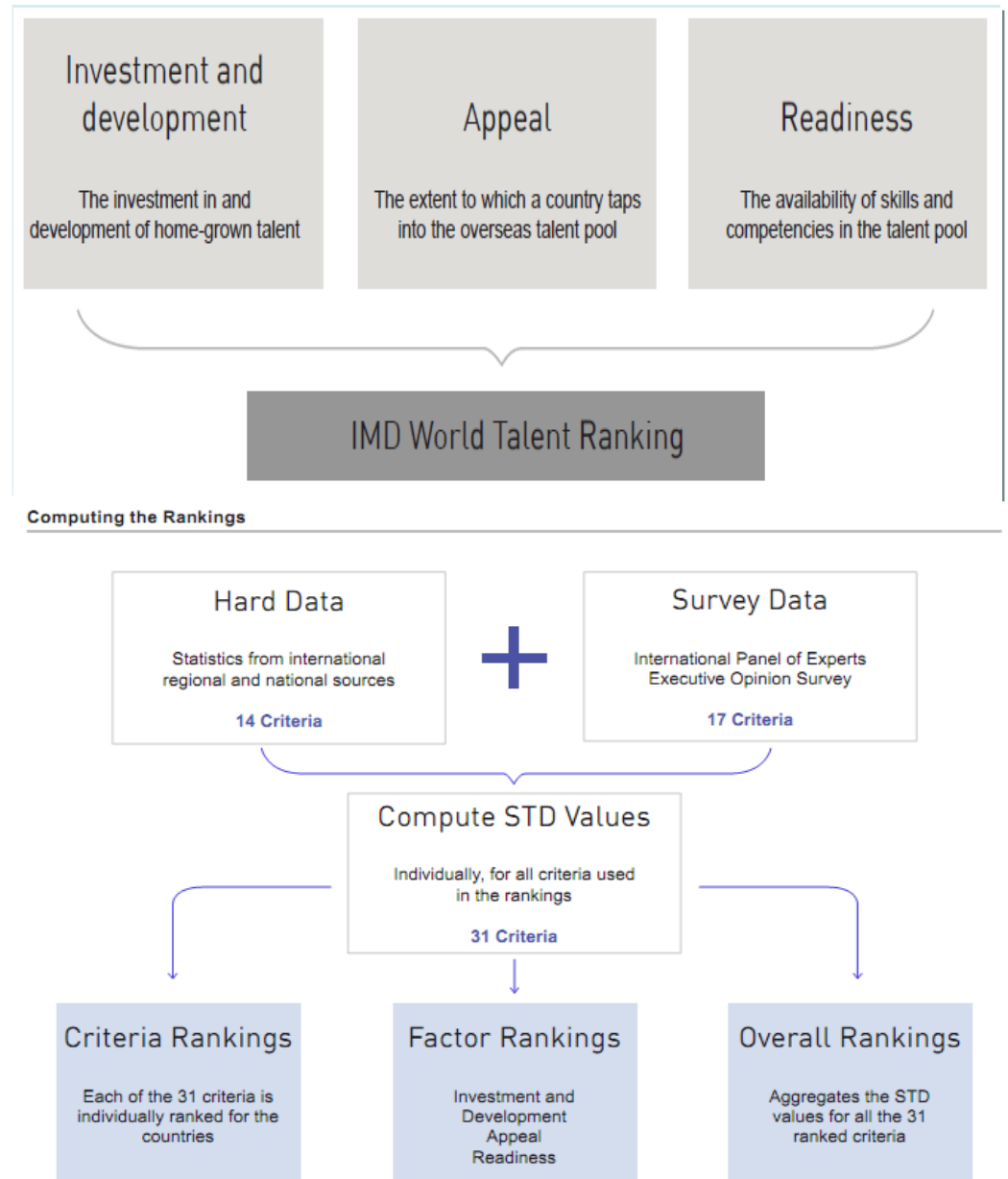
IMD / World Competitiveness Center

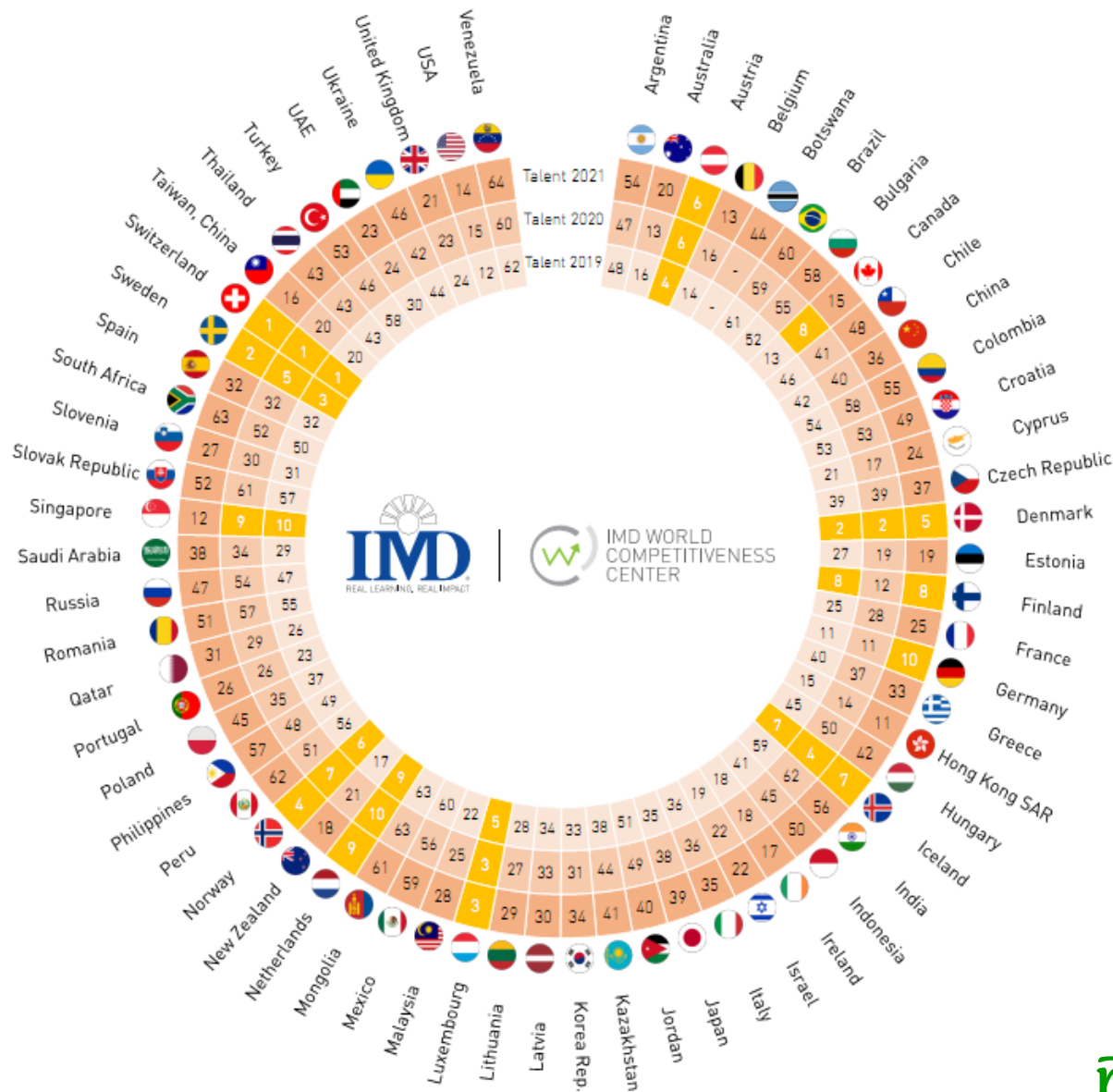
IMD WORLD
TALENT
RANKING

2022



ที่มา : IMD





การจัดอันดับ
ความสามารถ
ด้านบุคลากร
ของประเทศ
ต่าง ๆ
โดยรวมปี
2562-2564

ที่มา : IMD

อันดับความสามารถด้านบุคลากร และอันดับของแต่ละปัจจัยหลักของประเทศต่าง ๆ ปี 2564



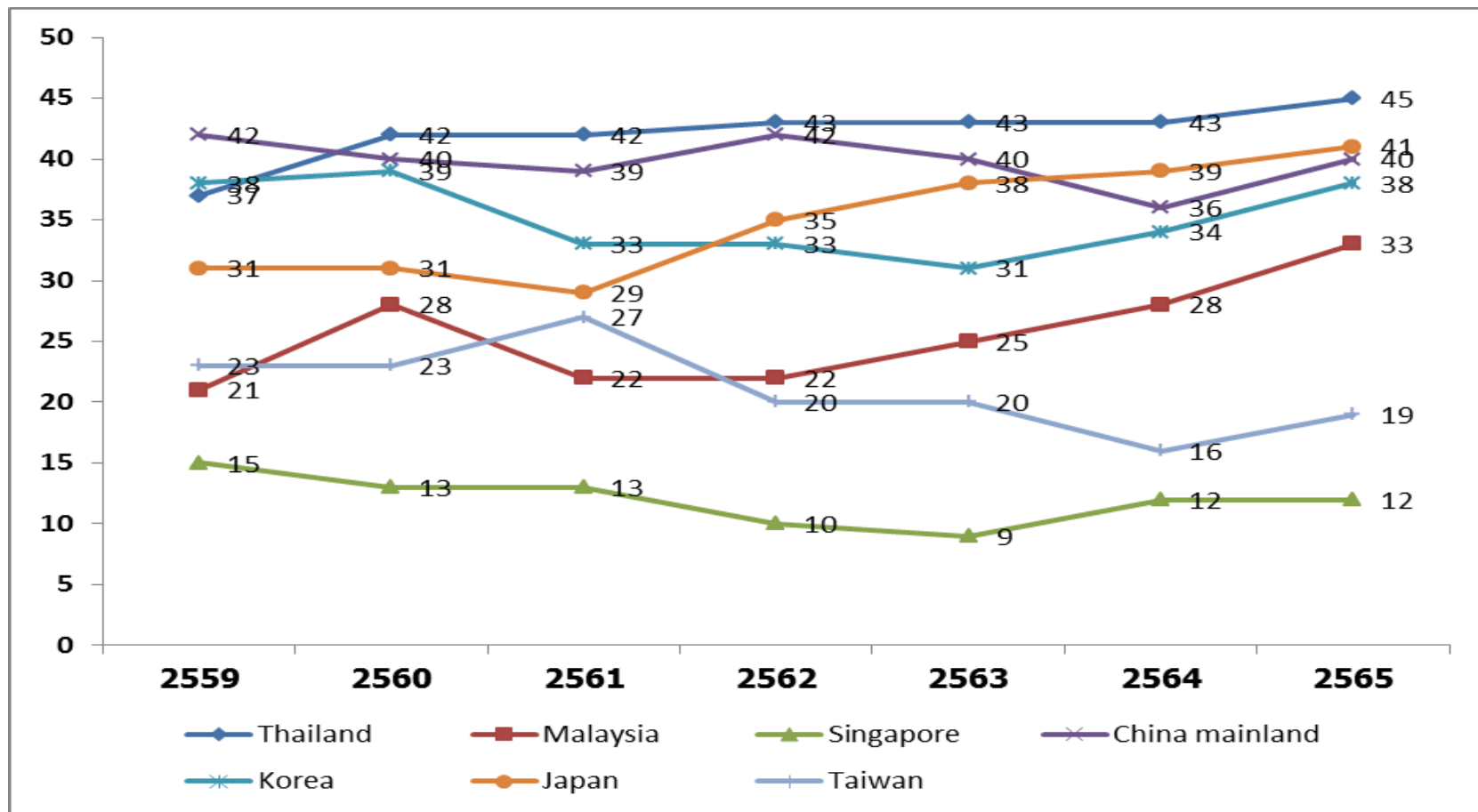
อันดับความสามารถด้านบุคลากร และอันดับของแต่ละ ปัจจัยหลักของประเทศต่าง ๆ ปี 2565



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

การจัดอันดับความสามารถด้านบุคลากร ของประเทศต่าง ๆ โดยรวมปี 2559-2565



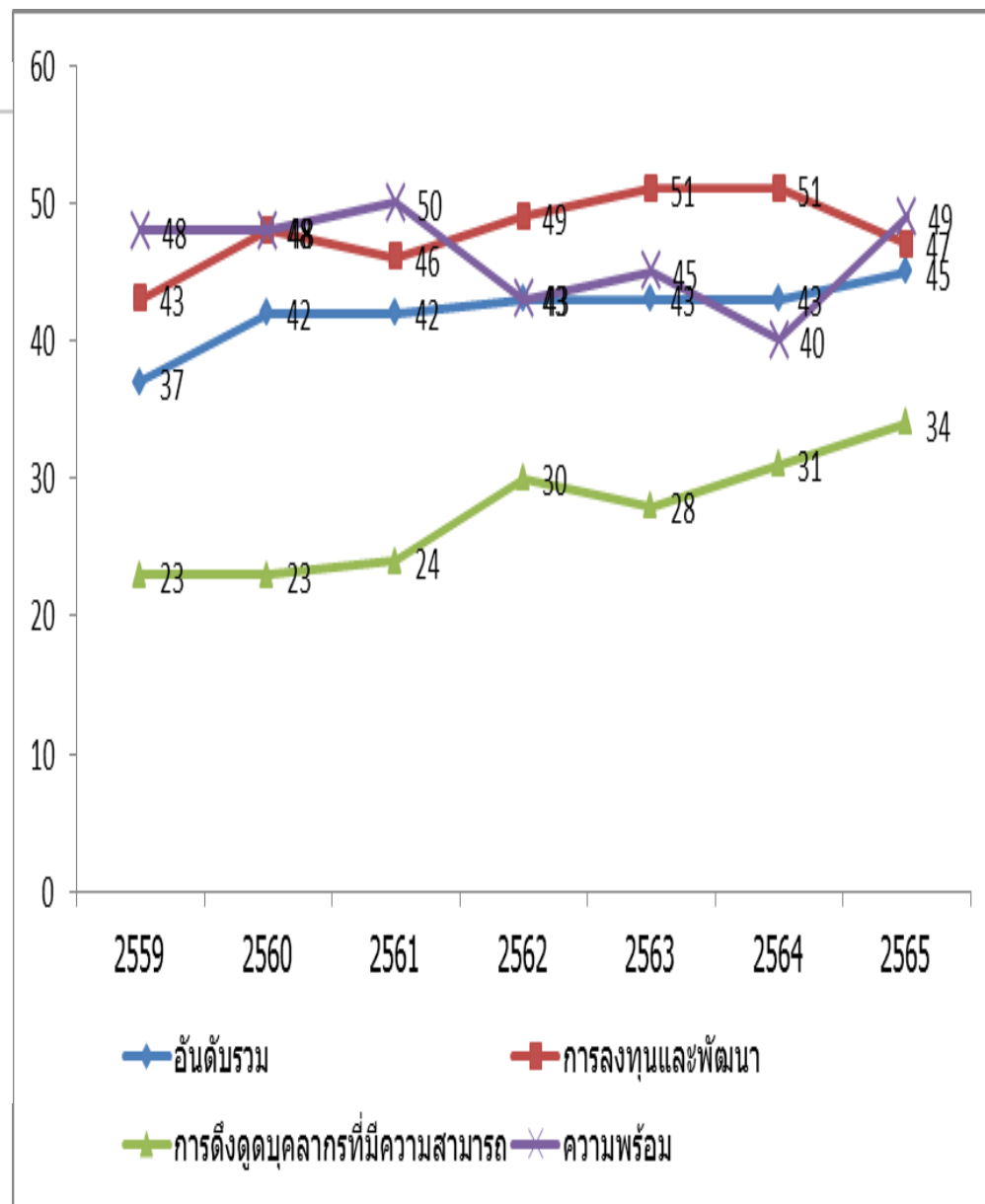
ที่มา : IMD

THAILAND

OVERALL PERFORMANCE (63 countries)

The direction of the triangle indicates the performance change from the last year:

- △ improved or stable
- ▽ declined



ที่มา : IMD 2022

- ▶ Overall top strengths
- ▷ Overall top weaknesses

THAILAND 2019

Investment & Development

		Value	2019 Rank
▷ Total public expenditure on education	Percentage of GDP	3.5 %	52
Gov. expenditure on education per student	Percentage of GDP per capita (secondary education)	18.0 %	43
▷ Total public exp. on education per student	Spending per enrolled pupil/student, all levels	930 US\$	55
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	16.20 ratio	36
▷ Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	24.16 ratio	58
▶ Apprenticeships	are sufficiently implemented	5.50 Survey [0..10]	19
Employee training	is a high priority in companies	6.26 Survey [0..10]	25
Female labor force	Percentage of total labor force	45.49 %	34
Health infrastructure	meets the needs of society	6.48 Survey [0..10]	28

Appeal

		Value	2019 Rank
Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	83.60 index	39
Attracting and retaining talents	is a priority in companies	6.69 Survey [0..10]	35
Worker motivation	in companies is high	6.06 Survey [0..10]	26
▶ Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	5.60 Survey [0..10]	23
Quality of life	is high	6.42 Survey [0..10]	36
Foreign highly-skilled personnel	are attracted to your country's business environment	5.66 Survey [0..10]	29
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	12,681 US\$	44
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	184,089 US\$	26
▶ Effective personal income tax rate	Percentage of an income equal to GDP per capita	4.09 %	5
Justice	is fairly administered	6.00 Survey [0..10]	28
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	26.27 micrograms	55

Readiness

		Value	2019 Rank
Labor force growth	Percentage change	0.88 %	32
Skilled labor	is readily available	5.86 Survey [0..10]	29
Finance skills	are readily available	6.02 Survey [0..10]	38
▶ International experience	of senior managers is generally significant	6.04 Survey [0..10]	20
Competent senior managers	are readily available	6.06 Survey [0..10]	24
Primary and secondary education	meets the needs of a competitive economy	5.25 Survey [0..10]	45
▶ Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	27.86 %	15
University education	meets the needs of a competitive economy	5.52 Survey [0..10]	44
Management education	meets the needs of the business community	5.94 Survey [0..10]	40
Language skills	are meeting the needs of enterprises	4.95 Survey [0..10]	46
▷ Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	0.48 number	51
Educational assessment - PISA	PISA survey of 15-year olds	418 Average	49

THAILAND 2020

- Overall top strengths
- ▷ Overall top weaknesses

Investment & Development

		Value	2020 Rank
▷ Total public expenditure on education	Percentage of GDP	3.0 %	57
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	1,167 US\$	52
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	16.89 ratio	42
▷ Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	25.95 ratio	59
► Apprenticeships	are sufficiently implemented	5.77 Survey [0..10]	17
Employee training	is a high priority in companies	6.33 Survey [0..10]	25
Female labor force	Percentage of total labor force	45.53 %	34
Health infrastructure	meets the needs of society	7.51 Survey [0..10]	22

Appeal

		Value	2020 Rank
Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	83.60 index	39
Attracting and retaining talents	is a priority in companies	6.98 Survey [0..10]	27
Worker motivation	in companies is high	6.22 Survey [0..10]	27
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	5.63 Survey [0..10]	26
Quality of life	is high	6.45 Survey [0..10]	38
► Foreign highly-skilled personnel	are attracted to your country's business environment	6.86 Survey [0..10]	16
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	12,681 US\$	44
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	184,089 US\$	26
► Effective personal income tax rate	Percentage of an income equal to GDP per capita	4.09 %	5
Justice	is fairly administered	5.96 Survey [0..10]	30
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	26.34 micrograms	55

Readiness

		Value	2020 Rank
▷ Labor force growth	Percentage change	-0.67 %	55
Skilled labor	is readily available	6.29 Survey [0..10]	21
Finance skills	are readily available	6.37 Survey [0..10]	37
► International experience	of senior managers is generally significant	6.33 Survey [0..10]	15
Competent senior managers	are readily available	6.29 Survey [0..10]	20
Primary and secondary education	meets the needs of a competitive economy	5.80 Survey [0..10]	39
► Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	27.86 %	16
University education	meets the needs of a competitive economy	5.96 Survey [0..10]	38
Management education	meets the needs of the business community	6.45 Survey [0..10]	34
Language skills	are meeting the needs of enterprises	5.02 Survey [0..10]	47
▷ Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	0.48 number	53
Educational assessment - PISA	PISA survey of 15-year olds	412 Average	50

THAILAND 2021

- Overall top strengths
- ▷ Overall top weaknesses

Investment & Development

		Value	2021 Rank
▷ Total public expenditure on education	Percentage of GDP	3.0 %	58
▷ Total public exp. on education per student	Spending per enrolled pupil/student, all levels	1,294 US\$	52
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	13.00 ratio	20
▷ Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	26.25 ratio	61
Apprenticeships	are sufficiently implemented	5.56 Survey [0..10]	24
Employee training	is a high priority in companies	6.45 Survey [0..10]	20
Female labor force	Percentage of total labor force	45.66 %	36
► Health infrastructure	meets the needs of society	7.86 Survey [0..10]	16

Appeal

		Value	2021 Rank
Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	82.60 index	47
Attracting and retaining talents	is a priority in companies	7.23 Survey [0..10]	25
Worker motivation	in companies is high	6.28 Survey [0..10]	22
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	5.73 Survey [0..10]	20
Quality of life	is high	6.54 Survey [0..10]	38
Foreign highly-skilled personnel	are attracted to your country's business environment	6.02 Survey [0..10]	22
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	12,681 US\$	44
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	1.77 %	10
Justice	is fairly administered	5.70 Survey [0..10]	30
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	27.32 micrograms	54

Readiness

		Value	2021 Rank
► Labor force growth	Percentage change	0.96 %	9
Skilled labor	is readily available	6.19 Survey [0..10]	22
Finance skills	are readily available	6.22 Survey [0..10]	37
International experience	of senior managers is generally significant	5.87 Survey [0..10]	25
► Competent senior managers	are readily available	6.37 Survey [0..10]	19
Primary and secondary education	meets the needs of a competitive economy	5.63 Survey [0..10]	42
► Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	27.86 %	19
University education	meets the needs of a competitive economy	5.95 Survey [0..10]	37
Management education	meets the needs of the business community	6.21 Survey [0..10]	37
Language skills	are meeting the needs of enterprises	5.02 Survey [0..10]	46
▷ 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	51

THAILAND 2022

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

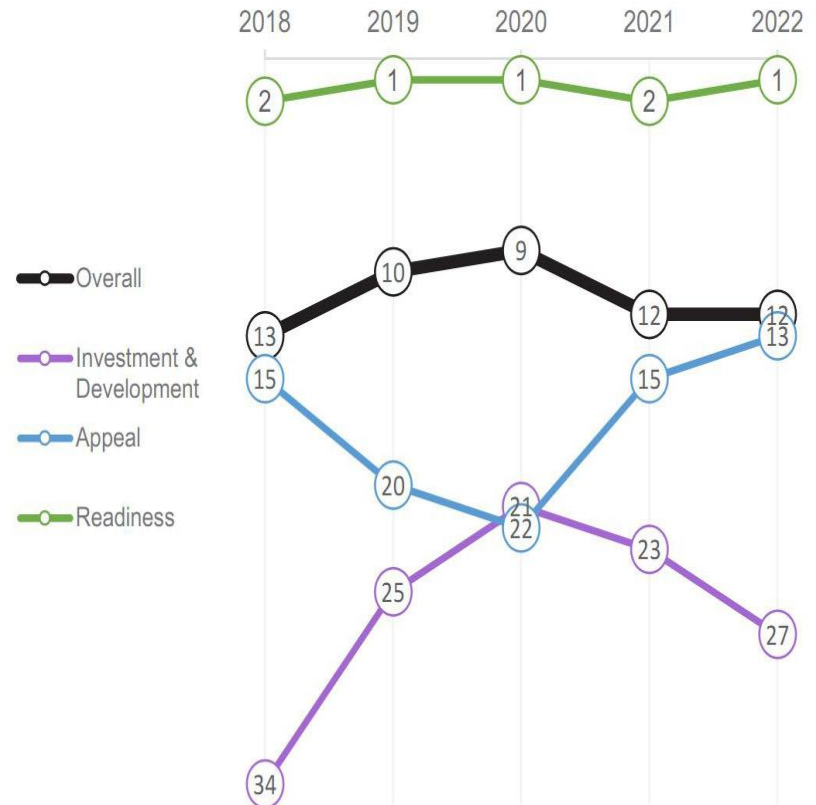
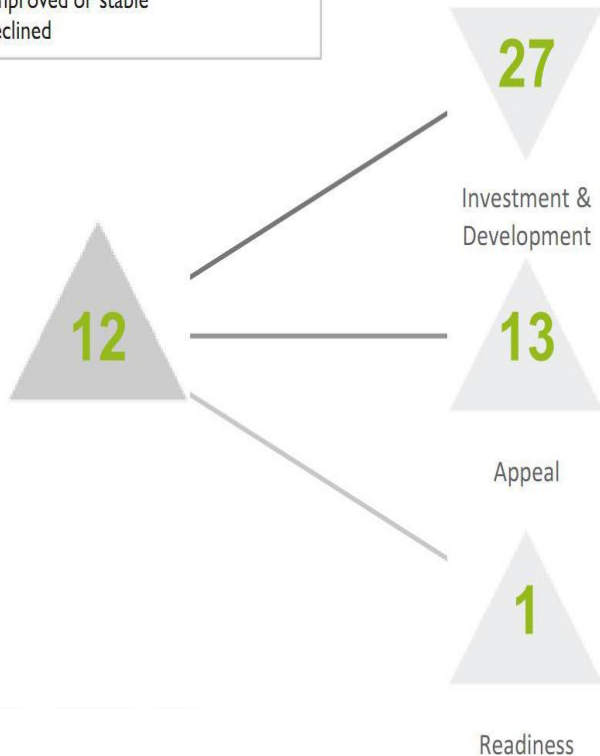
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SINGAPORE

OVERALL PERFORMANCE (63 countries)

The direction of the triangle indicates the performance change from the last year:

- △ improved or stable
- ▽ declined



ที่มา : IMD 2022

- ▶ Overall top strengths
- ▷ Overall top weaknesses

SINGAPORE 2019

Investment & Development

		Value	2019 Rank
▷ Total public expenditure on education	Percentage of GDP	2.7 %	61
Gov. expenditure on education per student	Percentage of GDP per capita (secondary education)	- %	-
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	12,890 US\$	8
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	14.69 ratio	28
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	11.48 ratio	26
Apprenticeships	are sufficiently implemented	5.03 Survey [0..10]	28
Employee training	is a high priority in companies	6.19 Survey [0..10]	28
Female labor force	Percentage of total labor force	45.76 %	32
Health infrastructure	meets the needs of society	8.46 Survey [0..10]	4

Appeal

		Value	2019 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	110.10 index	57
Attracting and retaining talents	is a priority in companies	7.46 Survey [0..10]	19
Worker motivation	in companies is high	6.49 Survey [0..10]	20
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	6.84 Survey [0..10]	9
Quality of life	is high	8.68 Survey [0..10]	12
▶ Foreign highly-skilled personnel	are attracted to your country's business environment	8.19 Survey [0..10]	2
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\$	299,993 US\$	4
▷ Effective personal income tax rate	Percentage of an income equal to GDP per capita	18.79 %	34
Justice	is fairly administered	8.16 Survey [0..10]	10
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	19.43 micrograms	43

Readiness

		Value	2019 Rank
▷ Labor force growth	Percentage change	0.51 %	45
Skilled labor	is readily available	6.27 Survey [0..10]	16
Finance skills	are readily available	7.22 Survey [0..10]	13
International experience	of senior managers is generally significant	7.29 Survey [0..10]	9
Competent senior managers	are readily available	6.76 Survey [0..10]	7
▶ Primary and secondary education	meets the needs of a competitive economy	8.71 Survey [0..10]	3
▶ Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	34.50 %	2
University education	meets the needs of a competitive economy	8.49 Survey [0..10]	5
Management education	meets the needs of the business community	8.00 Survey [0..10]	4
Language skills	are meeting the needs of enterprises	8.51 Survey [0..10]	9
▶ Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	9.48 number	3
▶ Educational assessment - PISA	PISA survey of 15-year olds	560 Average	1

SINGAPORE 2020

- ▶ Overall top strengths
- ▷ Overall top weaknesses

Investment & Development

		Value	2020 Rank
▷ Total public expenditure on education	Percentage of GDP	2.6 %	61
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	13,453 US\$	9
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	14.33 ratio	28
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	11.31 ratio	24
Apprenticeships	are sufficiently implemented	5.58 Survey [0..10]	24
Employee training	is a high priority in companies	6.82 Survey [0..10]	16
Female labor force	Percentage of total labor force	46.27 %	28
Health infrastructure	meets the needs of society	8.85 Survey [0..10]	4

Appeal

		Value	2020 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	110.10 index	57
Attracting and retaining talents	is a priority in companies	7.58 Survey [0..10]	18
Worker motivation	in companies is high	6.89 Survey [0..10]	17
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	6.95 Survey [0..10]	8
Quality of life	is high	8.61 Survey [0..10]	16
Foreign highly-skilled personnel	are attracted to your country's business environment	8.03 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\$	299,993 US\$	4
▷ Effective personal income tax rate	Percentage of an income equal to GDP per capita	18.79 %	34
Justice	is fairly administered	8.39 Survey [0..10]	7
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	19.72 micrograms	44

Readiness

		Value	2020 Rank
Labor force growth	Percentage change	1.77 %	15
▶ Skilled labor	is readily available	7.34 Survey [0..10]	3
Finance skills	are readily available	7.68 Survey [0..10]	7
International experience	of senior managers is generally significant	7.34 Survey [0..10]	7
Competent senior managers	are readily available	7.00 Survey [0..10]	7
▶ Primary and secondary education	meets the needs of a competitive economy	8.87 Survey [0..10]	2
Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	33.48 %	4
▶ University education	meets the needs of a competitive economy	8.82 Survey [0..10]	3
▶ Management education	meets the needs of the business community	8.16 Survey [0..10]	3
Language skills	are meeting the needs of enterprises	8.37 Survey [0..10]	11
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	9.18 number	4
▶ Educational assessment - PISA	PISA survey of 15-year olds	556 Average	2

SINGAPORE 2021

- Overall top strengths
- ▷ Overall top weaknesses

Investment & Development

		Value	2021 Rank
▷ Total public expenditure on education	Percentage of GDP	2.5 %	62
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	13,246 US\$	9
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	14.20 ratio	27
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	11.33 ratio	23
Apprenticeships	are sufficiently implemented	5.63 Survey [0..10]	20
Employee training	is a high priority in companies	6.35 Survey [0..10]	23
Female labor force	Percentage of total labor force	46.27 %	30
Health infrastructure	meets the needs of society	8.60 Survey [0..10]	5

Appeal

		Value	2021 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	101.80 index	58
Attracting and retaining talents	is a priority in companies	7.69 Survey [0..10]	12
Worker motivation	in companies is high	6.45 Survey [0..10]	18
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	6.49 Survey [0..10]	9
Quality of life	is high	8.27 Survey [0..10]	18
► Foreign highly-skilled personnel	are attracted to your country's business environment	8.08 Survey [0..10]	3
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	2.42 %	14
Justice	is fairly administered	8.16 Survey [0..10]	8
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	19.00 micrograms	42

Readiness

		Value	2021 Rank
Labor force growth	Percentage change	-0.76 %	41
Skilled labor	is readily available	6.33 Survey [0..10]	20
Finance skills	are readily available	7.48 Survey [0..10]	11
International experience	of senior managers is generally significant	6.85 Survey [0..10]	8
Competent senior managers	are readily available	6.64 Survey [0..10]	13
► Primary and secondary education	meets the needs of a competitive economy	8.40 Survey [0..10]	4
► Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	35.40 %	4
University education	meets the needs of a competitive economy	8.35 Survey [0..10]	6
Management education	meets the needs of the business community	7.94 Survey [0..10]	8
Language skills	are meeting the needs of enterprises	8.49 Survey [0..10]	7
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	9.30 number	5
► Educational assessment - PISA	PISA survey of 15-year olds	556 Average	2

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

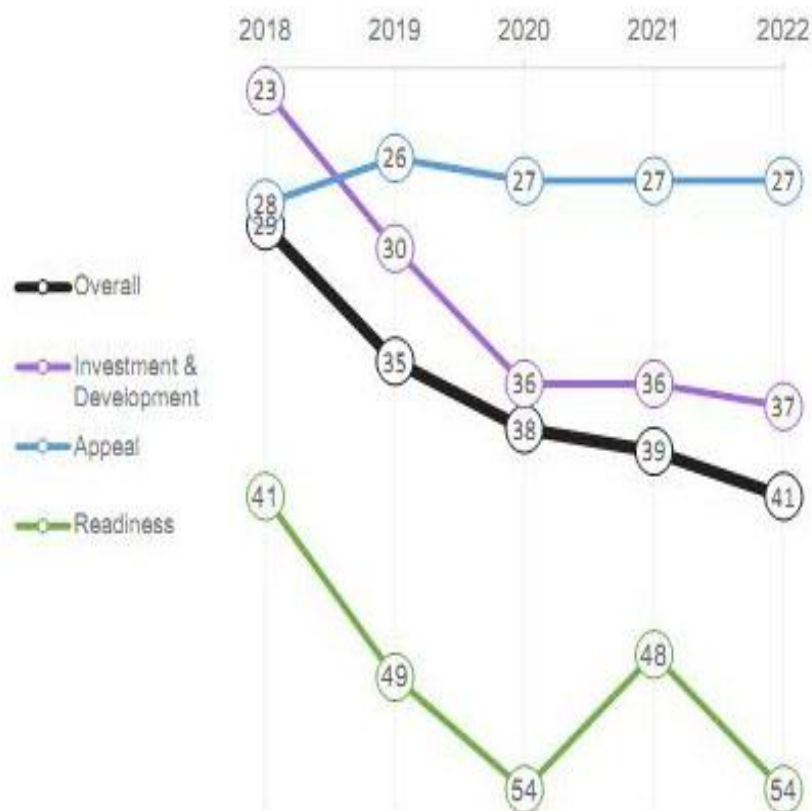
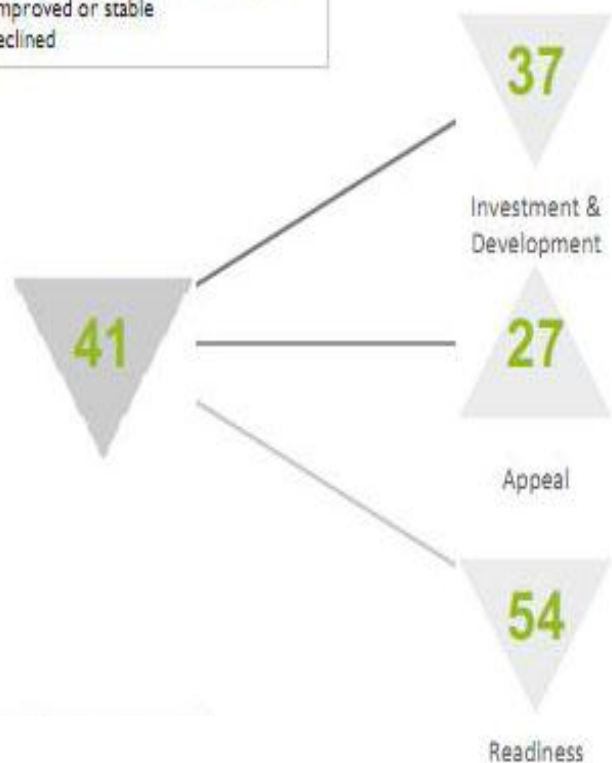
		Value	2022 Rank
▷ Labor force growth	Percentage change	-2.86 %	60
Skilled labor	is readily available	6.50 Survey [0..10]	8
Finance skills	are readily available	6.93 Survey [0..10]	12
International experience	of senior managers is generally significant	7.14 Survey [0..10]	5
Competent senior managers	are 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

JAPAN

OVERALL PERFORMANCE (63 countries)

The direction of the triangle indicates the performance change from the last year:

- △ improved or stable
- ▽ declined



ที่มา : IMD

Investment & Development

		Value	2019 Rank
▷ Total public expenditure on education	Percentage of GDP	3.2 %	55
► Gov. expenditure on education per student	Percentage of GDP per capita (secondary education)	23.9 %	13
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	7,538 US\$	23
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	16.43 ratio	39
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	12.45 ratio	34
► Apprenticeships	are sufficiently implemented	6.15 Survey [0..10]	11
Employee training	is a high priority in companies	6.78 Survey [0..10]	15
Female labor force	Percentage of total labor force	44.13 %	42
Health infrastructure	meets the needs of society	7.24 Survey [0..10]	21

Appeal

		Value	2019 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	114.70 index	59
► Attracting and retaining talents	is a priority in companies	8.03 Survey [0..10]	4
Worker motivation	in companies is high	6.03 Survey [0..10]	27
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	4.13 Survey [0..10]	44
Quality of life	is high	7.70 Survey [0..10]	24
Foreign highly-skilled personnel	are attracted to your country's business environment	3.77 Survey [0..10]	51
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\$	265,052 US\$	11
Effective personal income tax rate	Percentage of an income equal to GDP per capita	14.33 %	26
Justice	is fairly administered	7.34 Survey [0..10]	20
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	11.79 micrograms	17

Readiness

		Value	2019 Rank
Labor force growth	Percentage change	1.64 %	18
Skilled labor	is readily available	4.99 Survey [0..10]	44
Finance skills	are readily available	5.98 Survey [0..10]	39
▷ International experience	of senior managers is generally significant	2.49 Survey [0..10]	63
▷ Competent senior managers	are readily available	3.11 Survey [0..10]	60
Primary and secondary education	meets the needs of a competitive economy	6.31 Survey [0..10]	32
Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	21.01 %	42
University education	meets the needs of a competitive economy	4.88 Survey [0..10]	51
Management education	meets the needs of the business community	4.73 Survey [0..10]	53
▷ Language skills	are meeting the needs of enterprises	3.12 Survey [0..10]	62
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	1.30 number	46
► Educational assessment - PISA	PISA survey of 15-year olds	535 Average	4

- Overall top strengths
- ▷ Overall top weaknesses

JAPAN 2020

Investment & Development

		Value	2020 Rank
Total public expenditure on education	Percentage of GDP	3.1 %	52
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	7,704 US\$	23
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	16.17 ratio	36
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	12.30 ratio	33
► Apprenticeships	are sufficiently implemented	5.93 Survey [0..10]	12
Employee training	is a high priority in companies	6.24 Survey [0..10]	28
Female labor force	Percentage of total labor force	44.40 %	43
Health infrastructure	meets the needs of society	7.26 Survey [0..10]	24

Appeal

		Value	2020 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	114.70 index	59
► Attracting and retaining talents	is a priority in companies	7.76 Survey [0..10]	14
Worker motivation	in companies is high	5.83 Survey [0..10]	37
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	4.79 Survey [0..10]	36
Quality of life	is high	7.54 Survey [0..10]	28
Foreign highly-skilled personnel	are attracted to your country's business environment	3.50 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\$	265,052 US\$	11
Effective personal income tax rate	Percentage of an income equal to GDP per capita	14.33 %	26
Justice	is fairly administered	6.72 Survey [0..10]	22
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	11.86 micrograms	17

Readiness

		Value	2020 Rank
Labor force growth	Percentage change	0.82 %	34
Skilled labor	is readily available	5.13 Survey [0..10]	48
Finance skills	are readily available	5.28 Survey [0..10]	53
▷ International experience	of senior managers is generally significant	2.75 Survey [0..10]	63
▷ Competent senior managers	are readily available	3.16 Survey [0..10]	61
Primary and secondary education	meets the needs of a competitive economy	6.09 Survey [0..10]	33
Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	21.71 %	42
University education	meets the needs of a competitive economy	4.89 Survey [0..10]	52
▷ Management education	meets the needs of the business community	4.65 Survey [0..10]	57
▷ Language skills	are meeting the needs of enterprises	2.99 Survey [0..10]	62
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	1.44 number	45
► Educational assessment - PISA	PISA survey of 15-year olds	520 Average	5

JAPAN 2021

- Overall top strengths
- ▷ Overall top weaknesses

Investment & Development

		Value	2021 Rank
▷ Total public expenditure on education	Percentage of GDP	3.1 %	56
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	7,704 US\$	24
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	15.90 ratio	37
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	12.15 ratio	34
Apprenticeships	are sufficiently implemented	5.41 Survey [0..10]	27
Employee training	is a high priority in companies	6.27 Survey [0..10]	27
Female labor force	Percentage of total labor force	44.32 %	43
Health infrastructure	meets the needs of society	6.69 Survey [0..10]	31

Appeal

		Value	2021 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	113.20 index	60
► Attracting and retaining talents	is a priority in companies	8.55 Survey [0..10]	1
Worker motivation	in companies is high	6.04 Survey [0..10]	28
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	3.84 Survey [0..10]	48
Quality of life	is high	7.43 Survey [0..10]	28
Foreign highly-skilled personnel	are attracted to your country's business environment	3.82 Survey [0..10]	49
► 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\$	7
Collected personal income tax	On profits, income and capital gains, as a percentage of GDP	5.97 %	37
► Justice	is fairly administered	7.06 Survey [0..10]	18
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	13.65 micrograms	26

Readiness

		Value	2021 Rank
Labor force growth	Percentage change	-0.27 %	31
Skilled labor	is readily available	4.93 Survey [0..10]	46
Finance skills	are readily available	5.86 Survey [0..10]	45
▷ International experience	of senior managers is generally significant	2.61 Survey [0..10]	64
▷ Competent senior managers	are readily available	3.52 Survey [0..10]	58
Primary and secondary education	meets the needs of a competitive economy	6.42 Survey [0..10]	31
Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	21.77 %	44
University education	meets the needs of a competitive economy	4.64 Survey [0..10]	54
Management education	meets the needs of the business community	4.82 Survey [0..10]	55
▷ Language skills	are meeting the needs of enterprises	3.19 Survey [0..10]	62
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	1.61 number	44
► Educational assessment - PISA	PISA survey of 15-year olds	520 Average	5

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

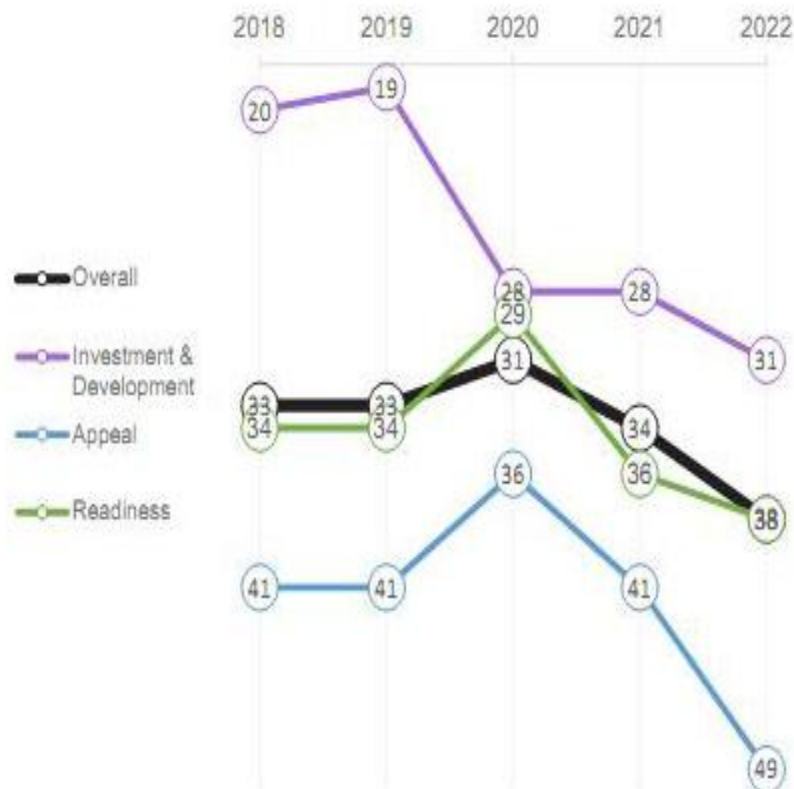
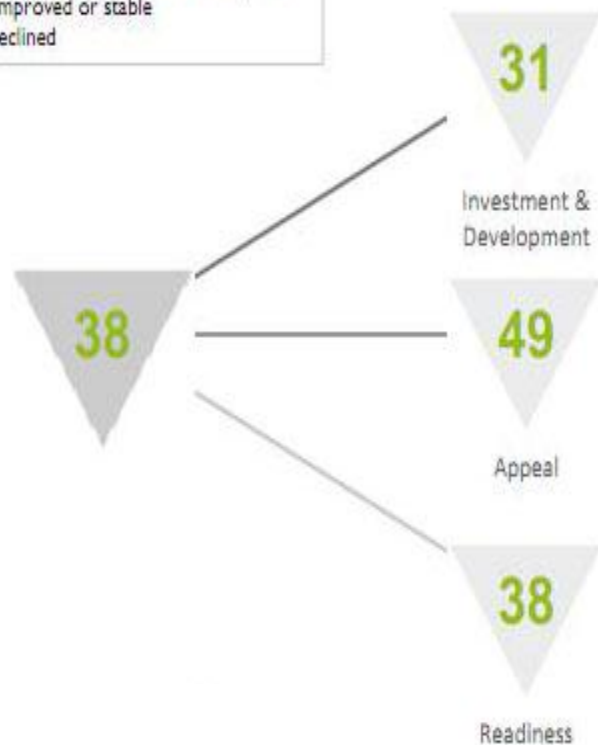
		Value	2022 Rank
Labor force growth	Percentage change	0.07 %	42
Skilled labor	is readily available	5.03 Survey [0..10]	36
Finance skills	are readily available	5.62 Survey [0..10]	43
▷ International experience	of senior managers is generally significant	3.01 Survey [0..10]	63
▷ Competent senior managers	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

KOREA REP.

OVERALL PERFORMANCE (63 countries)

The direction of the triangle indicates the performance change from the last year:

- △ improved or stable
- ▽ declined



ที่มา : IMD

- ▶ Overall top strengths
- ▷ Overall top weaknesses

KOREA REP. 2019

Investment & Development

		Value	2019 Rank
Total public expenditure on education	Percentage of GDP	5.0 %	24
▶ Gov. expenditure on education per student	Percentage of GDP per capita (secondary education)	28.2 %	3
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	6,070 US\$	27
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	16.42 ratio	38
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	13.54 ratio	44
Apprenticeships	are sufficiently implemented	5.52 Survey [0..10]	18
Employee training	is a high priority in companies	5.98 Survey [0..10]	33
Female labor force	Percentage of total labor force	42.64 %	46
Health infrastructure	meets the needs of society	7.39 Survey [0..10]	18

Appeal

		Value	2019 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	109.40 index	56
Attracting and retaining talents	is a priority in companies	7.61 Survey [0..10]	14
Worker motivation	in companies is high	5.32 Survey [0..10]	41
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	4.81 Survey [0..10]	30
Quality of life	is high	5.41 Survey [0..10]	43
Foreign highly-skilled personnel	are attracted to your country's business environment	4.05 Survey [0..10]	49
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	24,963 US\$	28
▶ Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	249,573 US\$	14
▶ Effective personal income tax rate	Percentage of an income equal to GDP per capita	8.43 %	13
Justice	is fairly administered	3.71 Survey [0..10]	49
▷ Exposure to particle pollution	Mean population exposure to PM2.5. Micrograms per cubic metre	25.00 micrograms	53

Readiness

		Value	2019 Rank
Labor force growth	Percentage change	0.53 %	43
Skilled labor	is readily available	5.52 Survey [0..10]	34
Finance skills	are readily available	6.24 Survey [0..10]	34
▷ International experience	of senior managers is generally significant	4.76 Survey [0..10]	52
Competent senior managers	are readily available	4.67 Survey [0..10]	48
Primary and secondary education	meets the needs of a competitive economy	4.74 Survey [0..10]	47
▶ Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	29.91 %	9
▷ University education	meets the needs of a competitive economy	4.38 Survey [0..10]	55
▷ Management education	meets the needs of the business community	5.04 Survey [0..10]	51
Language skills	are meeting the needs of enterprises	5.65 Survey [0..10]	44
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	1.38 number	43
▶ Educational assessment - PISA	PISA survey of 15-year olds	520 Average	9

KOREA REP. 2020

- Overall top strengths
- ▷ Overall top weaknesses

Investment & Development

		Value	2020 Rank
Total public expenditure on education	Percentage of GDP	4.3 %	37
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	6,230 US\$	29
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	16.51 ratio	39
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	12.78 ratio	36
Apprenticeships	are sufficiently implemented	5.67 Survey [0..10]	18
Employee training	is a high priority in companies	6.84 Survey [0..10]	15
▷ Female labor force	Percentage of total labor force	42.92 %	45
Health infrastructure	meets the needs of society	8.00 Survey [0..10]	15

Appeal

		Value	2020 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	109.40 index	56
► Attracting and retaining talents	is a priority in companies	7.81 Survey [0..10]	11
Worker motivation	in companies is high	5.48 Survey [0..10]	43
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	5.46 Survey [0..10]	28
Quality of life	is high	6.43 Survey [0..10]	39
Foreign highly-skilled personnel	are attracted to your country's business environment	4.70 Survey [0..10]	43
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	24,963 US\$	28
► Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	249,586 US\$	14
► Effective personal income tax rate	Percentage of an income equal to GDP per capita	8.43 %	13
Justice	is fairly administered	5.04 Survey [0..10]	40
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	25.14 micrograms	53

Readiness

		Value	2020 Rank
Labor force growth	Percentage change	1.04 %	25
Skilled labor	is readily available	5.97 Survey [0..10]	31
Finance skills	are readily available	6.59 Survey [0..10]	28
International experience	of senior managers is generally significant	5.51 Survey [0..10]	39
Competent senior managers	are readily available	5.27 Survey [0..10]	42
Primary and secondary education	meets the needs of a competitive economy	5.53 Survey [0..10]	44
► Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	29.35 %	10
▷ University education	meets the needs of a competitive economy	5.30 Survey [0..10]	48
▷ Management education	meets the needs of the business community	5.53 Survey [0..10]	48
Language skills	are meeting the needs of enterprises	6.08 Survey [0..10]	38
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	1.64 number	41
► Educational assessment - PISA	PISA survey of 15-year olds	520 Average	6

KOREA REP. 2021

- ▶ Overall top strengths
- ▷ Overall top weaknesses

Investment & Development

		Value	2021 Rank
Total public expenditure on education	Percentage of GDP	4.5 %	35
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	7,722 US\$	23
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	16.62 ratio	43
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	12.10 ratio	31
▶ Apprenticeships	are sufficiently implemented	6.00 Survey [0..10]	12
Employee training	is a high priority in companies	6.11 Survey [0..10]	32
Female labor force	Percentage of total labor force	42.86 %	47
▶ Health infrastructure	meets the needs of society	8.15 Survey [0..10]	12

Appeal

		Value	2021 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	95.90 index	55
▶ Attracting and retaining talents	is a priority in companies	8.00 Survey [0..10]	6
Worker motivation	in companies is high	5.34 Survey [0..10]	43
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	5.28 Survey [0..10]	24
Quality of life	is high	6.44 Survey [0..10]	39
Foreign highly-skilled personnel	are attracted to your country's business environment	4.42 Survey [0..10]	46
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	24,963 US\$	28
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	4.78 %	30
Justice	is fairly administered	4.59 Survey [0..10]	43
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	27.45 micrograms	55

Readiness

		Value	2021 Rank
Labor force growth	Percentage change	-0.62 %	39
Skilled labor	is readily available	4.95 Survey [0..10]	45
Finance skills	are readily available	5.78 Survey [0..10]	46
▷ International experience	of senior managers is generally significant	4.66 Survey [0..10]	52
▷ Competent senior managers	are readily available	4.24 Survey [0..10]	53
Primary and secondary education	meets the needs of a competitive economy	5.85 Survey [0..10]	38
▶ Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	29.61 %	12
▷ University education	meets the needs of a competitive economy	5.23 Survey [0..10]	47
Management education	meets the needs of the business community	5.72 Survey [0..10]	46
Language skills	are meeting the needs of enterprises	6.17 Survey [0..10]	35
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	1.91 number	40
▶ Educational assessment - PISA	PISA survey of 15-year olds	520 Average	6

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

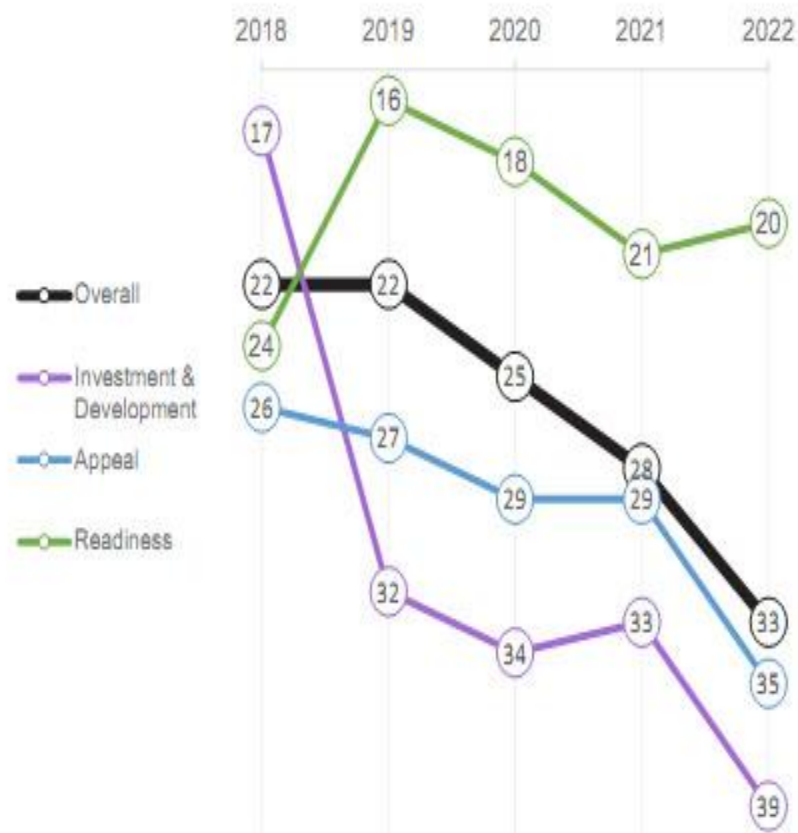
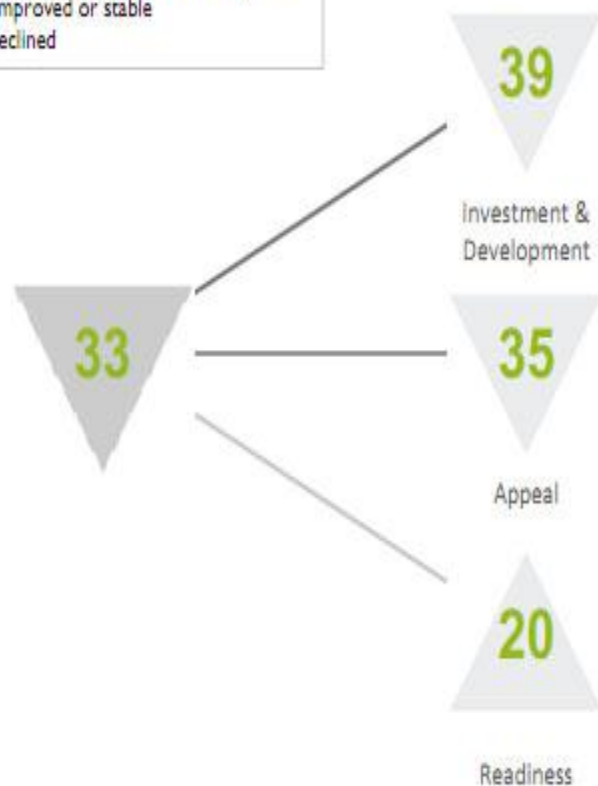
		Value	2022 Rank
Labor force growth	Percentage change	1.06 %	29
Skilled labor	is readily available	4.58 Survey [0..10]	43
Finance skills	are readily available	5.60 Survey [0..10]	44
▷ International experience	of senior managers is generally significant	4.32 Survey [0..10]	59
▷ Competent senior managers	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

MALAYSIA

OVERALL PERFORMANCE (63 countries)

The direction of the triangle indicates the performance change from the last year:

- △ improved or stable
- ▽ declined



ที่มา : IMD 2022

- ▶ Overall top strengths
- ▷ Overall top weaknesses

MALAYSIA 2019

Investment & Development

		Value	2019 Rank
Total public expenditure on education	Percentage of GDP	4.5 %	34
Gov. expenditure on education per student	Percentage of GDP per capita (secondary education)	21.5 %	29
▷ Total public exp. on education per student	Spending per enrolled pupil/student, all levels	1,745 US\$	46
▶ Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	11.60 ratio	10
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	12.00 ratio	31
Apprenticeships	are sufficiently implemented	5.95 Survey [0..10]	13
Employee training	is a high priority in companies	6.64 Survey [0..10]	18
▷ Female labor force	Percentage of total labor force	38.94 %	52
Health infrastructure	meets the needs of society	7.42 Survey [0..10]	17

Appeal

		Value	2019 Rank
Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	68.50 index	13
Attracting and retaining talents	is a priority in companies	6.61 Survey [0..10]	37
Worker motivation	in companies is high	6.29 Survey [0..10]	24
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	5.56 Survey [0..10]	24
Quality of life	is high	6.85 Survey [0..10]	33
Foreign highly-skilled personnel	are attracted to your country's business environment	6.56 Survey [0..10]	16
▷ Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	13,564 US\$	41
▷ Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	119,219 US\$	42
Effective personal income tax rate	Percentage of an income equal to GDP per capita	10.53 %	15
Justice	is fairly administered	6.63 Survey [0..10]	25
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	15.96 micrograms	29

Readiness

		Value	2019 Rank
▶ Labor force growth	Percentage change	2.00 %	11
▶ Skilled labor	is readily available	6.88 Survey [0..10]	5
Finance skills	are readily available	6.86 Survey [0..10]	21
International experience	of senior managers is generally significant	6.51 Survey [0..10]	12
▶ Competent senior managers	are readily available	6.67 Survey [0..10]	9
Primary and secondary education	meets the needs of a competitive economy	6.61 Survey [0..10]	25
▶ Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	32.10 %	6
University education	meets the needs of a competitive economy	6.56 Survey [0..10]	29
Management education	meets the needs of the business community	6.61 Survey [0..10]	28
Language skills	are meeting the needs of enterprises	6.93 Survey [0..10]	25
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	3.15 number	23
▷ Educational assessment - PISA	PISA survey of 15-year olds	445 Average	41

- Overall top strengths
- ▷ Overall top weaknesses

MALAYSIA 2020

Investment & Development

		Value	2020 Rank
Total public expenditure on education	Percentage of GDP	4.4 %	34
▷ Total public exp. on education per student	Spending per enrolled pupil/student, all levels	3,267 US\$	42
► Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	11.70 ratio	12
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	11.30 ratio	22
Apprenticeships	are sufficiently implemented	5.31 Survey [0..10]	28
Employee training	is a high priority in companies	6.13 Survey [0..10]	31
▷ Female labor force	Percentage of total labor force	39.01 %	55
Health infrastructure	meets the needs of society	7.30 Survey [0..10]	23

Appeal

		Value	2020 Rank
► Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	68.50 index	13
Attracting and retaining talents	is a priority in companies	6.50 Survey [0..10]	41
Worker motivation	in companies is high	5.97 Survey [0..10]	31
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	5.24 Survey [0..10]	30
Quality of life	is high	7.00 Survey [0..10]	33
Foreign highly-skilled personnel	are attracted to your country's business environment	5.99 Survey [0..10]	25
▷ Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	13,564 US\$	41
▷ Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	119,219 US\$	42
► Effective personal income tax rate	Percentage of an income equal to GDP per capita	10.53 %	15
Justice	is fairly administered	6.23 Survey [0..10]	27
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	16.04 micrograms	29

Readiness

		Value	2020 Rank
► Labor force growth	Percentage change	1.97 %	12
Skilled labor	is readily available	5.99 Survey [0..10]	30
Finance skills	are readily available	6.43 Survey [0..10]	33
International experience	of senior managers is generally significant	5.80 Survey [0..10]	32
Competent senior managers	are readily available	6.10 Survey [0..10]	24
Primary and secondary education	meets the needs of a competitive economy	6.53 Survey [0..10]	29
► Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	40.77 %	1
University education	meets the needs of a competitive economy	6.31 Survey [0..10]	32
Management education	meets the needs of the business community	6.32 Survey [0..10]	39
Language skills	are meeting the needs of enterprises	6.82 Survey [0..10]	28
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	3.15 number	27
▷ Educational assessment - PISA	PISA survey of 15-year olds	431 Average	44

MALAYSIA 2021

- Overall top strengths
- ▷ Overall top weaknesses

Investment & Development

		Value	2021 Rank
Total public expenditure on education	Percentage of GDP	4.2 %	40
▷ Total public exp. on education per student	Spending per enrolled pupil/student, all levels	1,963 US\$	47
► Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	12.00 ratio	13
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	11.00 ratio	20
Apprenticeships	are sufficiently implemented	5.60 Survey [0..10]	21
Employee training	is a high priority in companies	6.31 Survey [0..10]	25
▷ Female labor force	Percentage of total labor force	39.02 %	53
Health infrastructure	meets the needs of society	7.43 Survey [0..10]	22

Appeal

		Value	2021 Rank
► Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	63.10 index	16
Attracting and retaining talents	is a priority in companies	6.41 Survey [0..10]	40
Worker motivation	in companies is high	5.76 Survey [0..10]	31
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	5.23 Survey [0..10]	26
Quality of life	is high	6.59 Survey [0..10]	37
Foreign highly-skilled personnel	are attracted to your country's business environment	5.87 Survey [0..10]	23
▷ Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	13,564 US\$	41
▷ 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	2.56 %	17
Justice	is fairly administered	5.41 Survey [0..10]	35
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	16.55 micrograms	34

Readiness

		Value	2021 Rank
► Labor force growth	Percentage change	0.55 %	16
Skilled labor	is readily available	6.14 Survey [0..10]	25
Finance skills	are readily available	6.29 Survey [0..10]	33
International experience	of senior managers is generally significant	5.69 Survey [0..10]	30
Competent senior managers	are readily available	5.89 Survey [0..10]	28
Primary and secondary education	meets the needs of a competitive economy	6.11 Survey [0..10]	34
► Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	39.17 %	2
University education	meets the needs of a competitive economy	6.33 Survey [0..10]	33
Management education	meets the needs of the business community	6.49 Survey [0..10]	31
Language skills	are meeting the needs of enterprises	6.66 Survey [0..10]	28
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	2.52 number	32
▷ Educational assessment - PISA	PISA survey of 15-year olds	431 Average	45

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

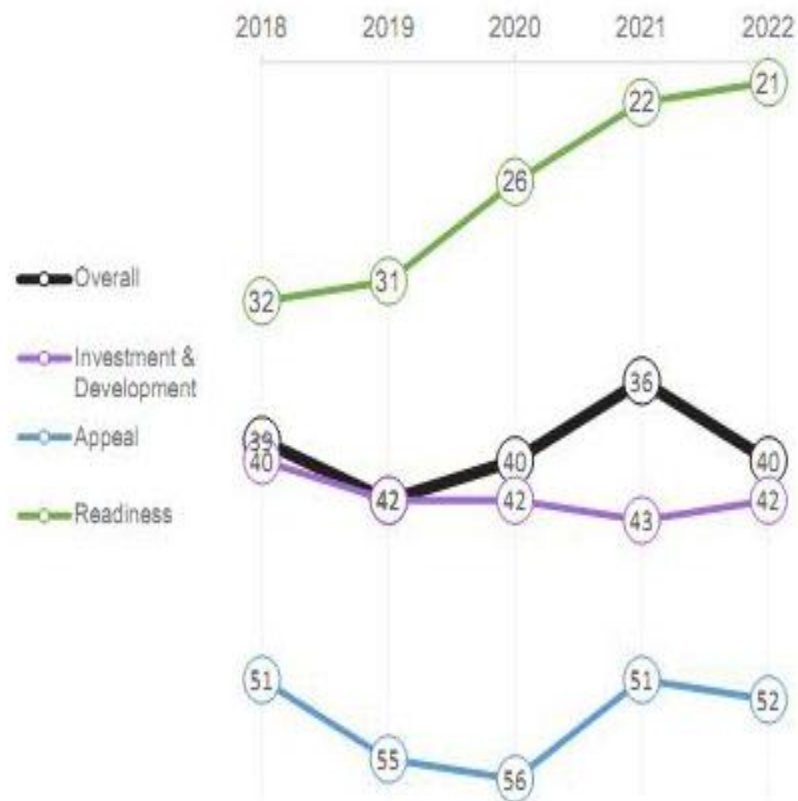
READINESS

		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

CHINA

OVERALL PERFORMANCE (63 countries)

The direction of the triangle indicates the performance change from the last year:
 △ improved or stable
 ▽ declined



ที่มา : IMD 2022

Investment & Development

		Value	2019 Rank
Total public expenditure on education	Percentage of GDP	3.6 %	47
Gov. expenditure on education per student	Percentage of GDP per capita (secondary education)	- %	-
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	1,631 US\$	48
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	16.59 ratio	40
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	13.31 ratio	42
Apprenticeships	are sufficiently implemented	5.28 Survey [0..10]	23
► Employee training	is a high priority in companies	6.81 Survey [0..10]	13
Female labor force	Percentage of total labor force	- %	-
Health infrastructure	meets the needs of society	5.94 Survey [0..10]	32

Appeal

		Value	2019 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	108.60 index	55
Attracting and retaining talents	is a priority in companies	7.34 Survey [0..10]	23
► Worker motivation	in companies is high	6.88 Survey [0..10]	16
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	4.71 Survey [0..10]	32
Quality of life	is high	6.26 Survey [0..10]	37
Foreign highly-skilled personnel	are attracted to your country's business environment	5.79 Survey [0..10]	27
▷ Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	11,684 US\$	48
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	155,675 US\$	34
Effective personal income tax rate	Percentage of an income equal to GDP per capita	20.14 %	38
Justice	is fairly administered	5.88 Survey [0..10]	30
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	53.14 micrograms	59

Readiness

		Value	2019 Rank
▷ Labor force growth	Percentage change	-0.04 %	56
Skilled labor	is readily available	5.91 Survey [0..10]	27
Finance skills	are readily available	6.52 Survey [0..10]	28
International experience	of senior managers is generally significant	5.07 Survey [0..10]	45
Competent senior managers	are readily available	5.93 Survey [0..10]	26
► Primary and secondary education	meets the needs of a competitive economy	7.76 Survey [0..10]	11
Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	- %	-
► University education	meets the needs of a competitive economy	7.34 Survey [0..10]	19
Management education	meets the needs of the business community	6.83 Survey [0..10]	26
Language skills	are meeting the needs of enterprises	5.73 Survey [0..10]	42
▷ Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	0.11 number	57
► Educational assessment - PISA	PISA survey of 15-year olds	525 Average	6

CHINA MAINLAND 2020

- ▶ Overall top strengths
- ▷ Overall top weaknesses

Investment & Development

		Value	2020 Rank
▷ Total public expenditure on education	Percentage of GDP	3.5 %	49
▷ Total public exp. on education per student	Spending per enrolled pupil/student, all levels	1,755 US\$	50
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	16.43 ratio	38
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	13.26 ratio	44
Apprenticeships	are sufficiently implemented	5.51 Survey [0..10]	27
▶ Employee training	is a high priority in companies	6.64 Survey [0..10]	19
Female labor force	Percentage of total labor force	- %	-
Health infrastructure	meets the needs of society	6.43 Survey [0..10]	31

Appeal

		Value	2020 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	108.60 index	55
Attracting and retaining talents	is a priority in companies	6.86 Survey [0..10]	29
▶ Worker motivation	in companies is high	6.97 Survey [0..10]	16
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	4.94 Survey [0..10]	33
Quality of life	is high	6.54 Survey [0..10]	36
Foreign highly-skilled personnel	are attracted to your country's business environment	5.45 Survey [0..10]	32
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	11,684 US\$	48
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	155,675 US\$	34
Effective personal income tax rate	Percentage of an income equal to GDP per capita	20.14 %	38
Justice	is fairly administered	5.83 Survey [0..10]	32
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	53.45 micrograms	59

Readiness

		Value	2020 Rank
Labor force growth	Percentage change	-0.05 %	48
▶ Skilled labor	is readily available	6.60 Survey [0..10]	14
Finance skills	are readily available	6.46 Survey [0..10]	31
International experience	of senior managers is generally significant	5.22 Survey [0..10]	44
Competent senior managers	are readily available	5.76 Survey [0..10]	35
▶ Primary and secondary education	meets the needs of a competitive economy	7.56 Survey [0..10]	18
Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	- %	-
University education	meets the needs of a competitive economy	7.05 Survey [0..10]	24
Management education	meets the needs of the business community	6.72 Survey [0..10]	29
Language skills	are meeting the needs of enterprises	5.85 Survey [0..10]	42
▷ Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	0.13 number	55
▶ Educational assessment - PISA	PISA survey of 15-year olds	579 Average	1

CHINA MAINLAND 2021

- ▶ Overall top strengths
- ▶ Overall top weaknesses

Investment & Development

		Value	2021 Rank
▶ Total public expenditure on education	Percentage of GDP	3.5 %	51
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	1,767 US\$	48
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	16.39 ratio	41
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	14.18 ratio	46
Apprenticeships	are sufficiently implemented	5.57 Survey [0..10]	23
▶ Employee training	is a high priority in companies	6.81 Survey [0..10]	13
Female labor force	Percentage of total labor force	- %	-
Health infrastructure	meets the needs of society	6.71 Survey [0..10]	30

Appeal

		Value	2021 Rank
▶ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	98.80 index	56
Attracting and retaining talents	is a priority in companies	7.07 Survey [0..10]	31
Worker motivation	in companies is high	6.72 Survey [0..10]	14
Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	4.68 Survey [0..10]	31
Quality of life	is high	7.09 Survey [0..10]	31
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\$	11,684 US\$	48
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	1.05 %	5
Justice	is fairly administered	6.37 Survey [0..10]	26
▶ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	47.73 micrograms	61

Readiness

		Value	2021 Rank
▶ Labor force growth	Percentage change	0.72 %	14
Skilled labor	is readily available	6.19 Survey [0..10]	23
Finance skills	are readily available	6.69 Survey [0..10]	24
International experience	of senior managers is generally significant	4.91 Survey [0..10]	44
Competent senior managers	are readily available	6.00 Survey [0..10]	26
▶ Primary and secondary education	meets the needs of a competitive economy	8.00 Survey [0..10]	7
Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	- %	-
University education	meets the needs of a competitive economy	7.27 Survey [0..10]	21
Management education	meets the needs of the business community	7.09 Survey [0..10]	21
Language skills	are meeting the needs of enterprises	6.30 Survey [0..10]	34
▶ Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	0.14 number	56
▶ Educational assessment - PISA	PISA survey of 15-year olds	579 Average	1

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

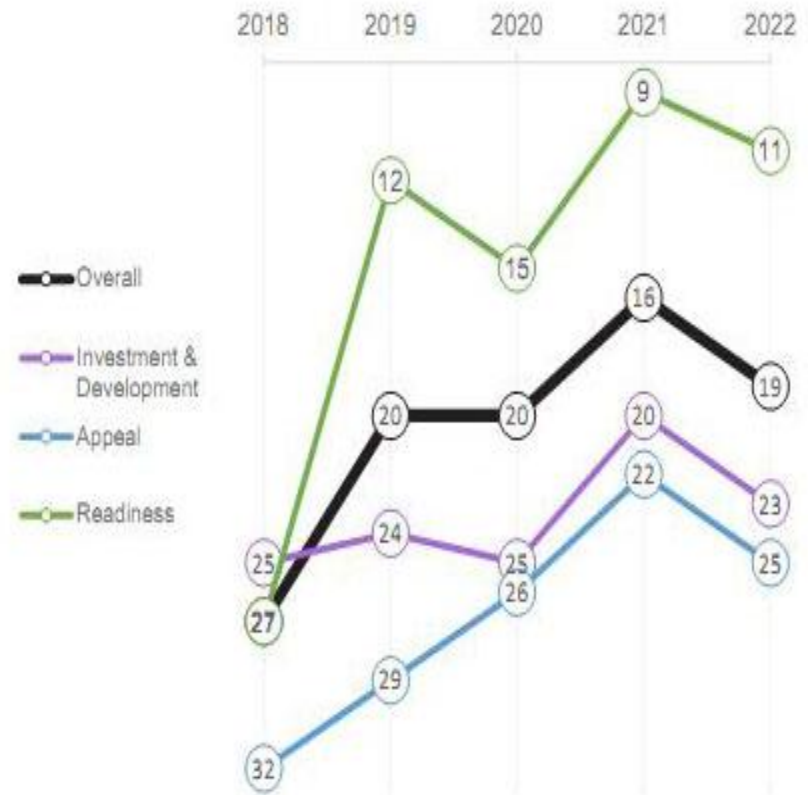
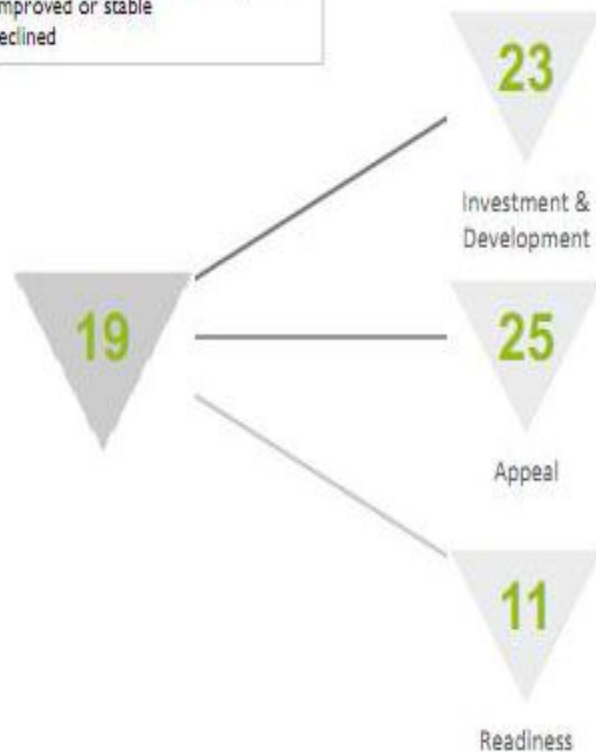
		Value	2022 Rank
▷ Labor force growth	Percentage change	-0.75 %	51
▶ Skilled labor	is readily available	6.49 Survey [0..10]	9
Finance skills	are readily available	7.09 Survey [0..10]	10
International experience	of senior managers is generally significant	4.94 Survey [0..10]	47
Competent senior managers	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

TAIWAN, CHINA

OVERALL PERFORMANCE (63 countries)

The direction of the triangle indicates the performance change from the last year:

- △ improved or stable
- ▽ declined



ที่มา : IMD

- ▶ Overall top strengths
- ▷ Overall top weaknesses

TAIWAN, CHINA 2019

Investment & Development

		Value	2019 Rank
▷ Total public expenditure on education	Percentage of GDP	3.8 %	46
Gov. expenditure on education per student	Percentage of GDP per capita (secondary education)	23.2 %	15
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	4,942 US\$	33
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	12.10 ratio	17
▷ Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	13.90 ratio	46
Apprenticeships	are sufficiently implemented	5.83 Survey [0..10]	14
Employee training	is a high priority in companies	6.79 Survey [0..10]	14
Female labor force	Percentage of total labor force	44.40 %	40
▶ Health infrastructure	meets the needs of society	8.42 Survey [0..10]	6

Appeal

		Value	2019 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	89.70 index	48
Attracting and retaining talents	is a priority in companies	6.61 Survey [0..10]	38
▶ Worker motivation	in companies is high	7.01 Survey [0..10]	12
▷ Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	3.74 Survey [0..10]	46
Quality of life	is high	7.15 Survey [0..10]	30
▷ Foreign highly-skilled personnel	are attracted to your country's business environment	4.14 Survey [0..10]	48
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	26,500 US\$	27
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	185,939 US\$	25
▶ Effective personal income tax rate	Percentage of an income equal to GDP per capita	5.77 %	9
Justice	is fairly administered	5.52 Survey [0..10]	36
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	20.00 micrograms	44

Readiness

		Value	2019 Rank
Labor force growth	Percentage change	0.67 %	41
Skilled labor	is readily available	5.92 Survey [0..10]	26
Finance skills	are readily available	6.85 Survey [0..10]	22
International experience	of senior managers is generally significant	5.22 Survey [0..10]	36
Competent senior managers	are readily available	5.64 Survey [0..10]	31
Primary and secondary education	meets the needs of a competitive economy	6.46 Survey [0..10]	30
▶ Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	33.15 %	3
University education	meets the needs of a competitive economy	6.23 Survey [0..10]	34
Management education	meets the needs of the business community	6.78 Survey [0..10]	27
Language skills	are meeting the needs of enterprises	5.77 Survey [0..10]	40
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	5.15 number	13
▶ Educational assessment - PISA	PISA survey of 15-year olds	537 Average	2

TAIWAN, CHINA 2020

- Overall top strengths
- ▷ Overall top weaknesses

Investment & Development

		Value	2020 Rank
► Total public expenditure on education	Percentage of GDP	3.7 %	45
Total public exp. on education per student	Spending per enrolled pupil/student, all levels	5,223 US\$	33
Pupil-teacher ratio (primary education)	Ratio of students to teaching staff	12.10 ratio	16
Pupil-teacher ratio (secondary education)	Ratio of students to teaching staff	12.90 ratio	39
Apprenticeships	are sufficiently implemented	5.86 Survey [0..10]	15
Employee training	is a high priority in companies	6.99 Survey [0..10]	12
Female labor force	Percentage of total labor force	44.49 %	40
► Health infrastructure	meets the needs of society	8.77 Survey [0..10]	5

Appeal

		Value	2020 Rank
▷ Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	89.70 index	48
Attracting and retaining talents	is a priority in companies	6.73 Survey [0..10]	34
► Worker motivation	in companies is high	7.21 Survey [0..10]	8
▷ Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	3.94 Survey [0..10]	48
Quality of life	is high	7.98 Survey [0..10]	22
▷ Foreign highly-skilled personnel	are attracted to your country's business environment	4.59 Survey [0..10]	47
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	26,500 US\$	27
Remuneration of management	Total base salary plus bonuses and long-term incentives, US\$	185,939 US\$	25
► Effective personal income tax rate	Percentage of an income equal to GDP per capita	5.77 %	9
Justice	is fairly administered	5.94 Survey [0..10]	31
▷ Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	18.30 micrograms	43

Readiness

		Value	2020 Rank
Labor force growth	Percentage change	0.61 %	37
Skilled labor	is readily available	6.18 Survey [0..10]	24
Finance skills	are readily available	6.80 Survey [0..10]	24
International experience	of senior managers is generally significant	5.72 Survey [0..10]	34
Competent senior managers	are readily available	5.92 Survey [0..10]	28
Primary and secondary education	meets the needs of a competitive economy	7.54 Survey [0..10]	19
► Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	32.85 %	5
University education	meets the needs of a competitive economy	6.89 Survey [0..10]	27
Management education	meets the needs of the business community	6.81 Survey [0..10]	27
Language skills	are meeting the needs of enterprises	6.28 Survey [0..10]	33
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	5.48 number	13
► Educational assessment - PISA	PISA survey of 15-year olds	516 Average	8

TAIWAN, CHINA 2021

- Overall top strengths
- Overall top weaknesses

Investment & Development

		Value	2021 Rank
► Total public expenditure on education	Percentage of GDP	3.6 %	50
► Total public exp. on education per student	Spending per enrolled pupil/student, all levels	5,154 US\$	33
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	12.40 ratio	36
► Apprenticeships	are sufficiently implemented	6.26 Survey [0..10]	7
► Employee training	is a high priority in companies	7.40 Survey [0..10]	5
Female labor force	Percentage of total labor force	44.52 %	42
Health infrastructure	meets the needs of society	8.49 Survey [0..10]	8

Appeal

		Value	2021 Rank
► Cost-of-living index	Index of a basket of goods & services in the main city, including housing (New York City = 100)	84.40 index	49
Attracting and retaining talents	is a priority in companies	7.16 Survey [0..10]	27
► Worker motivation	in companies is high	7.55 Survey [0..10]	5
► Brain drain	(well-educated and skilled people) does not hinder competitiveness in your economy	4.47 Survey [0..10]	35
Quality of life	is high	7.72 Survey [0..10]	24
► Foreign highly-skilled personnel	are attracted to your country's business environment	4.98 Survey [0..10]	38
Remuneration in services professions	Gross annual income including supplements such as bonuses, US\$	26,500 US\$	27
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	2.65 %	19
Justice	is fairly administered	6.42 Survey [0..10]	25
Exposure to particle pollution	Mean population exposure to PM2.5, Micrograms per cubic metre	16.20 micrograms	33

Readiness

		Value	2021 Rank
Labor force growth	Percentage change	0.15 %	24
Skilled labor	is readily available	6.51 Survey [0..10]	13
Finance skills	are readily available	7.15 Survey [0..10]	15
International experience	of senior managers is generally significant	5.84 Survey [0..10]	27
Competent senior managers	are readily available	6.06 Survey [0..10]	25
Primary and secondary education	meets the needs of a competitive economy	7.44 Survey [0..10]	18
► Graduates in Sciences	% of graduates in ICT, Engineering, Math & Natural Sciences	32.27 %	5
University education	meets the needs of a competitive economy	7.33 Survey [0..10]	20
Management education	meets the needs of the business community	7.36 Survey [0..10]	16
Language skills	are meeting the needs of enterprises	6.49 Survey [0..10]	31
Student mobility inbound	Foreign tertiary-level students per 1000 inhabitants	5.43 number	14
► Educational assessment - PISA	PISA survey of 15-year olds	516 Average	8

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

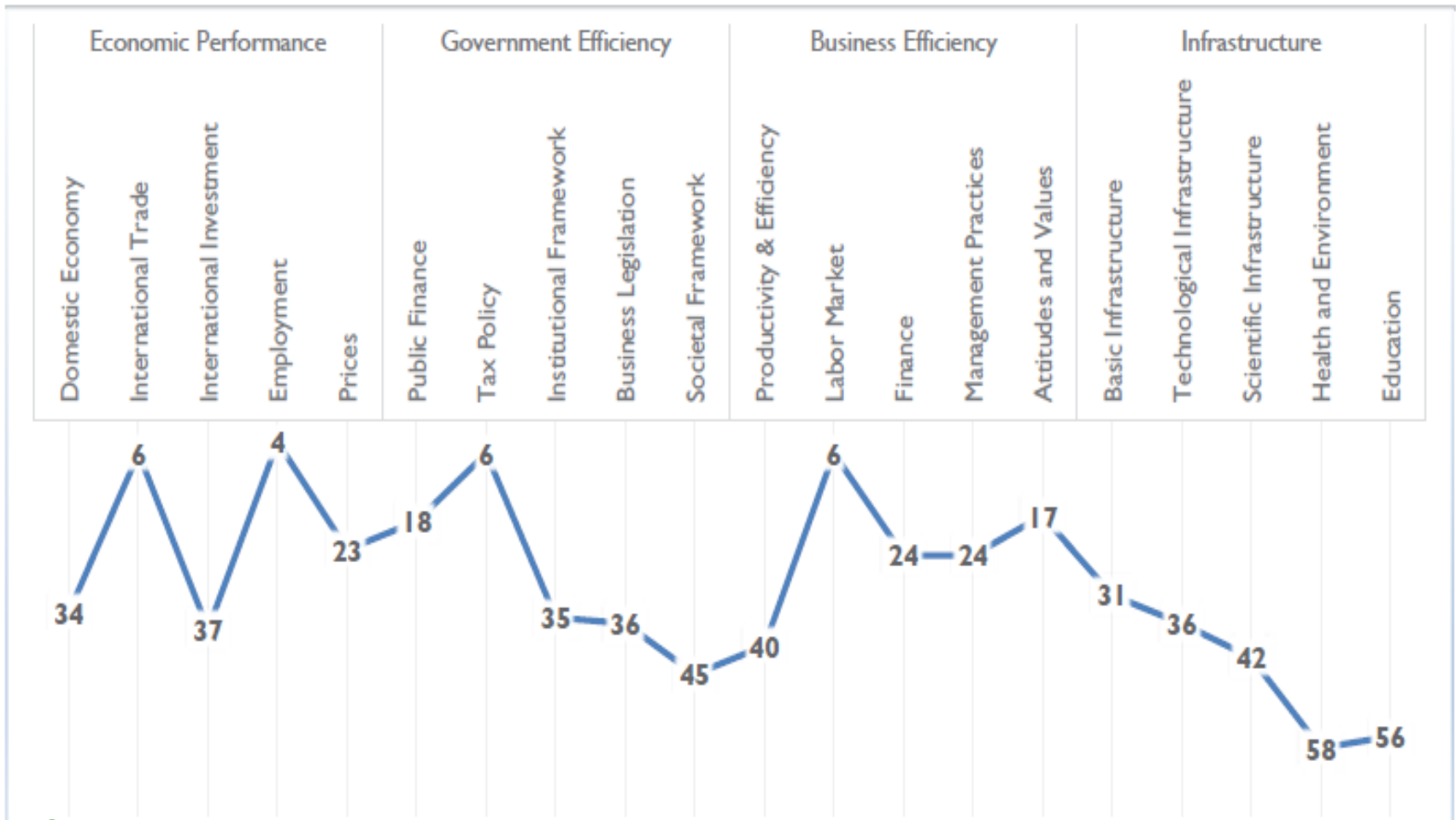
APPEAL

		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

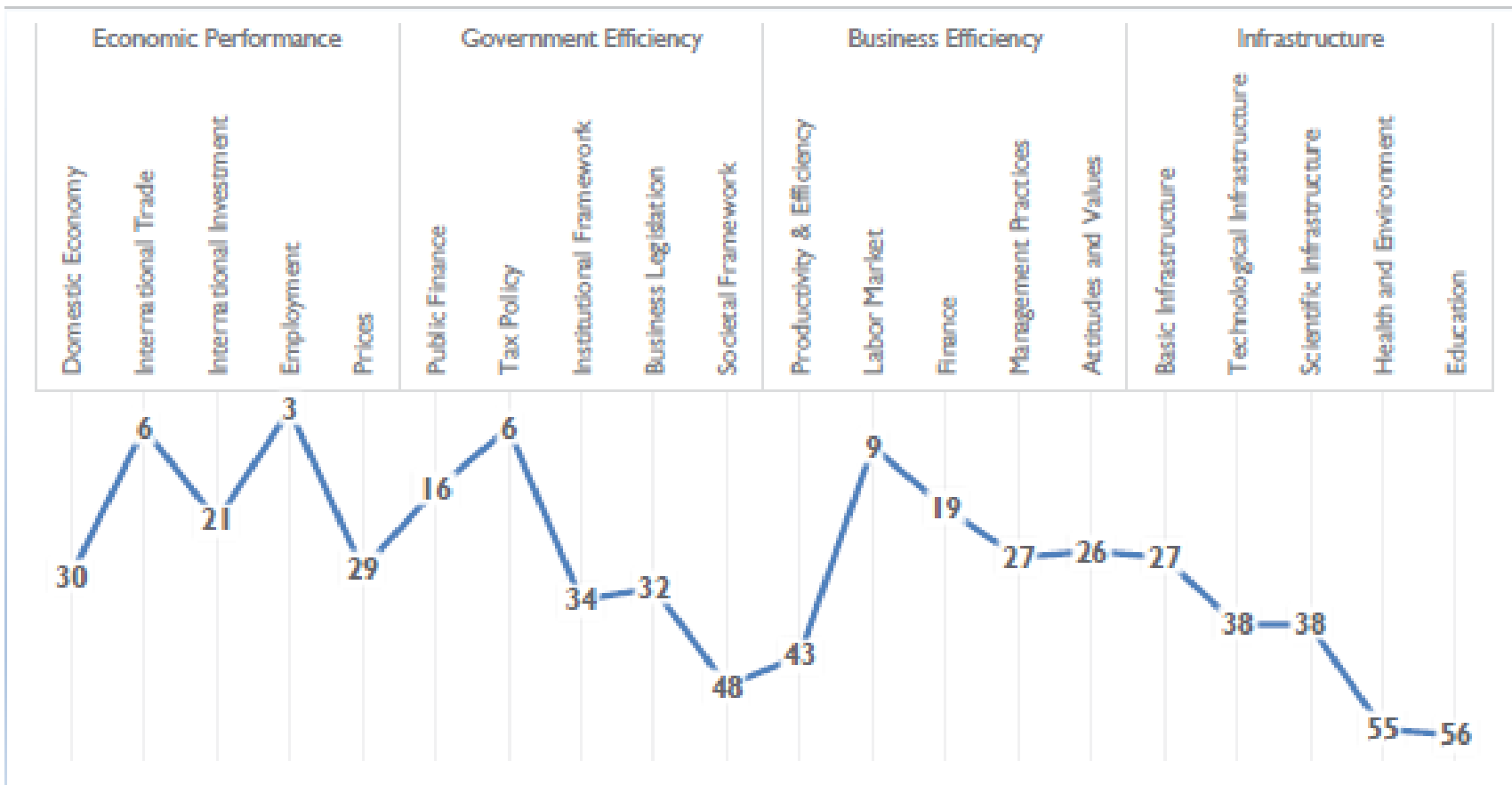
อันดับความสามารถในการแข่งขันของประเทศไทย ในปี 2561 จำแนกตามปัจจัยหลักในแต่ละหมวด



ที่มา : IMD

อันดับความสามารถในการแข่งขันของประเทศไทย ในปี 2562 จำแนกตามปัจจัยหลักในแต่ละหมวด

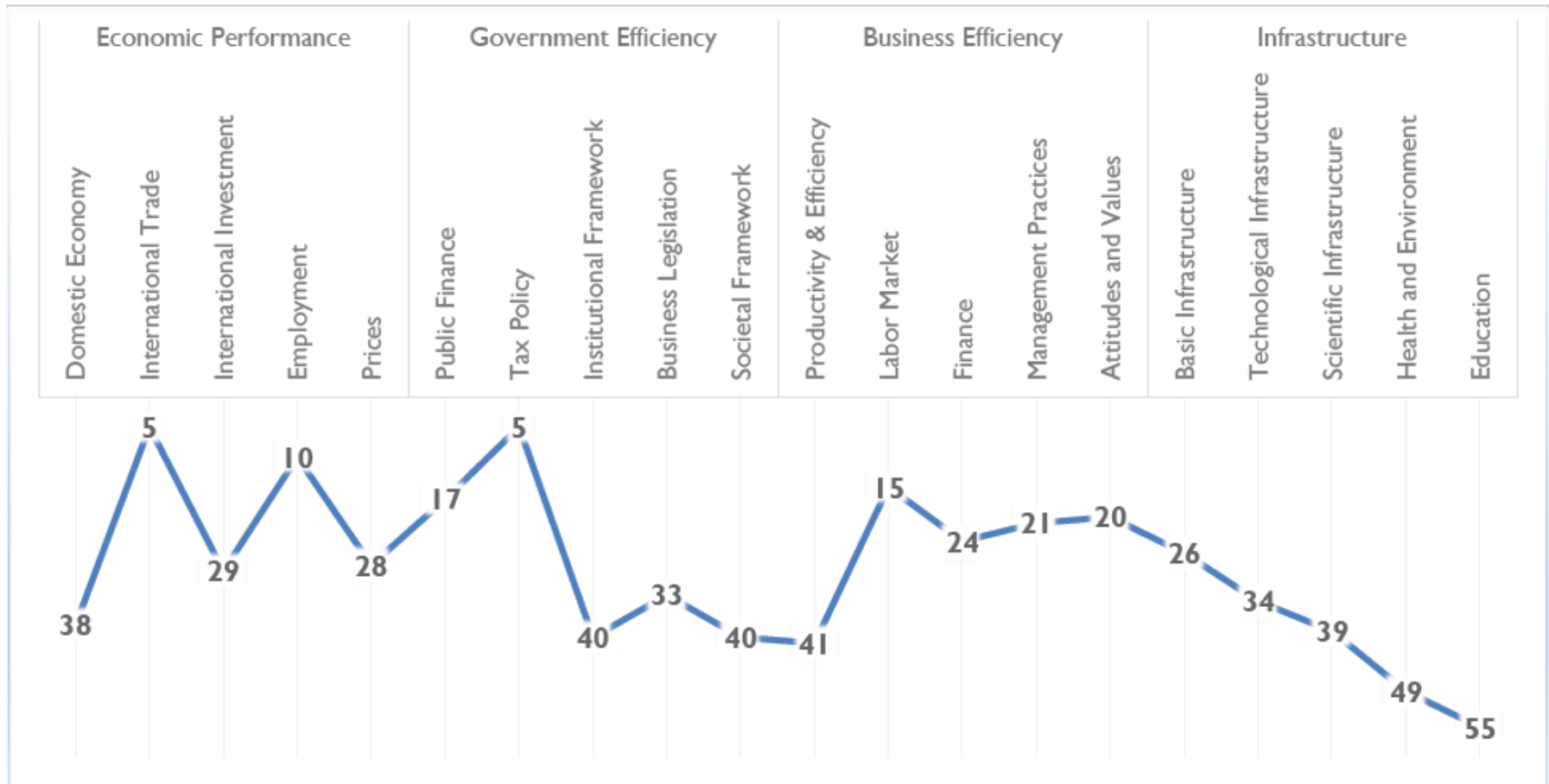
COMPETITIVENESS LANDSCAPE



ที่มา : IMD

อันดับความสามารถในการแข่งขันของประเทศไทย ในปี 2563 จำแนกตามปัจจัยหลักในแต่ละหมวด

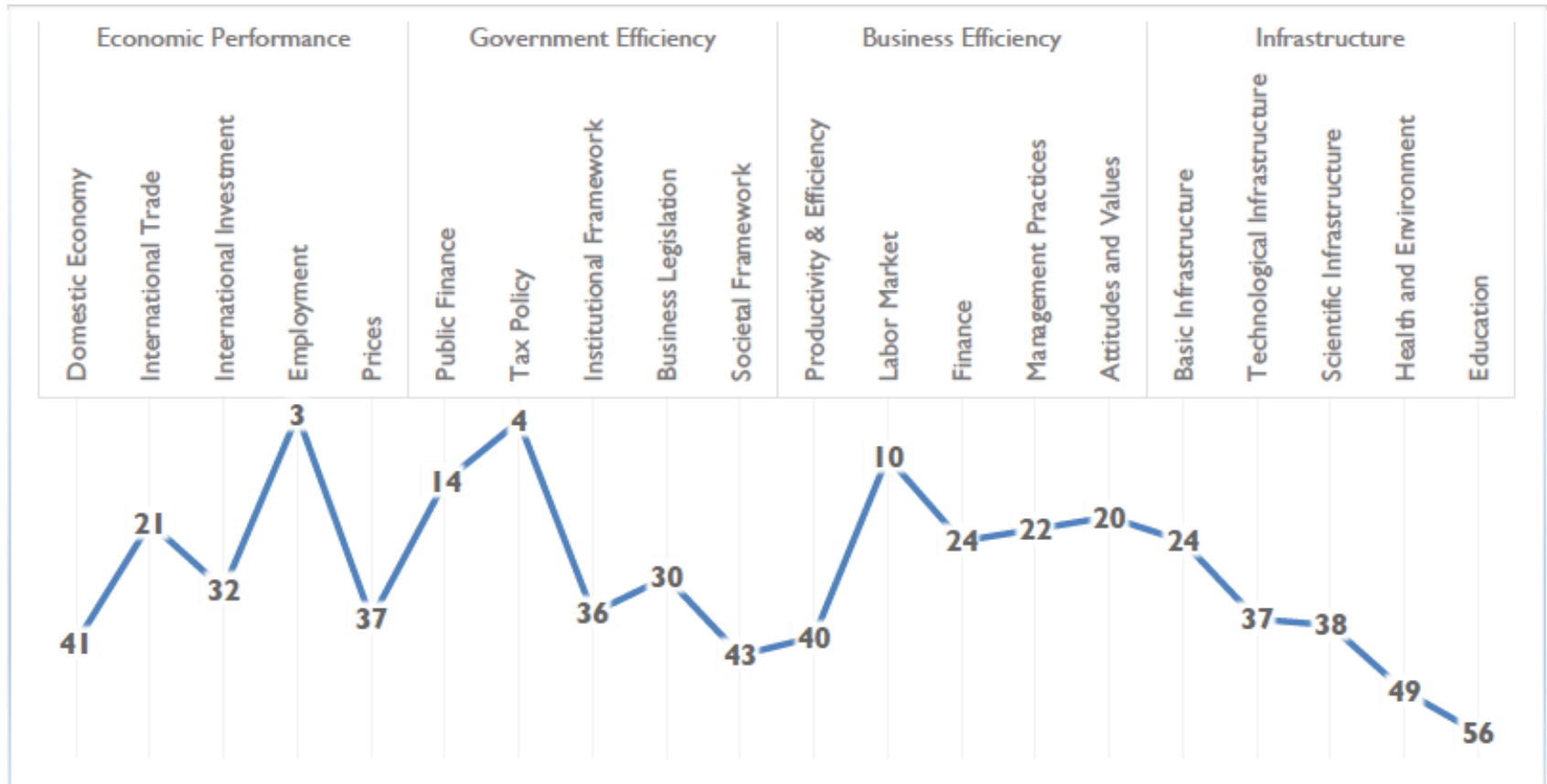
COMPETITIVENESS LANDSCAPE



ที่มา : IMD

อันดับความสามารถในการแข่งขันของประเทศไทย ในปี 2564 จำแนกตามปัจจัยหลักในแต่ละหมวด

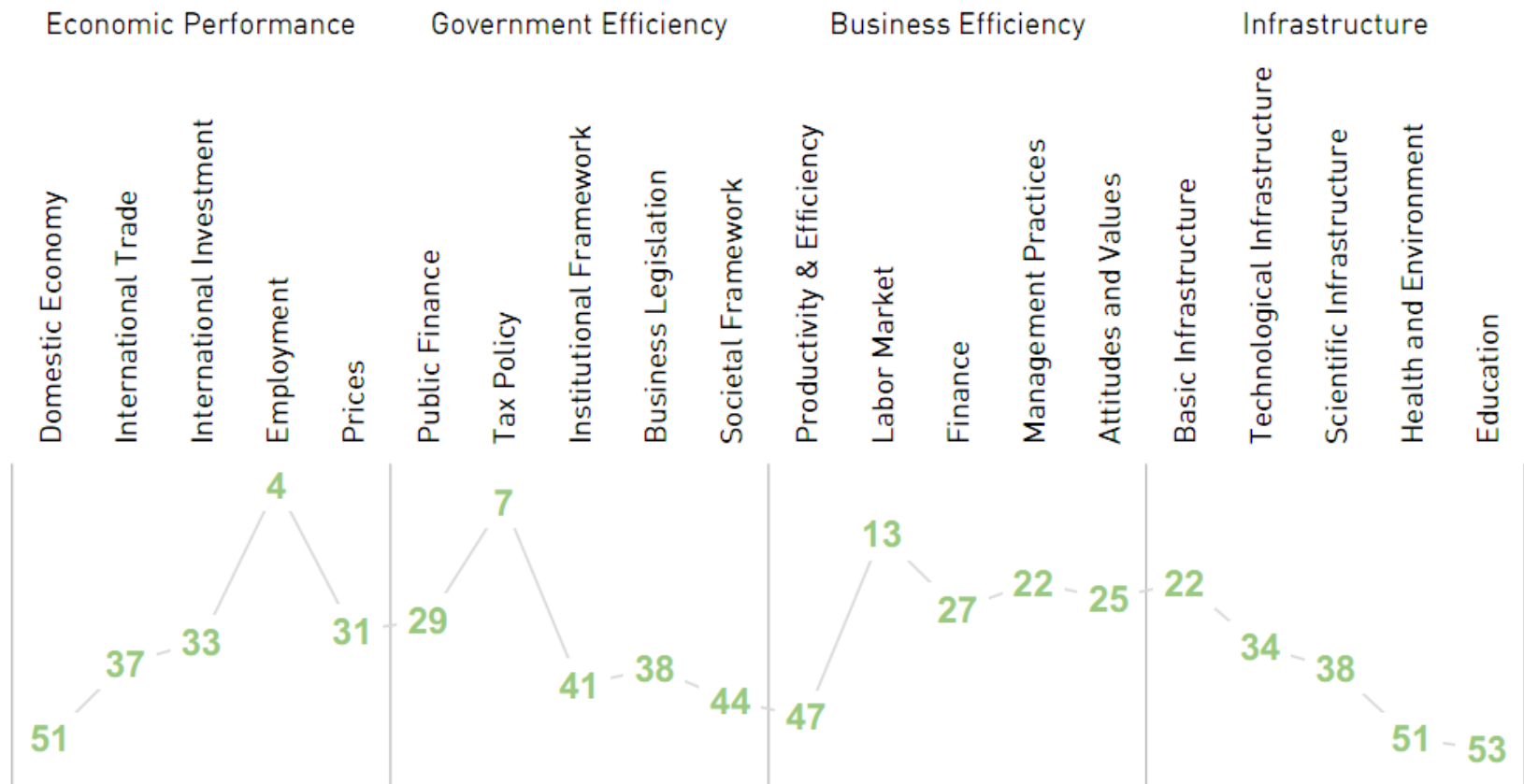
COMPETITIVENESS LANDSCAPE



ที่มา : IMD

อันดับความสามารถในการแข่งขันของประเทศไทย ในปี 2565 จำแนกตามปัจจัยหลักในแต่ละหมวด

COMPETITIVENESS LANDSCAPE



ที่มา : IMD

2021

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][2]	Dependent Population	Percentage of total population
4.1.09	Dependency ratio	Population under 15 and over 64 years old, divided by active population (15 to 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

2022

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

ที่มา : IMD

2021

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
4.2.04 [S]	Communications technology	Communications technology (voice and data) meets business requirements
4.2.05	Computers in use	Worldwide share/ Source: Computer Industry Almanac
4.2.06	Computers per capita	Number of computers per 1000 people/ Source: Computer Industry Almanac
4.2.07	Internet users	Number of internet users per 1000 people
4.2.08	Broadband subscribers	Number of subscriptions per 1000 inhabitants
4.2.09	Internet bandwidth speed	Average speed
4.2.10 [S]	Digital/Technological skills	Digital/Technological skills are readily available
4.2.11 [S]	Qualified engineers	Qualified engineers are available in your labor market
4.2.12 [S]	Public-private partnerships	Public and private sector ventures are supporting technological development
4.2.13 [S]	Development & application of tech.	Development and application of technology are supported by the legal environment
4.2.14 [S]	Funding for technological development	Funding for technological development is readily available
4.2.15	High-tech exports (\$)	US\$ millions
4.2.16	High-tech exports (%)	Percentage of manufactured exports
4.2.17	ICT service exports	Percentage of service exports
4.2.18 [S]	Cyber security	Cyber security is being adequately addressed by corporations

2022

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

ที่มา : IMD

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 and economics since 1950
4.3.14	Nobel prizes per capita	Awarded in physics, chemistry, physiology or medicine 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	Patent 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
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

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 [2]	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: Human Development Report
4.4.12	Energy intensity	Total energy consumed for each 1000 US\$ of GDP in MTOE
4.4.13 [B]	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 from fuel combustion
4.4.16	CO2 emissions intensity	CO2 emissions from fuel combustion 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 hectares 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

2022

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

2021

Education

4.5.01	Total public expenditure on education	Percentage of GDP
4.5.02 [B]	Total public expenditure on education per capita	US\$ per capita
4.5.03	Total public exp. 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	[3] Educational assessment - PISA	PISA survey of 15-year olds
4.5.12	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

2022

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

INFRASTRUCTURE ของประเทศไทย ปี 2561

STRENGTHS

Infrastructure	Rank
4.2.02 Mobile Broadband subscribers	3
4.1.11 Dependency ratio	9
4.2.03 Mobile Telephone costs	13
4.2.17 High-tech exports (%)	13
4.2.01 Investment in Telecommunications	18
4.4.17 Renewable energies (%)	20
4.2.09 Internet bandwidth speed	20
4.4.22 Sustainable development	23
4.2.13 Public-private partnerships	26
4.3.11 Science degrees	29

WEAKNESSES

Infrastructure	Rank
4.5.05 Pupil-teacher ratio (secondary education)	62
4.4.08 Medical assistance	60
4.4.11 Energy intensity	59
4.4.01 Total health expenditure	59
4.2.08 Broadband subscribers	58
4.3.18 Number of patents in force	56
4.5.06 Secondary school enrollment	55
4.2.06 Computers per capita	55
4.4.10 Human development index	55
4.3.16 Patent applications per capita	55

INFRASTRUCTURE ของประเทศไทย ปี 2562

STRENGTHS

Infrastructure	Rank
4.2.02 Mobile Broadband subscribers	4
4.1.10 Dependency ratio	9
4.2.16 High-tech exports (%)	9
4.2.03 Mobile Telephone costs	13
4.4.18 Renewable energy (%)	19
4.2.01 Investment in Telecommunications	19
4.2.12 Public-private partnerships	20
4.2.04 Communication technology	23
4.1.16 Energy infrastructure	25
4.4.25 Sustainable development	27

WEAKNESSES

Infrastructure	Rank
4.4.09 Medical assistance	60
4.5.06 Pupil-teacher ratio (secondary education)	60
4.2.08 Broadband subscribers	58
4.4.12 Energy intensity	58
4.4.01 Total health expenditure	57
4.5.07 Secondary school enrollment	56
4.2.06 Computers per capita	55
4.4.17 Exposure to particle pollution	55
4.2.07 Internet users	54
4.3.18 Number of patents in force	54

INFRASTRUCTURE ของประเทศไทย ปี 2563

STRENGTHS

WEAKNESSES

Infrastructure	Rank
4.1.09 Dependency ratio	7
4.2.02 Mobile Broadband subscribers	10
4.2.16 High-tech exports (%)	11
4.2.01 Investment in Telecommunications	14
4.2.03 Mobile Telephone costs	15
4.4.25 Sustainable development	16
4.2.12 Public-private partnerships	16
4.2.09 Internet bandwidth speed	20
4.4.18 Renewable energies (%)	20
4.1.15 Energy infrastructure	20

Infrastructure	Rank
4.4.09 Medical assistance	60
4.2.17 ICT service exports	60
4.4.12 Energy intensity	58
4.2.08 Broadband subscribers	58
4.5.01 Total public expenditure on education	58
4.5.06 Pupil-teacher ratio (secondary education)	57
4.5.07 Secondary school enrollment	57
4.4.01 Total health expenditure	57
4.3.18 Number of patents in force	56
4.5.04 Total public exp. on education per student	56

INFRASTRUCTURE ของประเทศไทย ปี 2564

STRENGTHS

Infrastructure	Rank
4.1.09 Dependency ratio	7
4.2.01 Investment in Telecommunications	10
4.2.16 High-tech exports (%)	12
4.4.04 Health infrastructure	16
4.3.11 Graduates in Science	16
4.2.03 Mobile Telephone costs	20
4.2.09 Internet bandwidth speed	20
4.1.15 Energy infrastructure	20
4.4.18 Renewable energy (%)	21
4.4.25 Sustainable development	21

WEAKNESSES

Infrastructure	Rank
4.5.06 Secondary school enrollment	61
4.5.05 Pupil-teacher ratio (secondary education)	60
4.2.17 ICT service exports	60
4.1.07 Population - growth	60
4.4.09 Medical assistance	59
4.2.06 Computers per capita	59
4.5.01 Total public expenditure on education	59
4.4.12 Energy intensity	59
4.4.01 Total health expenditure	57
4.4.14 Water use efficiency	56

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 2561

STRENGTHS

Infrastructure	Rank
4.4.21 Environment-related technologies	1
4.2.08 Broadband subscribers	1
4.3.18 Number of patents in force	1
4.2.02 Mobile Broadband subscribers	1
4.4.05 Life expectancy at birth	2
4.3.11 Science degrees	3
4.3.05 Business expenditure on R&D (%)	3
4.3.16 Patent applications per capita	4
4.5.06 Secondary school enrollment	5
4.2.07 Internet users	5

WEAKNESSES

Infrastructure	Rank
4.1.11 Dependency ratio	62
4.5.18 Language skills	61
4.2.03 Mobile Telephone costs	57
4.5.01 Total public expenditure on education	57
4.2.01 Investment in Telecommunications	56
4.1.08 Population - growth	54
4.5.16 Management education	53
4.1.24 Electricity costs for industrial clients	52
4.4.17 Renewable energies (%)	48
4.2.10 Digital/Technological skills	48

INFRASTRUCTURE ของประเทศไทยปี 2562

STRENGTHS

Infrastructure	Rank
4.4.25 Sustainable development	1
4.2.02 Mobile Broadband subscribers	1
4.4.23 Environment-related technologies	2
4.2.08 Broadband subscribers	2
4.3.18 Number of patents in force	2
4.4.06 Life expectancy at birth	2
4.3.11 Science degrees	3
4.3.05 Business expenditure on R&D (%)	4
4.3.16 Patent applications per capita	4
4.5.07 Secondary school enrollment	4

WEAKNESSES

Infrastructure	Rank
4.1.10 Dependency ratio	63
4.5.19 Language skills	62
4.2.10 Digital/Technological skills	60
4.2.03 Mobile Telephone costs	58
4.2.01 Investment in Telecommunications	57
4.1.07 Population - growth	56
4.5.01 Total public expenditure on education	55
4.5.16 Management education	53
4.5.15 University education	51
4.1.21 Electricity costs for industrial clients	50

INFRASTRUCTURE ของประเทศไทยปี 2563

STRENGTHS

Infrastructure	Rank
4.2.08 Broadband subscribers	1
4.2.02 Mobile 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
4.3.05 Business expenditure on R&D (%)	4
4.3.16 Patent applications per capita	4
4.5.07 Secondary school enrollment	4
4.5.13 Students who are not low achievers -PISA	5
4.2.07 Internet users	5

WEAKNESSES

Infrastructure	Rank
4.1.09 Dependency ratio	63
4.2.10 Digital/Technological skills	62
4.5.19 Language skills	62
4.2.03 Mobile Telephone costs	61
4.5.17 Management education	57
4.1.07 Population - growth	56
4.5.01 Total public expenditure on education	55
4.2.17 ICT service exports	54
4.5.16 University education	52
4.2.01 Investment in Telecommunications	52

INFRASTRUCTURE ของประเทศไทยปี 2564

STRENGTHS

Infrastructure	Rank
4.2.08 Broadband subscribers	1
4.4.25 Sustainable development	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
4.3.05 Business expenditure on R&D (%)	4
4.3.16 Patent applications per capita	4
4.3.02 Total expenditure on R&D (%)	5
4.4.01 Total health expenditure	5
4.5.12 Students who are not low achievers -PISA	5

WEAKNESSES

Infrastructure	Rank
4.1.09 Dependency ratio	64
4.2.03 Mobile Telephone costs	62
4.2.10 Digital/Technological skills	62
4.5.19 Language skills	62
4.5.01 Total public expenditure on education	57
4.5.16 Management education	55
4.5.15 University education	54
4.2.17 ICT service exports	54
4.1.07 Population - growth	54
4.1.20 Electricity costs for industrial clients	53

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 ของประเทศไทย ปี 2561

STRENGTHS

Infrastructure	Rank
4.2.09 Internet bandwidth speed	1
4.3.05 Business expenditure on R&D (%)	2
4.3.02 Total expenditure on R&D (%)	2
4.5.07 Higher education achievement	3
4.3.16 Patent applications per capita	3
4.3.10 Researchers in R&D per capita	3
4.3.18 Number of patents in force	3
4.4.21 Environment-related technologies	4
4.1.11 Dependency ratio	4
4.5.03 Government expenditure on education per student	4

WEAKNESSES

Infrastructure	Rank
4.4.17 Renewable energies (%)	58
4.4.16 Exposure to particle pollution	56
4.4.23 Pollution problems	55
4.2.03 Mobile Telephone costs	52
4.2.14 Development and application of technology	52
4.5.15 University education	49
4.5.05 Pupil-teacher ratio (secondary education)	48
4.2.01 Investment in Telecommunications	47
4.4.25 Quality of life	47
4.5.16 Management education	47

INFRASTRUCTURE ของประเทศไทย ปี 2562

STRENGTHS

Infrastructure	Rank
4.3.02 Total expenditure on R&D (%)	1
4.3.05 Business expenditure on R&D (%)	2
4.3.10 Researchers in R&D per capita	2
4.5.08 Higher education achievement	3
4.3.16 Patent applications per capita	3
4.5.03 Gov. expenditure on education per student	3
4.4.23 Environment-related technologies	4
4.3.19 Medium- and high-tech value added	4
4.3.18 Number of patents in force	4
4.1.10 Dependency ratio	4

WEAKNESSES

Infrastructure	Rank
4.4.18 Renewable energy (%)	57
4.2.03 Mobile Telephone costs	57
4.5.15 University education	55
4.4.26 Pollution problems	54
4.4.17 Exposure to particle pollution	53
4.5.16 Management education	51
4.2.13 Development and application of technology	50
4.5.14 Primary and secondary education	47
4.2.01 Investment in Telecommunications	46
4.5.06 Pupil-teacher ratio (secondary education)	46

INFRASTRUCTURE ของประเทศไทย ปี 2563

STRENGTHS		WEAKNESSES	
Infrastructure	Rank	Infrastructure	Rank
4.3.05 Business expenditure on R&D (%)	2	4.4.24 Environmental agreements	56
4.3.02 Total expenditure on R&D (%)	2	4.4.18 Renewable energy (%)	56
4.2.09 Internet bandwidth speed	2	4.2.03 Mobile Telephone costs	55
4.3.10 Researchers in R&D per capita	2	4.4.19 Forest area growth	55
4.4.23 Environment-related technologies	3	4.4.17 Exposure to particle pollution	53
4.3.16 Patent applications per capita	3	4.5.17 Management education	48
4.3.07 Total R&D personnel per capita	3	4.5.15 University education	48
4.1.10 Dependency ratio	3	4.1.07 Population - growth	45
4.5.08 Higher education achievement	4	4.5.10 Student mobility inbound	44
4.3.19 Medium- and high-tech value added	4	4.2.13 Development and application of technology	44

INFRASTRUCTURE ของประเทศไทย ปี 2564

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
4.3.19 Medium- and high-tech value added	4
4.5.07 Higher education achievement	4
4.3.18 Number of patents in force	4
4.1.09 Dependency ratio	4
4.4.23 Environment-related technologies	5

WEAKNESSES

Infrastructure	Rank
4.4.18 Renewable energy (%)	57
4.2.03 Mobile Telephone costs	57
4.4.24 Environmental agreements	56
4.4.17 Exposure to particle pollution	55
4.4.19 Forest area growth	51
4.5.15 University education	47
4.5.16 Management education	46
4.2.13 Development and application of technology	45
4.2.01 Investment in Telecommunications	44
4.1.07 Population - growth	42

INFRASTRUCTURE ของประเทศเกาหลีปี 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 ของสาธารณรัฐประชาชนจีน ปี 2561

STRENGTHS

Infrastructure	Rank
4.3.11 Science degrees	5
4.4.21 Environment-related technologies	6
4.1.11 Dependency ratio	7
4.1.18 Maintenance and development	9
4.2.17 High-tech exports (%)	10
4.2.19 Cyber security	10
4.1.06 Management of cities	10
4.2.13 Public-private partnerships	11
4.5.14 Science in schools	11
4.2.18 ICT service exports	12

WEAKNESSES

Infrastructure	Rank
4.4.16 Exposure to particle pollution	57
4.4.10 Human development index	57
4.2.07 Internet users	56
4.5.09 Student mobility inbound	56
4.4.23 Pollution problems	56
4.5.08 Women with degrees	54
4.4.11 Energy intensity	52
4.4.08 Medical assistance	51
4.2.06 Computers per capita	49
4.4.01 Total health expenditure	49

INFRASTRUCTURE ของสาธารณรัฐประชาชนจีน ปี 2562

STRENGTHS

Infrastructure	Rank
4.4.23 Environment-related technologies	5
4.3.11 Science degrees	5
4.2.16 High-tech exports (%)	6
4.1.10 Dependency ratio	8
4.2.17 ICT service exports	10
4.5.14 Primary and secondary education	11
4.3.05 Business expenditure on R&D (%)	13
4.1.05 Management of cities	13
4.3.02 Total expenditure on R&D (%)	14
4.1.16 Energy infrastructure	14

WEAKNESSES

Infrastructure	Rank
4.2.09 Internet bandwidth speed	61
4.4.17 Exposure to particle pollution	59
4.5.10 Student mobility inbound	57
4.2.07 Internet users	56
4.4.26 Pollution problems	56
4.4.11 Human development index	54
4.4.12 Energy intensity	52
4.4.09 Medical assistance	52
4.4.01 Total health expenditure	51
4.2.06 Computers per capita	49

INFRASTRUCTURE ของสาธารณรัฐประชาชนจีน ปี 2563

STRENGTHS

WEAKNESSES

Infrastructure	Rank	Infrastructure	Rank
4.5.13 Students who are not low achievers -PISA	1	4.4.17 Exposure to particle pollution	59
4.5.18 University education index	4	4.2.07 Internet users	56
4.3.11 Science degrees	4	4.5.10 Student mobility inbound	56
4.4.23 Environment-related technologies	5	4.4.11 Human development index	55
4.2.16 High-tech exports (%)	7	4.5.01 Total public expenditure on education	51
4.1.09 Dependency ratio	9	4.4.12 Energy intensity	51
4.2.12 Public-private partnerships	11	4.4.01 Total health expenditure	50
4.4.19 Forest area growth	11	4.4.09 Medical assistance	50
4.1.05 Management of cities	11	4.2.06 Computers per capita	49
4.2.10 Digital/Technological skills	12	4.5.04 Total public exp. on education per student	48

INFRASTRUCTURE ของสาธารณรัฐประชาชนจีน ปี 2564

STRENGTHS

WEAKNESSES

Infrastructure	Rank	Infrastructure	Rank
4.5.13 Students who are not low achievers -PISA	1	4.4.17 Exposure to particle pollution	61
4.4.23 Environment-related technologies	3	4.2.07 Internet users	58
4.4.19 Forest area growth	3	4.5.09 Student mobility inbound	56
4.5.17 University education index	3	4.4.11 Human development index	56
4.2.12 Public-private partnerships	4	4.5.01 Total public expenditure on education	52
4.5.14 Primary and secondary education	7	4.4.12 Energy intensity	52
4.1.09 Dependency ratio	8	4.5.03 Total public exp. on education per student	50
4.2.16 High-tech exports (%)	8	4.4.09 Medical assistance	50
4.1.05 Management of cities	11	4.2.06 Computers per capita	49
4.2.17 ICT service exports	12	4.4.01 Total health expenditure	49

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 ของประเทศไทยมาเลเซีย ปี 2561

STRENGTHS

Infrastructure	Rank
4.3.11 Science degrees	4
4.2.17 High-tech exports (%)	4
4.2.01 Investment in Telecommunications	5
4.5.08 Women with degrees	7
4.5.04 Pupil-teacher ratio (primary education)	9
4.2.13 Public-private partnerships	10
4.1.24 Electricity costs for industrial clients	12
4.1.11 Dependency ratio	14
4.4.22 Sustainable development	16
4.2.14 Development and application of technology	17

WEAKNESSES

Infrastructure	Rank
4.4.01 Total health expenditure	55
4.4.11 Energy intensity	53
4.4.08 Medical assistance	53
4.4.17 Renewable energies (%)	50
4.2.08 Broadband subscribers	49
4.4.10 Human development index	48
4.3.16 Patent applications per capita	46
4.1.05 Access to commodities	46
4.1.04 Access to water	45
4.2.09 Internet bandwidth speed	44

INFRASTRUCTURE ของประเทศมาเลเซีย ปี 2562

STRENGTHS

Infrastructure	Rank
4.3.11 Science degrees	4
4.5.09 Women with degrees	4
4.2.16 High-tech exports (%)	4
4.2.01 Investment in Telecommunications	6
4.2.03 Mobile Telephone costs	9
4.2.12 Public-private partnerships	9
4.5.05 Pupil-teacher ratio (primary education)	11
4.1.10 Dependency ratio	11
4.4.04 Health infrastructure	17
4.4.27 Environmental laws	17

WEAKNESSES

Infrastructure	Rank
4.4.01 Total health expenditure	56
4.4.12 Energy intensity	55
4.4.09 Medical assistance	54
4.2.08 Broadband subscribers	51
4.4.18 Renewable energy (%)	50
4.4.11 Human development index	47
4.3.16 Patent applications per capita	46
4.4.06 Life expectancy at birth	46
4.2.06 Computers per capita	43
4.3.18 Number of patents in force	40

INFRASTRUCTURE ของประเทศมาเลเซีย ปี 2563

STRENGTHS

WEAKNESSES

Infrastructure

Rank

Infrastructure

Rank

4.2.16 High-tech exports (%) 3

4.5.09 Women with degrees 4

4.3.11 Science degrees 5

4.2.01 Investment in Telecommunications 8

4.5.05 Pupil-teacher ratio (primary education) 11

4.1.09 Dependency ratio 12

4.1.20 Electricity costs for industrial clients 15

4.4.24 Environmental agreements 17

4.2.12 Public-private partnerships 17

4.2.13 Development and application of technology 20

4.4.01 Total health expenditure 56

4.4.09 Medical assistance 56

4.2.08 Broadband subscribers 54

4.4.12 Energy intensity 54

4.4.18 Renewable energy (%) 53

4.4.11 Human development index 49

4.4.05 Universal health care coverage index 49

4.5.04 Total public exp. on education per student 46

4.3.16 Patent applications per capita 46

4.4.06 Life expectancy at birth 46

INFRASTRUCTURE ของประเทศมาเลเซีย ปี 2564

STRENGTHS

Infrastructure	Rank
4.3.11 Graduates in Science	1
4.2.16 High-tech exports (%)	4
4.5.08 Women with degrees	4
4.5.04 Pupil-teacher ratio (primary education)	12
4.1.09 Dependency ratio	12
4.1.20 Electricity costs for industrial clients	14
4.2.12 Public-private partnerships	17
4.4.24 Environmental agreements	17
4.4.25 Sustainable development	19
4.4.04 Health infrastructure	22

WEAKNESSES

Infrastructure	Rank
4.4.01 Total health expenditure	59
4.4.09 Medical assistance	55
4.4.12 Energy intensity	55
4.2.08 Broadband subscribers	54
4.4.18 Renewable energy (%)	54
4.4.11 Human development index	49
4.4.05 Universal health care coverage index	49
4.4.19 Forest area growth	48
4.5.06 Secondary school enrollment	47
4.3.16 Patent applications per capita	46

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 ของประเทศสิงคโปร์ปี 2561

STRENGTHS

Infrastructure	Rank
4.3.11 Science degrees	1
4.5.07 Higher education achievement	1
4.2.17 High-tech exports (%)	1
4.5.14 Science in schools	1
4.2.07 Internet users	1
4.1.06 Management of cities	1
4.1.18 Maintenance and development	1
4.2.14 Development and application of technology	1
4.2.08 Broadband subscribers	2
4.4.24 Environmental laws	2

WEAKNESSES

Infrastructure	Rank
4.5.01 Total public expenditure on education	60
4.4.17 Renewable energies (%)	57
4.4.16 Exposure to particle pollution	55
4.2.03 Mobile Telephone costs	53
4.4.01 Total health expenditure	53
4.1.08 Population - growth	50
4.4.08 Medical assistance	41
4.2.01 Investment in Telecommunications	40
4.4.21 Environment-related technologies	24

INFRASTRUCTURE ของประเทศสิงคโปร์ปี 2562

STRENGTHS

Infrastructure	Rank
4.2.09 Internet bandwidth speed	1
4.3.19 Medium- and high-tech value added	1
4.3.11 Science degrees	1
4.2.08 Broadband subscribers	1
4.4.27 Environmental laws	1
4.1.05 Management of cities	1
4.2.13 Development and application of technology	1
4.3.20 Scientific research legislation	1
4.1.14 Quality of air transportation	1
4.2.02 Mobile Broadband subscribers	1

WEAKNESSES

Infrastructure	Rank
4.5.01 Total public expenditure on education	60
4.4.18 Renewable energy (%)	58
4.2.03 Mobile Telephone costs	56
4.1.21 Electricity costs for industrial clients	53
4.4.01 Total health expenditure	52
4.4.17 Exposure to particle pollution	43
4.2.01 Investment in Telecommunications	40
4.1.07 Population - growth	38
4.4.23 Environment-related technologies	28

INFRASTRUCTURE ของประเทศสิงคโปร์ปี 2563

STRENGTHS

Infrastructure	Rank
4.3.19 Medium- and high-tech value added	1
4.2.09 Internet bandwidth speed	1
4.1.05 Management of cities	1
4.1.13 Quality of air transportation	1
4.2.02 Mobile Broadband subscribers	1
4.2.07 Internet users	1
4.5.08 Higher education achievement	2
4.2.12 Public-private partnerships	2
4.5.13 Students who are not low achievers -PISA	2
4.2.13 Development and application of technology	2

WEAKNESSES

Infrastructure	Rank
4.5.01 Total public expenditure on education	61
4.4.18 Renewable energy (%)	59
4.1.20 Electricity costs for industrial clients	54
4.4.01 Total health expenditure	53
4.2.03 Mobile Telephone costs	50
4.4.17 Exposure to particle pollution	44
4.2.01 Investment in Telecommunications	41
4.4.19 Forest area growth	39
4.5.18 University education index	37
4.2.17 ICT service exports	32

INFRASTRUCTURE ของประเทศสิงคโปร์ปี 2564

STRENGTHS

Infrastructure	Rank
4.3.19 Medium- and high-tech value added	1
4.2.09 Internet bandwidth speed	1
4.2.13 Development and application of technology	1
4.1.13 Quality of air transportation	1
4.5.07 Higher education achievement	2
4.5.13 Students who are not low achievers -PISA	2
4.1.05 Management of cities	2
4.2.16 High-tech exports (%)	3
4.1.09 Dependency ratio	3
4.2.12 Public-private partnerships	3

WEAKNESSES

Infrastructure	Rank
4.5.01 Total public expenditure on education	63
4.4.19 Forest area growth	61
4.4.18 Renewable energy (%)	60
4.1.07 Population growth	56
4.2.01 Investment in Telecommunications	55
4.1.20 Electricity costs for industrial clients	54
4.4.01 Total health expenditure	53
4.2.03 Mobile Telephone costs	52
4.4.17 Exposure to particle pollution	42
4.5.17 University education index	37

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

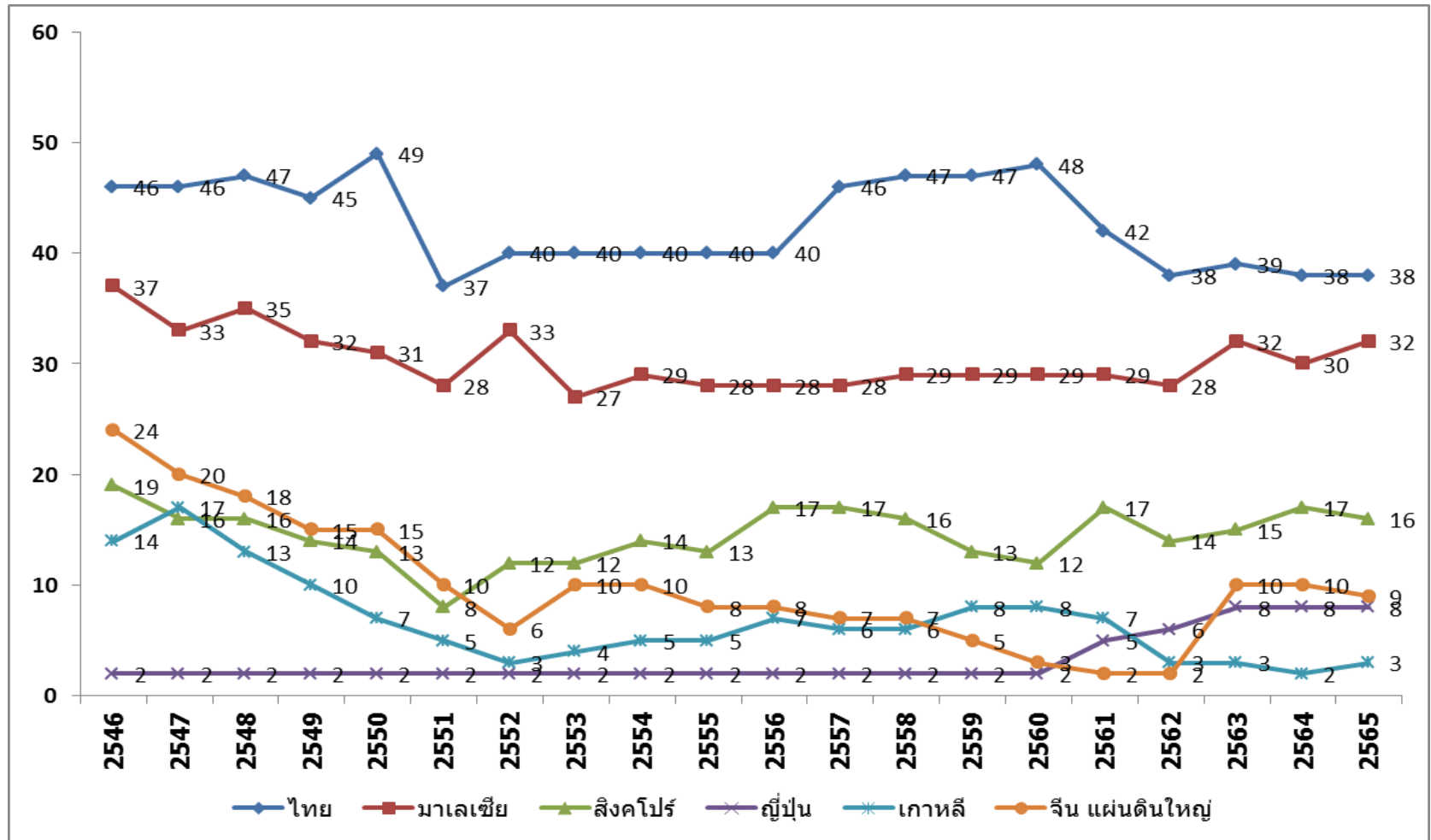
Infrastructure	Rank
4.1.07 Population growth	63
4.4.19 Forest area growth	61
4.5.01 Total public expenditure on education	61
4.4.18 Renewable energy (%)	58
4.1.20 Electricity costs for industrial clients	55
4.2.01 Investment in Telecommunications	55
4.4.01 Total health expenditure	54
4.2.06 Internet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

**อันดับความสามารถในการแข่งขันด้านโครงสร้างพื้นฐานทาง
วิทยาศาสตร์ และโครงสร้างพื้นฐานทางเทคโนโลยี
ของประเทศไทย ปี 2546 -2565**

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

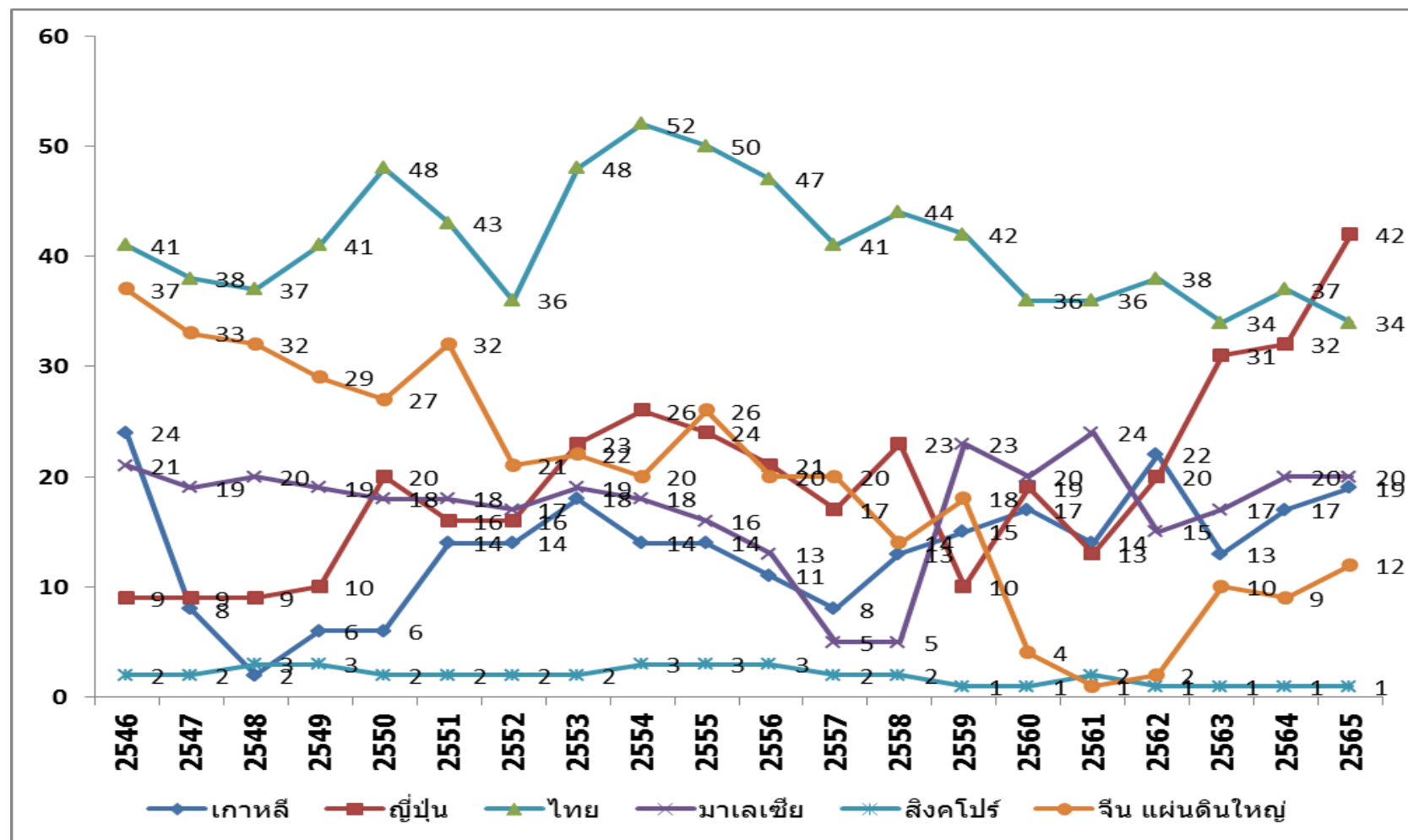
ที่มา : IMD

อันดับความสามารถในการแข่งขันด้านโครงสร้างพื้นฐาน ทางวิทยาศาสตร์ของประเทศต่าง ๆ โดยรวมปี 2546 - 2565



ที่มา : IMD

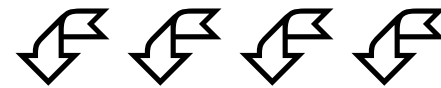
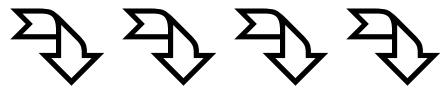
อันดับความสามารถในการแข่งขันด้านโครงสร้างพื้นฐาน ทางเทคโนโลยีของประเทศต่าง ๆ โดยรวม ปี 2546-2565



ที่มา : IMD

เทคโนโลยีกับการพัฒนาประเทศ

ความสำคัญของเทคโนโลยีต่อการพัฒนาประเทศ



ผู้ใดครองเทคโนโลยี

ผู้นั้นครองเศรษฐกิจ

ผู้ใดครองเทคโนโลยี

ผู้นั้นครองอำนาจ