




THE ARAB WORLD LANDSCAPE IN THE GLOBAL INNOVATION INDEX (GII) 2020

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As the world is struggling to cope with the COVID-19 crisis, now more than ever, innovation—primarily in finding treatments and a vaccine—is humanity’s best hope to overcome the economic lockdown.

GLOBAL INNOVATION INDEX 2020

“Every crisis brings opportunities and room for creative disruption. One side effect of the current crisis has been to stimulate interest in innovative solutions for health, naturally, but also for areas such as remote work, distance education, e-commerce, and mobility solutions. Unleashing these positive forces may well support societal goals.”





Institutions

Political, Regulatory & Business Environment

01



Human Capital

Base & Tertiary Education, R&D

02



Infrastructure

ICTs, General and Environmental Infrastructure

03



Market Sophistication

Credit, Investment & Trade

04



Business Sophistication

Knowledge workers & absorption, Innovation links

05



Knowledge & Technology Output

Knowledge Creation, Impact & Diffusion

06



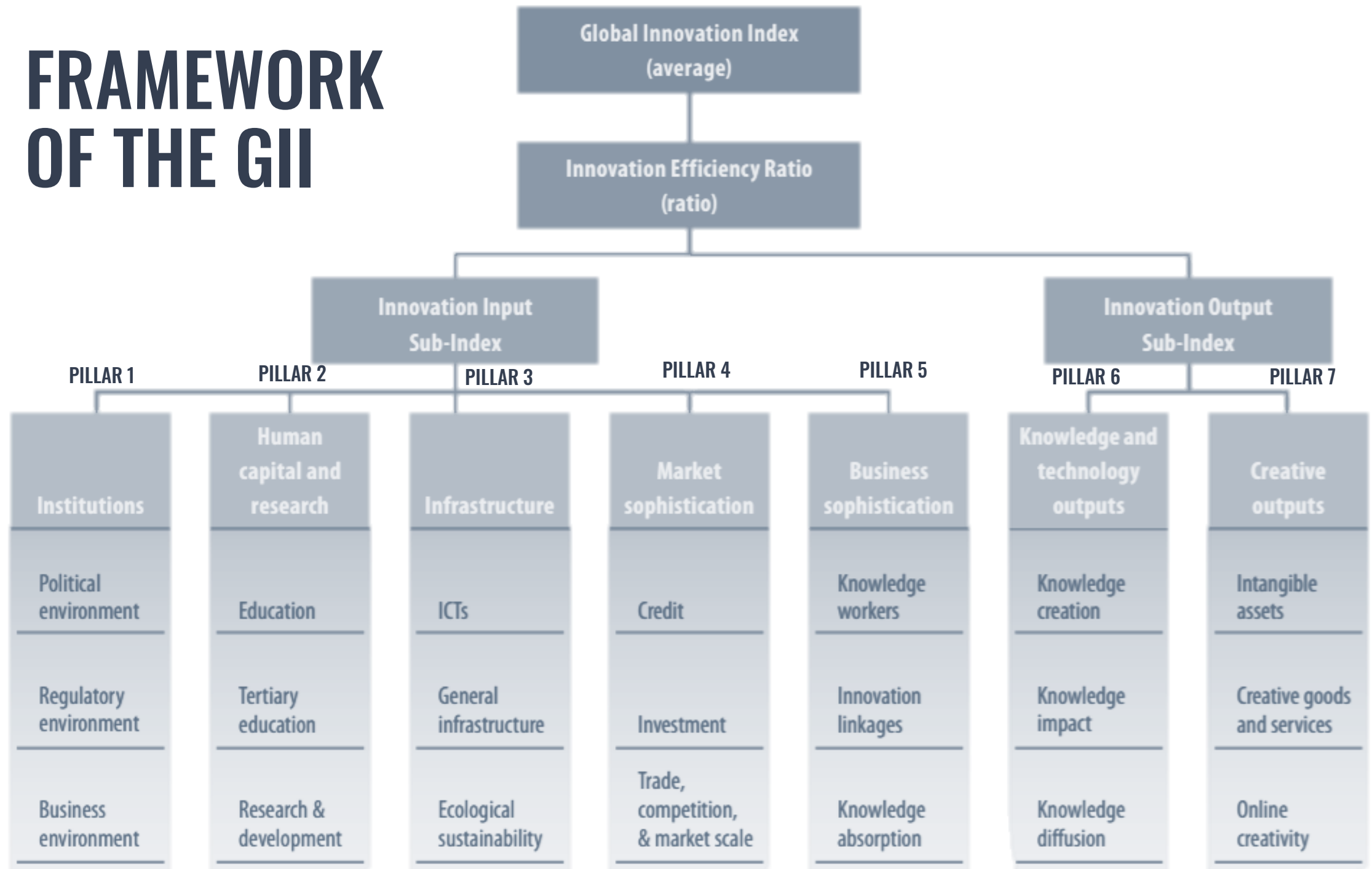
Creative Outputs

Intangible assets, Creative Goods, and Online Creativity

07

PILLARS

FRAMEWORK OF THE GII





INSTITUTIONS

PILLAR 1

Political Environment

Political and operational stability

Measures the likelihood and severity of political, legal, operational or security risks impacting business operations.

Government Effectiveness

Index that reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

Regulatory Environment

Regulatory quality

Index that reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private-sector development.

Rule of Law

Index that reflects the extent to which agents have confidence in and abide by the rules of society, quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

Cost of Redundancy dismissal

Sum of notice period and severance pay for redundancy dismissal (salary in weeks, averages for workers with 1, 5, and 10 years of tenure, with a minimum threshold of 8 weeks)

Business Environment

Ease of starting a business

The World Bank's Doing Business records all procedures for an entrepreneur to start up a business, as well as the time and cost to complete these procedures and the paid-in minimum capital requirement.

Ease of resolving insolvency

Average of the scores for the recovery rate and the strength of insolvency framework index. The latter is based on four other indices: commencement of proceedings index, management of debtor's assets index, reorganization proceedings index, and creditor participation index.

Captures the institutional framework of a country.



HUMAN CAPITAL & RESEARCH

PILLAR 2

Education



Expenditure on Education

Total Government expenditure on education (current, capital, and transfers), as % of GDP.

Government funding per 2ndary student

Total general initial government funding of education per student (transfers paid less transfers received) as % of GDP per capita.

School life Expectancy

School life expectancy, primary to tertiary education, both sexes (years).

Assessment in reading, mathematics, and science

School life expectancy, primary to tertiary education, both sexes (years).

Pupil-teacher ratio, 2ndary

Number of pupils enrolled in 2ndary school divided by the number of 2ndary school teachers.

Tertiary Education



Tertiary Enrollment

School enrolment, tertiary (% gross)

Graduates in science and engineering

Tertiary graduates in science, technology, engineering, and mathematics (% of total tertiary graduates)

Tertiary inbound mobility

The number of students from abroad studying in a given country as a percentage of the total tertiary-level enrolment in that country.

Research & Development



Researchers FTE

Researchers, full-time equivalent (FTE) (per million population) engaged in the management, conception or creation of new knowledge, products, processes, methods, or systems.

Gross expenditure on R&D

Gross expenditure on R&D (% of GDP).

Global R&D companies, average expenditure, top 3

Average expenditure of the top 3 global companies by R&D, mn US\$*

QS university ranking score of top 3 universities

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

Measures the level and standard of education and research activity in a country, prime determinants of the innovation capacity of a nation.





INFRASTRUCTURE

ICTs

ICT access

Index that includes 5 ICT indicators (20% each): Fixed and mobile telephone subscriptions/100 inhabitants;; International Internet bandwidth/Internet user; % of households with a computer and Internet access.

ICT use

Index that includes 3 ICT indicators (33% each): % of individuals using Internet; Fixed (wired)-broadband and mobile broadband Internet subscriptions/100 inhabitants.

Government Online service

Index that measures the use of ICTs by governments in delivering public services at the national level

Online e-participation

Index that measures government's use of online services in providing information to its citizens.

General Infrastructure

Electricity Output

Electricity production (GWh per mn population). Hydropower, coal, oil, gas, nuclear power generation, geothermal, solar, wind, tide and wave energy, and combustible renewables and waste.

Logistics performance

Index that assesses 6 components are: Customs; Trade and Transport Infrastructure, International shipments; Logistics Services; Tracking and tracing; and Timeliness of shipments.

Gross Capital Formation

Gross capital formation is expressed as a ratio of total investment in current local currency to GDP.

Ecological Sustainability

GDP per unit of energy use

Purchasing power parity gross domestic product (PPP\$ GDP) per kilogram of oil equivalent of energy use.

Environmental Performance

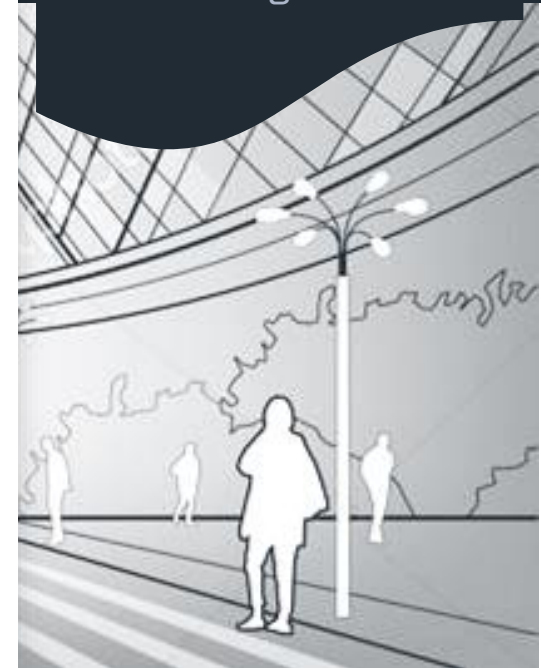
Index that assesses how close countries are to established environmental policy targets, based on 32 environmental performance indicators

ISO 14001 environment certificates

Specifies the requirements for an environmental management system that an organization can use to enhance its environmental performance. Number of certificates issued (per billion PPP\$ GDP).

PILLAR 3

Friendly communication, transport, and energy infrastructures facilitate the exchange of ideas, services, and goods & feed into the innovation system through increased productivity and efficiency, lower transaction costs, better access to markets, and sustainable growth.





MARKET SOPHISTICATION

PILLAR 4

Credit



Ease of getting credit

Sum of the strength of the legal rights index (range 0–12) and the depth of credit information index (range 0–8).

Domestic credit to private sector

Expressed as % of GDP. Financial resources provided to the private sector by financial corporations, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable that establish a claim for repayment.

Microfinance institutions gross loan portfolio

Combined gross loan balances of microfinance institutions (current US\$) in a country as a percentage of its GDP (current US\$).

Investment



Ease of protecting minority investors

Sum of the scores for the extent of conflict of interest regulation index and the extent of shareholder governance index.

Market Capitalization

Aka “market value”, it refers to the share price times the number of shares outstanding (including their several classes) for listed domestic companies. (% of GDP, 3-years average)

Venture Capital Deals

Corresponds to a query on venture capital deals, with the data collected by investment location (per billion PPP\$ GDP)

Trade, competition, and market scale



Applied tariff rate, weighted average

“Weighted mean applied tariff” is the average of effectively applied rates weighted by the product import shares corresponding to each partner country (%).

Intensity of local competition

Average answer to the survey question: In your country, how intense is competition in the local markets? [1 = not intense at all; 7 = extremely intense]†

Domestic market scale

Measured by gross domestic product (GDP) based on the purchasing-power-parity (PPP) valuation of country GDP, in current international dollars (billions).

The availability of credit and an environment that supports investment, access to the international market, competition, and market scale are all critical for businesses to prosper and for innovation to occur.





BUSINESS SOPHISTICATION

PILLAR 5

Knowledge workers



Knowledge-intensive employment

Employment in knowledge-intensive occupations (managers, professionals and technicians) (% of workforce)

Firms offering formal training

% of firms offering formal training programs for their full-time employees

GERD performed by business enterprise

Gross expenditure on R&D performed by business enterprise as a % of GDP.

GERD financed by business enterprise

Gross expenditure on R&D financed by business enterprise as a % of total GERD

Females employed with advanced degrees

Females employed with advanced degrees, % total employed (25+ years old)

Innovation linkages



University/industry research collaboration

Average answer/country to the question: To what extent do businesses and universities collaborate on R&D?

State of cluster development

Average answer/country to the question: How widespread are well-developed and deep clusters?

GERD financed by abroad

% of GERD financed by abroad (billions, national currency)—that is, with foreign financing as a percentage of GDP (billions, national currency)

Joint venture/strategic alliance deals

Number of deals, fractional counting (per billion PPP\$ GDP)

Patent families filed in two offices

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

Knowledge absorption



Intellectual property payments

Charges for use of intellectual property, i.e., payments (% of total trade, three-year average)

High-tech imports

High-technology imports as a percentage of total trade. aerospace; computers & office machines; electronics; telecommunications; pharmacy; scientific instruments; electrical machinery; chemistry; non-electrical machinery; and armament.

ICT services imports

Telecommunications, computers, and information services imports (% of total trade)

Foreign direct investment net inflows

Foreign direct investment (FDI), net inflows (% of GDP, three-year average)

Captures the level of business sophistication to assess how conducive firms are to innovation activity. Asserts that businesses foster their productivity, competitiveness, and innovation potential with the employment of highly qualified professionals and technician.





KNOWLEDGE & TECHNOLOGY OUTPUTS PILLAR 6

Knowledge Creation



Patent applications by origin

Number of resident patent applications filed at a given national or regional patent office (per billion PPP\$ GDP)

PCT applications by origin

Number of Patent Cooperation Treaty applications (per billion PPP\$ GDP). PCT app is an international patent app filed through the WIPO

Utility models by origin

Number of resident utility model applications (per billion PPP\$ GDP). A “utility model” (UM) is a special form of patent right.

Scientific and technical publications

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

Citable documents H-index

The H-index is the economy's number of published articles (H) that have received at least H citations.

Knowledge Impact



Growth rate of GDP per person engaged

Measure of labor productivity defined as output per unit of labor input (in %, 3-year average)

New business density

Number of newly registered corporations per 1,000 working-age (15–64 years old)

Total computer software spending

Total compute software spending: operating systems, database systems, programming tools, utilities, and applications (% of GDP)

ISO 9001 quality certificates

ISO 9001 Quality management systems Requirements: Number of certificates issued (per billion PPP\$ GDP)

High-tech and medium-high-tech manufacturing

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

Knowledge Diffusion



Intellectual property receipts

Charges for use of intellectual property, i.e., receipts (% of total trade, three-year average)

High-tech net exports

High-technology exports minus re-exports (% of total trade).

ICT services exports

Telecommunications, computers, and information services exports (% of total trade)

Foreign direct investment net outflows

Foreign direct investment (FDI), net outflows (% of GDP, three-year average)

This pillar covers all those variables that are traditionally thought to be the fruits of inventions and/ or innovations



CREATIVE OUTPUTS

PILLAR 7

Intangible assets

Trademark application class count by origin

Number of classes in resident trademark applications (per billion PPP\$ GDP). A “trademark” is a sign used by the owner of certain products or services.

Global brand value

Sum of Global Brand Values, top 5,000 (% of GDP)

Industrial designs by origin

Number of designs contained in resident industrial design applications (per billion PPP\$ GDP). An “industrial design” is a set of exclusive rights granted to applicants for protecting the aesthetic aspect of their products.

ICTs & organizational model creation

Average answer to the question: In your country, to what extent do ICTs enable new organizational models (e.g., virtual teams, remote working, telecommuting) within companies?

Creative Goods & Services

Cultural & creative services exports

Creative services exports: Advertising, market research, Audiovisual, Heritage and recreational services (% of total trade)

National feature films produced

Number of national feature films produced (per million population 15–69 years old)

Entertainment & media market

Global entertainment and media market (per thousand population 15–69 years old)

Printing publications & other media output

Printing, and reproduction of recorded media output (% of manufactures total output)

Creative good exports

Creative goods exports (% of total trade)

Online Creativity

Intellectual property receipts

Charges for use of intellectual property, i.e., receipts (% of total trade, three-year average)

High-tech net exports

High-technology exports minus re-exports (% of total trade).

ICT services exports

Telecommunications, computers, and information services exports (% of total trade)

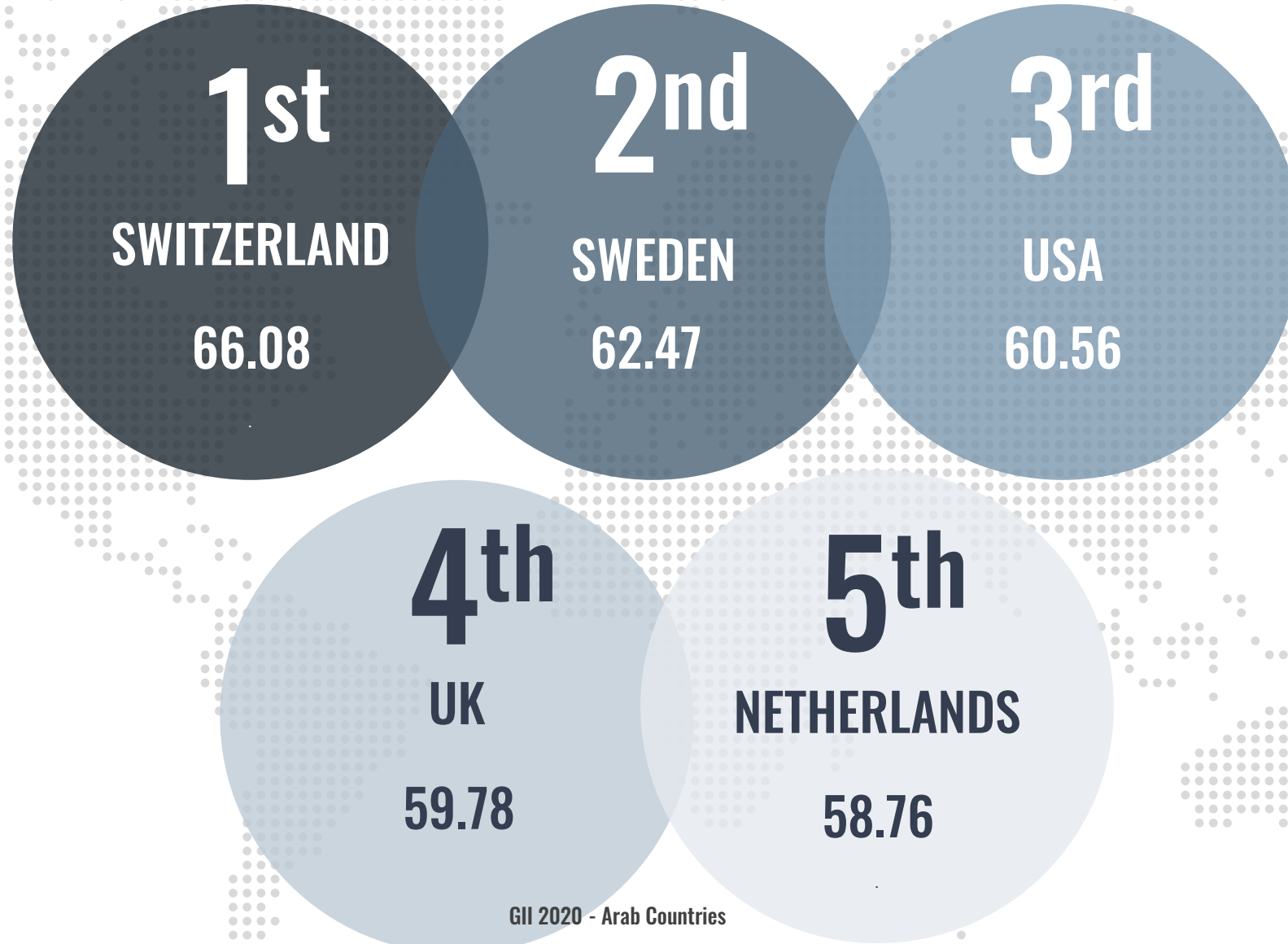
Foreign direct investment net outflows

Foreign direct investment (FDI), net outflows (% of GDP, three-year average)

The role of creativity for innovation is still largely underappreciated in innovation measurement and policy debates. Since its inception, the GII has always emphasized measuring creativity as part of its Innovation Output Sub-Index



TOP COUNTRIES BY GLOBAL RANK & SCORE, 2020



TOP GII RANK BY PILLAR, 2020

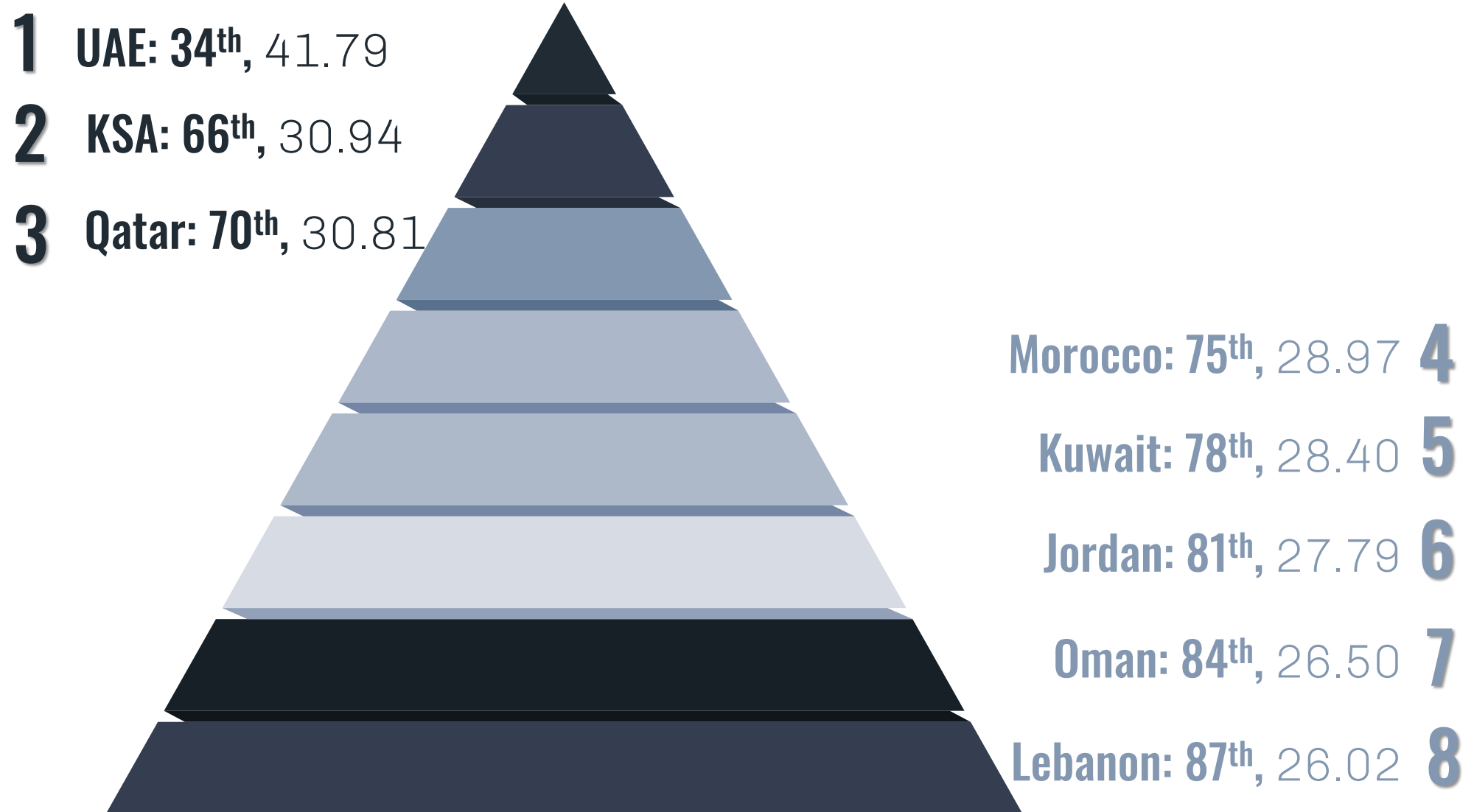


Country	Institutions	Human capital & research	Infrastructure	Market sophistication	Business sophistication	Knowledge & technology outputs	Creative outputs
Switzerland	13	6	3	6	2	1	2
Sweden	11	3	2	12	1	2	7
USA	9	12	24	2	5	3	11
UK	16	10	6	5	19	9	5
Netherlands	7	14	18	23	4	8	6

The background of the slide features a light blue and white abstract design. It includes stylized gears of various sizes, some with teeth, and several blue arrows pointing in different directions, suggesting a theme of progress, technology, or industry.

THE GII IN ARAB COUNTRIES

TOP ARAB COUNTRIES BY GLOBAL RANK & SCORE, 2020



GII RANK BY PILLAR, ARAB COUNTRIES, 2020

	Institutions	Human capital & research	Infrastructure	Market sophistication	Business sophistication	Knowledge & technology outputs	Creative outputs
UAE	28	17	17	30	22	78	34
KSA	102	31	57	44	51	88	69
QATAR	58	83	28	94	77	85	58
MOROCCO	77	81	71	88	107	60	75
KUWAIT	88	63	55	81	98	73	88
JORDAN	63	78	95	52	94	82	84
OMAN	70	43	56	104	95	124	94
LEBANON	103	85	98	90	80	76	85
EGYPT	115	90	99	106	103	65	101
ALGERIA	104	74	100	130	126	125	118
YEMEN	131	125	129	129	104	128	124

UAE

UAE maintains its global high-standing in the GII 2020 as it ranked number 1 in the Arab World for the fifth consecutive year and improved to 34th globally in 2020.

- The country ranked 22nd on the **innovation input sub-index**, a 2-rank increase from 2019, and surpassing countries such as Iceland, Luxembourg, China, Spain and Russia.
- UAE also improved on the **innovation output sub-index**, ranking 55th, a 3-rank increase from its rank in 2019.
- The positive positioning across these indices reflects the significant improvements and high performances in pillars such as *Human Capital & Research*, *Infrastructure*, *Business Sophistication*, and *Creative Outputs*. For example, these pillars include gains in indicators such as *R&D expenditures*, *ICT access and use* indices, *knowledge-intensive employment*, *patent families*, *high-tech imports*, *the percentage of research talent in business enterprises*, and *creative goods exports*.
- Additionally, the UAE has achieved a positive position on the new “*Global Brand value*” indicator, under the *creative outputs* pillar, where it ranked 16th globally.

ARAB REGION: MAIN FINDINGS

The GII **institutions pillar** has a significant impact on the Global Innovation Index. This pillar shows strong scores in some GCC countries (Oman, Qatar and the United Arab Emirates) and a relatively strong score in Jordan. However, all other Arab countries rank far below their international counterparts.

World data on **Human Capital and research**, particularly on base education show a wide scattering, with weak links to wealth. The results for Arab countries follow this trend, where several middle-income countries (Algeria, Egypt, Morocco and Tunisia) surpass those with higher income. However, the education indexes for Jordan and Lebanon are lower than expected. This is due to the low ranking of both countries in terms of expenditure on education as a percentage of GDP and government expenditure on secondary education per pupil as a percentage of GDP per capita.

Most Arab countries compare well in the **infrastructure pillar**, which measures the infrastructure of a national innovation system. On average, Arab countries tend to have an energy intensity – GDP (PPP \$) per unit of energy use (oil equivalent) - two to three times that of the global average – which has increased over the last two decades. Oil-producing Arab countries (high income) experienced the largest waste in energy. Only Morocco and Tunisia show good environmental performance index, while high-income countries are underperforming on an issue where innovation is key for achieving sustainable development

The **market sophistication pillar**, best represents the economic environment of a national innovation system addresses credit, investment, trade, competition and market scale. Most rank low or very low in terms of ease of getting credit, including high-income countries. However, the level of domestic credit to the private sector as a percentage of the GDP compares well with other countries. This inconsistency could be the result of concentrating bank credit on large firms and non-performing loans. The Arab region is also one of the weakest in micro-financing, with little effort to help new small businesses or support the formalization of informal enterprises.

ARAB REGION: MAIN FINDINGS

The **business sophistication pillar** analyses the functioning of the core engine by assessing how firms enable innovation activities. Most Arab countries are far below the global average and trends, except United Arab Emirates. Most Arab countries display weaknesses in the majority of the pillar's components, especially university-industry research collaboration. Consequently, the main difficulty with the core engine of innovation in Arab countries lies in the weak capacity of Arab firms to absorb technologies, and in the link between research and businesses.

The **knowledge & technology outputs pillar** concerns the fruits of invention and innovation. The strength of the United Arab Emirates in terms of business sophistication is not reflected in terms of output. The weakness of Morocco in business sophistication is compensated by strengths in ICT service exports and in the growth rate of PPP\$ GDP per worker. Many researchers from low and middle income Arab countries tend to migrate to high income countries, in search of better opportunities and living standards. Nevertheless, some ICT and high-tech products can be produced in low and medium income Arab countries, specifically for companies in high income Arab countries.

The seventh pillar of the Global Innovation Index on **creative outputs** provides some insight into the socioeconomic environment of innovation. Lebanon ranks high in creative goods and services, and Morocco and Qatar in intangible assets.

GCC countries, due to their high income, low population (except for Saudi Arabia) and the often voluntary approach of their leaders to adopt ICT technologies, clearly lead the pack among Arab countries.

Some other Arab countries have good resources, particularly in human capacity, education and even infrastructure.

However, political instability and conflict in certain Arab countries, such as Libya, Syrian Arab Republic and Yemen, have had an impact on their rankings. Overall, despite the good showing of some GCC countries, particularly the United Arab Emirates, most Arab countries are in the lower half of the tables among surveyed countries.

CONCLUSION