THE GLOBAL INNOVATION INDEX (GII)

2015 - 2019

Pakistan
Nepal
India
Myanmar (Burma)
East China Sea
Thailand
South China Sea
Bay of Bengal
Vietnam
Philippines
Gulf of Thailand
Sea
Malaysia

Source: Excerpts from The Global Innovation Index, 2015, 2016, 2017, 2018 and 2019

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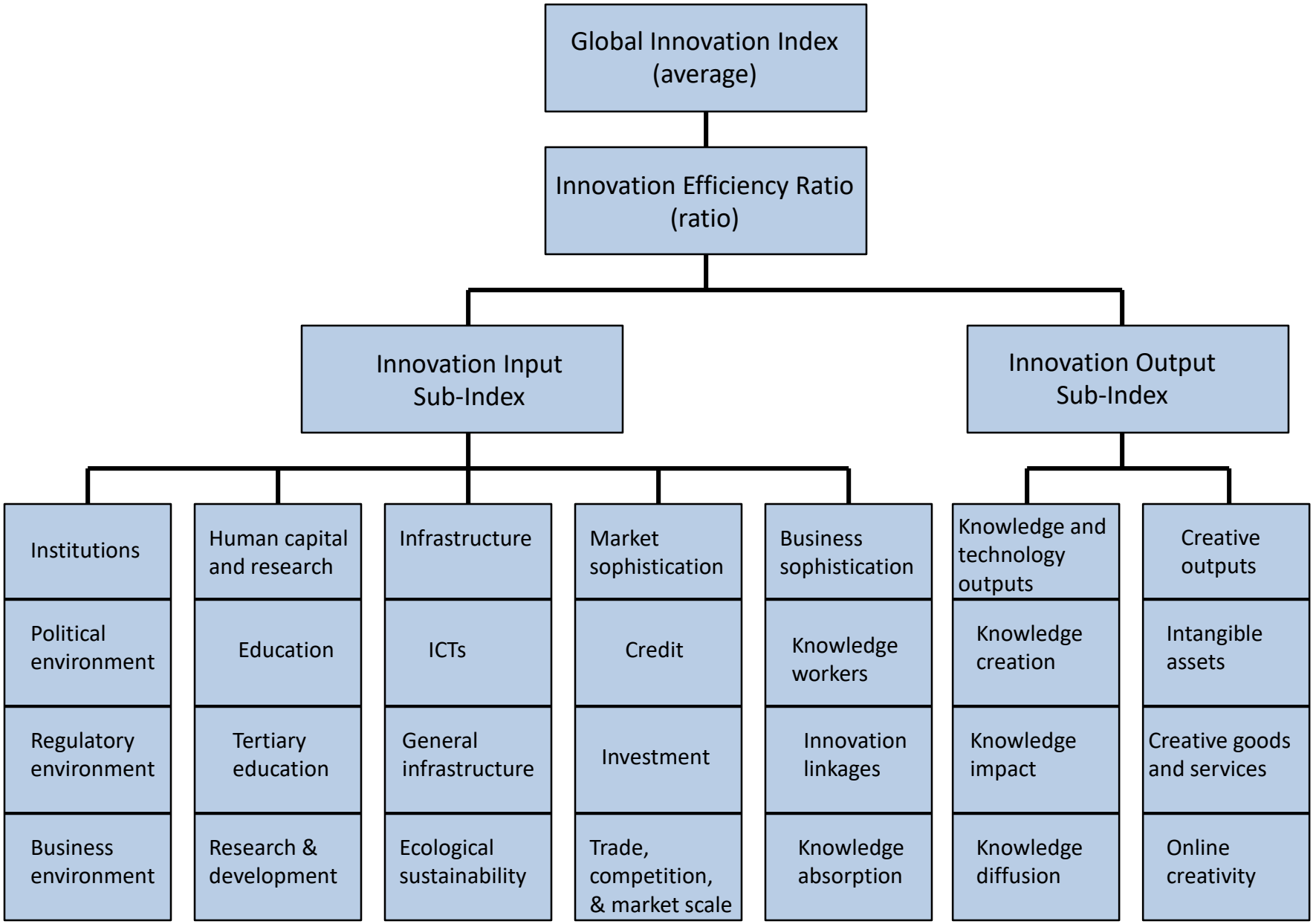
RATIONALE

- Innovation is the driver of economic progress and competitiveness
- There is awareness that innovation definition has broadened – not restricted to R&D laboratories and to published scientific papers. Innovation could be more general and includes social innovations and business model innovations.
- Innovation in emerging markets is seen as critical for inspiring people especially the next generation of entrepreneurs and innovators.
- GII helps to create an environment in which innovation factors are under continual evaluation. It provides a key tool and a rich database of detailed metrics for refining innovation policies.

Figure 1: Framework of the Global Innovation Index



INNOVATION INPUT SUB-INDEX

Pillar 1:	INSTITUTIONS	Subpillar 1:	POLITICAL ENVIRONMENT
		Subpillar 2:	REGULATORY ENVIRONMENT
		Subpillar 3:	BUSINESS ENVIRONMENT
Pillar 2:	HUMAN CAPITAL AND RESEARCH	Subpillar 1:	EDUCATION
		Subpillar 2:	TERTIARY EDUCATION
		Subpillar 3:	RESEARCH & DEVELOPMENT
Pillar 3:	INFRASTRUCTURE	Subpillar 1:	ICT
		Subpillar 2:	GENERAL INFRASTRUCTURE
		Subpillar 3:	ECOLOGICAL SUSTAINABILITY
Pillar 4:	MARKET SOPHISTICATION	Subpillar 1:	CREDIT
		Subpillar 2:	INVESTMENT
		Subpillar 3:	TRADE, COMPETITION & MARKET SCALE
Pillar 5:	BUSINESS SOPHISTICATION	Subpillar 1:	KNOWLEDGE WORKERS
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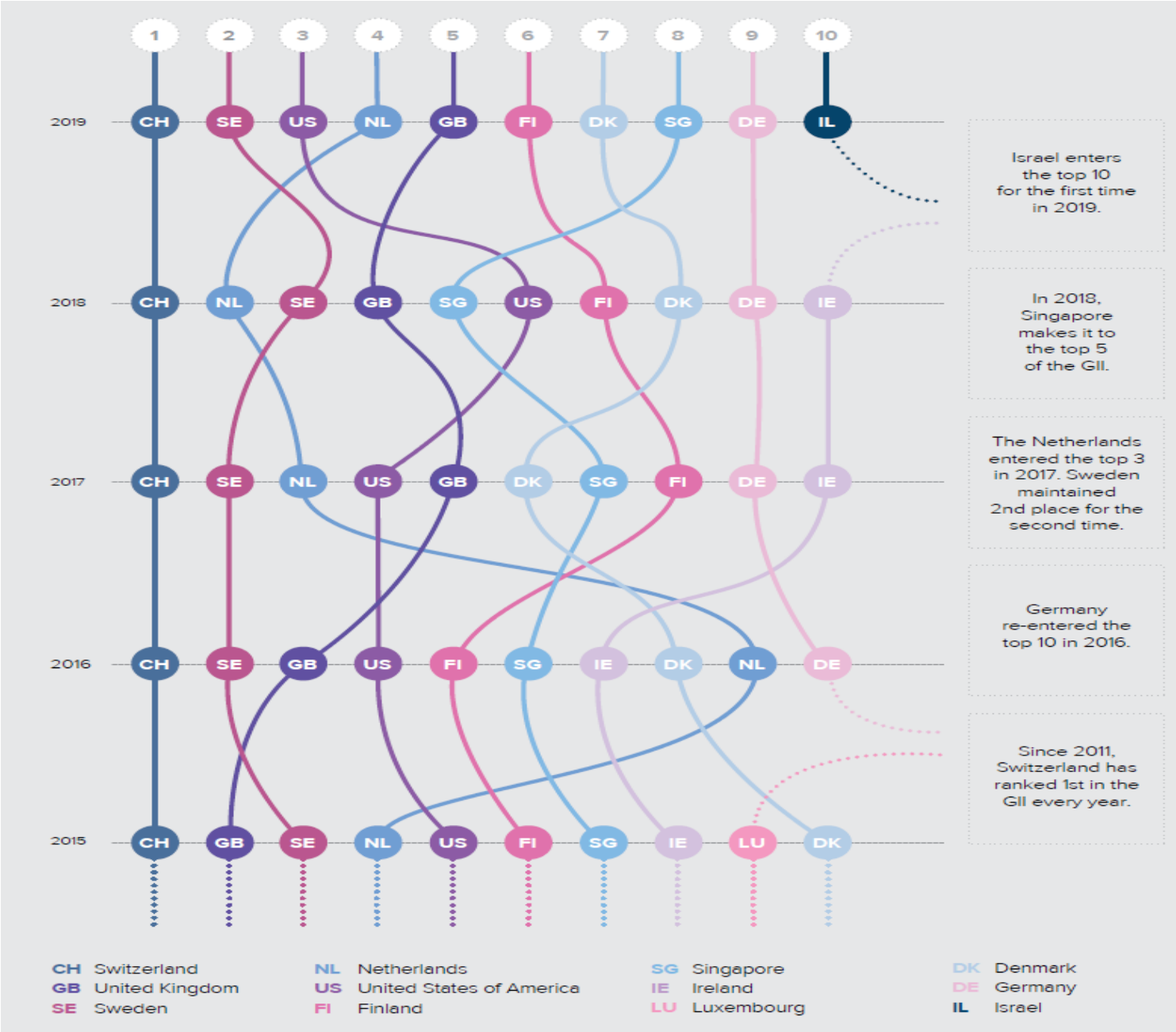
INNOVATION OUTPUT SUB-INDEX

Pillar 6:	KNOWLEDGE & TECHNOLOGY OUTPUTS	Subpillar 1:	KNOWLEDGE CREATION
		Subpillar 2:	KNOWLEDGE IMPACT
		Subpillar 3:	KNOWLEDGE DIFFUSION
Pillar 7:	CREATIVE OUTPUTS	Subpillar 1:	INTANGIBLE ASSETS
		Subpillar 2:	CREATIVE GOODS AND SERVICES
		Subpillar 3:	ONLINE CREATIVITY

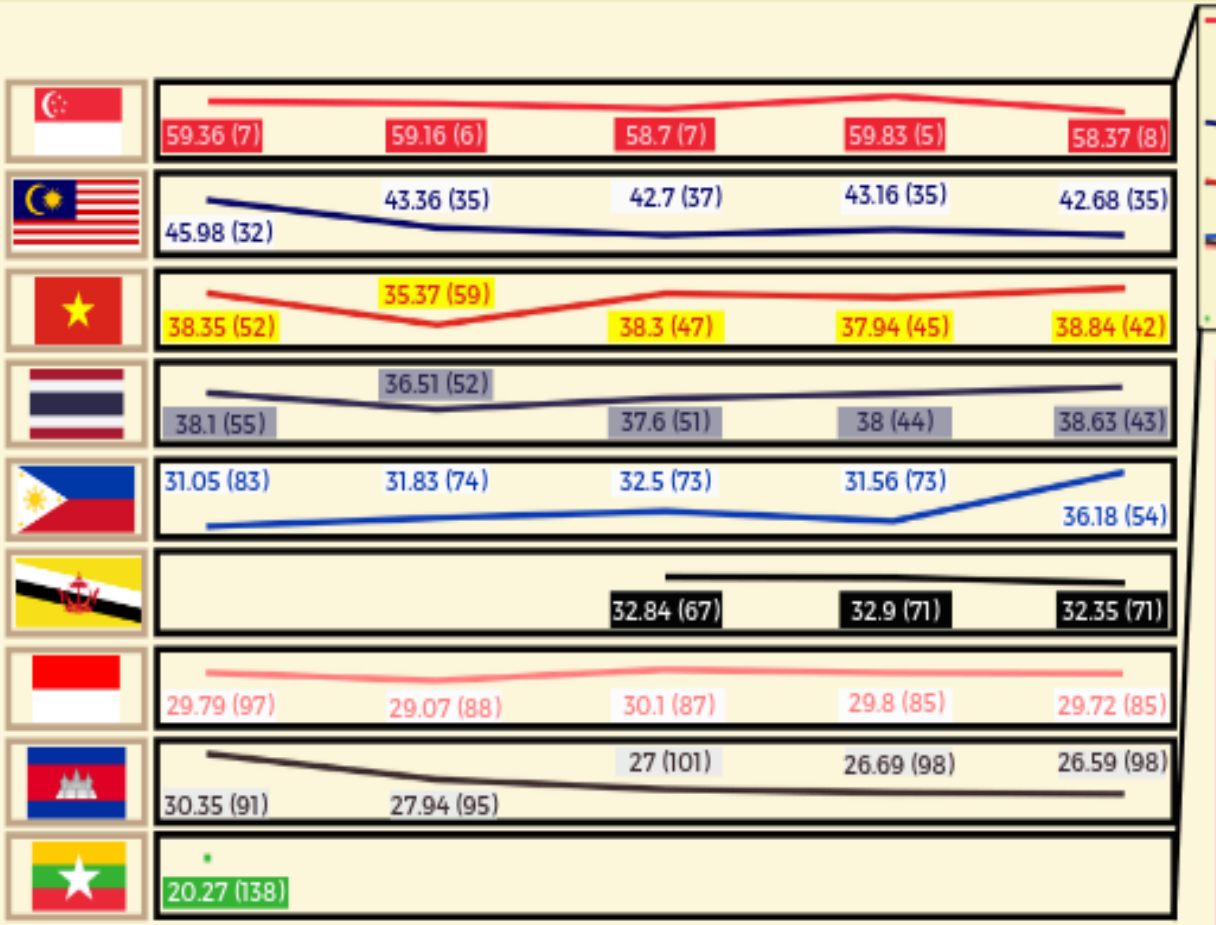
MOVEMENT IN THE TOP 10 OF THE GLOBAL INNOVATION INDEX

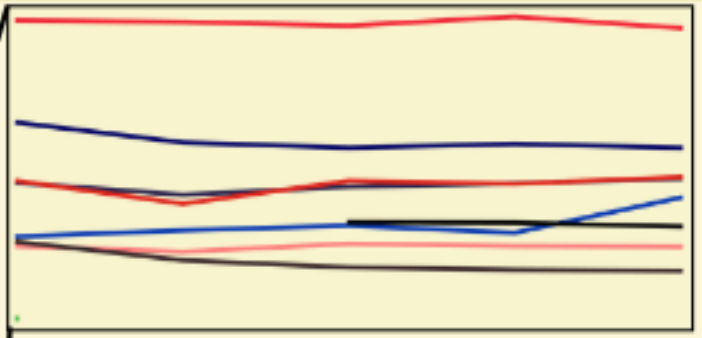


OVERALL GLOBAL INNOVATION INDEX: ASEAN RANKING AND SCORE
2015 - 2019

ASEAN Country	2015	2016	2017	2018	2019
SINGAPORE	7 (59.36)	6 (59.16)	7 (58.7)	5 (59.83)	8 (58.37)
MALAYSIA	32 (45.98)	35 (43.36)	37 (42.7)	35 (43.16)	35 (42.68)
THAILAND	55 (38.10)	52 (36.51)	51 (37.6)	44 (38.00)	43 (38.63)
PHILIPPINES	83 (31.05)	74 (31.83)	73 (32.5)	73 (31.56)	54 (36.18)
INDONESIA	97 (29.79)	88 (29.07)	87 (30.1)	85 (29.80)	85 (29.72)
VIETNAM	52 (38.35)	59 (35.37)	47 (38.3)	45 (37.94)	42 (38.84)
BRUNEI DARUSSALAM	n/a	n/a	71 (32.9)	67 (32.84)	71 (32.35)
CAMBODIA	91 (30.35)	95 (27.94)	101 (27.0)	98 (26.69)	98 (26.59)
MYANMAR	138 (20.27)	n/a	n/a	n/a	n/a

OVERALL GLOBAL INNOVATION INDEX (ASEAN)





The Global Innovation Index (GII) is a yearly publication of the World Intellectual Property Organization which presents an array of metrics to measure innovation in nearly 130 economies around the world. Among these metrics, there are 5 Pillars that were identified as to where S&T is contributing to. These are the Human Capital and Research, Infrastructure, Business Sophistication, Knowledge and Technology Outputs, and Creative Outputs.

The ASEAN has been consistently part of these studies. As a high-income economy, Singapore ranks between 5th to 8th from 2015 to 2019. In 2019, Singapore is shown to excel in Human and Capital Research (5th), Infrastructure (7th), Business Sophistication (4th) and Knowledge and Technology Outputs (11th).

Next in line is Malaysia, which is a bit far below Singapore, ranking between 32 to 37 in the past five years. It thrives in Human Capital and Research (33rd), Business Sophistication (36th) and Knowledge and Technology Outputs (34th).

Vietnam and Thailand have ranks that are close with each other since 2015 and has been alternately switching between 3rd and 4th highly innovative ASEAN member. Their most promising S&T metrics in 2019 is Knowledge and Technology Outputs where they are ranked 27th and 38th, respectively.

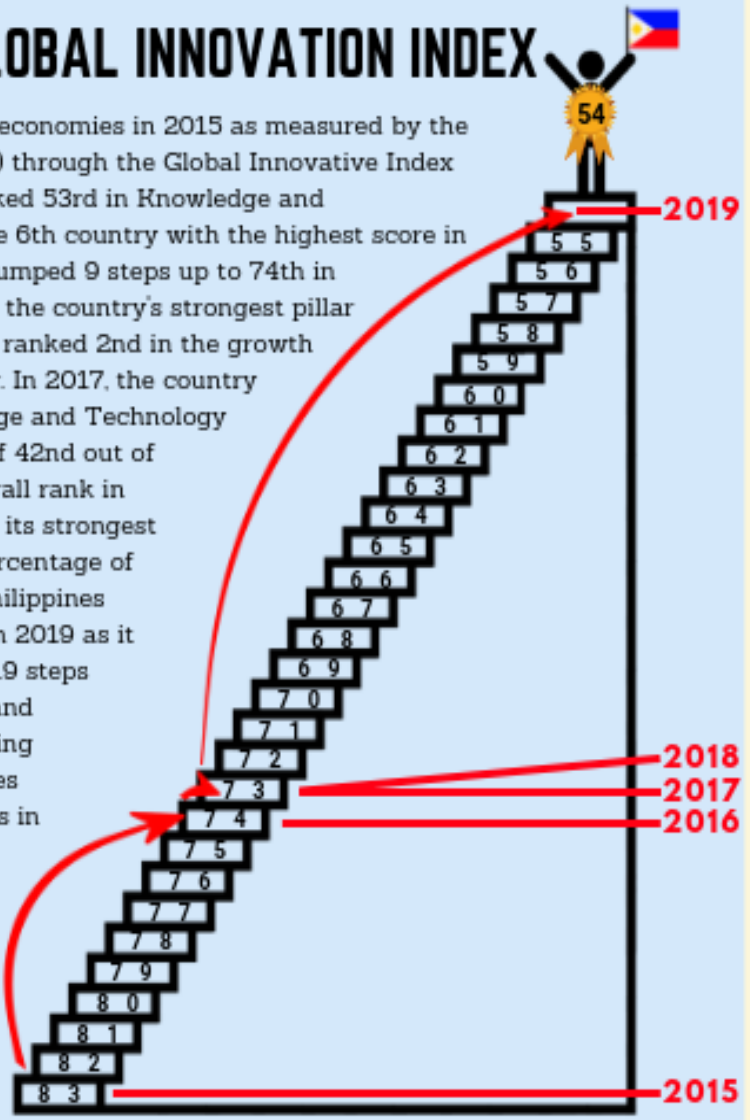
The Philippines has been observed to jump 19 ranks up from 2018 to 2019. It thrives in Business Sophistication (32nd) and Knowledge and Technology Outputs (31st).

Brunei Darussalam has no GII data for 2015 and 2016 but in 2019, it was the 6th highly innovative ASEAN member. Its most promising indicator is Business Sophistication where it is ranked 45th among 129 economies.

In 2019, Indonesia's most promising pillars are the Infrastructure (75th) and Creative Outputs (76th) whereas Cambodia's is its Knowledge and Technology Outputs (75th). Myanmar has no GII data since 2016.

PHILIPPINE RANKINGS IN GLOBAL INNOVATION INDEX

The Philippines was ranked 83rd among the 141 economies in 2015 as measured by the World Intellectual Property Organization (WIPO) through the Global Innovative Index (GII) with a score of 31.05. The country then ranked 53rd in Knowledge and Technology Outputs where it peaked at being the 6th country with the highest score in GERD financed by business. The country's rank jumped 9 steps up to 74th in 2016. Knowledge and Technology Outputs is still the country's strongest pillar at being 44th out of 128 economies where it also ranked 2nd in the growth rate of its purchasing parity per worker indicator. In 2017, the country only jumped a step higher, still keeping Knowledge and Technology Outputs as its strongest pillar, receiving a rank of 42nd out of 127 economies. The country maintained this overall rank in 2018. Knowledge and Technology Outputs is still its strongest pillar in innovation where it ranked 7th in the percentage of research talent in the business enterprise. The Philippines showed a promising performance in innovation in 2019 as it climbed from rank 73 to rank 54, a big jump of 19 steps higher than its previous year's rank. Knowledge and Technology Outputs is still the biggest contributing factor in achieving this rank where the Philippines achieved being the top one among 129 economies in high-tech net exports as its sub-index pillar. Moreover, Business Sophistication comes close where the country achieved being 32nd. Complementing the country's excellence in high-tech net exports, it also ranked 5th in high-tech imports.



INNOVATION EFFICIENCY RATIO: ASEAN RANKING

ASEAN Country	INNOVATION EFFICIENCY RATIO Ranking and Score				
	2015	2016	2017	2018	2019
SINGAPORE	100 (0.65)	78 (0.62)	63 (0.6)	63 (0.61)	52 (0.62)
MALAYSIA	56 (0.74)	59 (0.67)	46 (0.7)	48 (0.66)	54 (0.61)
THAILAND	43 (0.76)	53 (0.70)	24 (0.8)	33 (0.71)	40 (0.66)
PHILIPPINES	44 (0.76)	49 (0.71)	55 (0.6)	62 (0.61)	22 (0.74)
INDONESIA	42 (0.77)	52 (0.71)	42 (0.7)	66 (0.61)	77 (0.54)
VIETNAM	9 (0.92)	11 (0.84)	10 (0.8)	16 (0.80)	14 (0.78)
BRUNEI DARUSSALAM	n/a	n/a	124 (0.3)	124 (0.31)	128 (0.25)
CAMBODIA	80 (0.69)	90 (0.59)	61 (0.6)	60 (0.61)	63 (0.59)
MYANMAR	75 (0.69)	n/a	n/a	n/a	n/a

INNOVATION INPUT AND OUTPUT SUB-INDECES: ASEAN RANKING

ASEAN Country	INNOVATION INPUT SUB-INDEX					INNOVATION OUTPUT SUB-INDEX				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
SINGAPORE	1 (72.12)	1 (72.94)	1 (72.3)	1 (74.23)	1 (72.15)	20 (46.60)	20 (45.38)	17 (45.1)	15 (45.43)	15 (44.59)
MALAYSIA	31 (52.78)	32 (52.05)	36 (50.9)	34 (52.07)	34 (52.93)	34 (39.18)	39 (34.66)	34.5 (39)	39 (34.26)	39 (32.42)
THAILAND	62 (43.17)	57 (42.98)	65 (42.9)	52 (44.49)	47 (46.58)	50 (33.02)	50 (30.04)	43 (32.2)	45 (31.51)	43 (30.67)
PHILIPPINES	101 (35.24)	86 (37.23)	83 (39.4)	82 (39.14)	76 (41.68)	77 (26.86)	64 (26.43)	65 (25.6)	68 (23.98)	42 (30.68)
INDONESIA	114 (33.74)	99 (34.04)	99 (35.7)	90 (37.12)	87 (38.64)	85 (25.83)	76 (24.10)	73 (24.5)	73 (22.47)	78 (20.80)
VIETNAM	78 (40.04)	79 (38.45)	71 (41.7)	65 (42.17)	63 (43.75)	39 (36.65)	42 (32.29)	38 (34.9)	41 (33.70)	37 (33.93)
BRUNEI DARUSSALAM	n/a	n/a	40 (49.3)	37 (50.05)	35 (51.74)	n/a	n/a	110 (16.5)	112 (15.63)	120 (12.95)
CAMBODIA	96 (35.98)	94 (35.06)	104 (33.2)	103 (33.06)	104 (33.51)	91 (24.72)	95 (20.82)	87 (20.9)	84 (20.32)	84 (19.68)
MYANMAR	139 (23.92)	n/a	n/a	n/a	n/a	130 (16.62)	n/a	n/a	n/a	n/a

- In terms of the GII's input and output sub-indices, the country's scores and rankings improved. In the input sub-index for innovative activities, the Philippines' score rose to 41.68 from 39.14 last year. Its level ranking increased to 76th from 82nd.
- As for the output sub-index, the country's score increased to 30.68 from 23.98 and its ranking climbed to 42nd from 68th in 2018.

The Philippines'

GLOBAL INNOVATION INDEX (GII)

Rankings

Science and Technology contributes to these areas...

	2015	2016	2017	2018	2019
Human capital & research	123rd	95th	95th	86th	83rd
Infrastructure	83rd	72nd	72nd	67th	58th
Business sophistication	81st	74th	45th	44th	32nd
Knowledge and technology ouputs	53rd	44th	42nd	49th	31st
Creative outputs	101st	96th	94th	92nd	63rd
Overall global ranking	83rd	74th	73rd	73rd	54th

Source: The Global Innovation Index 2015, 2016, 2017, 2018, 2019;
Icons made by Freepik from www.flaticon.com

The Philippines improved in almost all the metrics which the Global Innovation Index 2019 used where *Science and Technology (S&T)* contributes to the following pillars:

- Human Capital and Research
- Infrastructure
- Business Sophistication
- Knowledge and Technology Outputs, and
- Creative Outputs

It can be observed that there has been a steady improvement in the Philippines' ranking in these areas from 2015 to 2019. This year, the country attained its highest ranking of 31st in the area of Knowledge & technology outputs. The other two GII pillars whose measurement of indicators are not directly affected by innovations in Science and Technology are: Institutions and Market sophistication.

HUMAN CAPITAL AND RESEARCH

INDICATORS

1. Education

    1.1 Expenditure on education, % GDP
    1.2 Government expenditures on education/pupil, secondary
    1.3 School life expectancy, years
    1.4 PISA scales in reading, maths & science
    1.5 Pupil-teacher ratio, secondary

2. Tertiary Education

    2.1 Tertiary enrolment, % gross
    2.2 Graduates in science & engineering, %
    2.3 Tertiary inbound mobility, %

3. Research and development (R&D)

    2.1 Researchers, FTE/million population
    2.2 Gross expenditure on R&D, % GDP
    2.3 Global R&D firms, average exp. top 3, million $US
    2.4 QS university ranking, average score top 3

DESCRIPTIONS OF SELECTED INDICATORS

Indicator	Description
Graduates in science and engineering[1]	The share of all tertiary graduates in science, manufacturing, engineering, and construction over all tertiary graduates (% of total tertiary graduates).
Researchers[2]	Researchers in R&D are professionals engaged in the conception or creation of new knowledge, products, processes, methods, or systems and in the management of the projects concerned. Postgraduate PhD students engaged in R&D are included (Researchers, full-time equivalence (FTE) (per million population).
Gross Expenditure on R&D, % GDP[3]	Total domestic intramural expenditure (US$) on R&D during a given period as a percentage of GDP. Intramural R&D expenditure is all expenditure for R&D performed within a statistical unit or sector of the economy during a specific period, whatever the source of funds.
QS University Ranking, ave. score of top 3 universities[4]	Average score of the top three universities per country. If fewer than three universities are listed in the Quacquarelli Symonds ranking of the global top 700 universities, the sum of the scores of the listed universities is divided by three, thus implying a score of zero for the non-listed universities.

Source: [1] *UNESCO Institute for Statistics, UIS online database (2006–14). (http://stats.uis.unesco.org)*
[2] *UNESCO Institute for Statistics, UIS online database (2007–14). (http://stats.uis.unesco.org)*
[3] *UNESCO Institute for Statistics, UIS online database (2007–15). (http://stats.uis.unesco.org)*
[4] *QS Quacquarelli Symonds Ltd, QS World University Ranking 2015/2016, Top Universities. (http://www.topuniversities. com/university-rankings/world-university-rankings/2015)*

Graduates in Science & Engineering

Tertiary graduates in science, manufacturing, engineering and construction over all tertiary graduates (% of total tertiary graduates)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	n/a	n/a	n/a	n/a	5 (34.5)
MALAYSIA	9 (63.40)	6 (66.49)	7 (33.3)	4 (33.8)	8 (32.1)
THAILAND	n/a	n/a	n/a	20 (26.8)	20 (27.9)
BRUNEI	n/a	n/a	6 (34.0)	8 (30.5)	11 (30.5)
VIETNAM	29 (48.02)	39 (42.90)	40 (22.4)	44 (22.7)	46 (22.7)
PHILIPPINES	n/a	26 (49.70)	27 (25.5)	17 (28.7)	18 (28.7)
INDONESIA	40 (42.71)	46 (41.35)	47 (21.7)	54 (20.7)	68 (19.4)
CAMBODIA	93 (22.09)	93 (21.39)	93 (12.5)	78 (15.4)	86 (15.4)

- Under the Human Capital and Research Pillar, the country's score and rankings improved in the Graduates in Science and Engineering indicator

  From 25.5 in 2017 with ranking 27th , the percentage of tertiary graduates in science and engineering has increased to a score in 2018 and maintaining the score in 2019 with ranks 17 and 18 respectively. Within Southeast Asia, the Philippines ranked higher than Vietnam (46th), Indonesia (68th) and Cambodia (86th).

Researchers

Researchers, headcounts (full-time equivalence per million population)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	7 (77.20)	6 (80.71)	6 (6658.5)	5 (6729.7)	5 (6729.7)
MALAYSIA	37 (21.26)	39 (21.61)	37 (2017.4)	35 (2274.0)	36 (2357.9)
THAILAND	57 (6.48)	59 (6.44)	51 (874.3)	53 (865.4)	48 (1210.4)
BRUNEI	n/a	n/a	n/a	n/a	n/a
VIETNAM	n/a	n/a	58 (674.8)	58 (672.1)	58 (700.8)
PHILIPPINES	85 (0.87)	69 (2.54)	75 (189.4)	76 (187.7)	78 (187.7)
INDONESIA	84 (1.01)	83 (0.94)	87 (89.5)	86 (89.2)	86 (89.2)
CAMBODIA	n/a	n/a	n/a	98 (30.4)	100 (30.4)

Gross Expenditure on R&D (GERD)

GERD: Gross expenditure on R&D (% of GDP)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	18 (47.93)	16 (46.05)	15 (2.2)	13 (2.2)	13 (2.2)
MALAYSIA	32 (26.61)	33 (24.68)	29 (1.3)	23 (1.3)	23 (1.3)
THAILAND	70 (8.95)	72 (7.46)	52 (0.6)	53 (0.6)	53 (0.6)
BRUNEI	n/a	n/a	n/a	n/a	n/a
VIETNAM	90 (4.24)	89 (3.43)	73 (0.4)	66 (0.4)	66 (0.4)
PHILIPPINES	105 (2.31)	97 (2.19)	96 (0.1)	97 (0.1)	97 (0.1)
INDONESIA	109 (1.68)	105 (0.95)	105 (0.1)	107 (0.1)	107 (0.1)
CAMBODIA	n/a	n/a	n/a	100 (0.1)	100 (0.1)

QS University Ranking, average score of top 3 universities

Average score of top 3 universities at the QS world university ranking

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	20 (58.37)	16 (62.70)	12 (70.3)	13 (70.2)	12 (68.9)
MALAYSIA	27 (49.43)	28 (49.13)	29 (44.4)	25 (49.3)	17 (50.6)
THAILAND	36 (40.17)	36 (38.17)	37 (33.4)	38 (32.9)	39 (28.0)
BRUNEI	n/a	n/a	75 (0.0)	61 (11.3)	53 (19.6)
VIETNAM	73 (0.0)	73 (0.0)	75 (0.0)	78 (0.0)	64 (9.9)
PHILIPPINES	45 (29.93)	47 (27.57)	47 (24.4)	48 (24.4)	51 (19.9)
INDONESIA	41 (32.90)	41 (32.33)	38 (29.8)	37 (34.9)	36 (31.3)
CAMBODIA	73 (0.0)	73 (0.0)	75 (0.0)	78 (0.0)	78 (0.0)

INFRASTRUCTURE

DESCRIPTIONS OF INFORMATION AND COMMUNICATION TECHNOLOGIES INDICATORS

Indicator	Description
ICT access[1]	The ICT access index is a composite indicator that weights five ICT indicators (20% each): (1) Fixed telephone lines per 100 inhabitants; (2) Mobile cellular telephone subscriptions per 100 inhabitants; (3) International Internet bandwidth (bit/s) per Internet user; (4) Percentage of households with a computer; and (5) Percentage of households with Internet access. It is the first sub-index in ITU's ICT Development Index (IDI).
ICT use[1]	The ICT use index is a composite indicator that weights three ICT indicators (33% each): (1) Percentage of individuals using the Internet; (2) Fixed (wired)-broadband Internet subscriptions per 100 inhabitants; (3) Active mobile-broadband subscriptions per 100 inhabitants. It is the second sub-index in ITU's ICT Development Index (IDI).
Government's online service[2]	To arrive at a set of online service index values, research teams assessed each country's national websites, including the national central portal, e-services portal, and e-participation portal as well as the websites of the related ministries of education, labour, social services, health, finance, and environment, as applicable. In addition to being assessed for content and features, the national sites were tested for a minimal level of web content accessibility as described in the *Web Content Accessibility Guidelines of the* World Wide Web Consortium.
Online e-participation[2]	This is measured to offer insight into how different countries are using online tools to promote interaction between citizen and government, as well as among citizens, for the benefit of all. The index ranges from 0 to 1, with 1 showing greater e-participation.

Source: [1] *International Telecommunication Union, Measuring the Information Society 2012, ICT Development Index 2012 (2010–11). (http://www.itu.int/ITU-D/ict/publications/idi/)*

[2] *United Nations Public Administration Network, e-Government Survey 2012 (2010–12). (http://www2.unpan.org/egovkb/)*

ICT ACCESS

ICT access index

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	13 (86.10)	14 (86.39)	11 (87.0)	12 (86.1)	9 (87.2)
MALAYSIA	54 (65.80)	55 (66.09)	59 (67.5)	56 (69.3)	43 (75.0)
THAILAND	79 (48.80)	77 (51.98)	75 (55.0)	76 (54.8)	77 (56.8)
BRUNEI	n/a	n/a	47 (72.1)	39 (74.7)	39 (76.6)
VIETNAM	91 (44.80)	89 (44.26)	90 (46.0)	89 (47.5)	90 (48.8)
PHILIPPINES	96 (43.00)	90 (43.89)	89 (47.0)	86 (48.7)	94 (47.5)
INDONESIA	95 (43.20)	84 (45.96)	88 (47.1)	87 (48.5)	85 (51.4)
CAMBODIA	106 (37.30)	101 (37.74)	99 (42.1)	100 (41.6)	102 (41.6)

ICT USE

ICT use index

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	14 (71.90)	15 (76.10)	18 (75.4)	22 (74.5)	26 (75.8)
MALAYSIA	65 (31.60)	54 (47.58)	41 (58.6)	43 (61.7)	47 (64.8)
THAILAND	66 (31.20)	60 (42.81)	63 (43.3)	62 (53.3)	61 (57.2)
BRUNEI	n/a	n/a	85 (29.7)	39 (63.0)	33 (70.3)
VIETNAM	83 (25.00)	78 (30.05)	77 (35.1)	85 (36.5)	92 (38.7)
PHILIPPINES	87 (22.80)	68 (35.45)	88 (29.3)	83 (37.0)	78 (44.7)
INDONESIA	93 (18.00)	95 (17.95)	96 (21.9)	94 (31.9)	77 (44.8)
CAMBODIA	119 (5.50)	108 (7.77)	97 (20.9)	97 (25.6)	96 (34.1)

GOVERNMENT'S ONLINE SERVICE

Government's online service index

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	2 (99.21)	2 (99.21)	3 (97.1)	3 (97.1)	2 (98.6)
MALAYSIA	31 (67.72)	31 (67.72)	40 (71.7)	40 (71.7)	27 (88.9)
THAILAND	74 (44.09)	73 (44.09)	77 (55.1)	77 (55.1)	85 (63.9)
BRUNEI	n/a	n/a	83 (50.7)	82 (50.7)	67 (72.2)
VIETNAM	79 (41.73)	78 (41.73)	72 (57.2)	72 (57.2)	57 (73.6)
PHILIPPINES	66 (48.03)	66 (48.03)	51 (66.7)	51 (66.7)	30 (88.2)
INDONESIA	90 (36.22)	88 (36.22)	102 (36.2)	102 (36.2)	92 (56.9)
CAMBODIA	122 (17.32)	112 (17.32)	126 (5.1)	125 (5.1)	123 (25.0)

ONLINE E-PARTICIPATION

E-Participation Index

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	10 (90.20)	10 (90.20)	8 (91.5)	8 (91.5)	13 (96.6)
MALAYSIA	59 (52.94)	59 (52.94)	47 (67.8)	47 (67.8)	32 (88.8)
THAILAND	54 (54.90)	54 (54.90)	65 (59.3)	65 (59.3)	80 (65.2)
BRUNEI	n/a	n/a	101 (37.3)	101 (37.3)	92 (60.7)
VIETNAM	64 (49.02)	64 (49.02)	43 (69.5)	43 (69.5)	70 (69.1)
PHILIPPINES	51 (56.86)	51 (56.86)	65 (59.3)	65 (59.3)	19 (93.8)
INDONESIA	104 (29.41)	99 (29.41)	101 (37.3)	101 (37.3)	88 (61.8)
CAMBODIA	121 (19.61)	112 (19.61)	125 (6.8)	124 (6.8)	126 (17.4)

- Under the Infrastructure Pillar, the country's score and rankings improved in the following indicators:

1. ICT use

   From 37.0 in 2018 and ranking 83rd, the ICT access index improved with a score of 44.7 and ranking 78th this year.

2. Government's Online Service

   Within Southeast Asia, the Philippines ranked 30th with a score of 88.2, followed by Thailand (85th), Brunei (67th), Vietnam (57th), Indonesia (92nd) and Cambodia (123rd).

3. Online E-Participation

   Showing greater e-participation with the use of online tools to promote interaction between citizen and government, the country did well with a score of 93.8 and ranking 19th out of 129 countries this year.

BUSINESS SOPHISTICATION

DESCRIPTION OF SELECTED KNOWLEDGE WORKERS INDICATORS

Indicator	Description
Employment in knowledge-intensive services	Sum of people in categories 1 to 3 as a percentage of total people employed, according to the International Standard Classification of Occupations (ISCO). Categories included: ISCO-08: 1 Managers, 2 Professionals, and 3 Technicians and associate professionals (years 2009–10); ISCO-88: 1 Legislators, senior officials and managers, 2 Professionals, 3 Technicians and associate professionals; ISCO-1968: 1 Professional, technical and related workers (category 0 Armed forces is excluded), 2 Administrative and managerial workers, 3 Clerical and related workers (years 2003–08).
GERD performed by business enterprise	Gross expenditure on R&D performed by business enterprise as a percentage of GDP.
GERD financed by business enterprise	Percentage of gross expenditure on R&D financed by business enterprise.

EMPLOYMENT IN KNOWLEDGE INTENSIVE SERVICES

Employment in knowledge-intensive services (% of workforce)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	2 (89.04)	2 (85.02)	2 (54.3)	2 (54.3)	1 (56.1)
MALAYSIA	57 (41.14)	51 (39.70)	53 (25.5)	51 (27.3)	50 (27.3)
THAILAND	97 (22.61)	90 (21.20)	91 (13.8)	90 (14.3)	90 (14.3)
BRUNEI	n/a	n/a	25 (40.5)	26 (40.5)	26 (40.6)
VIETNAM	101 (15.86)	94 (15.53)	94 (10.8)	95 (11.0)	117 (1.1)
PHILIPPINES	63 (39.42)	60 (36.96)	58 (24.0)	56 (25.3)	55 (25.2)
INDONESIA	102 (13.98)	96 (13.24)	96 (9.8)	96 (10.8)	97 (10.9)
CAMBODIA	110 (5.78)	100 (5.48)	102 (4.1)	97 (10.2)	107 (50.3)

- In the Business sophistication pillar, the Philippines' score in employment in knowledge-intensive services slightly increased from 25.3 (56th) last year to 25.2 (57th) this year. Among the eight (8) Southeast Asian countries, the Philippines placed fourth in 2019 with Singapore on the top list, followed by Brunei, Malaysia, Thailand, Indonesia, Cambodia and Vietnam.

GERD PERFORMED BY BUSINESS ENTERPRISE

GERD: Performed by business enterprise (%of GDP)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	17 (35.42)	16 (34.26)	16 (1.3)	15 (1.3)	16 (1.3)
MALAYSIA	26 (20.90)	27 (20.29)	32 (0.6)	27 (0.7)	25 (0.8)
THAILAND	49 (5.64)	52 (5.27)	36 (0.4)	37 (0.4)	35 (0.6)
BRUNEI	n/a	n/a	n/a	n/a	n/a
VIETNAM	71 (1.42)	68 (1.43)	52 (0.2)	48 (0.3)	42 (0.4)
PHILIPPINES	68 (1.79)	69 (1.42)	69 (0.0)	71 (0.0)	72 (0.0)
INDONESIA	79 (0.45)	75 (0.63)	76 (0.0)	76 (0.0)	78 (0.0)
CAMBODIA	n/a	n/a	n/a	79 (0.0)	81 (0.0)

GERD FINANCED BY BUSINESS ENTERPRISE

GERD: Financed by business enterprise (% of total GERD)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	16 (70.49)	17 (68.14)	16 (54.1)	16 (54.1)	19 (54.1)
MALAYSIA	11 (79.52)	11 (77.89)	75 (6.9)	23 (49.6)	16 (56.9)
THAILAND	17 (68.34)	18 (66.94)	6 (66.2)	6 (66.2)	4 (75.2)
BRUNEI	n/a	n/a	n/a	n/a	n/a
VIETNAM	53 (37.47)	54 (36.70)	36 (40.0)	13 (58.1)	8 (64.1)
PHILIPPINES	6 (81.85)	42 (47.65)	41 (36.9)	46 (36.9)	50 (36.9)
INDONESIA	n/a	n/a	n/a	n/a	n/a
CAMBODIA	n/a	n/a	n/a	66 (19.4)	67 (19.4)

DESCRIPTION OF SELECTED INNOVATION LINKAGES INDICATORS

Indicator	Description
University-industry research collaboration	Average answer to the survey question: To what extent do business and universities collaborate on research and development (R&D) in your country? (1 = Do not collaborate at all; 7 = Collaborate extensively)
State of cluster development	Mean of the average responses to two survey questions on the role of clusters in the economy. 'Clusters' are defined as geographic concentrations of firms, suppliers, producers of related products and services, and specialized institutions in a particular field. The questions are: (1) In your country, how prevalent are well-developed and deep clusters? [1 = nonexistent; 7 = widespread in many fields]; and (2) In your country, how extensive is collaboration among firms (e.g., suppliers, competitors, clients) in order to promote knowledge flows and innovation? [1 = collaboration is nonexistent; 7 = collaboration is extensive]
GERD financed by abroad	Percentage of gross expenditure on R&D financed by abroad—i.e., with foreign financing.
Patent families filed in at least three offices	Is defined as a set of interrelated patent applications filed in one or more countries/ jurisdictions to protect the same invention (either directly or through the WIPO-administered Patent Cooperation Treaty).

UNIVERSITY-INDUSTRY RESEARCH COLLABORATION

Average answer to the survey question: To what extent do business and universities collaborate on R&D In your country? (1=Do not collaborate at all; 7= Collaborate extensively)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 127 countries)	2019 (Rank out of 129 countries)
SINGAPORE	5 (76.29)	5 (76.29)	7 (74.5)	8 (71.3)	10 (70.0)
MALAYSIA	12 (72.10)	12 (72.10)	11 (70.0)	11 (69.6)	8 (72.0)
THAILAND	44 (49.23)	44 (49.23)	40 (46.2)	38 (48.6)	36 (52.2)
BRUNEI	n/a	n/a	79 (38.4)	83 (37.6)	86 (37.3)
VIETNAM	89 (37.84)	86 (37.84)	76 (38.9)	59 (41.7)	75 (38.6)
PHILIPPINES	53 (46.57)	54 (46.57)	59 (41.1)	56 (42.1)	25 (57.5)
INDONESIA	29 (59.12)	29 (59.12)	27 (57.0)	29 (55.3)	34 (53.8)
CAMBODIA	112 (32.95)	105 (32.95)	95 (34.7)	91 (35.8)	85 (37.4)

STATE OF CLUSTER DEVELOPMENT

Mean of the average responses to 2 survey questions on the role of clusters in the economy.
Question 1: In your country, how prevalent are well-developed and deep clusters? (1=nonexistent; 7=widespread in many fields; Question 2: In your country, how extensive is collaboration among firms to promote knowledge flows and innovation? (1=collaboration is nonexistent; 7=collaboration is extensive)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	11 (68.81)	12 (68.81)	11 (69.5)	9 (69.6)	11 (68.6)
MALAYSIA	8 (71.29)	5 (72.02)	12 (69.5)	12 (68.1)	8 (71.1)
THAILAND	37 (53.28)	38 (51.16)	58 (46.2)	63 (46.2)	53 (48.8)
BRUNEI	n/a	n/a	47 (48.9)	71 (44.7)	87 (41.5)
VIETNAM	72 (45.97)	56 (47.00)	50 (47.50)	64 (46.2)	74 (45.2)
PHILIPPINES	48 (50.53)	44 (49.64)	62 (45.7)	59 (46.6)	48 (50.0)
INDONESIA	24 (58.81)	27 (56.15)	28 (57.6)	25 (59.9)	27 (60.0)
CAMBODIA	61 (47.74)	61 (45.70)	44 (49.1)	47 (50.5)	44 (52.2)

GERD FINANCED BY ABROAD

GERD: Financed by abroad (% of total GERD)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	62 (7.31)	63 (7.47)	57 (6.8)	53 (6.8)	54 (6.8)
MALAYSIA	66 (5.63)	68 (5.88)	96 (0.2)	82 (1.7)	91 (0.9)
THAILAND	77 (2.94)	75 (3.20)	81 (1.5)	85 (1.5)	92 (0.9)
BRUNEI	n/a	n/a	n/a	n/a	n/a
VIETNAM	71 (4.86)	72 (5.11)	82 (1.5)	68 (2.9)	64 (4.5)
PHILIPPINES	70 (5.02)	80 (2.35)	77 (1.8)	79 (1.8)	80 (1.8)
INDONESIA	n/a	n/a	n/a	n/a	n/a
CAMBODIA	n/a	n/a	n/a	10 (34.9)	9 (34.9)

PATENT FAMILIES FILED IN AT LEAST TWO OFFICES

Number of patent families filed by residents in at least two offices (per billion PPP $GDP)

Country	Ranking (Raw Score/Data)				
	2015* (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	19 (51.52)	20 (35.81)	19 (2.8)	18 (2.2)	18 (2.2)
MALAYSIA	56 (8.64)	48 (7.05)	45 (0.3)	40 (0.2)	50 (0.2)
THAILAND	90 (2.10)	85 (1.17)	77 (0.1)	64 (0.1)	58 (0.1)
BRUNEI	n/a	n/a	63 (0.1)	67 (0.1)	93 (0.0)
VIETNAM	96 (1.10)	90 (0.68)	96 (0.0)	98 (0.0)	84 (0.0)
PHILIPPINES	77 (4.32)	91 (0.67)	79 (0.1)	91 (0.1)	76 (0.0)
INDONESIA	105 (0.35)	112 (0.01)	117 (0.0)	113 (0.0)	91 (0.0)
CAMBODIA	n/a	n/a	93 (0.0)	88 (0.0)	93 (0.0)

* Patent families filed in at least three offices

- The GII report reveals the improvement of the country in terms of the following innovation linkages:

1. University-industry research collaboration

   From 42.1 in 2018 and ranking 56th, collaboration with academe and industry improved with a score of 57.5 and ranking 25th this year. This means recognizing the efforts of various government agencies in advancing innovation, as well as strengthening linkages with academe and industry.

2. State of cluster development

   Showing the extensive collaboration among firms in promoting knowledge flows and innovation, the country performed well with a score of 50.0 and ranking 48th out of 129 countries this year.

3. Patent families filed in at least three offices

   From a score of 0.1 in 2018 and ranking 91st, the set of patent applications filed in one or more countries slightly improved with ranking 76th while with a score of 0.0 this year.

DESCRIPTION OF SELECTED KNOWLEDGE ABSORPTION INDICATORS

Indicator	Description
Intellectual property payments	Charges for the use of intellectual property not included elsewhere payments (% of total trade) according to the Extended Balance of Payments Services Classification EBOPS 2010—that is, code SH Charges for the use of intellectual property not included elsewhere as a percentage of total trade. 'Total trade' is defined as the sum of total imports code G goods and code SOX commercial services (excluding government goods and services not included elsewhere) plus total exports of code G goods and code SOX commercial services (excluding government goods and services not included elsewhere), divided by 2.
High-tech imports	High-technology imports minus reimports over total imports minus reimports. The list of commodities contains technical products with a high intensity of R&D, based on the Eurostat classification, itself based on SITC Rev.4 and the Organisation for Economic Co-operation and Development (OECD) definition. Commodities belong to the following sectors: aerospace; computers & office machines; electronics, telecommunications; pharmacy; scientific instruments; electrical machinery; chemistry; nonelectrical machinery; and armament.
Communications, computer and information services imports	Communication, computer and information services imports (% of total service imports) according to the Extended Balance of Payments Services Classification EBOPS 2002, including codes 245 Communications services (postal, courier services, and telecommunications services); and/or 262 Computer and information services, as a percentage of code 200 Total services.

INTELLECTUAL PROPERTY PAYMENTS

Intellectual property payments (% of total trade)

Country	Ranking (Raw Score/Data)				
	2015* (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	1 (100.00)	n/a	n/a	n/a	n/a
MALAYSIA	51 (17.03)	n/a	n/a	n/a	n/a
THAILAND	12 (48.42)	n/a	n/a	n/a	n/a
BRUNEI	n/a	n/a	n/a	n/a	n/a
VIETNAM	n/a	n/a	n/a	n/a	n/a
PHILIPPINES	44 (21.59)	n/a	n/a	n/a	n/a
INDONESIA	40 (24.56)	n/a	n/a	n/a	n/a
CAMBODIA	97 (3.37)	n/a	n/a	105 (0.1)	n/a

* Royalty and license fees, payments (% of total trade)

HIGH-TECH IMPORTS

High-tech net imports (% of total trade)

Country	Ranking (Raw Score/Data)				
	2015* (Rank out of 141 countries)	2016* (Rank out of 128 countries)	2017* (Rank out of 127 countries)	2018* (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	6 (87.54)	4 (83.92)	5 (21.4)	1 (28.6)	7 (21.2)
MALAYSIA	1 (100.00)	3 (97.11)	1 (24.7)	1 (25.6)	3 (26.4)
THAILAND	15 (59.30)	12 (60.80)	12 (15.6)	11 (15.5)	12 (15.3)
BRUNEI	n/a	n/a	96 (6.0)	58 (1.6)	92 (6.1)
VIETNAM	4 (93.55)	6 (82.59)	3 (22.6)	4 (23.8)	1 (26.5)
PHILIPPINES	n/a	n/a	n/a	n/a	5 (23.2)
INDONESIA	52 (29.80)	60 (29.15)	58 (8.5)	54 (9.0)	49 (8.5)
CAMBODIA	108 (11.28)	107 (13.84)	122 (2.9)	120 (3.1)	125 (2.7)

* High-tech net imports (% of total trade)

- The Philippines has a wonderful performance under Knowledge Absorption with the improved level of ranking on high-tech imports. The country's score reached 23.2 (5th) followed by Singapore (7th), Thailand (12th), Indonesia (49th), Brunei (92nd) and Cambodia (125th). On the top of the list are Vietnam (1st) and Malaysia (3rd).

COMMUNICATIONS, COMPUTER AND INFORMATION SERVICES IMPORTS

ICT Services Imports – Telecommunications, computers and information services imports (% of total trade)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016* (Rank out of 128 countries)	2017* (Rank out of 127 countries)	2018* (Rank out of 126 countries)	2019* (Rank out of 129 countries)
SINGAPORE	85 (16.53)	38 (24.65)	33 (1.7)	69 (1.4)	11 (2.7)
MALAYSIA	43 (38.05)	48 (22.19)	38 (1.6)	37 (1.6)	48 (1.4)
THAILAND	115 (4.88)	115 (4.37)	117 (0.2)	116 (0.2)	123 (0.2)
BRUNEI	n/a	n/a	113 (0.3)	115 (0.3)	86 (0.8)
VIETNAM	n/a	120 (0.64)	123 (0.1)	45 (0.3)	126 (0.0)
PHILIPPINES	75 (20.72)	72 (14.57)	68 (1.0)	82 (0.8)	83 (0.8)
INDONESIA	73 (20.83)	73 (14.37)	66 (1.0)	54 (1.3)	54 (1.3)
CAMBODIA	94 (13.54)	87 (10.34)	87 (0.7)	93 (0.6)	97 (0.69)

- Communications, computer and information services imports (% of total services imports)

KNOWLEDGE AND TECHNOLOGY OUTPUTS

DESCRIPTION OF KNOWLEDGE CREATION INDICATORS

Indicator	Description
National office resident patent applications	Number of patent applications filed by residents at the national patent office. Data are scaled by PPP$ GDP (billions). 'Patent' is defined in the description of indicator 5.2.5. Patent applications by resident data are based on 'equivalent count', by which applications at regional offices are multiplied by the corresponding number of member states. (SOURCE:WIPO)
Patent Cooperation Treaty resident applications	Number of patent applications filed by residents under the World Intellectual Property Organization (WIPO)-administered Patent Cooperation Treaty (PCT). Data are reported for PCT member countries only, and scaled by PPP$ GDP (billions). 'Patent' is defined in the description of indicator 5.2.5. PCT applications are assigned to a particular country of origin according to the country of residence of the first-named applicant. The PCT system simplifies the process of multiple national patent filings by reducing the requirement to file a separate application in each jurisdiction. However, the decision of whether to grant patent rights remains in the hands of national and regional patent offices, and the patent rights remain limited to the jurisdiction of the patent granting authority. The PCT international application process starts with the international phase, during which an international search and, possibly, a preliminary examination are performed, and concludes with the national phase, during which national and regional patent offices decide on the patentability of an invention according to national law. (Source: WIPO)
National office resident utility model applications	Number of utility model (UM) applications filed by residents at the national patent office. (SOURCE: WIPO)
Scientific and technical publications	The number of scientific and engineering articles published in the following fields: physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences. (Source: Thompson Reuters, Web of Science; Science Citation Index; Social Sciences Citation Index; IMF; World Economic Outlook)
Citable documents H index	The H index is an economy's number of published articles (H) that have received at least H citations, in the period 1996–2011. It quantifies both country scientific productivity and scientific impact and is also applicable to scientists, journals, etc. (Source: SCImago Journal & Cöuntry Rank; http://www.scimagojr.com)

NATIONAL OFFICE RESIDENT PATENT APPLICATIONS

Patent applications by origin (Number of resident patent applications filed at a given national or regional patent office

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016* (Rank out of 128 countries)	2017* (Rank out of 127 countries)	2018* (Rank out of 126 countries)	2019* (Rank out of 129 countries)
SINGAPORE	37 (19.97)	37 (16.19)	33 (3.1)	32 (3.3)	33 (3.0)
MALAYSIA	49 (13.03)	52 (9.88)	54 (1.6)	59 (1.3)	57 (1.2)
THAILAND	51 (12.28)	67 (5.23)	66 (0.9)	65 (0.9)	69 (0.8)
BRUNEI	n/a	n/a	68 (0.8)	73 (0.8)	92 (0.2)
VIETNAM	65 (6.96)	66 (5.29)	61 (1.1)	67 (0.9)	65 (0.9)
PHILIPPINES	82 (2.45)	77 (2.62)	75 (0.5)	84 (0.4)	82 (0.4)
INDONESIA	86 (1.85)	90 (1.37)	81 (0.4)	85 (0.4)	72 (0.7)
CAMBODIA	112 (0.0)	113 (0.11)	118 (0.0)	120 (0.0)	121 (0.0)

- Number of patent applications filed by residents at the national patent office (per billion PPP$ GDP)

PATENT COOPERATION TREATY RESIDENT APPLICATIONS

Number of international patent applications filed by residents at the PCT (per billion PPP$ GDP)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016* (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018* (Rank out of 126 countries)	2019* (Rank out of 129 countries)
SINGAPORE	20 (25.36)	19 (27.09)	19 (1.8)	20 (1.7)	20 (1.7)
MALAYSIA	42 (5.08)	45 (4.57)	50 (0.2)	57 (0.2)	58 (0.1)
THAILAND	67 (0.79)	59 (1.64)	60 (0.1)	60 (0.1)	69 (0.1)
BRUNEI	n/a	n/a	56 (0.1)	74 (0.1)	83 (0.0)
VIETNAM	94 (0.12)	81 (0.50)	100 (0.0)	88 (0.0)	82 (0.0)
PHILIPPINES	79 (0.57)	82 (0.48)	89 (0.0)	97 (0.0)	90 (0.0)
INDONESIA	98 (0.03)	96 (0.0)	103 (0.0)	107 (0.0)	97 (0.0)
CAMBODIA	n/a	n/a	n/a	n/a	n/a

- PCT international applications by origin

NATIONAL OFFICE RESIDENT UTILITY MODEL APPLICATIONS

Utility model applications by origin

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016* (Rank out of 128 countries)	2017* (Rank out of 127 countries)	2018* (Rank out of 126 countries)	2019* (Rank out of 129 countries)
SINGAPORE	n/a	n/a	n/a	n/a	n/a
MALAYSIA	53 (1.39)	51 (1.70)	51 (0.1)	52 (0.1)	48 (0.1)
THAILAND	19 (25.71)	18 (28.33)	16 (1.9)	11 (2.1)	13 (1.9)
BRUNEI	n/a	n/a	n/a	n/a	n/a
VIETNAM	37 (7.40)	34 (8.48)	35 (0.6)	35 (0.5)	35 (0.4)
PHILIPPINES	23 (18.29)	21 (23.36)	23 (1.1)	18 (1.4)	15 (1.6)
INDONESIA	54 (1.26)	54 (1.18)	53 (0.1)	48 (0.1)	54 (0.1)
CAMBODIA	n/a	n/a	n/a	n/a	n/a

- Number of utility model applications filed by residents at the National Patent Office (per billion PPP$ GDP)

- Under the Knowledge and Technology Outputs, the level of ranking both in the national office resident patent applications, patent cooperation treaty resident applications and national office resident utility model applications improved from last year.
- In the National Office Resident Utility Model Applications (or Utility Model Applications by Origin) sub-index pillar the Philippines seconded Thailand which ranked 13th out of 129 countries this year. The Philippines received a score of 1.6, gaining its rank of 15th in this indicator. These were followed by Vietnam (35th), Malaysia (48th) and Indonesia (54th)

SCIENTIFIC AND TECHNICAL PUBLICATIONS

Number of scientific and technical journal articles (per billion PPP$ GDP)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	33 (38.71)	29 (39.71)	28 (26.1)	27 (18.9)	28 (17.5)
MALAYSIA	54 (20.74)	55 (18.63)	58 (12.3)	58 (8.6)	59 (8.0)
THAILAND	85 (9.71)	86 (8.67)	84 (6.5)	84 (4.6)	86 (4.5)
BRUNEI	n/a	n/a	88 (6.1)	89 (4.0)	102 (3.1)
VIETNAM	99 (6.78)	95 (6.80)	94 (5.6)	79 (4.9)	74 (5.6)
PHILIPPINES	131 (1.94)	123 (1.43)	120 (1.6)	120 (1.1)	123 (0.9)
INDONESIA	137 (0.48)	127 (0.00)	124 (0.7)	123 (0.5)	125 (0.6)
CAMBODIA	106 (6.14)	98 (6.36)	99 (5.0)	109 (2.3)	109 (2.3)

CITABLE DOCUMENTS H INDEX

The H Index is the economy's number of published articles (H) that have received at least H citations in the period 1996-2011)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	27 (32.03)	27 (32.86)	25 (33.9)	24 (35.6)	23 (36.5)
MALAYSIA	51 (14.33)	48 (14.31)	45 (15.0)	43 (16.1)	43 (17.0)
THAILAND	38 (19.22)	38 (19.15)	38 (19.3)	38 (19.9)	38 (20.2)
BRUNEI	n/a	n/a	116 (2.1)	118 (2.0)	119 (1.9)
VIETNAM	58 (11.83)	58 (11.09)	58 (10.6)	57 (11.3)	57 (11.7)
PHILIPPINES	54 (12.81)	55 (12.50)	54 (12.5)	54 (13.1)	54 (13.4)
INDONESIA	56 (12.27)	56 (11.79)	55 (11.8)	56 (12.0)	55 (12.7)
CAMBODIA	112 (4.78)	104 (4.23)	103 (4.0)	98 (4.4)	99 (4.3)

DESCRIPTION OF KNOWLEDGE IMPACT INDICATORS

Indicator	Description
Total computer software spending	Computer software spending includes the total value of purchased or leased packaged software such as operating systems, database systems, programming tools, utilities, and applications. It excludes expenditures for internal software development and outsourced custom software development.
High-tech and medium-high-tech output	High-tech and medium-high-tech output as a percentage of total manufactures output, on the basis of the Organisation for Economic Co-operation and Development (OECD) classification of Technology Intensity Definition, itself based on International Standard Industrial Classification ISIC Revision 3.

TOTAL COMPUTER SOFTWARE SPENDING

Total computer software spending (% of GDP)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	21 (31.26)	24 (27.37)	34 (0.3)	35 (0.3)	41 (0.3)
MALAYSIA	20 (34.39)	21 (31.43)	29 (0.4)	29 (0.4)	29 (0.4)
THAILAND	26 (27.16)	31 (22.82)	47 (0.3)	51 (0.3)	61 (0.2)
BRUNEI	n/a	n/a	n/a	n/a	n/a
VIETNAM	31 (24.79)	33 (22.46)	39 (0.3)	45 (0.3)	38 (0.3)
PHILIPPINES	53 (18.97)	53 (16.71)	61 (0.3)	64 (0.2)	55 (0.3)
INDONESIA	44 (21.08)	32 (22.57)	36 (0.3)	31 (0.3)	33 (0.3)
CAMBODIA	n/a	n/a	112 (0.0)	111 (0.0)	115 (0.0)

HIGH-TECH AND MEDIUM HIGH-TECH OUTPUT

High-tech and medium-high-tech output (% of total manufactures output)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	1 (100.00)	1 (100.00)	2 (0.6)	1 (0.7)	1 (0.8)
MALAYSIA	19 (60.62)	26 (53.41)	28 (0.4)	14 (0.4)	17 (0.4)
THAILAND	11 (63.33)	20 (60.55)	19 (0.4)	15 (0.4)	18 (0.4)
BRUNEI	n/a	n/a	99 (0.0)	96 (0.0)	101 (0.0)
VIETNAM	44 (37.73)	48 (36.99)	46 (0.3)	47 (0.2)	27 (0.4)
PHILIPPINES	62 (23.44)	12 (63.12)	18 (0.4)	27 (0.4)	25 (0.4)
INDONESIA	36 (44.54)	38 (43.88)	43 (0.3)	35 (0.3)	35 (0.3)
CAMBODIA	n/a	n/a	n/a	n/a	n/a

- The GII report reveals the improvement of the country in terms of the following knowledge impact indicators:

1. Total computer software spending

   From 0.2 in 2018 and ranking 64th, the total computer spending increased 9 steps with a score of 0.3 and ranking 55th this year.

2. High-tech and medium high-tech output

   From 0.4 in 2018 and ranking 27th, high-tech and medium high-tech output slightly increased its rank to 25.

DESCRIPTION OF SELECTED KNOWLEDGE DIFFUSION INDICATORS

Indicator	Description
Intellectual property receipts	Charges for the use of intellectual property not included elsewhere receipts (% of total trade) according to the Extended Balance of Payments Services Classification EBOPS 2010—that is, code SH Charges for the use of intellectual property not included elsewhere as a percentage of total trade. 'Total trade' is defined as the sum of total imports code G goods and code SOX commercial services (excluding government goods and services not included elsewhere) plus total exports of code G goods and code SOX commercial services (excluding government goods and services not included elsewhere), divided by 2.
High-tech exports	High-technology exports minus reexports over total exports minus reexports.

INTELLECTUAL PROPERTY RECEIPTS

Intellectual property receipts (% of total trade)

Country	Ranking (Raw Score/Data)				
	2015* (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	26 (36.57)	n/a	n/a	n/a	n/a
MALAYSIA	74 (8.17)	n/a	n/a	n/a	n/a
THAILAND	61 (13.55)	n/a	n/a	n/a	n/a
BRUNEI	n/a	n/a	n/a	n/a	n/a
VIETNAM	n/a	n/a	n/a	n/a	n/a
PHILIPPINES	98 (0.91)	n/a	n/a	n/a	n/a
INDONESIA	80 (5.01)	n/a	n/a	n/a	n/a
CAMBODIA	82 (4.72)	n/a	n/a	n/a	n/a

- Royalty & license fees, receipts (% of total trade)

HIGH-TECH NET EXPORTS

High-tech net exports (% of total net exports)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	1 (100.00)	1 (100.00)	3 (29.1)	1 (28.6)	1 (27.4)
MALAYSIA	1 (100.00)	1 (100.00)	1 (32.3)	1 (33.3)	1 (34.1)
THAILAND	14 (55.92)	10 (53.74)	9 (15.2)	8 (15.5)	8 (15.0)
BRUNEI	n/a	n/a	62 (1.4)	58 (1.6)	44 (3.1)
VIETNAM	1 (100.00)	4 (83.86)	4 (26.8)	1 (29.9)	1 (32.9)
PHILIPPINES	n/a	n/a	n/a	n/a	1 (32.7)
INDONESIA	43 (13.21)	41 (12.15)	43 (3.5)	54 (9.0)	43 (3.1)
CAMBODIA	70 (3.13)	66 (2.71)	69 (0.9)	120 (3.1)	65 (1.1)

- The Philippines performed well this year having a score of 32.7 and ranking 1st out of 129 countries.
- Among the ASEAN members, the country ranked 1st together with Singapore, Vietnam and Malaysia.

CREATIVE OUTPUTS

DESCRIPTION OF SELECTED INTANGIBLE ASSETS INDICATORS

Indicator	Description
ICTs and business model creation	Average answer to the question: To what extent are information and communication technologies creating new business models, services and products in your country? [1 = not at all; 7 = a significant extent]
ICTs and organizational models creation	Average answer to the question: To what extent are information and communication technologies creating new organizational models (e.g., virtual teams, remote working, telecommuting) within businesses in your country? [1 = not at all; 7 = a significant extent]

ICT AND BUSINESS MODEL CREATION

Average answer to the question: To what extent are ICT creating new business models, services and products In your country? (1= not at all; 7= a significant extent)

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	9 (75.63)	6 (79.46)	7 (81.5)	8 (80.7)	7 (80.4)
MALAYSIA	10 (75.04)	10 (77.08)	20 (76.2)	20 (76.4)	21 (74.4)
THAILAND	44 (61.20)	41 (63.61)	39 (67.1)	33 (69.3)	39 (67.3)
BRUNEI	n/a	n/a	93 (51.9)	85 (55.3)	74 (58.0)
VIETNAM	52 (59.39)	66 (57.67)	78 (57.1)	80 (56.6)	83 (56.1)
PHILIPPINES	48 (60.47)	57 (60.28)	60 (60.9)	58 (60.8)	32 (68.9)
INDONESIA	32 (65.32)	46 (62.74)	52 (62.9)	48 (65.1)	40 (67.1)
CAMBODIA	77 (53.15)	69 (56.78)	61 (60.7)	74 (57.7)	66 (60.1)

ICTs AND ORGANIZATIONAL MODEL CREATION

Average answer to the survey question: In your country, to what extent do ICTs enable new organizational models (e.g. virtual teams, remote working, telecommuting) within businesses? [1 = not at all; 7 = to a great extent]

Country	Ranking (Raw Score/Data)				
	2015 (Rank out of 141 countries)	2016 (Rank out of 128 countries)	2017 (Rank out of 127 countries)	2018 (Rank out of 126 countries)	2019 (Rank out of 129 countries)
SINGAPORE	11 (72.23)	11 (74.53)	9 (76.7)	11 (75.9)	14 (74.6)
MALAYSIA	4 (74.87)	8 (76.27)	18 (73.7)	18 (72.5)	17 (71.9)
THAILAND	66 (52.69)	49 (56.48)	43 (58.9)	40 (59.9)	43 (60.3)
BRUNEI	n/a	n/a	81 (47.7)	86 (48.2)	89 (47.5)
VIETNAM	69 (52.18)	65 (53.41)	61 (54.2)	66 (53.3)	63 (54.4)
PHILIPPINES	38 (60.25)	46 (57.11)	57 (54.8)	62 (53.6)	39 (61.7)
INDONESIA	33 (61.31)	38 (59.78)	38 (59.8)	34 (63.2)	27 (65.4)
CAMBODIA	58 (55.18)	63 (53.81)	52 (55.6)	46 (59.3)	41 (60.6)

- The GII report shows the improvement of the country in terms of the following indicators under the Creative Outputs Pillar:

1. ICT and business model creation

   From 60.8 in 2018 and ranking 58th, ICT creating new business models, services and products climbed a rank of 32nd with a score of 68.9 this year.

2. ICTs and organizational model creation

   The country stepping up from a score of 53.6 (62nd rank) in 2018 to 61.7 (39th rank) this year.

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