U.S. Chamber of Commerce
Global Innovation
Policy Center

2025 Thirteenth Edition

International IP Index

Statistical Annex

Introduction

The economic rationale for IP rights

Since 2015, the Index has included a *Statistical Annex* which investigates a series of correlations, or the statistical likelihood of two variables occurring together. The correlations examine the relationship between the strength of national IP environments, as measured by the Index scores, and different types of economic activity, including rates of R&D spending, innovation, technology creation, and creativity. The first *Annex*, published with the third edition of the Index, examined the relationships between the Index scores of 30 economies and 15 economic variables. This year's *Annex* mirrors the growth of the wider Index and surveys the relationship between the Index scores of 55 economies and a set of 30 economic variables.

This represents an increase of over 75% in the number of economies sampled and a doubling in the number of economic variables included since the first edition of the *Annex*.

As more economies and more social and economic variables have been added to the *Statistical Annex*, the picture becomes clearer: IP protection is a critical instrument for economies seeking to enhance access to innovation, grow domestic innovative output, and enjoy the dynamic growth benefits of an innovative economy. Conversely, weak IP protection hinders long-term strategic aspirations around innovation and high-tech economic development.

The 2025 Statistical Annex

This year's *Annex* includes a section dedicated to the creative economy and the economic impact of creative and copyright-intensive industries. As this section illustrates, the creative economy is a rapidly growing component of global economic activity, contributing to the broader socio-economic revolution in which IP-intensive and knowledge-based industries are making up a growing share of global economic activity. Critically–and like all other IP-intensive industries–the creative economy needs strong IP protection to thrive, develop, and grow. The effective protection and enforcement of copyright and related rights play a pivotal role in stimulating creators and promoting creative activity. As the data presented below demonstrates, economies with stronger copyright protection and enforcement tend, on average, to also see higher levels of creative outputs.

Overall, both the copyright specific analysis and the statistical correlations show, again, the strong, direct, and statistically significant relationship between the strength of the national IP environment, as measured by the Index, and rates of innovation, growth, and high-tech economic activity. Below Table 1 presents the main findings of the analysis in this year's *Annex*.

Table 1: Economic Benefits of Improving IP Protection: Findings from 30 Correlations

	2018 (strength of correlation)	2019 (strength of correlation)	2021 (strength of correlation)	2022 (strength of correlation)	2023 (strength of correlation)	2024 (strength of correlation)	2025 (strength of correlation)	Economies with robust IP protection (scoring above 50% on the Index) on average tend to experience the following benefits compared with economies scoring below 50%
Readiness for the Fourth Industrial Revolution and Future of Growth								
Future of Growth	NA	NA	NA	NA	NA	.86	.86	97% more likely to be prepared for the future of growth
Drivers of Production	NA	.85	.83	.84	.83	.83	.83	40% more likely to adapt to the Fourth Industrial Revolution and secure new growth opportunities
Technology & Innovation	NA	.87	.85	.85	.84	.84	.84	55% more likely to be able to transform their economies using sophisticated, state-of-the-art technologies
Global Trade & Investment	NA	.71	.70	.71	.70	.70	.70	41% more open for business and attractive to foreign investment
Resources to Innovate								
Innovation Capability	NA	.88	.87	.87	.85	.85	.86	65% more likely to maintain sophisticated environments capable of producing innovative outputs
Enabling Infrastructure	NA	.79	.79	.82	.82	.82	.82	77% more likely to experience the benefits of an innovation-driven economy, ranging from high-skilled and high-paid workers to increased R&D activity
Availability of R&D Funding	.71	.71	.69	.70	.69	.69	.69	33% more likely to see private-sector investment in R&D activities
Access to Venture Capital and Private Equity Funds	.79	.78	.75	.79	.78	.79	.78	52% more likely to attract venture capital and private equity funds compared with economies whose IP regimes lag behind
Availability of Skilled Researchers	.82	.81	.80	.84	.83	.82	.82	Almost five times more likely to have highly skilled researchers in a given labor force
Talent Competitiveness	NA	.82	.82	.86	.85	.85	.85	52% more competitive human capital
Quality of Local Scientific and Technical Knowledge	NA	.85	.83	.84	.82	.82	.80	Almost four times more knowledge output in terms of scientific and technical journal articles
Growth of Knowledge-based Economies	.83	.83	.85	.82	.85	.81	.82	31% more likely to fully leverage information and communications technology (ICT)
Global Networking Impact	NA	.84	.84	.82	.80	.58	.56	16% more likely to support a dynamic ICT sector and experience the indirect benefits it generates

	2018 (strength of correlation)	2019 (strength of correlation)	2021 (strength of correlation)	2022 (strength of correlation)	2023 (strength of correlation)	2024 (strength of correlation)	2025 (strength of correlation)	Economies with robust IP protection (scoring above 50% on the Index) on average tend to experience the following benefits compared with economies scoring below 50%
Outputs of a Competitive Knowledge-based Economy								
Global Competitiveness – IMD Ranking	NA	NA	NA	NA	.69	.70	.61	Economies are 42% more competitive
Global Competitiveness – World Economic Forum Ranking	NA	.86	.86	.85	.84	.84	.84	Economies are 26% more competitive
Digital Competitiveness	NA	NA	NA	NA	.75	.72	.72	Economies are 41% more digitally competitive
Economic Complexity – Trade-related	NA	.82	.77	.70	.69	.74	.75	Significantly more likely to produce and export complex, knowledge-intensive products
Economic Complexity – Technological Complexity	NA	NA	NA	NA	NA	.63	.63	Have over five times the levels of complex technology
Economic Complexity – Research Complexity	NA	NA	NA	NA	NA	.70	.70	Produce over four times the complex research
Innovation	.86	.85	.85	.76	.84	.83	.83	Almost double the innovation output as measured by the Global Innovation Index
Triadic Patenting	.68	.65	.64	.65	.64	.64	.64	Over 600 more high-value inventions per million population
Employment in Knowledge-intensive Sectors	.67	.69	.73	.75	.70	.72	.73	Share of workforce employed in knowledge-intensive sectors is 86% higher
Growth of High-tech Sectors	.75	.79	.76	.74	.78	.76	.75	Produce 97% more knowledge and technology outputs
Biomedical Activity	.72	.73	.74	.74	.74	.74	.73	Almost ten times more clinical trial activity
Cutting-edge Clinical Trials	.73	.76	.77	.78	.77	.77	.76	Over 16 times more early-phase clinical trials
Development of Biotech Therapies	.76	.77	.77	.77	.76	.76	.76	Over 10 times more clinical research on biologic therapies
Value Added and Creativity								
Creative Outputs	.84	.82	.79	.80	.78	.75	.76	71% more likely to benefit from the growth in both volume and value of the dynamic content and media sectors
Online Creativity	.84	.81	.81	.81	.79	.78	.77	Generating almost double the amount of online and mobile content
Global Reach of Local Brands	NA	.86	.76	.77	.76	.76	.75	40% higher levels of international trademark applications
Access to Licensed Music Outlets	.79	.75	.75	.74	.75	.73	.68	Two-thirds more access to new music through legitimate and secure platforms

Methodology

The Pearson Correlation Coefficient is the statistical analysis used to test the relationship between the Index's scores and other economic variables in this *Annex*. The Pearson Correlation Coefficient is a widely used statistical method of establishing whether two variables are related to each other. This statistical test provides a value between -1 and 1, which represents the strength of this correlation. Thus, the Pearson Correlation Coefficient tells us whether a linear relationship exists between two variables, and if it is positive or negative.

In this *Annex*, the strength of a given positive correlation follows this legend:

- .00 to .19: "very weak"
- .20 to .39: "weak"
- .40 to .59: "moderate"
- .60 to .79: "strong"
- .80 to 1.0: "very strong"

Each individual test of the correlation between two variables was performed under a confidence level of 0.95, which means that if this procedure was repeated on multiple samples, the calculated confidence interval (i.e., a range estimation that is calculated from the observation, and therefore would be different for each sample) would encompass the true parameter 95% of the time. In other words, the confidence interval represents values for the parameter, for which the difference between the parameter and the observed estimate is not statistically significant at the 5% level.

However, it is important to note that correlation—a statistical test of the existence of a linear relationship between two variables—does not imply causation (i.e., the fact that two variables are very strongly correlated does not mean that one has caused the other). That said, a strong to very strong correlation does imply that a linear relationship exists between the two variables, the nature of which depends on the variables.

Creating the future: How copyright protection drives the growth and development of the creative economy

The center of attention: How the creative economy is increasingly recognized as a driver of economic growth and development

While humans have always created, the idea that the economic fruits of this creativity are a significant driver of economic activity is relatively new. At both the level of international institutions and national governments, the conceptualization of the 'creative economy,' 'creative sector,' or 'creative/cultural industries' as separate and distinct parts of the modern economy did not occur until the 1990s and early 2000s. Since then, increasing numbers of economies around the world and institutions such as World Intellectual Property Organization (WIPO), UN Trade and Development (UNCTAD), and the Organisation for Economic Co-operation and Development (OECD) are recognizing the distinct and increasing economic value of this sector and these industries. As a result, a growing number of economies and governments have introduced national policies seeking to stimulate the growth and development of creators. Critically, these policies and related programs are no longer defined solely within the context of supporting the national arts or cultural heritage as an end goal, but as distinct and value-added drivers of economic growth and activity. The creative sector is, consequently, part of the broader movement towards a knowledge-based economy where IP-intensive industries figure prominently.

As this Annex has documented over the last decade, more economies and governments are realizing that IP-intensive industries are what drive their economies forward and are responsible for a growing share of national economic output and employment. In short, whether you are a developed, emerging, or developing economy, IP-intensive industries represent the economic future. But an often-underappreciated aspect of what drives and grows these industries is IP rights.

In 2018, the Index included a special spotlight on the creative economy. The purpose of that spotlight was, first, to highlight the growing importance of the creative sector and related industries to economic growth and development and, secondly, to show the centrality of strong IP rights–especially the protection of copyright–in incentivizing this growth and development. Today, seven years later, the Annex will revisit this discussion both for creative industries, specifically, but also how these industries are part of the broader structural shift in the global economy towards IP-intensive industries. As the following pages demonstrate, the economic importance of the creative economy and IP-intensive industries–and the creators, innovators, and inventors that make it possible–has never been higher.

Measuring the creative economy–the national picture

One of the most important developments in identifying and measuring the economic contribution of the creative economy is the work done by WIPO. In the early 2000s, WIPO began to study the creative economy under the rubric of "Copyright-Based Industries." In 2003, it published the *Guide on Surveying the Economic Contribution of the Copyright-Based Industries*, which was followed by several country-specific assessments of the economic contributions of these industries.[1] This *Guide* was revised and updated in 2015. The WIPO methodology has been used by 50 economies to better understand, measure, and benchmark the economic contribution of copyright-based industries to their national economies. Out of these 50 economies, 27 are included in the Index.

This year's Index seeks to examine the impact that creative industries have on national economic output and job creation. Additionally, the Index examines the relationship between the strength of copyright protection–as measured by the Index–and the level of economic contribution in these economies. Table 2 below shows the contribution of copyright-based industries to GDP and employment as estimated in these economies compared to their overall percentage score on the Index's copyright related indicators.

Table 2: National economic contribution of copyright-based industries and Index, Category 2: Copyrights and Limitations, overall score

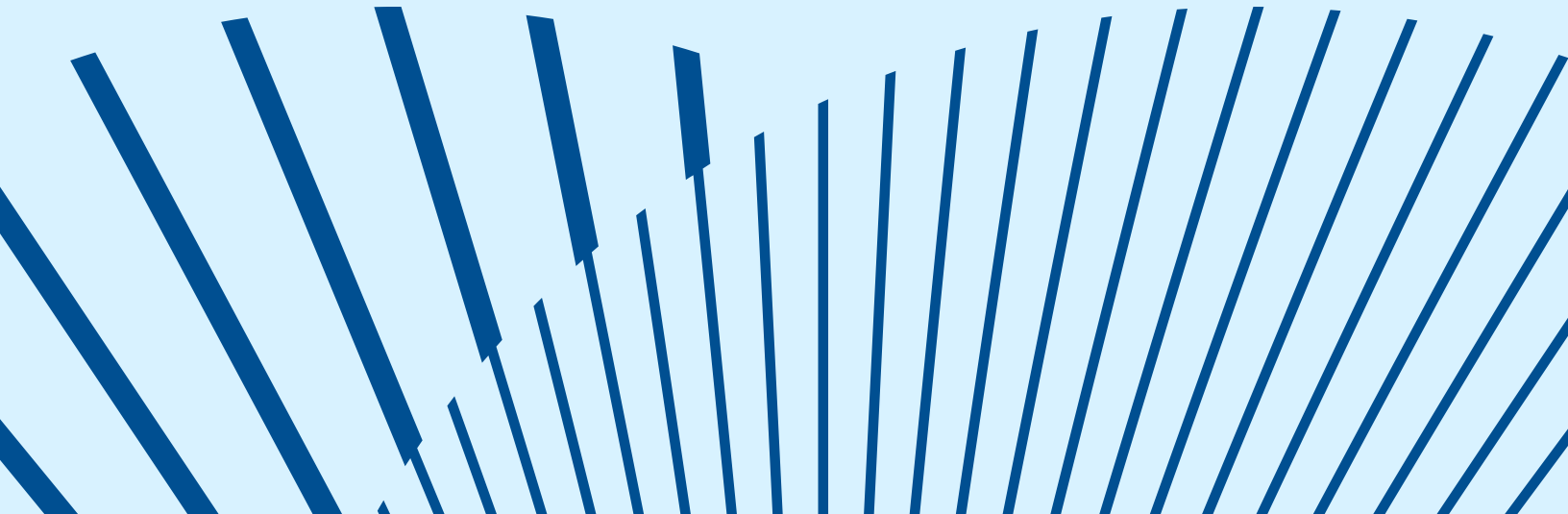
Index Economy	Percentage Contribution of Copyright-based Industries to GDP	Percentage Contribution of Copyright-based Industries to Employment	Index, Category 2: Copyrights and Limitations, Overall Score
U.S.	11.99%	7.71%	96.43%
Singapore	6.19%	6.21%	96.29%
France	7.02%	7.29%	92.71%
Netherlands	5.90%	8.80%	85.57%
South Korea	9.89%	6.24%	85.57%
Australia	6.80%	8.30%	84.00%
Canada	6.15%	5.35%	68.43%
Malaysia	5.70%	7.50%	64.71%
Hungary	8.25%	7.28%	62.57%
Mexico	4.77%	11.01%	54.14%
Peru	2.67%	4.50%	46.29%
China	7.35%	9.46%	43.29%
Kenya	5.32%	3.26%	43.29%
Ghana	4.02%	4.77%	42.67%
Thailand	4.48%	2.85%	39.71%
Indonesia	4.11%	3.75%	39.57%
Colombia	3.30%	5.80%	37.00%
Philippines	7.34%	14.14%	36.14%
South Africa	4.11%	4.08%	36.14%
Turkey	2.88%	4.34%	35.57%
Jordan	2.43%	2.88%	27.71%
Argentina	4.70%	3.00%	26.86%
Ukraine	2.85%	1.90%	26.14%
Ecuador	4.47%	3.47%	24.86%
Brunei	1.58%	3.20%	21.86%
Pakistan	4.45%	3.71%	18.29%
Russia	6.06%	7.30%	0.00%

As Table 2 shows, economies with a high Index score and strong levels of copyright protection also tend to see the largest contribution of copyright-based industries to national GDP and employment. In economies such as the U.S., France, and South Korea, copyright-based industries contribute between 7-12% to national GDP and between 6-8% of national employment. At the same time, all three economies achieve a score of between 86-96% on the Index's copyright indicators. This evidence supports the arguments made in this Statistical Annex through our correlations and the main Index for over ten years: strong IP rights have a positive and sustained impact on national economic activity.

More recent national data from the United States reinforces how important copyright-based industries and the creative sector are to job creation and economic activity. For example, in 2022, the U.S. Bureau of Economic Analysis (BEA) released an update to the national satellite account for 'Arts and Cultural Production.' This account provides an in-depth estimate and accounting of the economic contributions copyright-based and creative industries make to the U.S. economy.

In 2020, the sector accounted for just under USD 1.5 trillion (USD 1,458,938 million) nominal gross output. Like all industries and sectors of the economy, this was lower than in preceding years due to the negative socio-economic impact of the COVID-19 pandemic. In 2019, the economic contribution of these industries (nominal gross output) amounted to almost USD 100 billion more, at over USD 1.5 trillion (USD 1,541,080 million).[2] Similarly, the data released by the BEA shows the high number of jobs created by these industries. The BEA estimates that, despite the negative impact of the COVID-19 pandemic, which resulted in an 11.6% decline in employment, the arts and cultural industries employed a total of over 4.5 million Americans in 2020.[3]

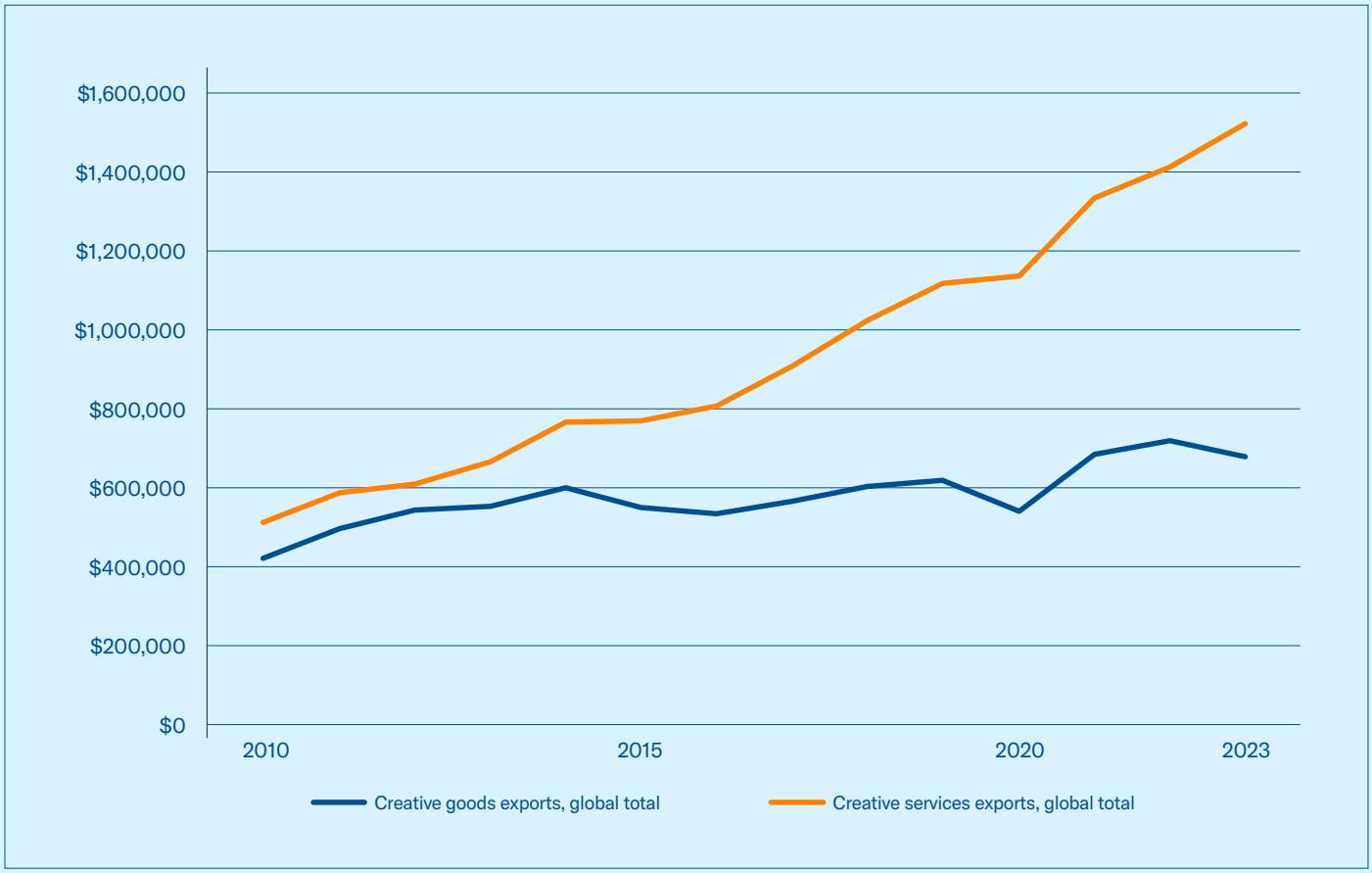
The following subsection examines the economic contribution of the creative economy in the international trade of creative goods and services.



Measuring the creative economy– the international picture

The growing importance of the creative economy to the global economy is also illustrated by the strong growth in the international trade of creative goods and services. Defined and categorized by UNCTAD, creative goods encompass a wide range of products, including arts and crafts, books, cinema, clothes, furniture, and video games. Creative services range from advertising and marketing to R&D services, computer software, engineering, recreational and cultural services, architectural services, as well as audio-visual services. Both these categories of trade have seen explosive growth over the last two decades. In 2002, the total global trade in creative goods was estimated by UNCTAD to be less than USD 200 billion, with the trade in international services negligible. Yet today, just over twenty years later, the combined global trade of creative goods and services is worth more than USD 2 trillion. Significantly, the share of creative services today constitutes the lion's share of that trade at an estimated USD 1.5 trillion. Figure 1 below shows the growth in the global trade in creative goods and services over the last twenty years.

Figure 1: Global total, trade (exports) of creative goods and services, 2010-2023, USD millions, current prices[4]



As Figure 1 shows, while trade in both creative goods and services has increased significantly since 2010, the growth in creative services has far outpaced that of creative goods. This is an important fact. Unlike creative services, most creative goods produced and manufactured in a given economy are not necessarily created there. Consider, for example, all manner of clothing and garments, accessories, furniture, designed household goods, and jewellery. These goods are often designed and created in one economy but manufactured and/or assembled elsewhere.

Drilling down deeper into what types of services are categorized and measured by UNCTAD as creative services, most of these are copyright-dependent and/or IP-intensive services. Figures 2 and 3 below show the overall USD value of these creative services and as a percentage of global creative services exports in 2023.

Figure 2: 2023 global total for trade (exports) of creative services, in USD millions at current prices, categories of creative services[5]

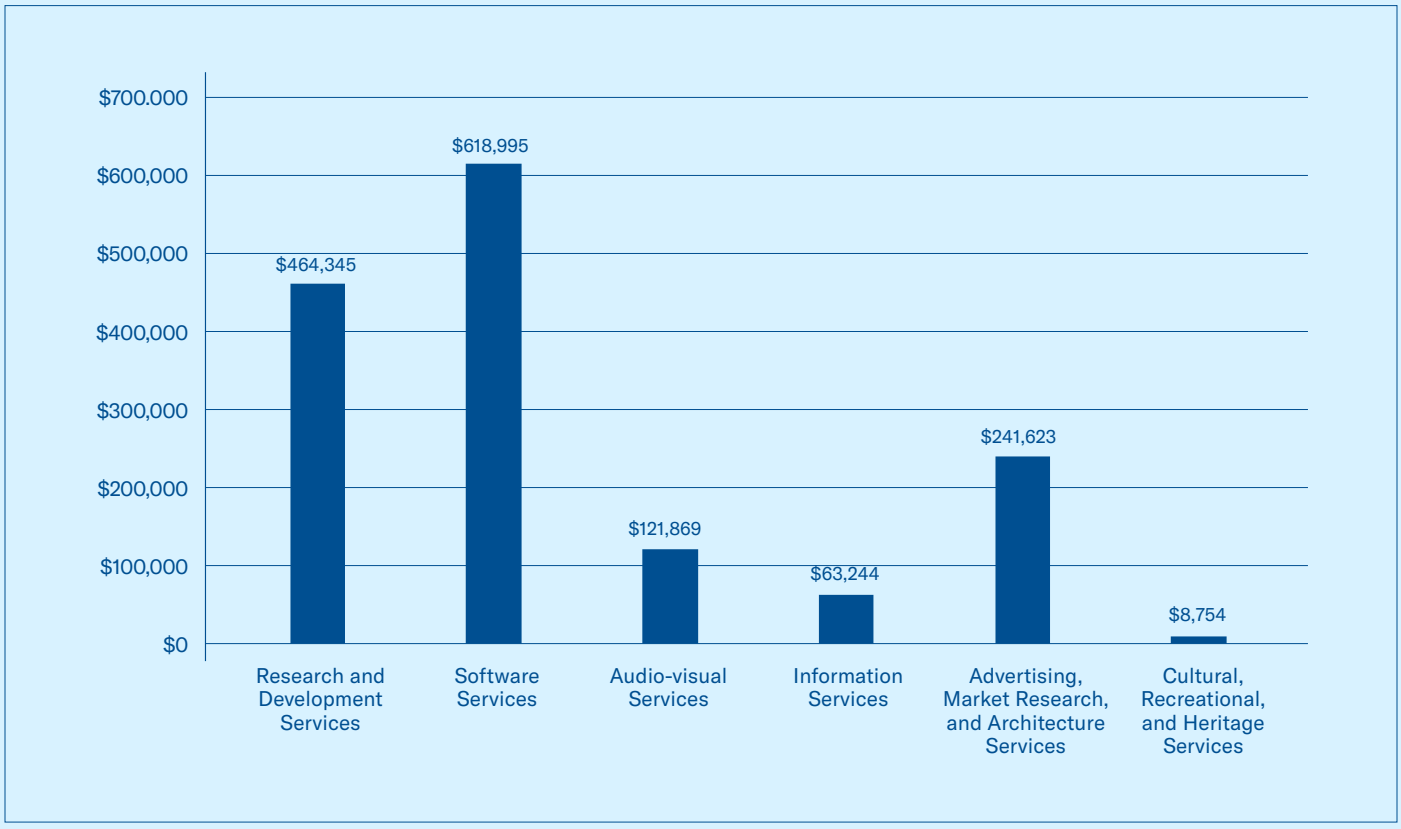
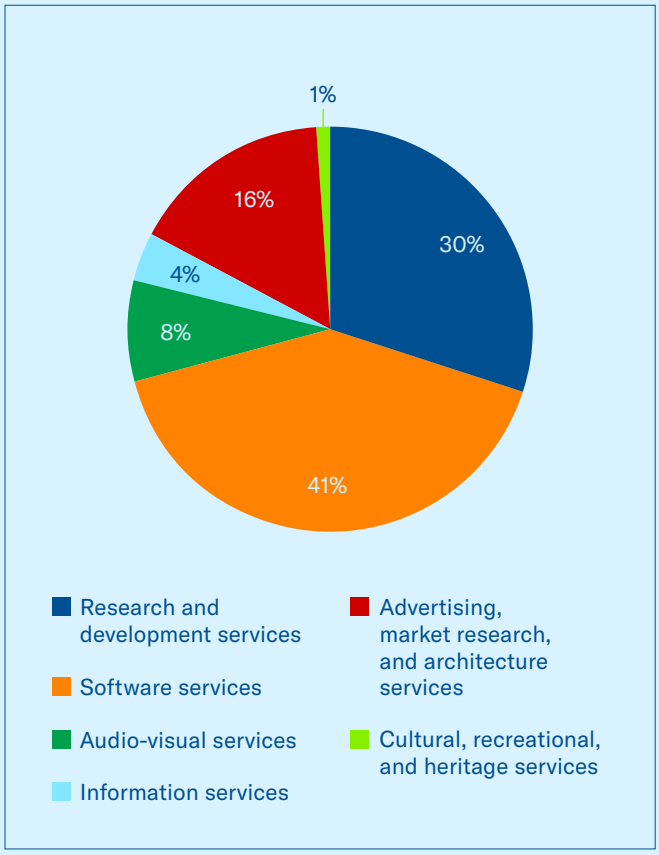


Figure 3: 2023 global total for trade (exports) of creative services, % of total creative services[6]



As Figures 2 and 3 show, the largest creative services–software services, research and development services, and audio-visual services–are IP-intensive and/or copyright-dependent. In this respect, the protection of IP is a critical component in stimulating the national production and export of these services. This can be most clearly seen at the national level, where the share of individual economies' global exports in creative services is compared to the strength of their national IP environment, as measured by the Index. Indeed, as the aggregated data in Figure 1 imply, today the export of creative services makes up a significant and growing share of many individual economies' total exports. Here too, the data strongly suggests that the strength of the national IP environment is a significant driver of creative services. Specifically, as Table 3 shows below, looking at the world's top 10 exporters of creative services in 2022, all but one, China, had scores of 80% or above on the Index.

Table 3: Top 10 exporters of creative services, 2022, % share of total world exports of creative services and Index overall % score. 13th edition[7]

Economy	Exports of Creative Services (USD billion)	% Share of Total World Exports of Creative Services	Index Overall % Score, 13th Edition
U.S.	244	17.70%	95.17%
Ireland	231	16.80%	89.51%
UK	87	6.30%	93.98%
Germany	79	5.70%	92.42%
China	67	4.90%	54.58%
Singapore	65	4.80%	80.11%
Netherlands	54	3.90%	91.26%
Japan	54	3.90%	90.81%
France	35	2.60%	93.51%
Switzerland	34	2.50%	85.83%

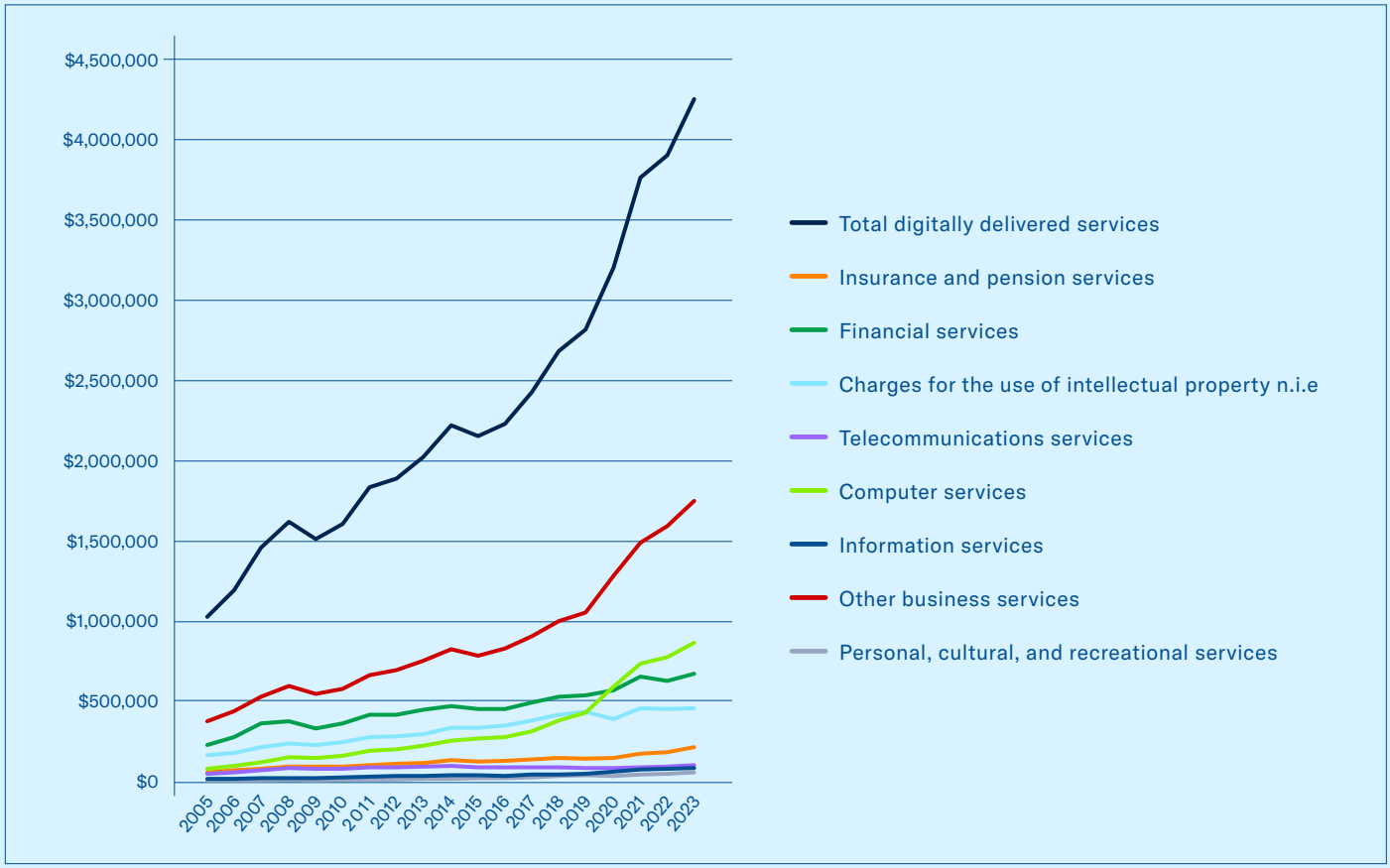
The growth of the value of creative services in international trade mirrors the digital and technological revolutions of the last twenty-five years. The ICT and internet revolutions have fundamentally changed how human beings interact socially and economically. In virtually all industries, businesses and economic interaction are currently being shaped by the collection of data and digital technologies. These technologies are allowing companies across all business sectors and public and private research organizations to collect and use greater levels of data and information than ever before, in what is known as 'big data.' Combined with increased computing capacity and the application of new technologies (such as artificial intelligence and machine learning) that allow us to analyse and better understand data collected, there is the possibility to make significant discoveries and breakthroughs in virtually any area of research and human socio-economic activity. Critically, these technologies have also allowed digital services and trade to cross borders and create a truly global digital marketplace for a huge selection of services. Such cross-border flows of data are today ingrained in countless services relied on by consumers, with numerous digital, automated, and virtual services relying on the seamless movement and storage of data in various locations. Significantly, as the most recent data from the World Trade Organization (WTO) clearly shows, services created by IP-intensive industries (including creative and copyright-dependent industries and services) make up the majority of this trade.

IP-intensive and growing at a rapid pace: The story of digital trade

The International Monetary Fund (IMF), the OECD, UNCTAD, and the WTO have been working closely for nearly a decade to better understand and measure global flows of digital trade. The first attempt at defining this trade was made in the *2019 Handbook on Measuring Digital Trade*. Providing the first internationally recognized and used definition of this trade, the Handbook marks a fundamental milestone in the development of comprehensive and comparable statistics on digital industries and their related trade. At the time of research, a second edition of this Handbook was published in 2023, as well as several stand-alone research papers relying on this data, such as the *2023 Digital Trade for Development*, also a joint project between the IMF, OECD, the World Bank, and the WTO.

As part of this work measuring digital trade, the WTO has developed a searchable database which covers so-called "digitally delivered services." The WTO defines these services and this database as providing "estimates on services traded through computer networks, such as the Internet, apps, emails, voice and video calls, and digital intermediation platforms. It covers over 200 economies and regions and 8 sub-sectors for the period 2005-23."[8] Below, Figure 4 shows the development of global exports in digitally traded services in aggregate and the underlying services that together make up this category of trade.

Figure 4: Total digitally delivered services, global exports, USD millions, 2005-2023

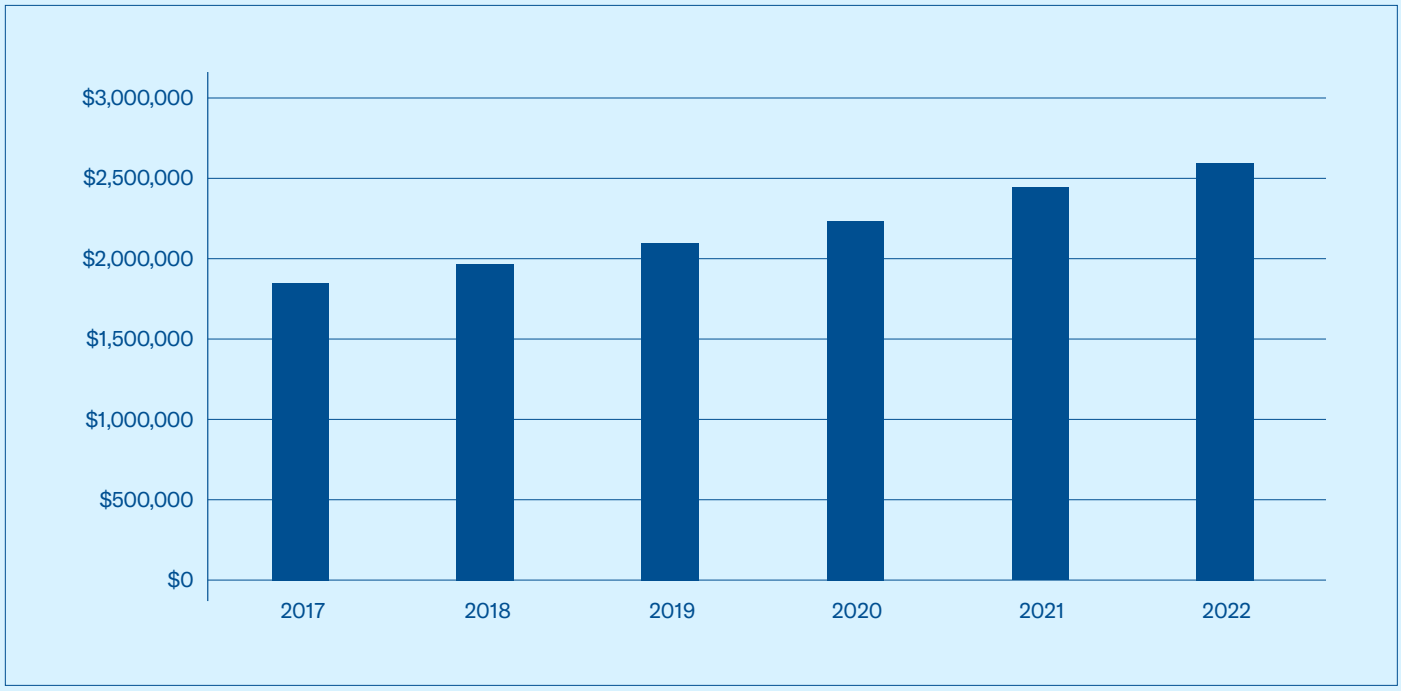


As Figure 4 shows, over the last two decades, there has been explosive growth in the global trade in digitally delivered services, growing from an estimated USD 1 trillion in 2005 to over USD 4 trillion in 2023.

Although the categorization and classification system used by the WTO is slightly different than that used by UNCTAD for creative services, the results largely overlap. Importantly, the largest stand-alone categories of both datasets are IP-intensive industries.

In addition to being measured at the international level, many individual economies are also creating national satellite accounts that measure digital trade and the value of the digital economy to their national economies. For example, the United States–again through the BEA–has been a pioneer in this field, releasing updated national estimates on the volume and value of the U.S. digital economy for several years. Figure 5 below shows the estimated value and growth of the U.S. digital economy from 2017 to 2022.

Figure 5: Digital economy real value added by activity, millions of chained (2017) dollars[9]



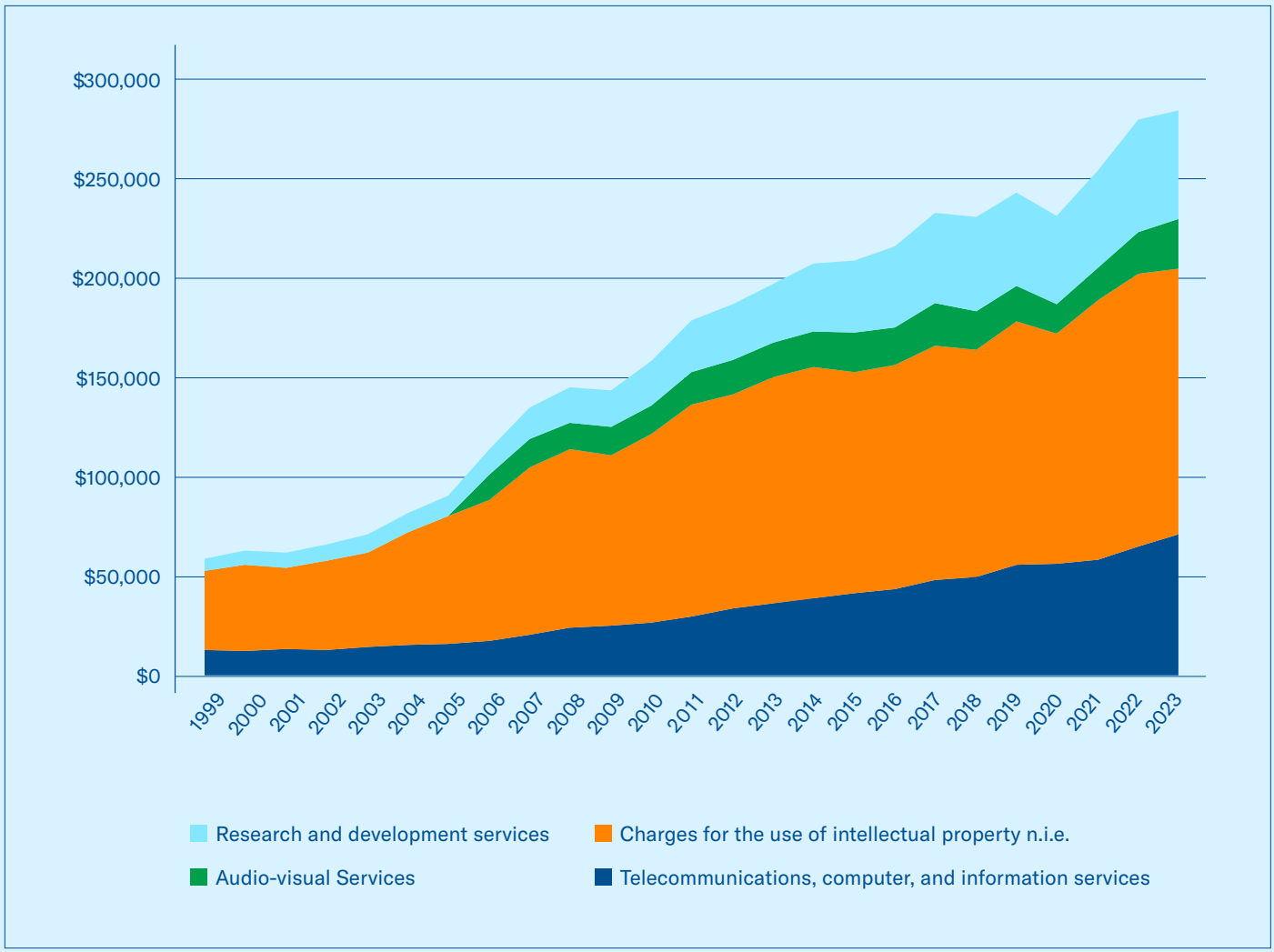
As Figure 5 displays, the value of the digital economy in the U.S. has grown by over 40% in six years from USD 1.9 trillion in 2017 to almost USD 2.6 trillion in 2022. This represents a growth rate of approximately 7% per year, significantly outpacing the general GDP growth and national output during this period.

The U.S. national statistical accounts also provide national data on similar categories of digital services exported to other economies as collected by UNCTAD and the WTO. These figures show, first, the tremendous growth and value of these digital services to the U.S. economy and, second, just like the

aggregated global data cited above, the centrality of IP-intensive industries within this digital trade. Below, Figure 6 shows the aggregated growth and value of four separate categories of services exported from the U.S. as categorized by the BEA–telecommunications, computer, and information services; charges for the use of intellectual property; audiovisual services; and research and development services– that are primarily digitally enabled and delivered and emanate from IP-intensive industries and reliant businesses.

As Figure 6 shows, the growth in the trade in these IP-intensive services over the last 24 years has been staggering. In 1999, the total value of these exported services was just under USD 60 billion. By 2023, this aggregated value had increased to almost USD 285 billion. Together, these IP-intensive and IP-enabled industries provide a substantial and critical source of export revenue for the U.S. economy.

Figure 6: U.S. trade in services for: telecommunications, computer, and information services; charges for the use of intellectual property; audiovisual services*; and research and development services, exports, USD millions, 1999-2023[10]



* Data for audiovisual services is only available from 2006.

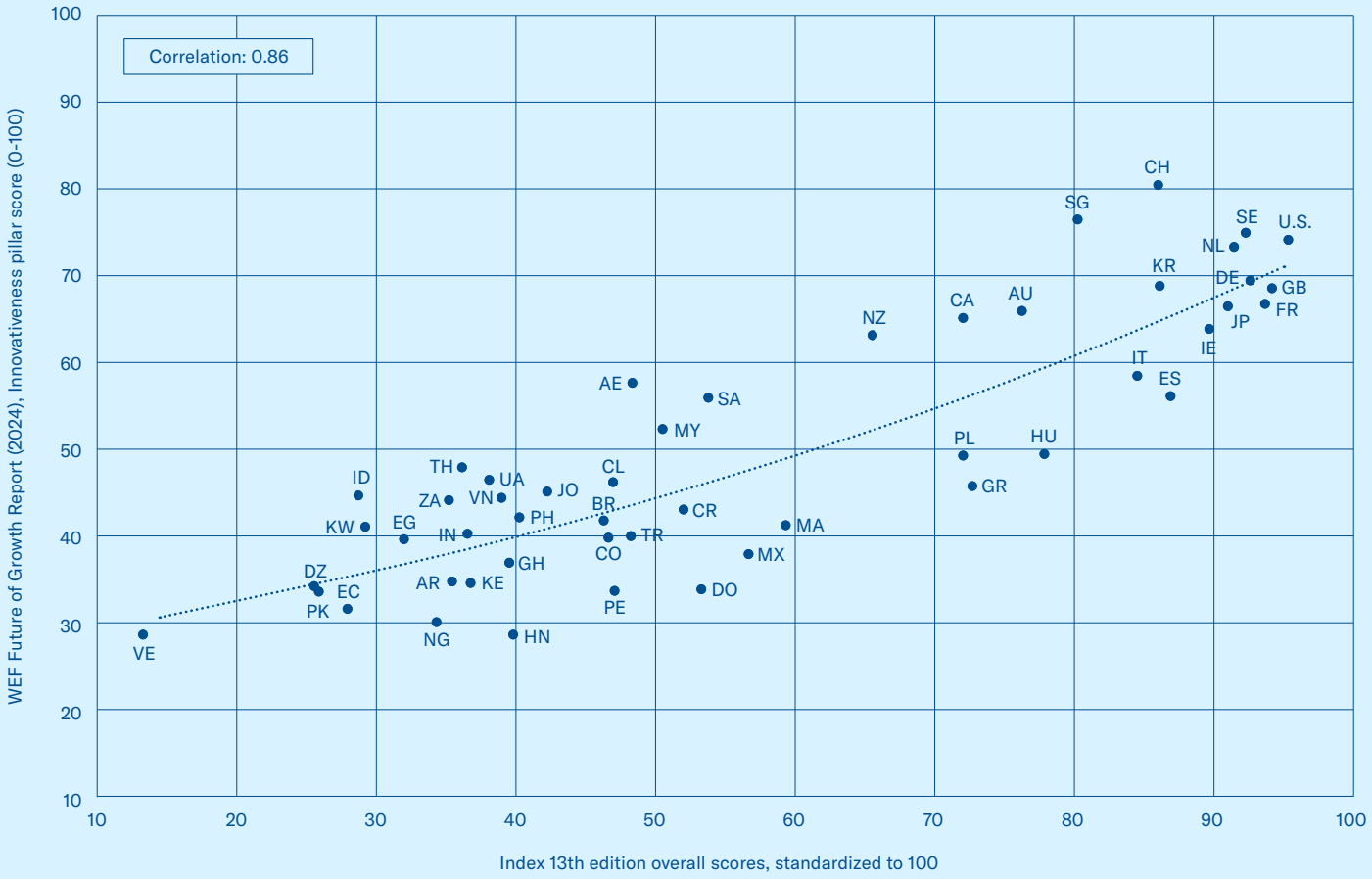
In Summary

IP-intensive and knowledge-intensive industries–including the creative economy and creative industries–currently make up the backbone of the global economy. The growth in the creation, registration, and commercialization of IP assets over the last quarter century has literally changed the world. Today's global economy is inter-linked, inter-dependent and open for business in a way that was impossible logistically, politically, or financially a mere generation ago. Indeed, the sum of the technological, cultural, political, and socio-economic changes of the last three decades amounts to what is truly a paradigm shift. New IP-based industries and technologies–not least in the digital sphere–are increasingly challenging traditional business models across the globe by increasing the global integration of value chains and enhancing consumer engagement, customers' expectations and experiences, and product durability. These technologies are also fundamentally changing production models by requiring extensive use of knowledge and skills, complex infrastructure, and an enabling environment for R&D collaboration and investments. The above-cited data and statistics from WIPO, UNCTAD, the WTO, and BEA all unequivocally tell the same story: IP-intensive industries are absolutely central to the growth and creation of digitally based technologies and digital trade. In this sense, the story of the creative economy and creative industries over the last 25 years is the same as for all IP-intensive industries. And the policy requirements are the same. As the data in this year's edition of the Statistical Annex makes clear yet again, to stimulate high-value economic activity, innovation, creativity, and job creation, a strong and supportive IP framework is not an option, but an absolute necessity.

Readiness for the Fourth Industrial Revolution and Future of Growth

Economies with Robust IP Environments are more likely to be prepared for the future of growth

Association between the Index scores and the Future of Growth Report, Innovativeness pillar score[11]

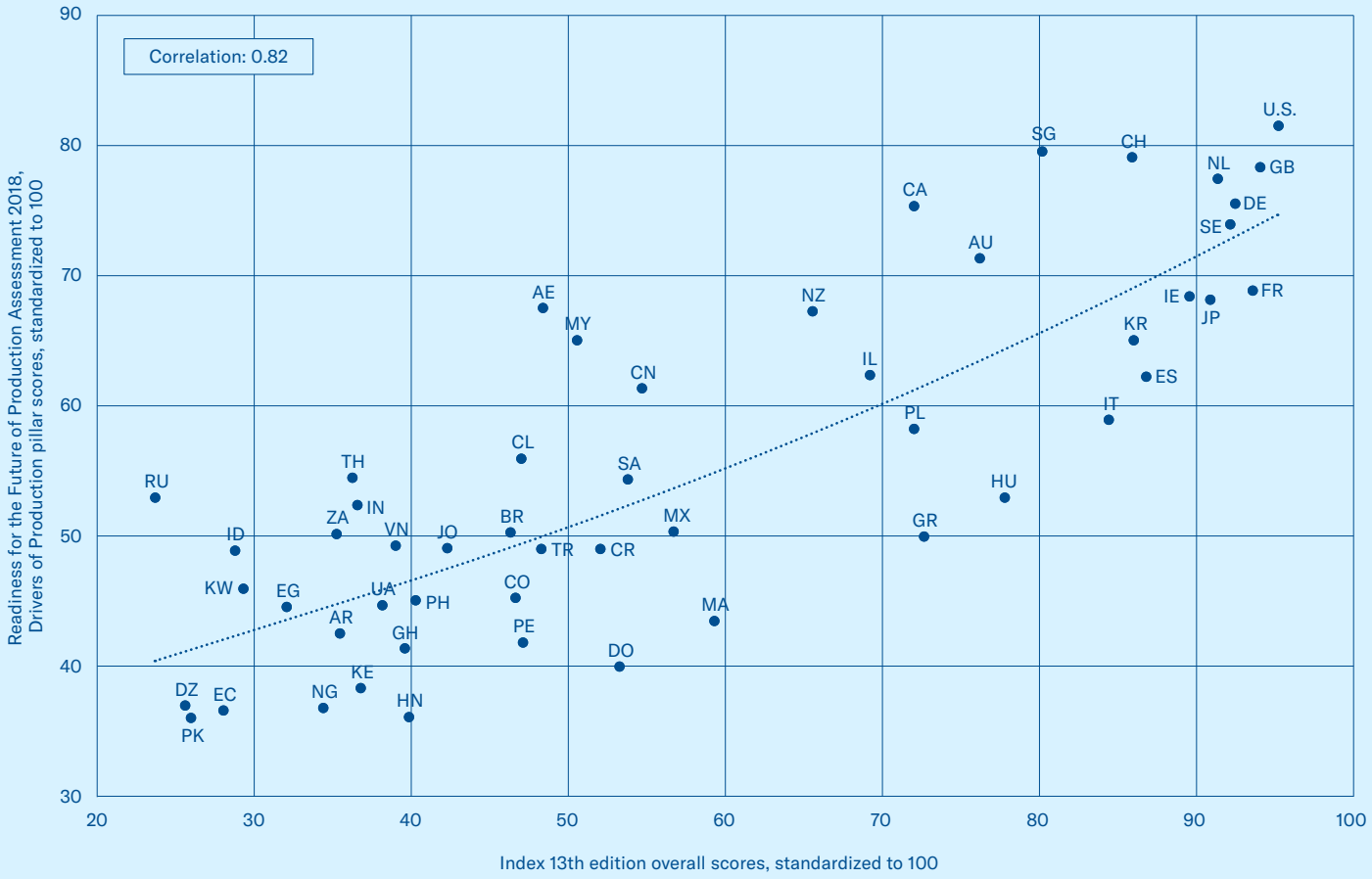


Data NA for Brunei, China, Israel, Russia, Taiwan

- The World Economic Forum defines the Future of Growth Report, Innovativeness pillar as evaluating the "extent to which an economy's trajectory can absorb and evolve in response to new technological, social, institutional and organizational developments to improve the longer-term quality of growth."[12]
- The Innovativeness pillar displays a very strong association–a correlation of .86–with the Index scores.
- Economies with robust IP environments are 97% more likely to be prepared for the future of growth.

Economies with Robust IP Environments are Significantly Better Positioned to Capitalize on the Fourth Industrial Revolution

Association between the Index scores and the Readiness for the Future of Production Assessment, Drivers of Production pillar scores[13]



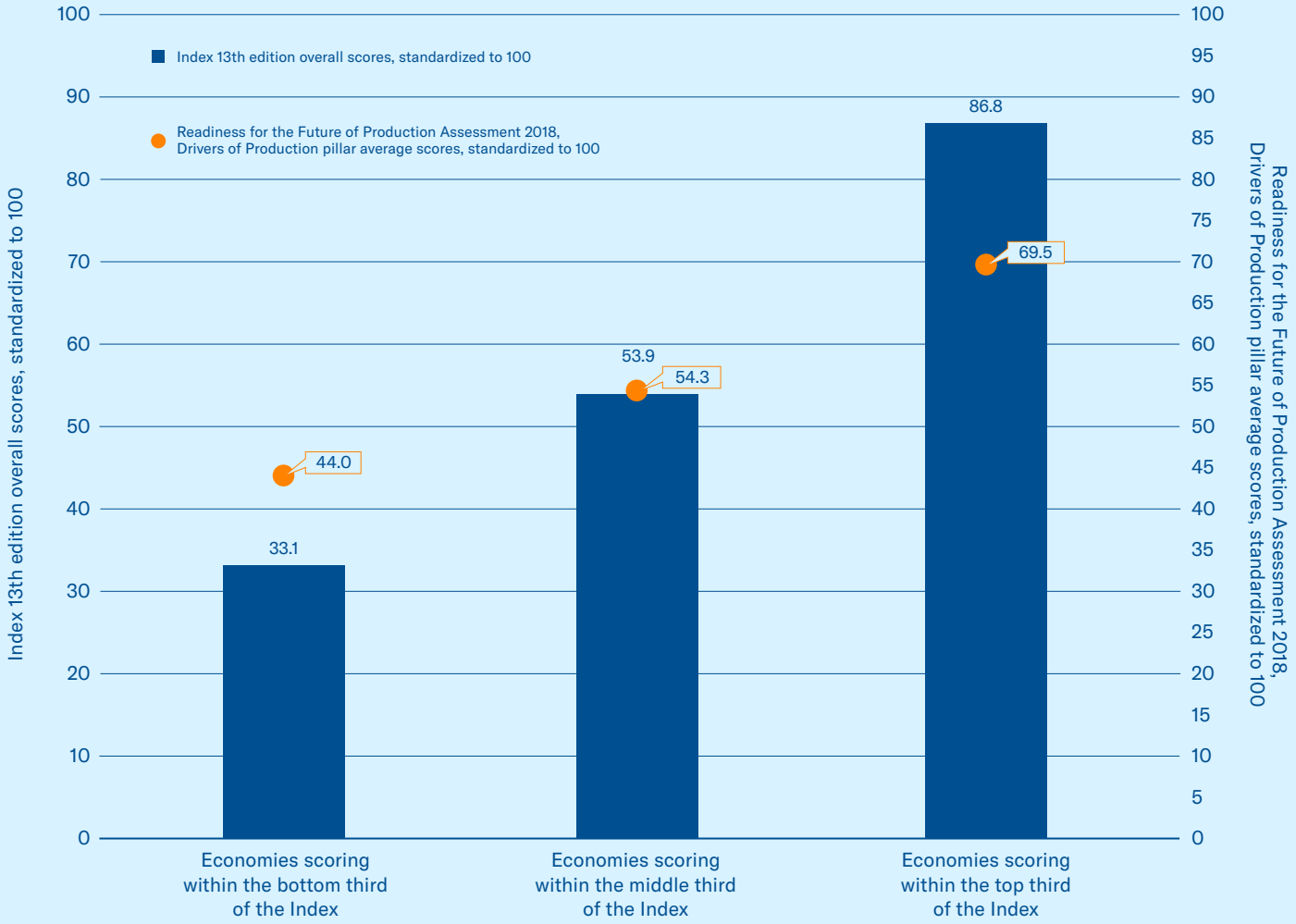
Data NA for Brunei, Taiwan and Venezuela

- The Readiness for the Future of Production Assessment's Drivers of Production pillar scores gauge performance in key sectors and themes that enable economies to capitalize on emerging technologies to compete in future production systems.

Those Readiness Assessment scores display a very strong association–a correlation of .82–with the Index scores.

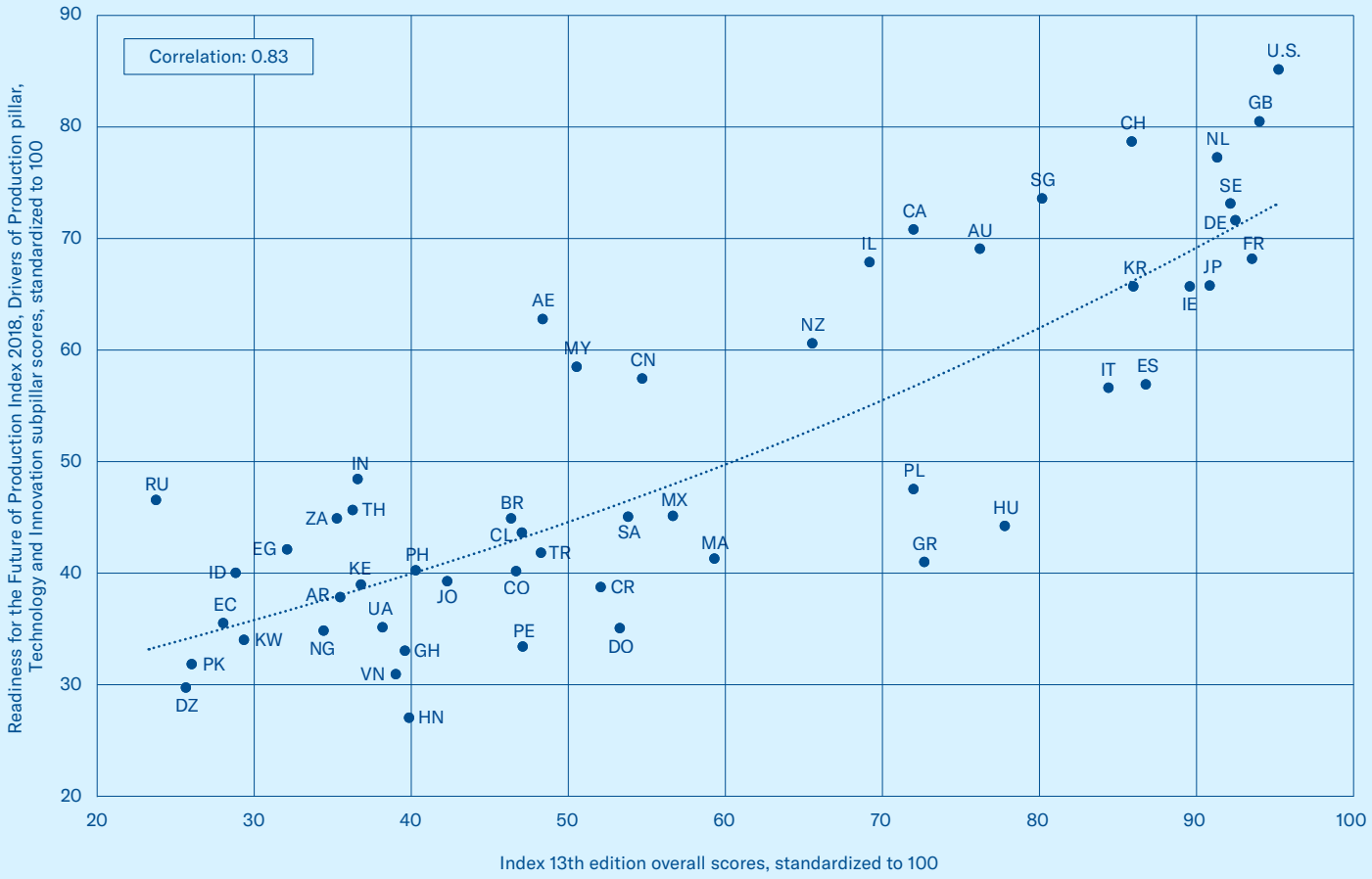
- This relationship adds to the strength of the overall findings of the Statistical Annex to date–namely, that robust IP protection is a critical component of the 21st century knowledge-based economy.
- In fact, a positive stepwise improvement can be seen across both measures: Economies with robust IP environments are 40% more likely to adapt to the Fourth Industrial Revolution and secure new growth opportunities.

Association between the Index scores and the Readiness for the Future of Production Assessment 2018, Driver of Production pillar scores: Division by thirds in Index scores, average scores per third



A Strong IP Framework Equals Greater Capacity for Innovation and Technological Absorptive Capacity

Association between the Index scores and the Readiness for the Future of Production Assessment, Drivers of Production pillar, Technology & Innovation subpillar scores[14]

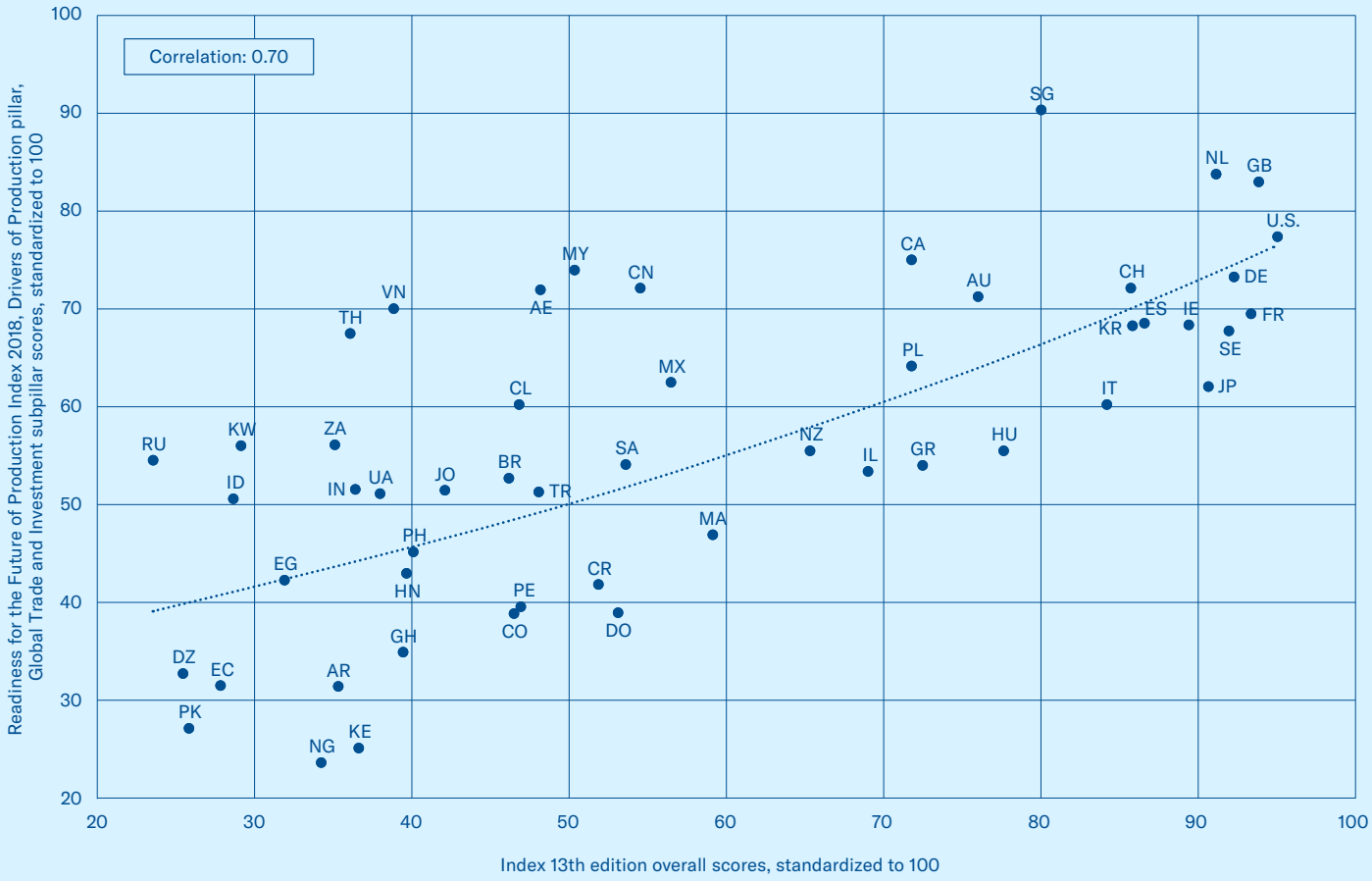


Data NA for Brunei, Taiwan and Venezuela

- The Readiness for the Future of Production Assessment's Technology & Innovation subpillar measures the extent to which economies have advanced, digitally secure, globally connected, and interoperable, the economic production system—a critical element for economies' ability to foster and commercialize new and innovative technologies.
- The Index exhibits a very strong correlation of .83 to the Technology & Innovation subpillar scores. In fact, economies with strong IP systems are 55% more likely to be able to transform their economies using sophisticated, state-of-the-art technologies compared to economies whose IP systems require improvement.

Favorable IP Regimes Promote Trade Openness and Attractiveness to Foreign Investments

Association between the Index scores and the Readiness for the Future of Production Assessment, Global Trade & Investment subpillar scores[15]



Data NA for Brunei, Taiwan and Venezuela

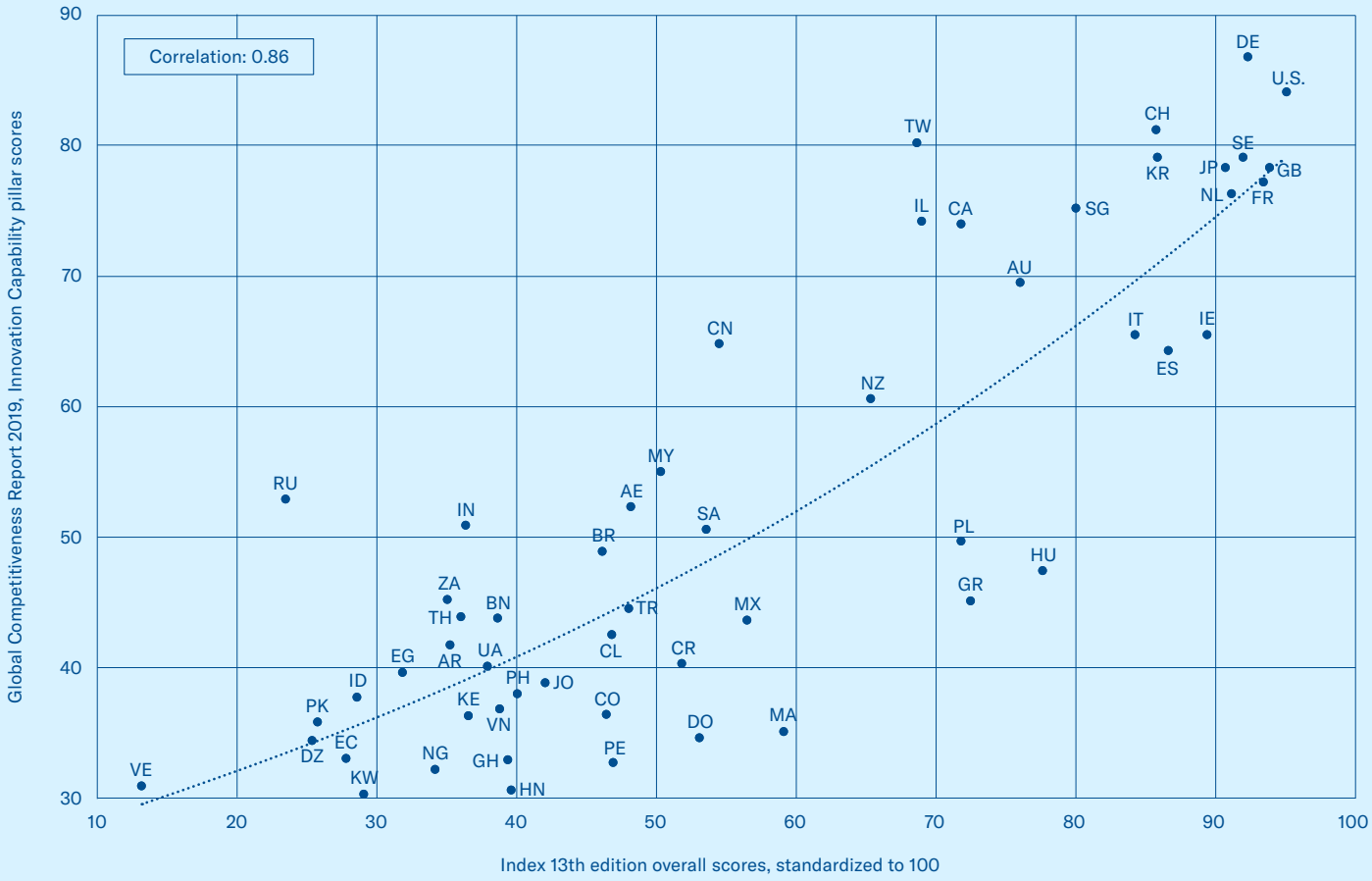
- The Readiness for the Future of Production Assessment's Global Trade & Investment subpillar measures economies' levels of openness to international trade and the availability of capital directed to production-related development. There is a strong relationship (at a correlation strength of .70) to the Index scores, suggesting that the strength of a national IP environment is a contributing factor to economies' ability to bolster knowledge and skill attainment, increase technology transfer, and boost productivity and competitiveness.

- Economies with fair to strong IP environments are 41% more open for business and attractive to foreign investments in their production systems compared to weaker economies.

Resources to Innovate

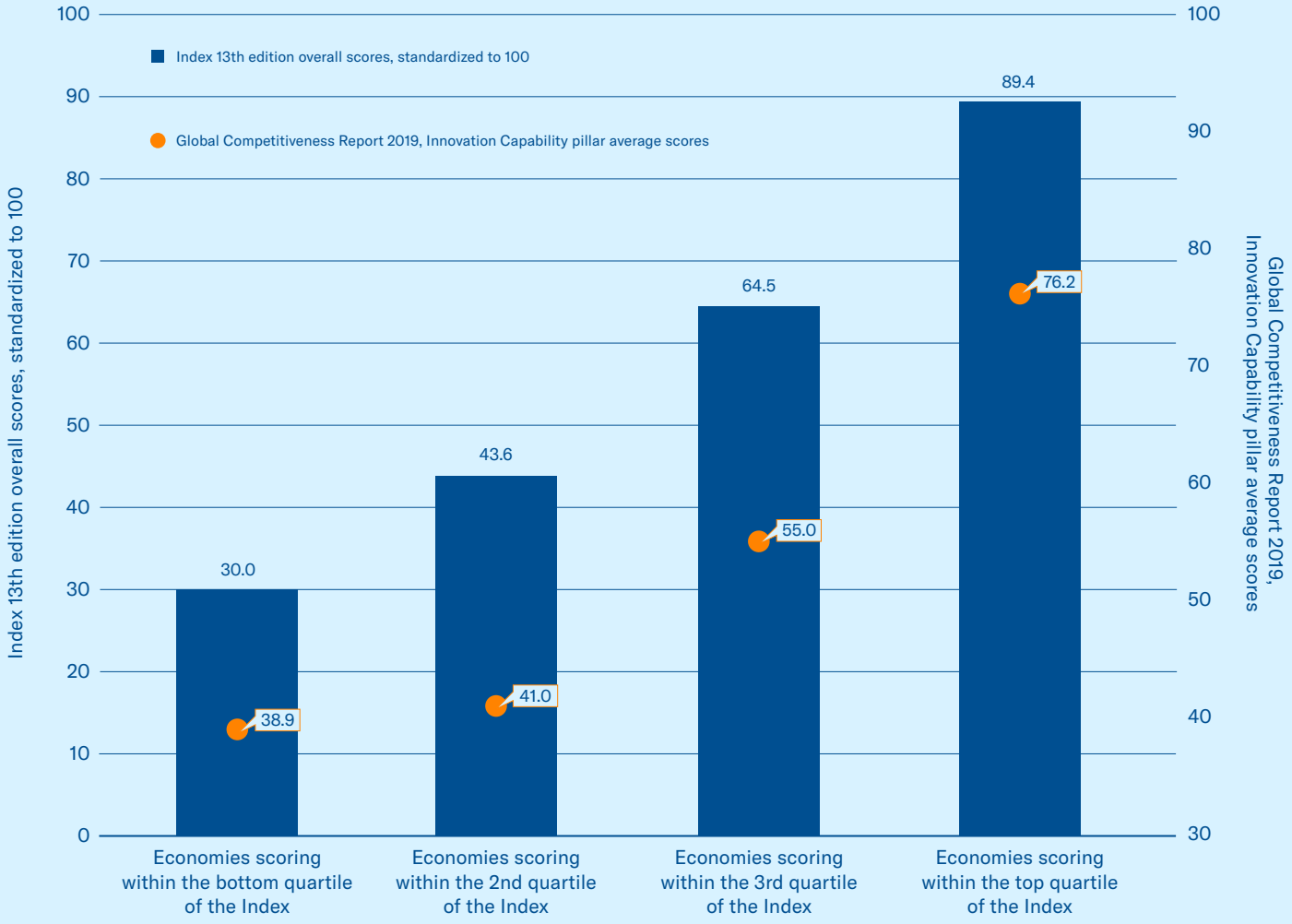
Robust IP Protection is a Key Component in Developing a Strong Innovation Capability

Association between the Index scores and the *Global Competitiveness Report 2019*, Innovation Capability Pillar scores[16]



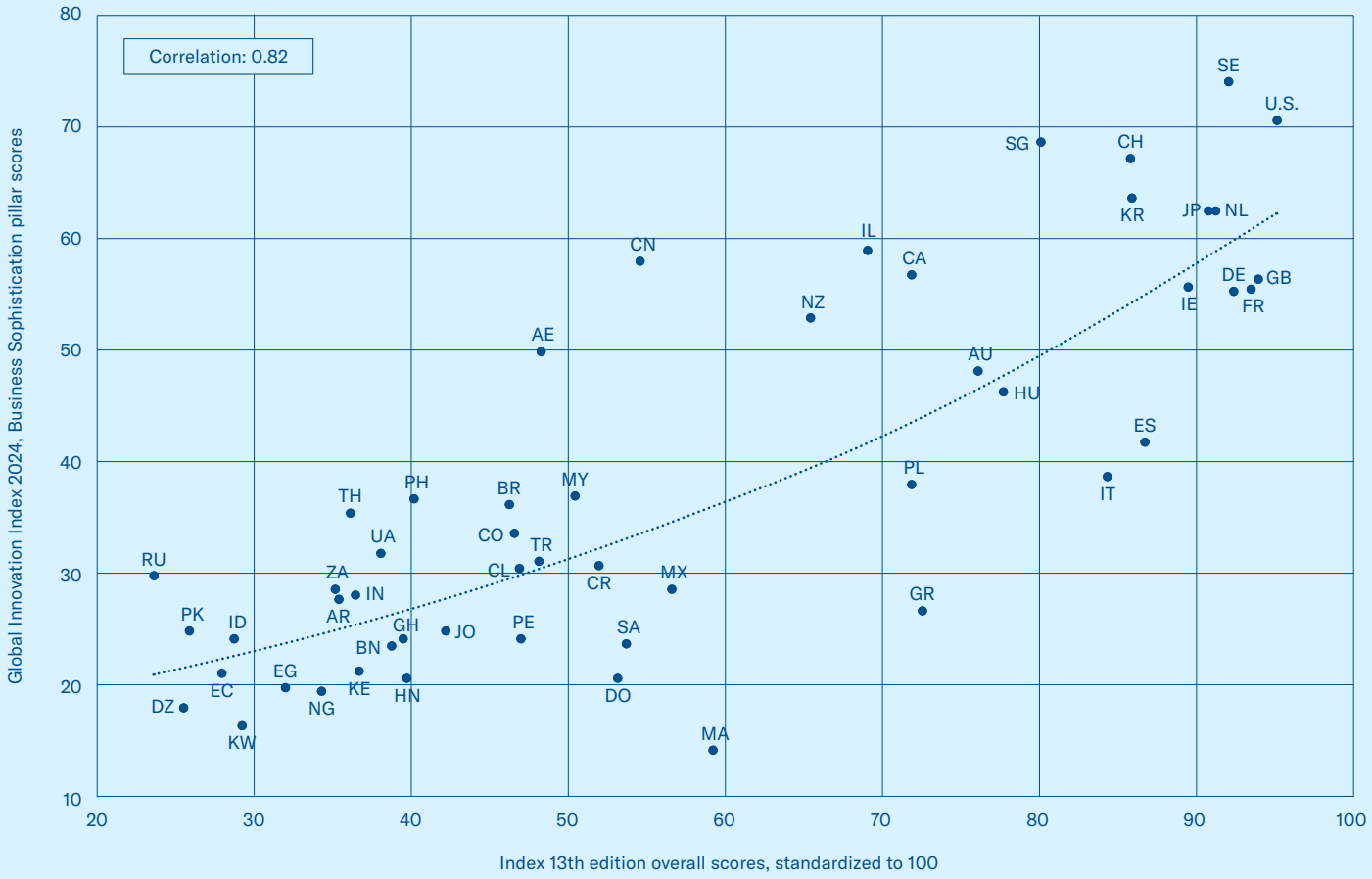
- A very strong relationship (a correlation of .86) was found between the Index scores and the *Global Competitiveness Report's* Innovation Capability pillar scores.
- Economies with fair to strong IP regimes are on average 65% more likely to maintain an environment capable of producing innovative outputs compared to weaker economies.
- The link between the two variables is particularly strong when looking at group averages by quartiles of Index scores: Economies scoring within the third and fourth quartiles of the Index are much more capable of innovating and benefiting from local innovation activities compared to economies scoring within the second and first quartiles of the Index.

Association between the Index scores and the Global Competitiveness Report 2019, Innovation Capability Pillar scores: Division by quartiles in Index scores, average scores per quartile



Supportive IP Regimes are Essential for Creating Environments that are Conducive to Innovation

Association between the Index scores and the Global Innovation Index 2023, Business Sophistication Pillar scores[17]

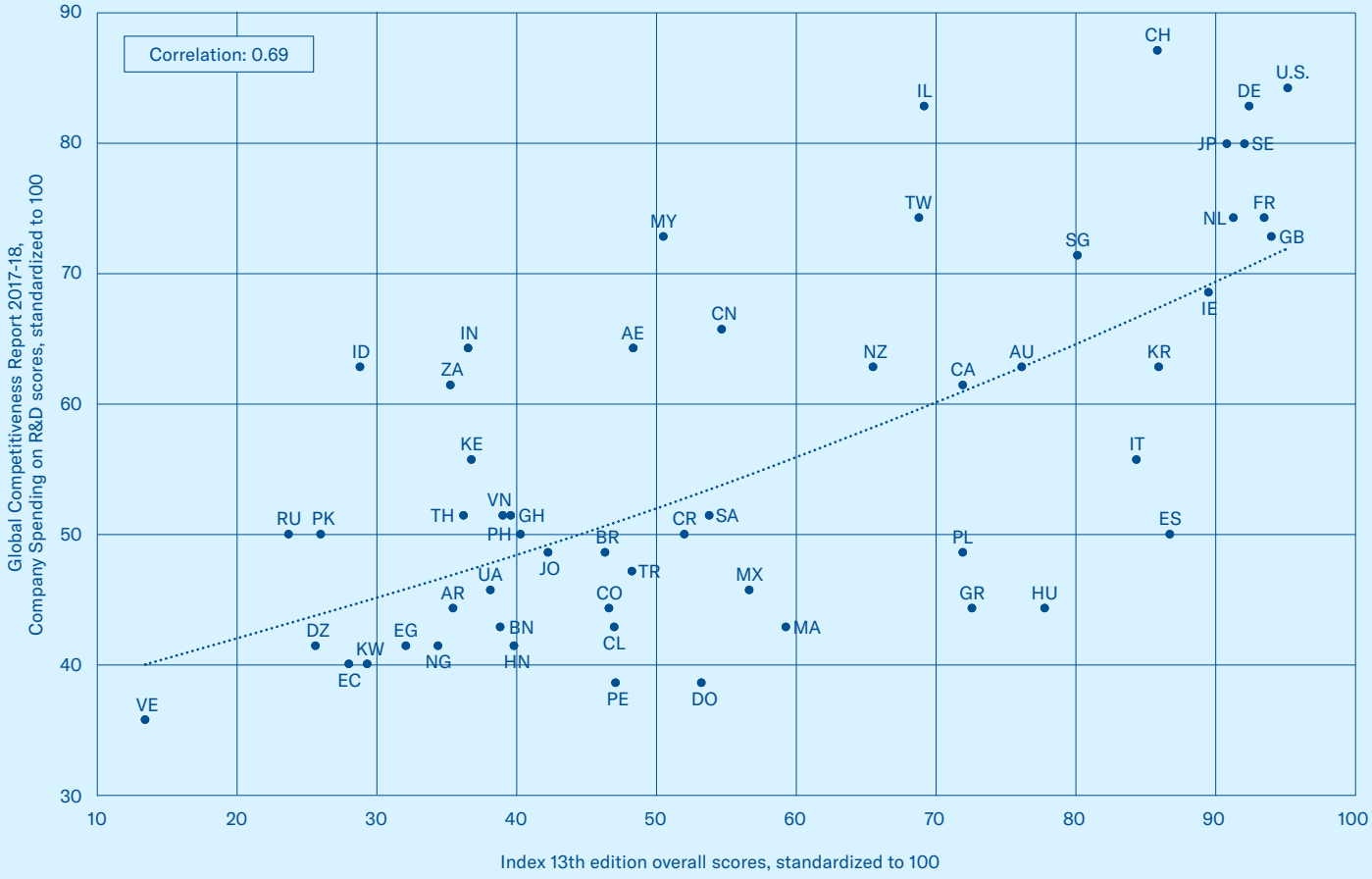


Data NA for Taiwan and Venezuela

- The *Global Innovation Index's* Business Sophistication pillar measures the availability of competent talent, levels of innovation linkages and infrastructure, and levels of FDI and reliance on high-tech imports. There is a very strong correlation of .82 to the Index scores.
- As a result, economies with strong IP protection are 77% more likely to experience the benefits of an innovation-driven economy, ranging from more high-skilled and high-paid workers to increased R&D activity.

Companies Are More Likely to Spend on R&D in Favorable IP Environments

Association between Index scores and the *Global Competitiveness Report 2017-18*, company spending on R&D scores[18]

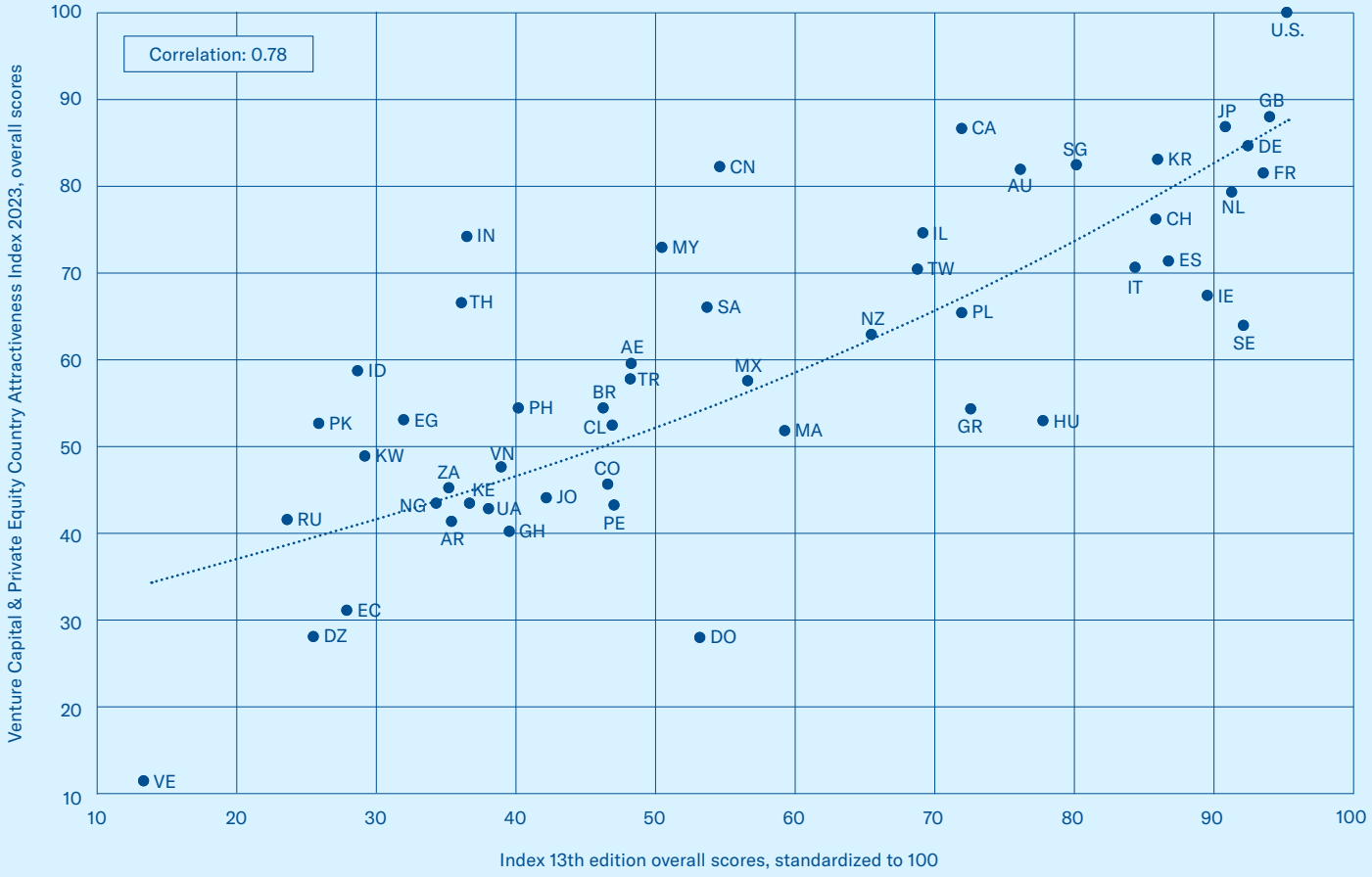


Data NA for Brunei, Taiwan and Venezuela

- A strong correlation of .69 exists between the Index scores and private sector propensity to spend on R&D.
- Economies with robust IP environments, scoring over 50% on the Index, are 33% more likely to see private-sector investment in R&D activities compared with companies in economies with less supportive IP environments.

Economies with Robust IP Regimes Are More Attractive to Investors

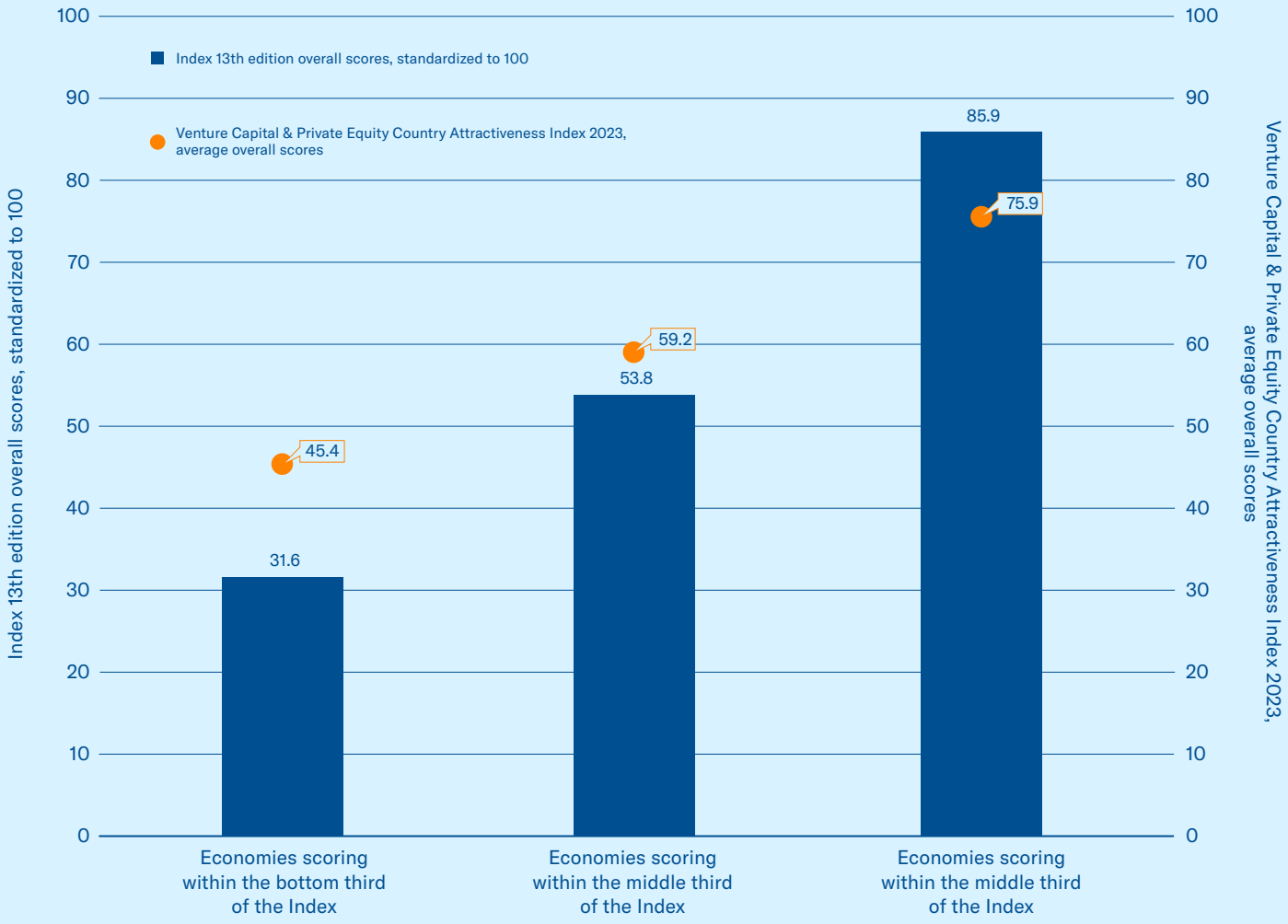
Association between the Index scores and the Venture Capital (VC) & Private Equity (PE) Country Attractiveness Index 2023 scores[19]



Data NA for Brunei, Costa Rica, and Honduras

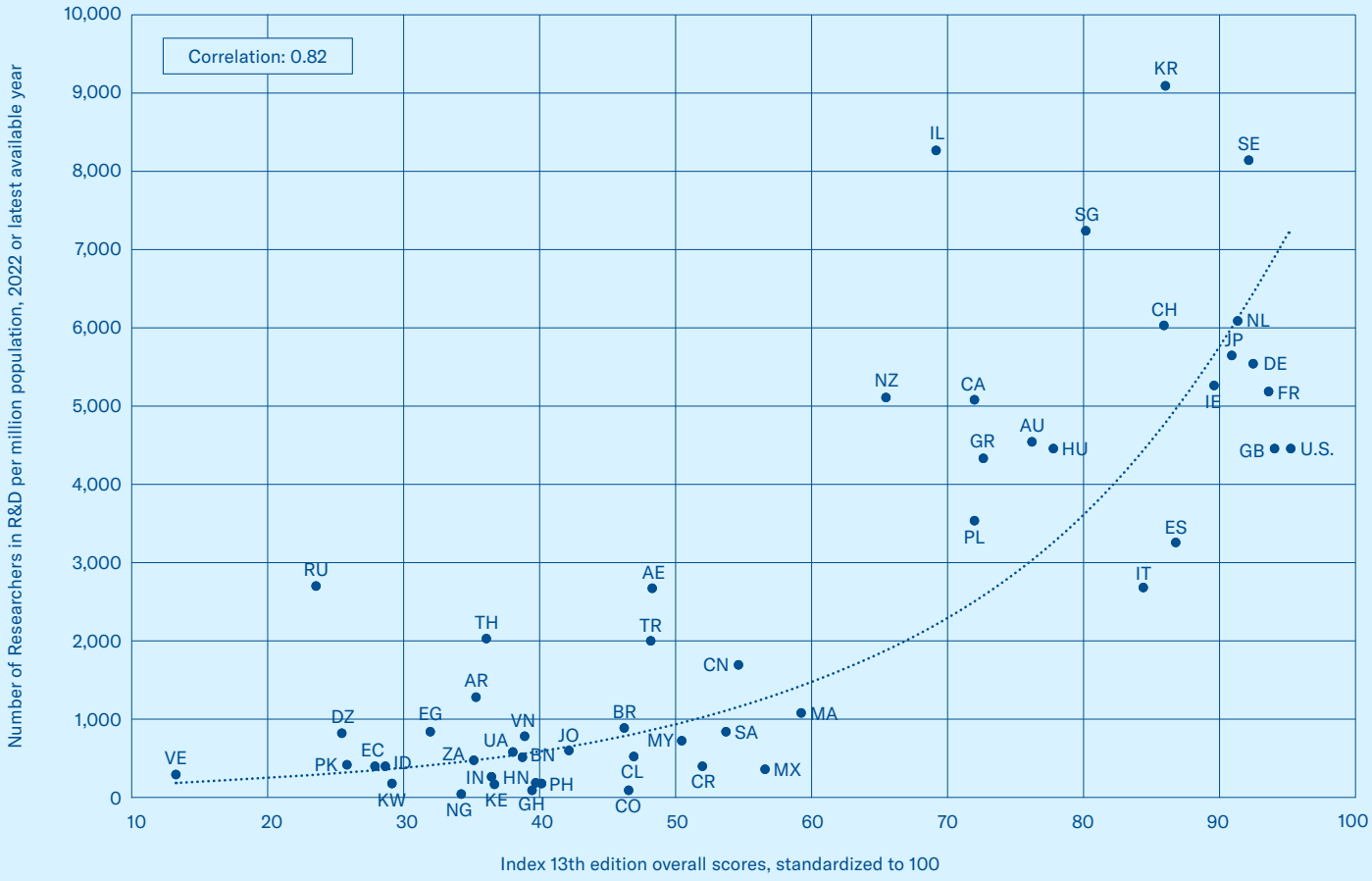
- There is a strong correlation of .78 to the IESE and EMLYON Business Schools' *Venture Capital & Private Equity Attractiveness Index* scores.
- Innovators and companies in economies with higher Index scores and stronger national IP environments are 52% more likely to attract venture capital and private equity funds compared with economies whose IP regimes lag behind.

Association between the Index scores and the *Venture Capital & Private Equity Country Attractiveness Index* scores: Division by thirds in Index scores, average scores per third



Strong IP Environments Encourage the Development of Human Capital

Association between Index scores and the number of researchers in R&D per million population[20]

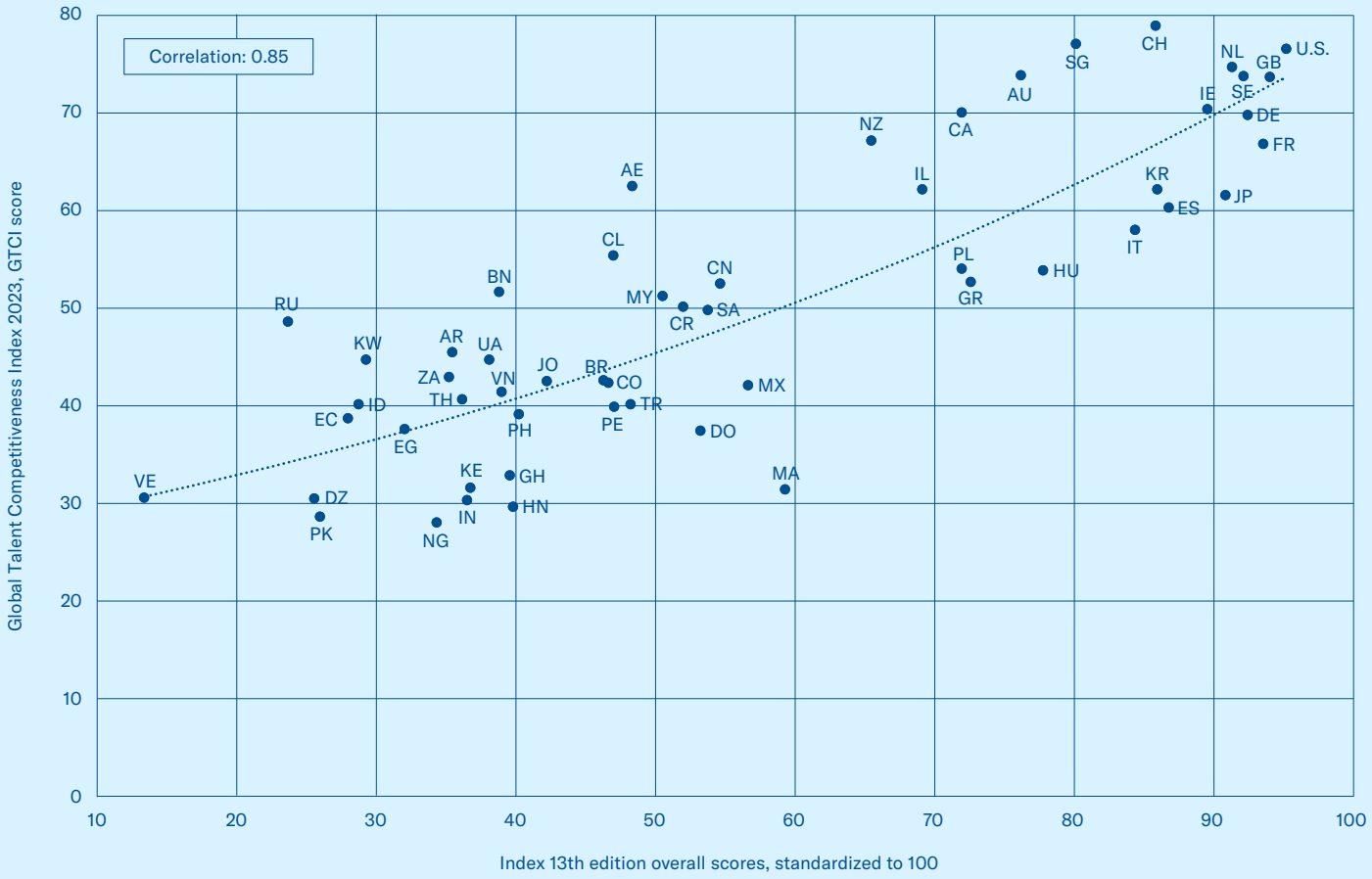


Data NA for Dominican Republic, Peru, and Taiwan

- The relationship between the Index scores and levels of human capital has remained very strong (a correlation strength of over .80, with this year being at .82) over the past six editions of the Annex.
- Economies with favorable IP regimes are almost five times more likely to have highly skilled researchers in their labor force.

Favorable IP Environments are Better Positioned for Competing in the Global Innovation Arena

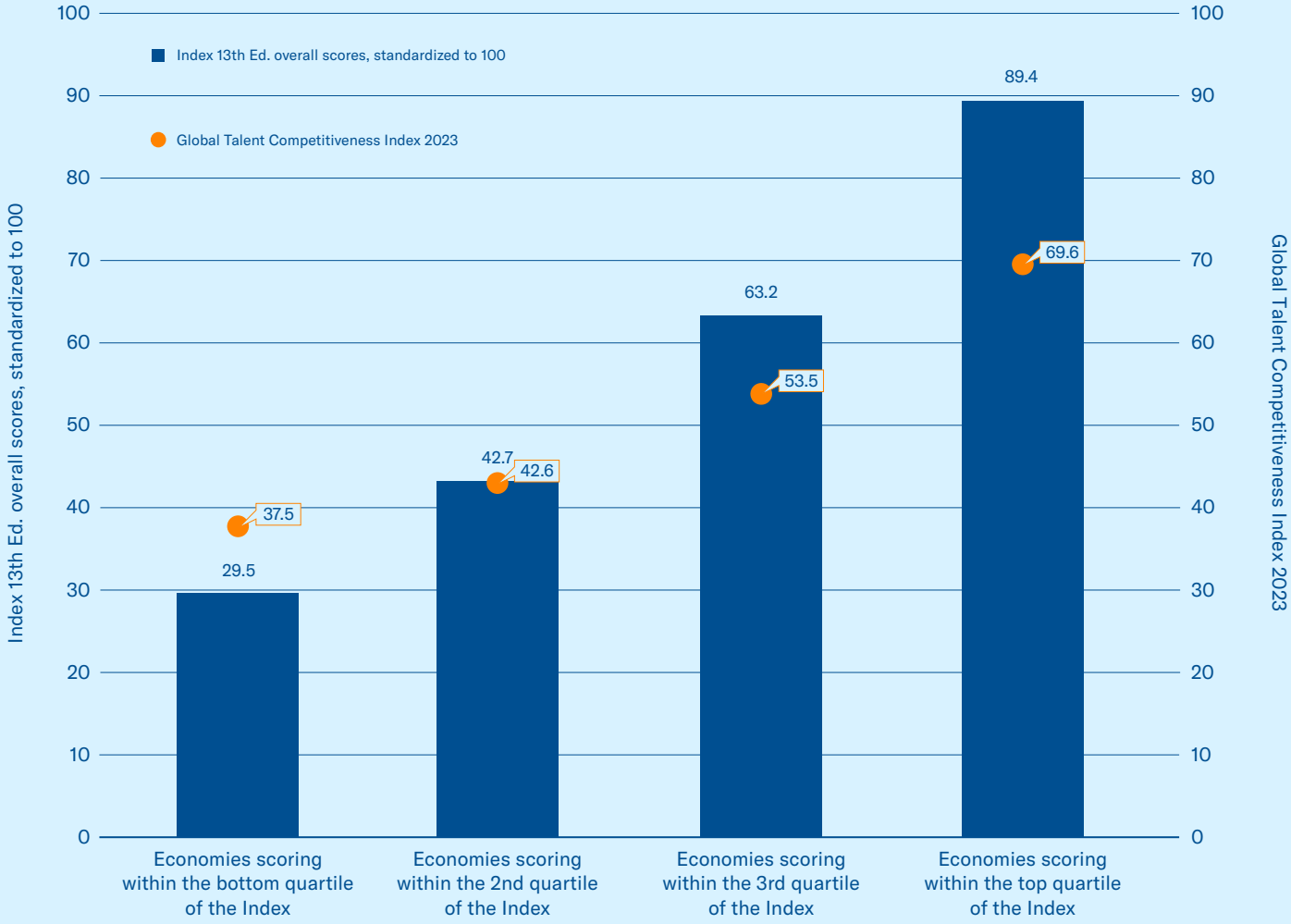
Association between the Index scores and the *Global Talent Competitiveness Index* 2023[21]



Data NA for Taiwan

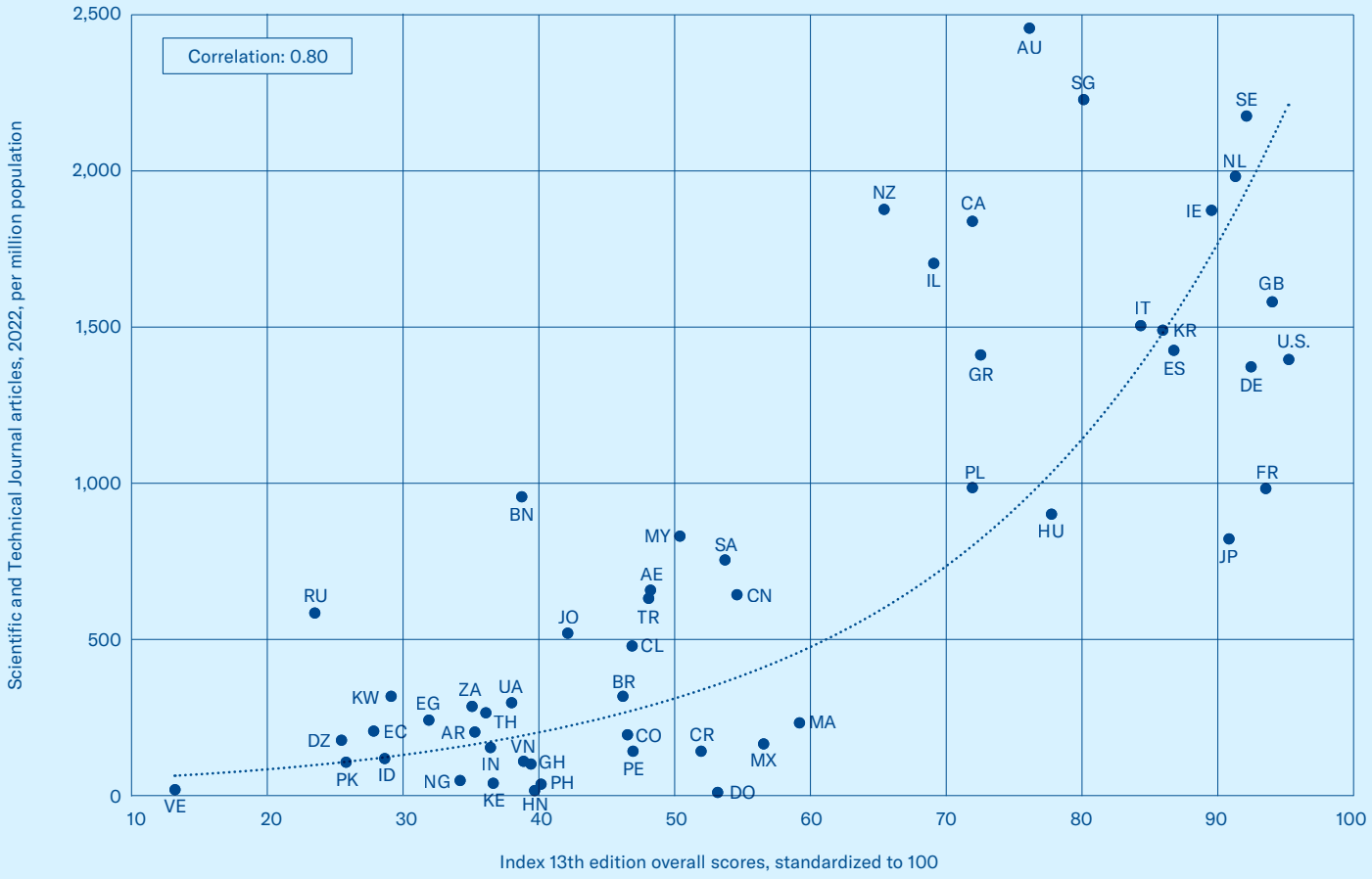
- IP protection displays a very strong relationship, at a correlation strength of .85, with economies' performance on the *Global Talent Competitiveness Index*. The latter benchmarks economies' ability to develop, attract, and empower human capital, measuring both inputs such as enabling landscape, market openness, quality of learning and sustainability, as well as outputs such as mid- and high-level skills and overall talent impact.
- Economies with higher Index scores are 52% more competitive on the Global Talent Competitiveness Index than those with lower scores.
- When dividing the Index scores into quartiles, a corresponding stepwise increase is revealed in economies' talent competitiveness, suggesting that the overall strength of economies' IP protection goes hand in hand with the development of a strong and competitive workforce.

Association between the Index scores and the Global Talent Competitiveness Index rankings: Division by quartiles in Index scores, average scores per quartile



Supportive IP Frameworks and Science and Technology Knowledge Production

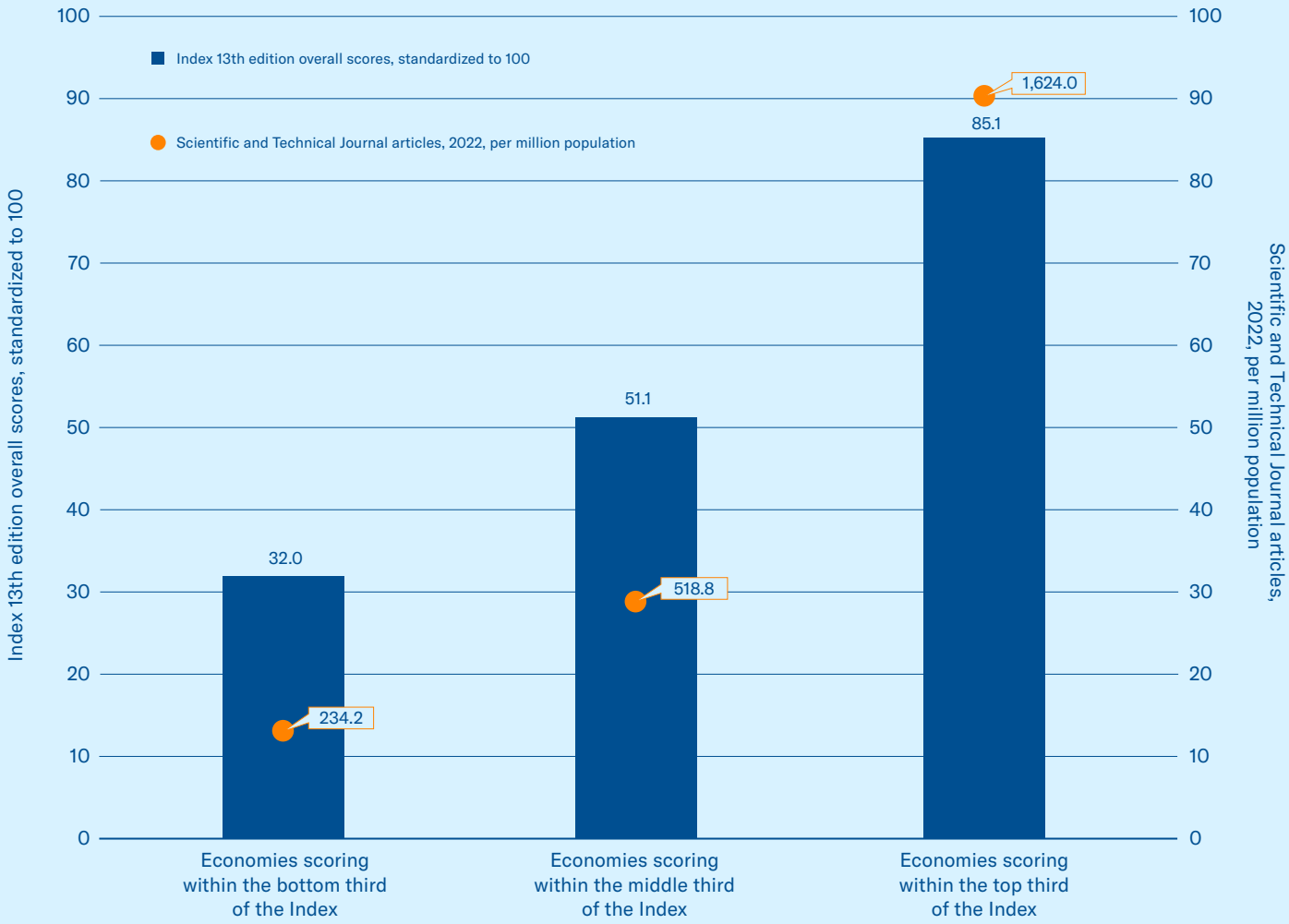
Association between the Index scores and the number of scientific and technical journal articles per million population[22]



Data NA for Taiwan

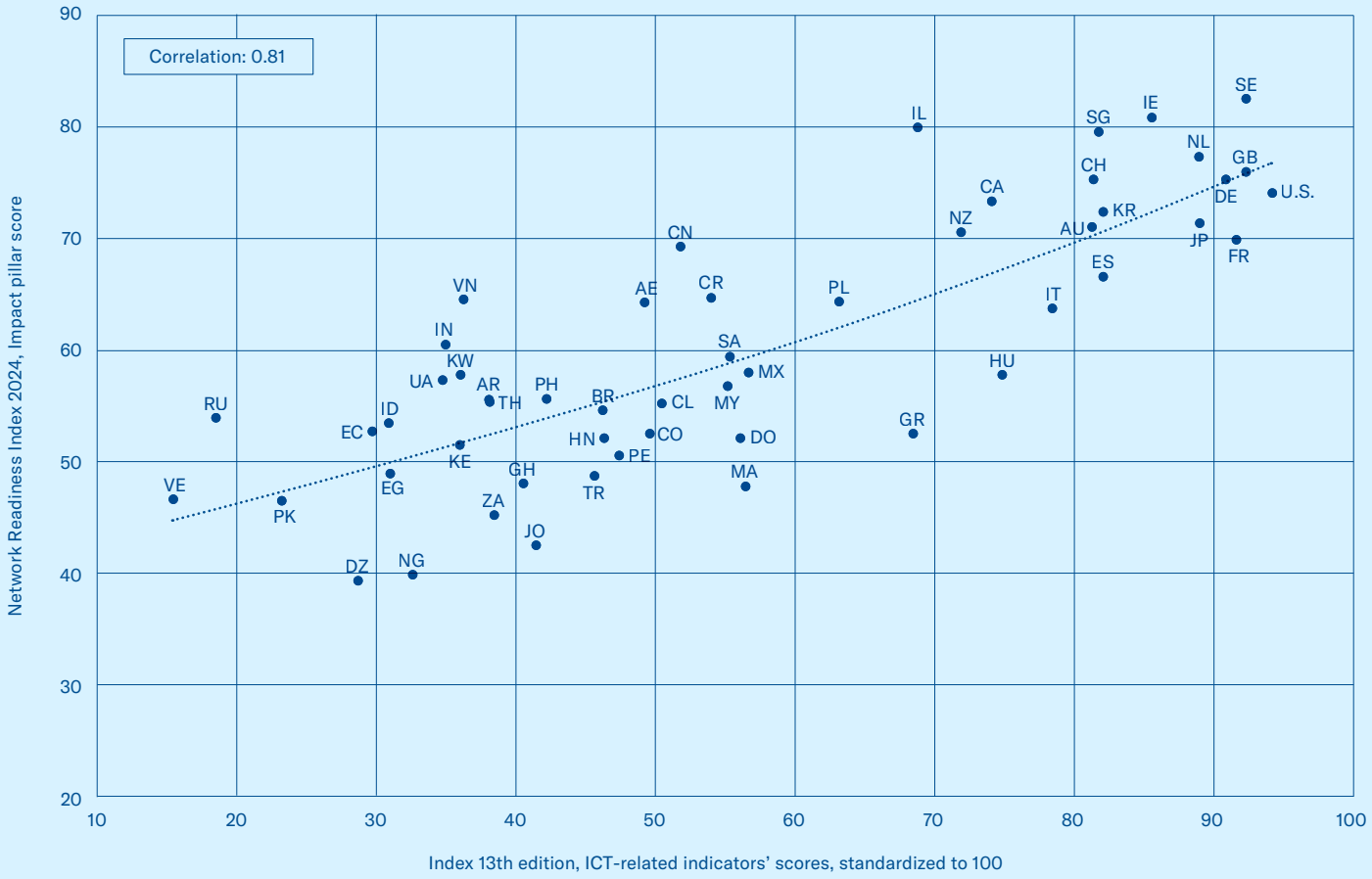
- The population-adjusted rate of scientific and technical journal articles–a robust measure for the quality and productivity of human capital in the fields of life-sciences, technology, and engineering–displays a very strong correlation (.80) with the Index's overall scores.
- Economies with robust IP systems, as measured by the Index, have almost four times more knowledge output in terms of scientific and technical journal articles.

Association between the Index scores and the number of scientific and technical journal articles per million population: Division by thirds in Index scores, average scores per third



IP Protection Contributes to the Growth of the ICT Sector and Knowledge-Based Economies

Association between the Index's ICT-related indicators scores and the *Network Readiness Index 2024*, Impact Pillar scores[23]

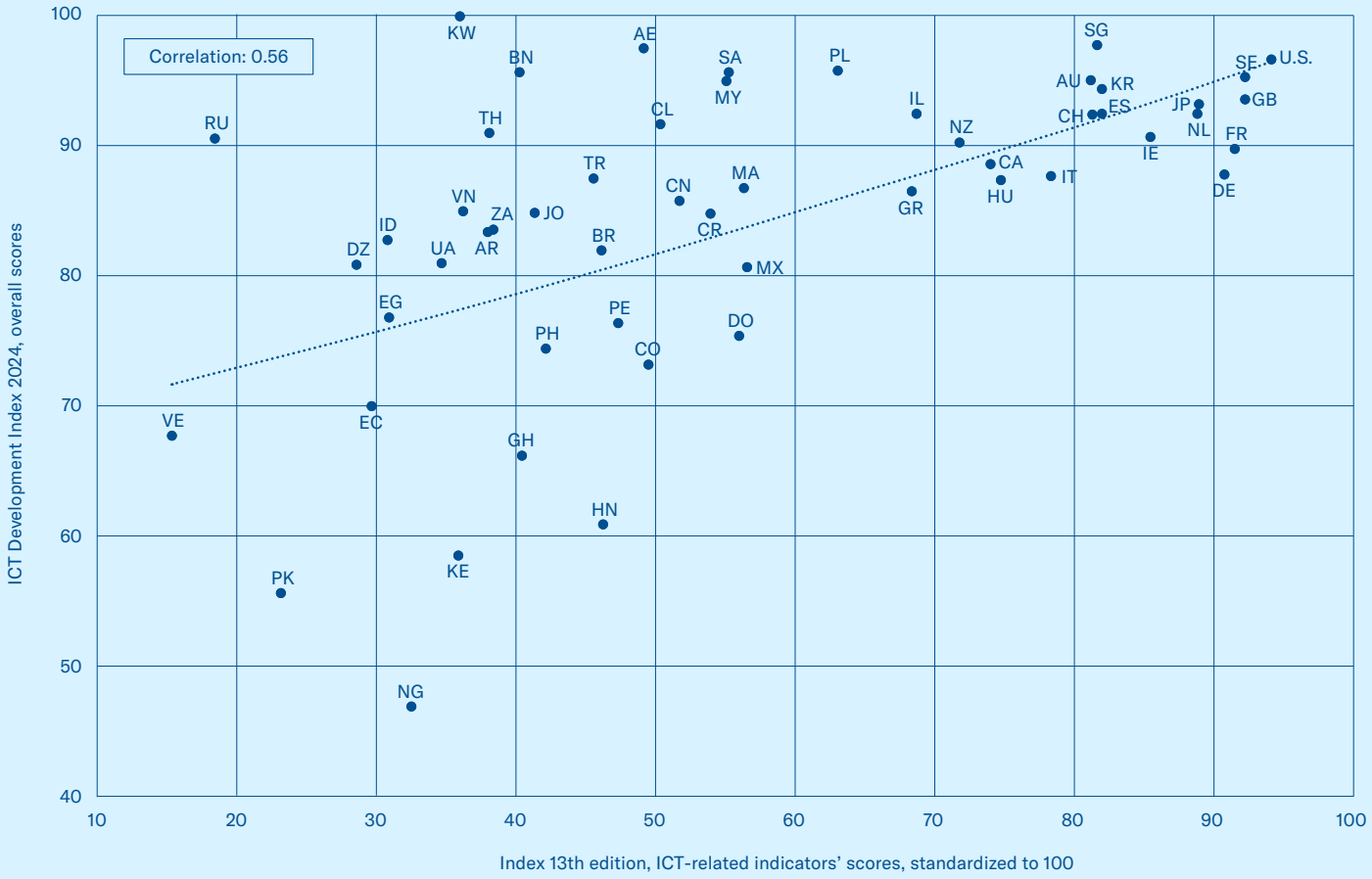


Data NA for Brunei and Taiwan.

- There is a very strong correlation (.81) between the Index's ICT-related indicators and the extent to which an economy leverages ICT and benefits from its economic and societal impact, as measured by the *Network Readiness Index*.
- Economies with stronger Index scores are 31% more likely to fully leverage ICTs for increased productivity and technology development.

IP Protection Contributes to the Growth of the ICT Sector and Knowledge-Based Economies

Association between the Index ICT-related indicators scores and the *Measuring digital development, The ICT Development Index 2024*[24]



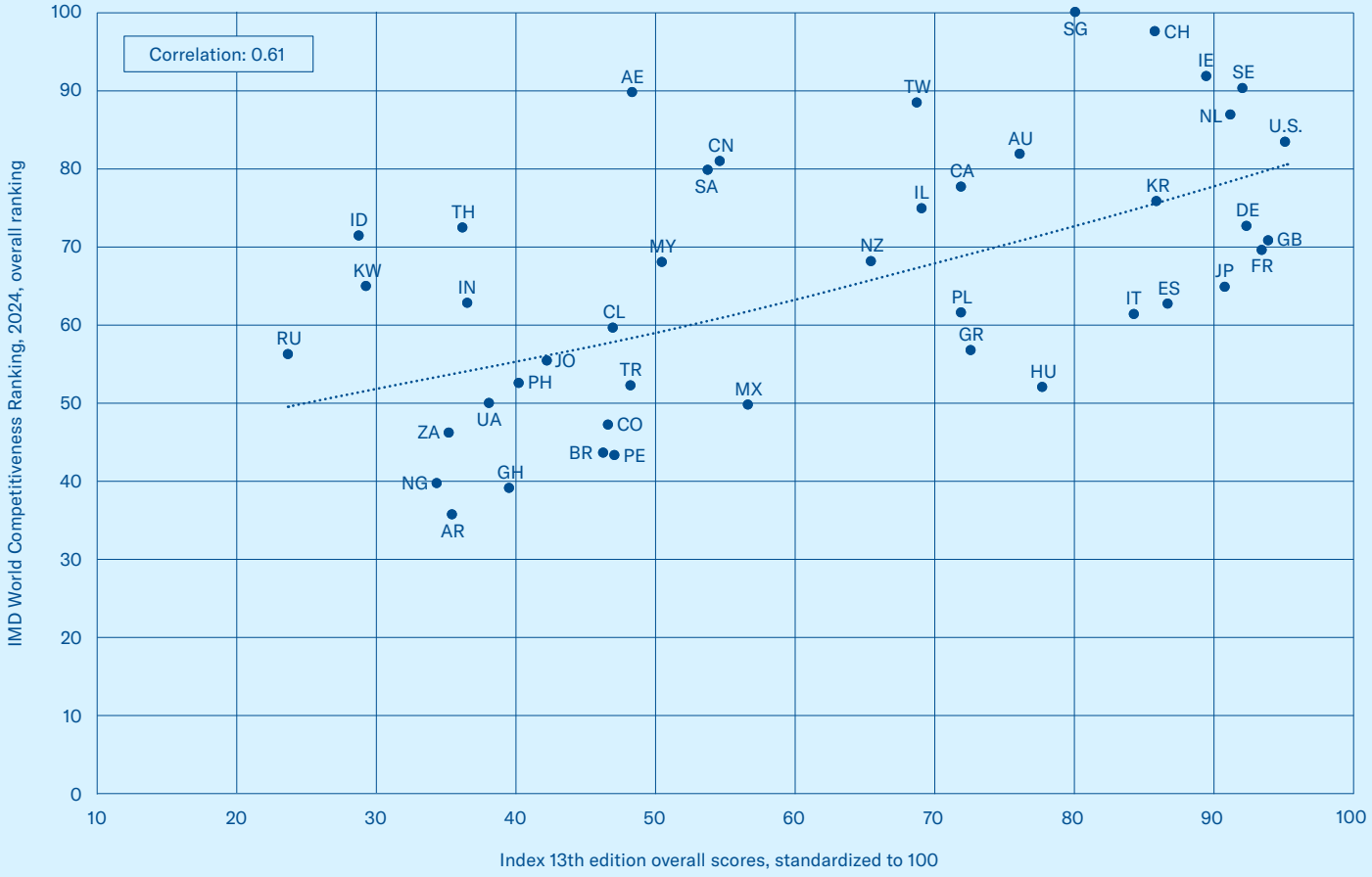
Data NA for India and Taiwan

- The Index's ICT related indicators' scores display a moderate correlation of .56 with the ICT Development Index.
- Economies with favorable IP environments are 16% more likely to support a dynamic ICT sector and experience the socio-economic benefits this generates.

Outputs of a competitive knowledge-based economy

Economies with Favorable IP Environments are More Globally Competitive

Association between the Index scores and the 2024 *IMD World Competitiveness Ranking* overall scores[25]

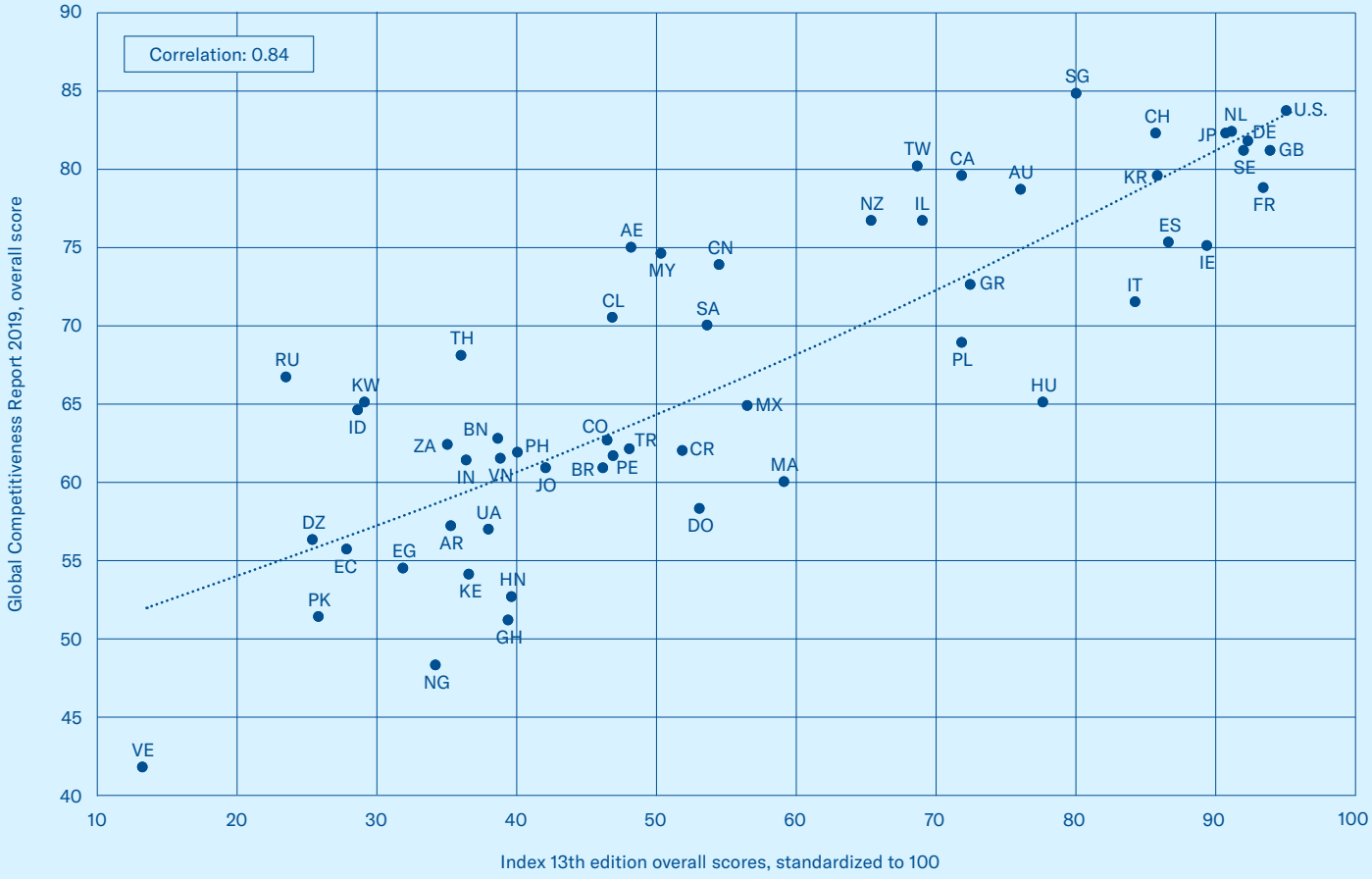


Data NA for Algeria, Brunei, Costa Rica, Dominican Republic, Ecuador, Egypt, Honduras, Kenya, Morocco, Pakistan, and Vietnam.

- The IMD World Competitiveness Ranking shows a strong relationship (at a correlation strength of .61) with the Index scores.
- On average, economies with stronger Index scores are 42% more competitive than economies scoring below 50%.

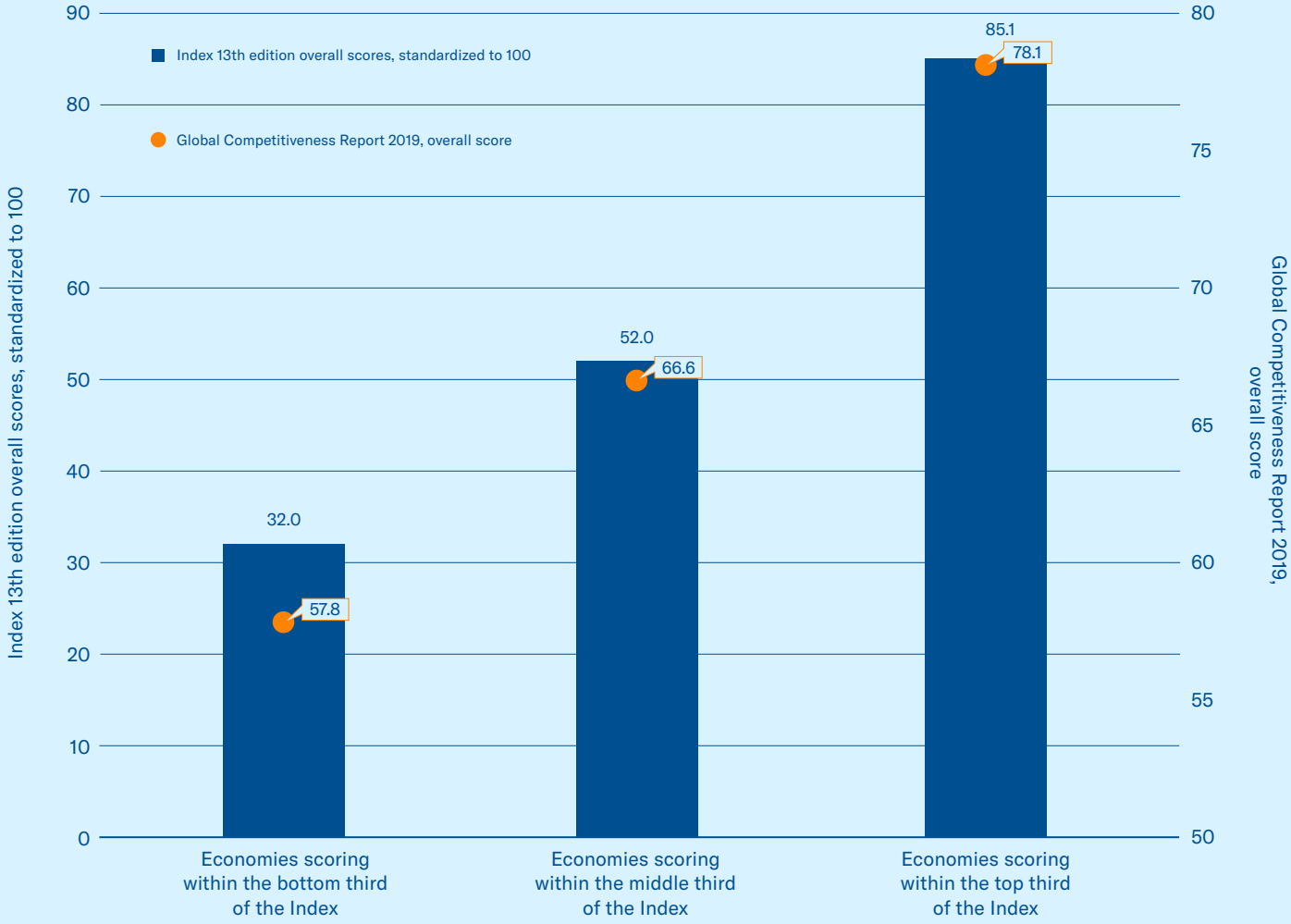
Economies with Favorable IP Environments are More Globally Competitive

Association between the Index scores and the *Global Competitiveness Report 2019* overall scores[26]



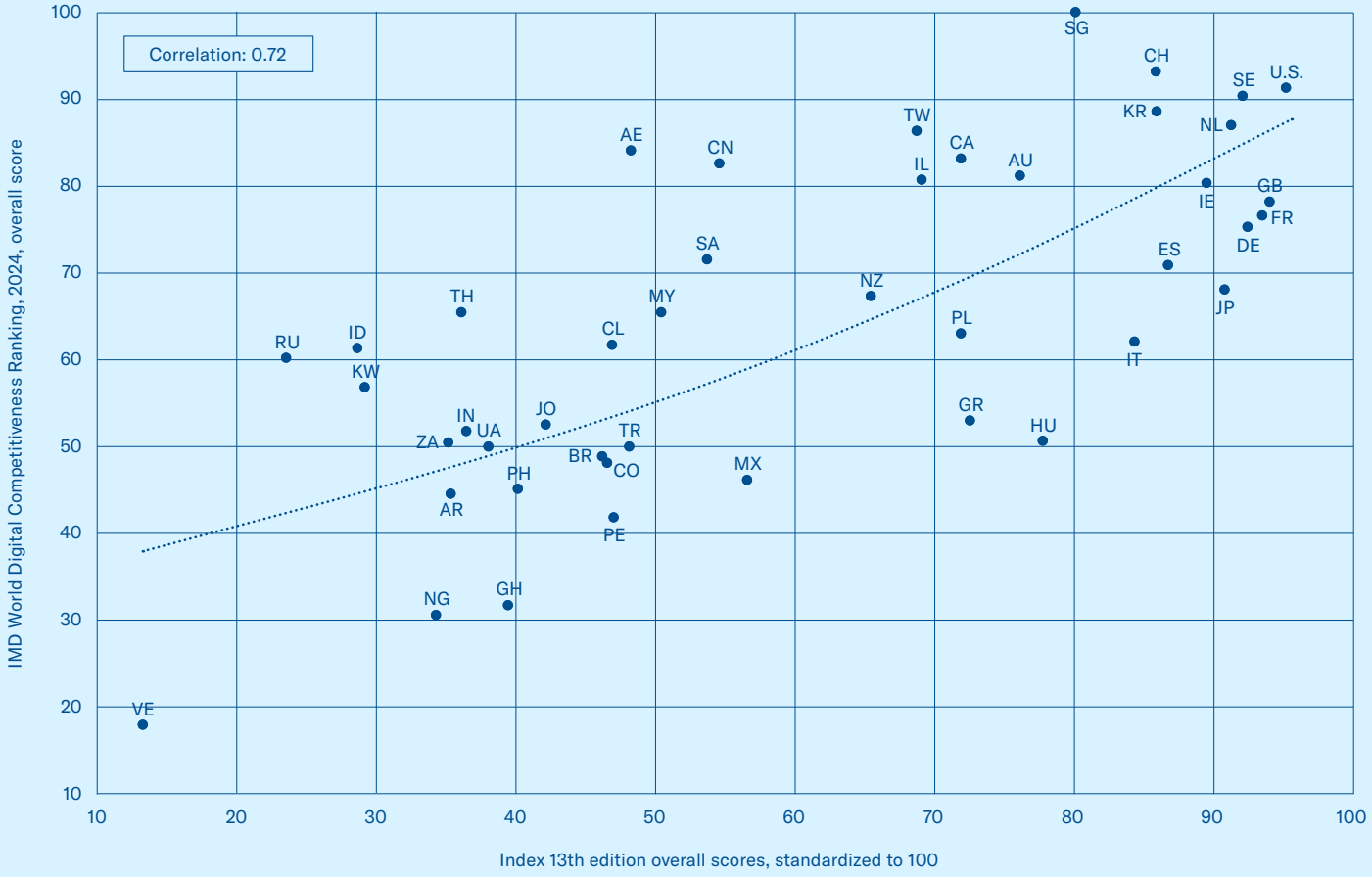
- The Global Competitiveness Index is a comprehensive benchmark of the set of institutions, policies, and factors that determine economies' productivity and competitiveness. There is a very strong relationship (at a correlation strength of .84) with the Index scores.
- On average, economies with stronger Index scores are 26% more competitive than economies scoring below 50%.
- When dividing the Index scores into thirds, a corresponding stepwise increase is revealed in economies' competitiveness, suggesting that the overall strength of economies' IP protection goes hand in hand with overall levels of international economic competitiveness.

Association between the Index scores and the *Global Competitiveness Report 2019* overall scores: Division by thirds in Index scores, average scores per third



Economies with Favorable IP Environments are More Digitally Competitive

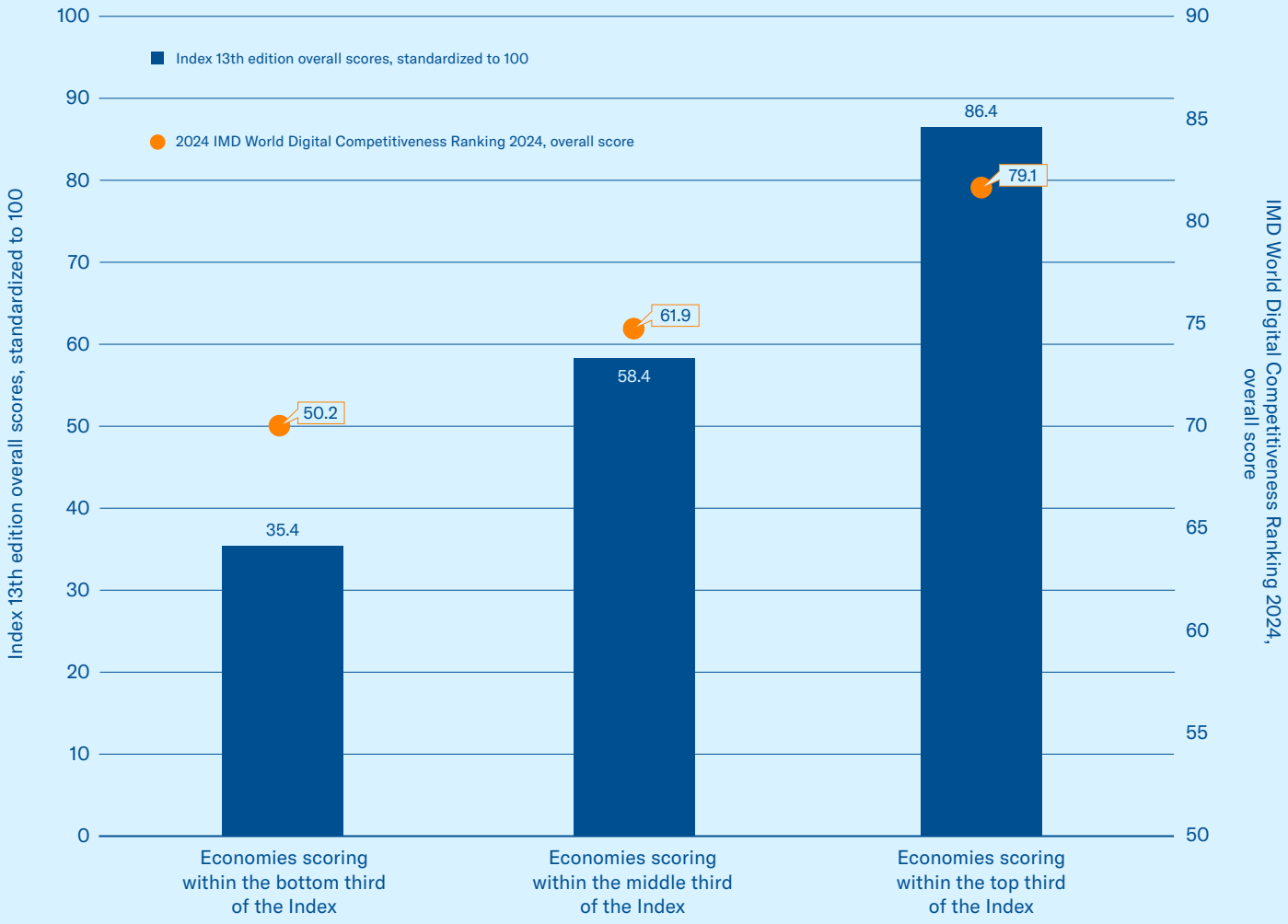
Association between the Index scores and the *2023 IMD World Digital Competitiveness Ranking* overall scores[27]



Data NA for Algeria, Brunei, Costa Rica, Dominican Republic, Ecuador, Egypt, Ghana, Honduras, Kenya, Morocco, Nigeria, Pakistan, and Vietnam.

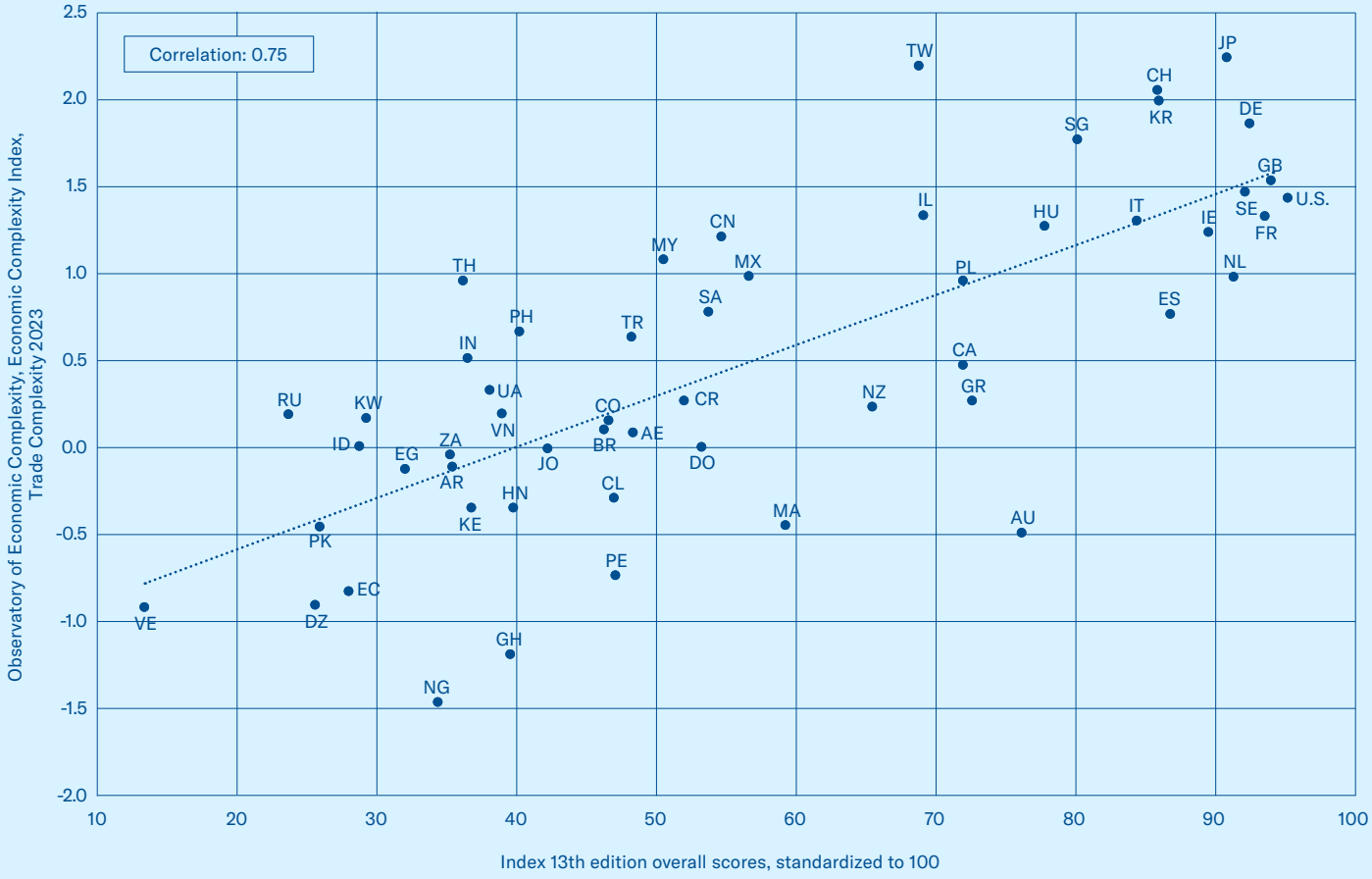
- The IMD World Digital Competitiveness Ranking "analyzes and ranks the extent to which countries adopt and explore digital technologies leading to transformation in government practices, business models, and society in general."[28]
- There is a strong relationship between digital competitiveness (at a correlation strength of .72) and the Index's overall scores.
- On average, economies with stronger Index scores are 41% more digitally competitive than economies scoring below 50%.
- When dividing the Index scores into thirds, a corresponding stepwise increase is revealed in economies' competitiveness, suggesting that the overall strength of economies' IP protection goes hand in hand with overall levels of international digital competitiveness.

Association between the Index scores and the *2024 IMD World Digital Competitiveness Ranking* overall scores: Division by thirds in Index scores, average scores per third



Robust IP Protection and Economic Complexity–Trade Complexity

Association between the Index scores and the Observatory of Economic Complexity's *Economic Complexity Index*[29]

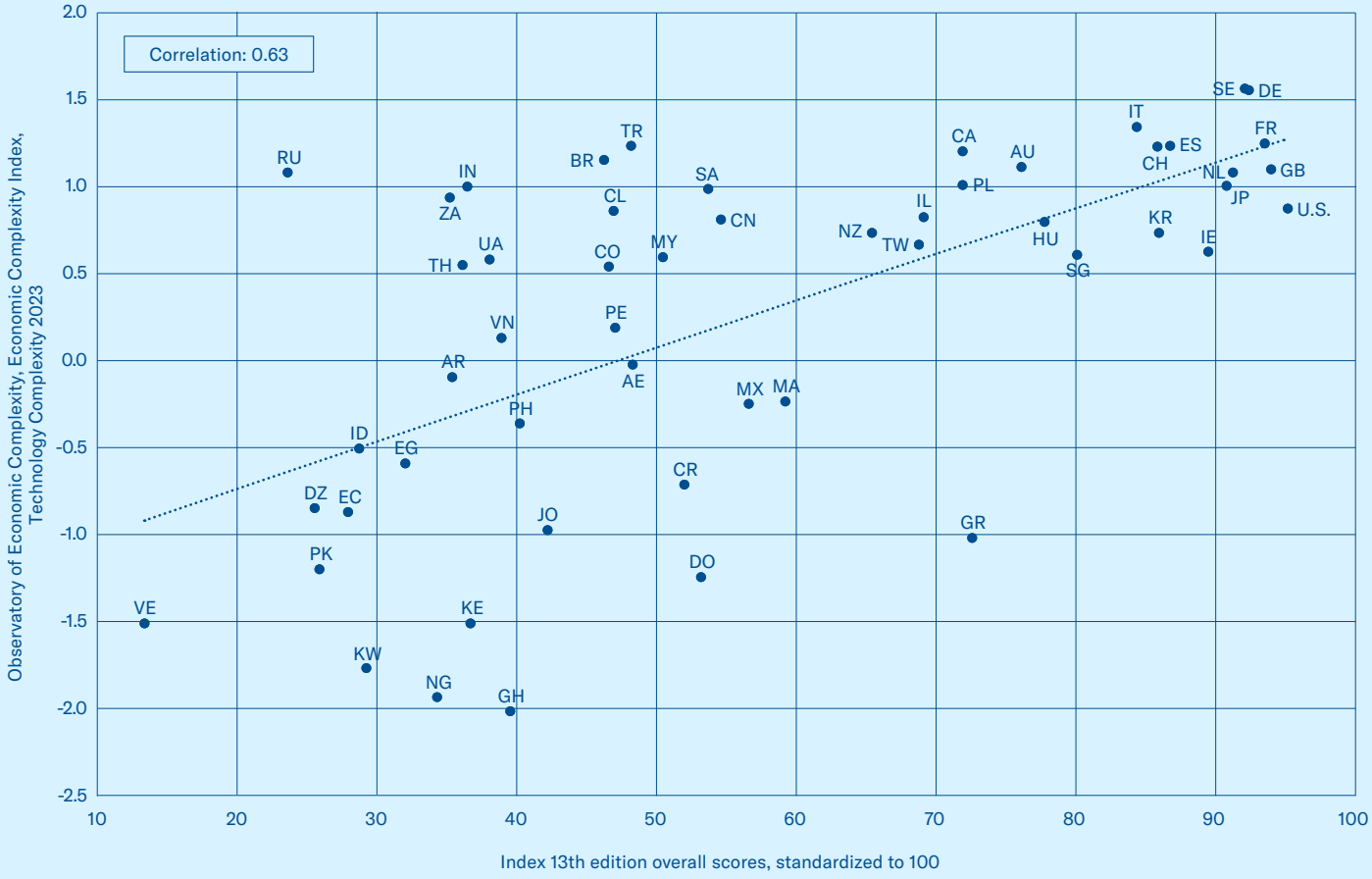


Data NA for Brunei

- The Observatory for Economic Complexity's *Economic Complexity Index* measures the complexity of knowledge required to produce a given product and the level of its exports. There is a strong correlation of .74 with the Index scores.
- Economies scoring above 50% of the Index are significantly more likely to produce and export complex, knowledge-intensive products and reap the associated social and economic benefits compared to economies scoring below.

Robust IP Protection and Economic Complexity–Technology Complexity

Association between the Index scores and the Observatory of Economic Complexity's *Economic Complexity Index–technology complexity*[30]

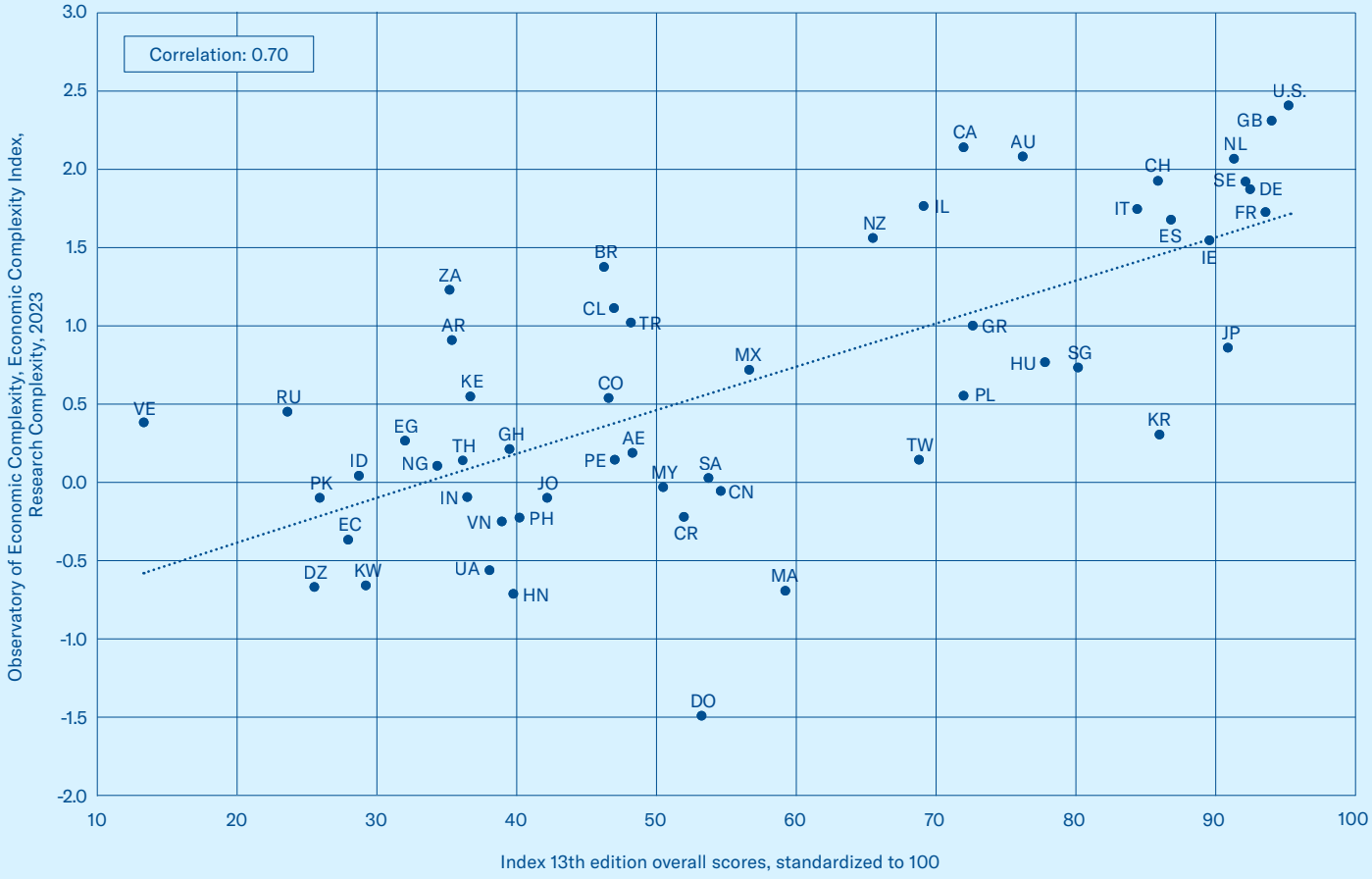


Data NA for Brunei and Honduras

- The Observatory for Economic Complexity's *Economic Complexity Index–technology complexity* measures the levels of complex technology in a given economy. There is a strong correlation of .63 with the Index scores.
- Economies scoring above 50% of the Index have over five times the levels of complex technology compared to economies scoring below.

Robust IP Protection and Economic Complexity–Research Complexity

Association between the Index scores and the Observatory of Economic Complexity's *Economic Complexity Index–research complexity*[31]

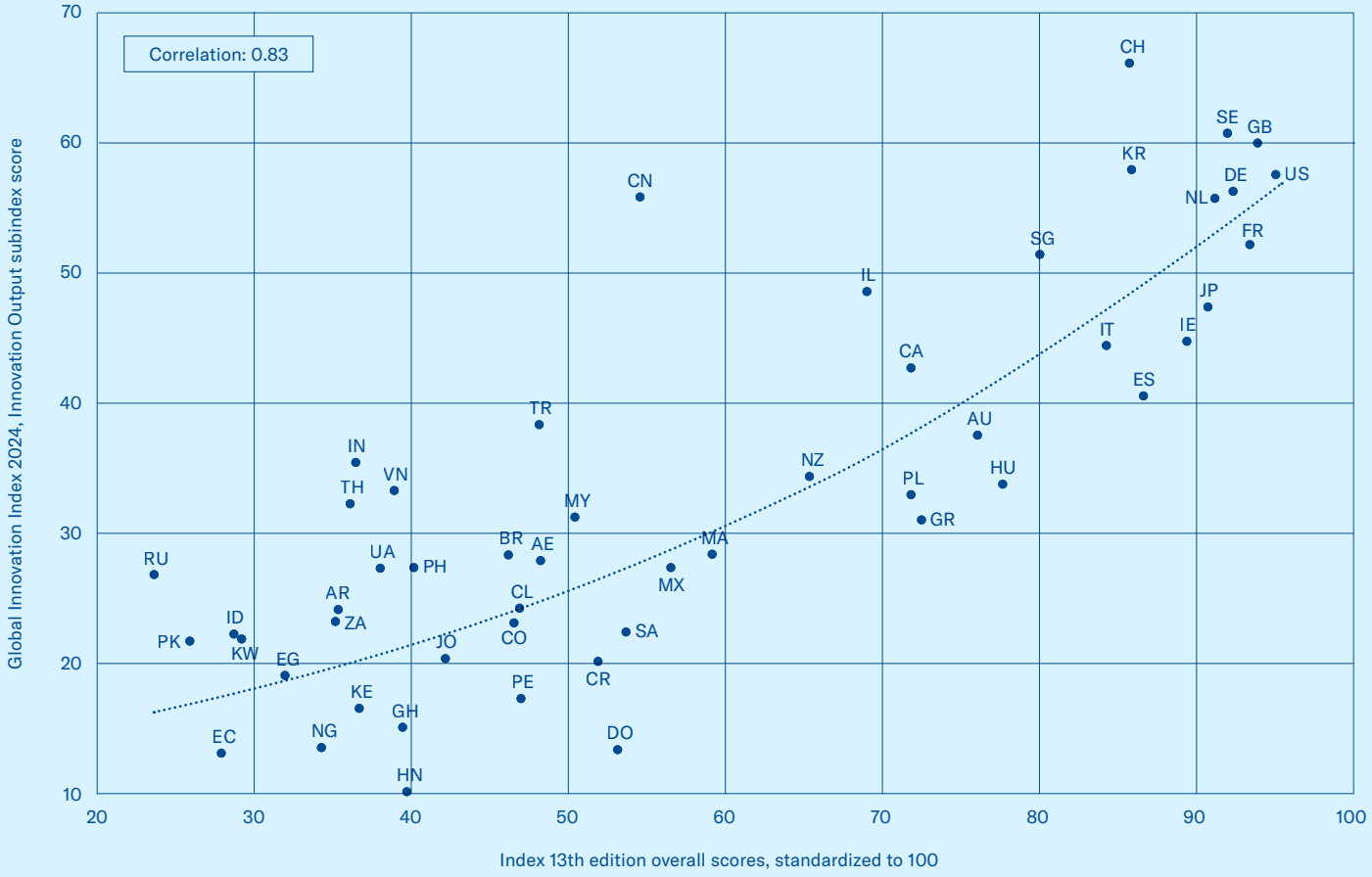


Data NA for Brunei

- The Observatory for Economic Complexity's *Economic Complexity Index–research complexity* measures the level of complex research in a given economy. There is a strong correlation of .70 with the Index scores.
- Economies scoring above 50% of the Index produce over four times the complex research compared to economies scoring below.

Strong IP Environments Have Higher Levels of Innovative Output

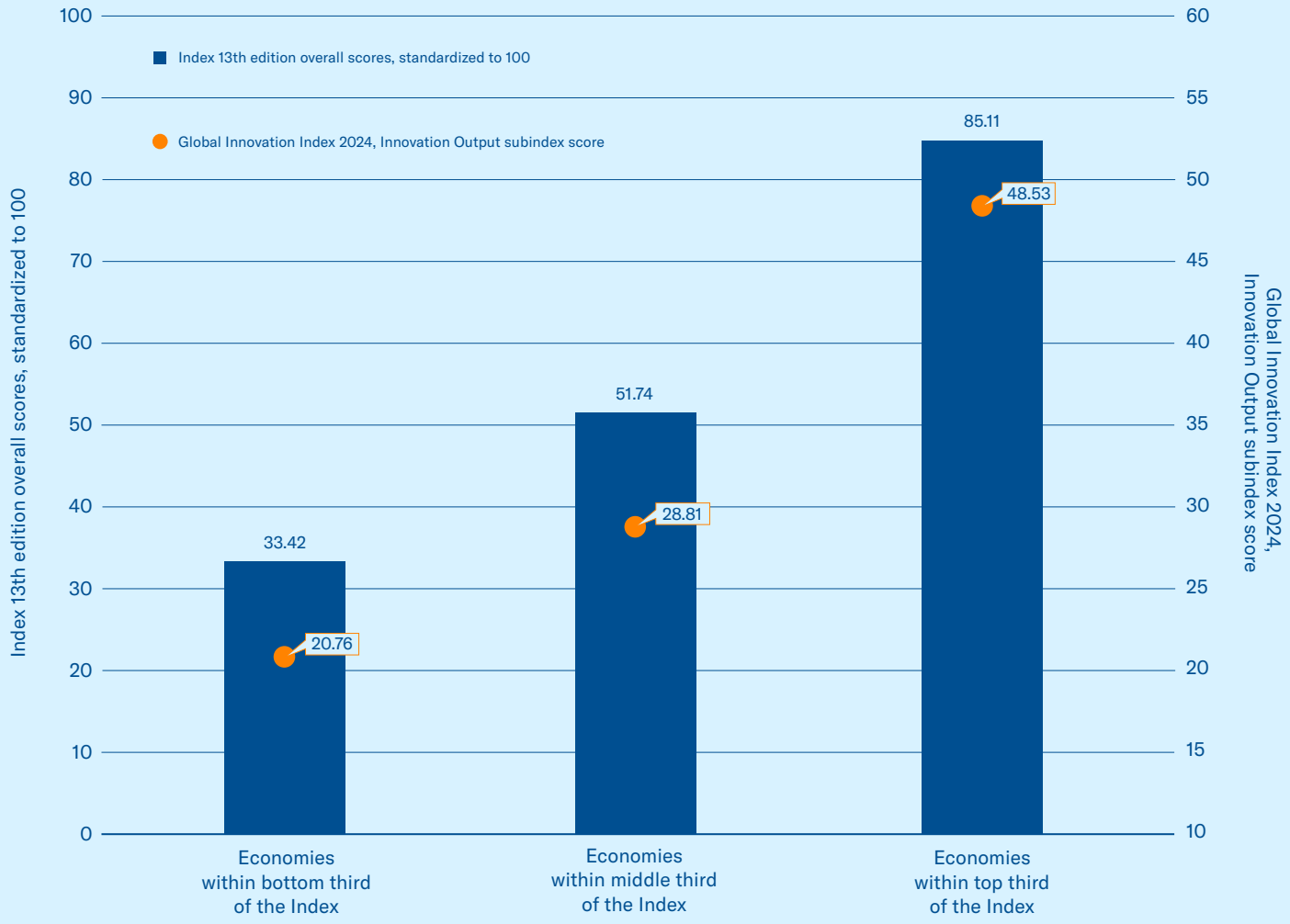
Association between Index scores and the *Global Innovation Index 2024*, Innovation Output Subindex scores[32]



Data NA for Taiwan and Venezuela

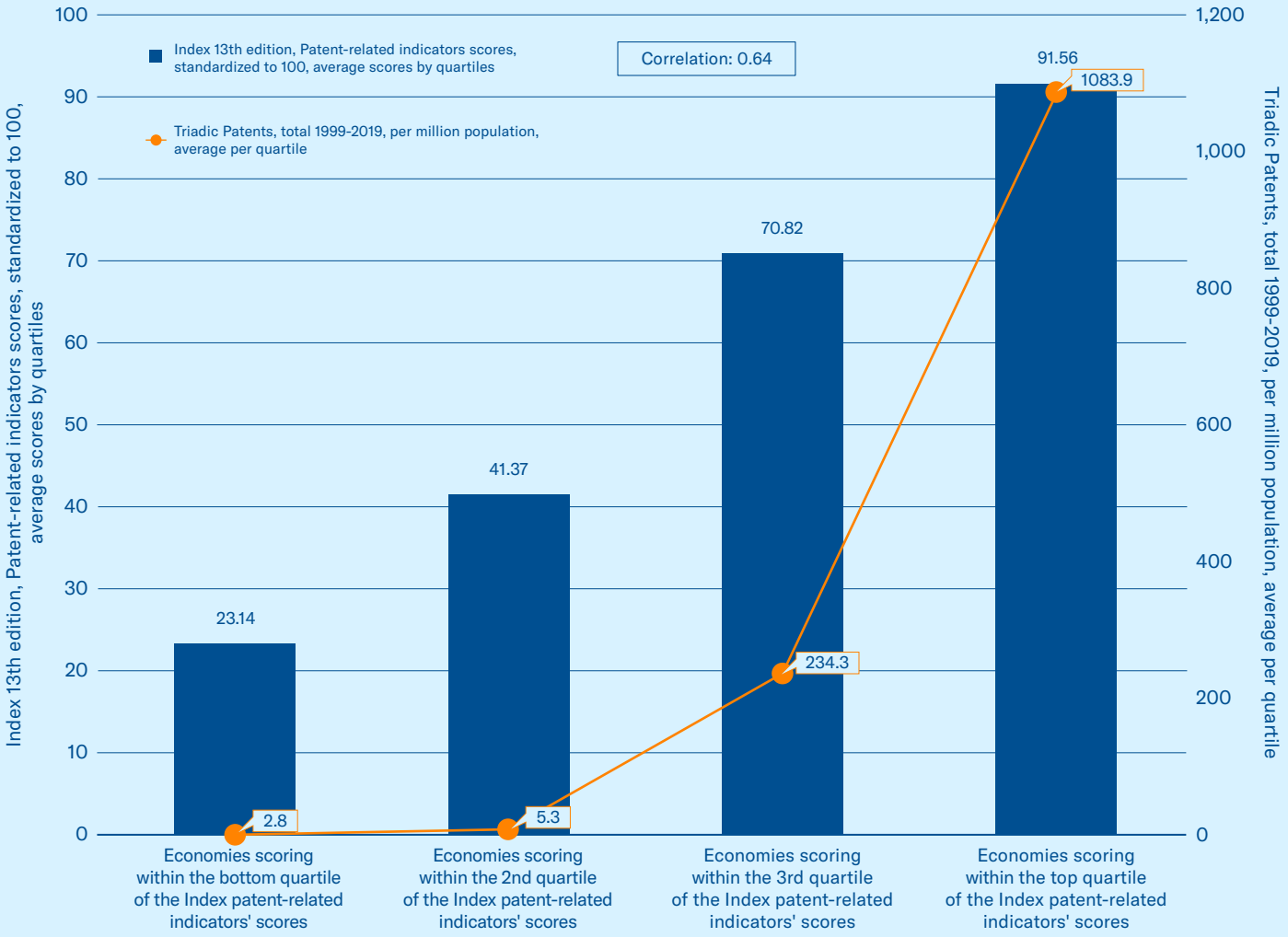
- The *Global Innovation Index's* Innovation Output subindex is an aggregate measure that examines a wide range of indicators reflecting knowledge creation and development, including intangible assets, research publications, and high-tech production. When compared to the Index, there is a very strong correlation of .83 to the Index scores.
- Economies with robust IP regimes experience almost double the innovation output compared to economies with weaker national IP environments.
- When dividing the Index scores into thirds, a corresponding stepwise increase is revealed in economies' innovation output, suggesting that the overall strength of economies' IP protection goes hand in hand with overall levels of innovation.

Association between Index scores and the Global Innovation Index, Innovation Output Subindex scores: Division by thirds in Index scores, average scores per third



Inventive Intensity Depends on Strong Patent Protection

Association between Index patent-related indicators scores, and triadic patents (total, 1999-2019) per million population, by quartiles in Index scores, average per quartile[33]

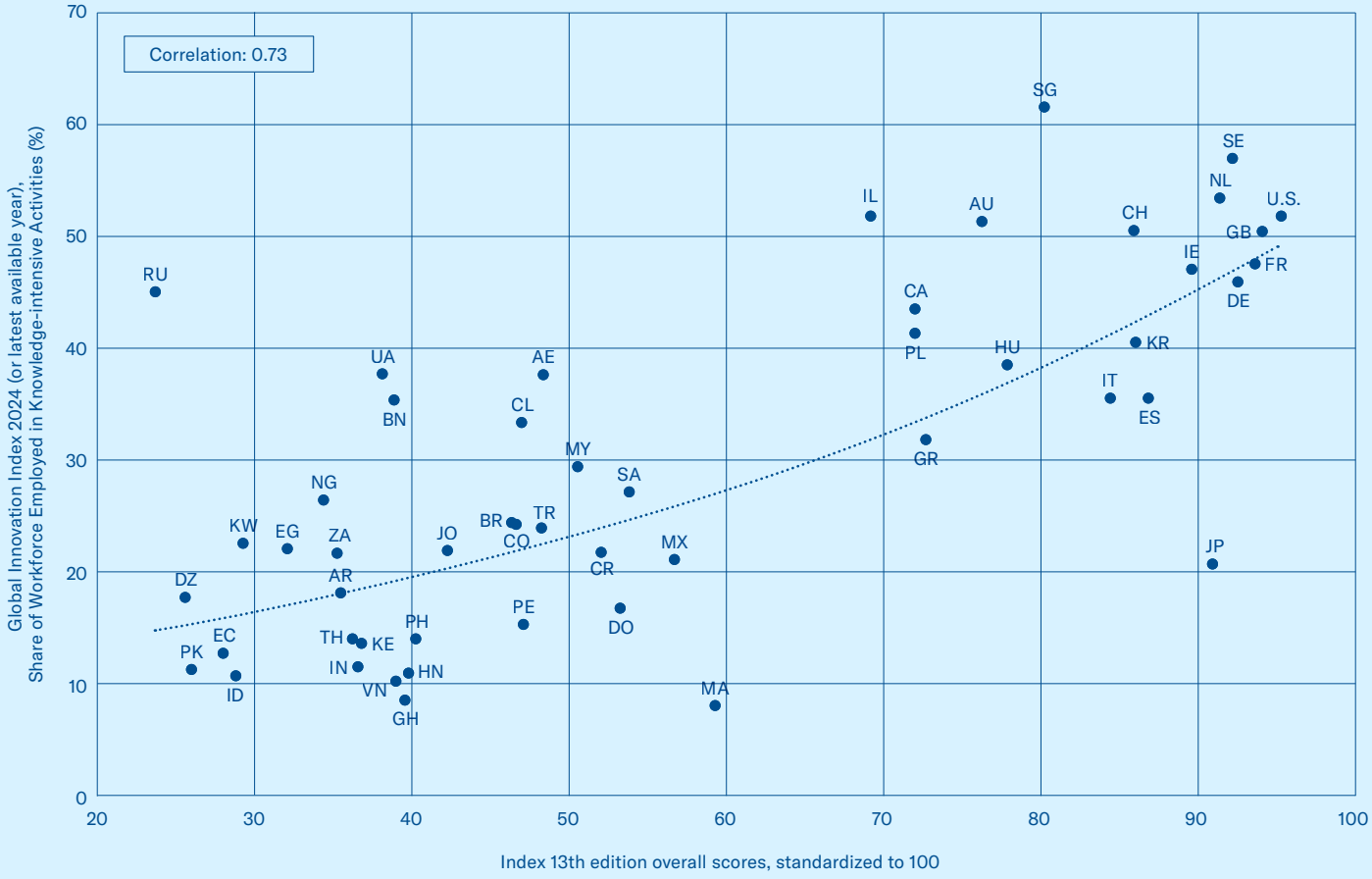


Data NA for Brunei, Dominican Republic, Ghana, Honduras and Vietnam.

- Triadic patenting rates are a measure of patent protection granted by the three biggest patent offices (the U.S. Patent and Trademark Office, European Patent Office, and Japan Patent Office) and serve as a good indicator of the development of high-value innovations with significant commercial potential.
- The Index patent-related indicators' scores display a strong relationship (a correlation of .64) with triadic patenting rates standardized for population. Strong IP environments generate more triadic patenting, while weaker environments see virtually no triadic patenting.
- Economies with the strongest IP frameworks have over 600 more high-value inventions patented per million population than economies with weaker IP environments.
- Economies in the lower two quartiles see rates of triadic patenting activity in the low single digits per million population.

A Robust IP Regime Promotes the Growth of Knowledge-Intensive Sectors

Association between the Index scores and *Global Innovation Index 2024*, share of workforce employed in knowledge-intensive services

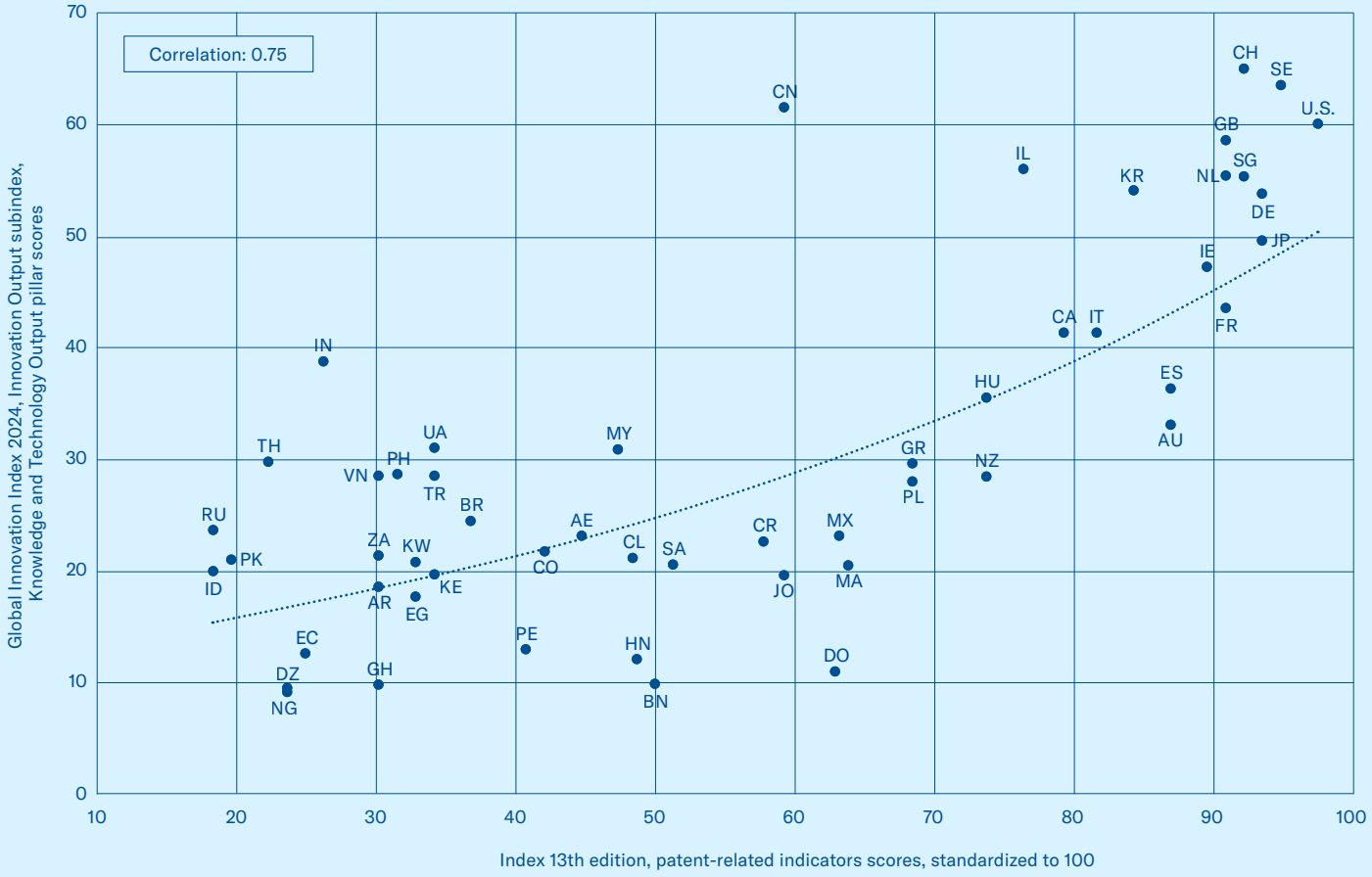


Data NA for China, New Zealand, Taiwan, and Venezuela.

- There is a strong correlation (.73) between Index scores and the share of the workforce employed in knowledge-intensive activities, as measured by the *Global Innovation Index 2024*.
- The share of the workforce concentrated in knowledge-intensive sectors in economies with robust IP environments is 86% higher compared to economies with weaker national IP environments.

Patent Protection is Linked to the Growth of High-Tech Sectors

Association between Index patent-related indicators scores, and the *Global Innovation Index 2024*, Innovation Output Subindex Knowledge and Technology Output pillar scores [34]

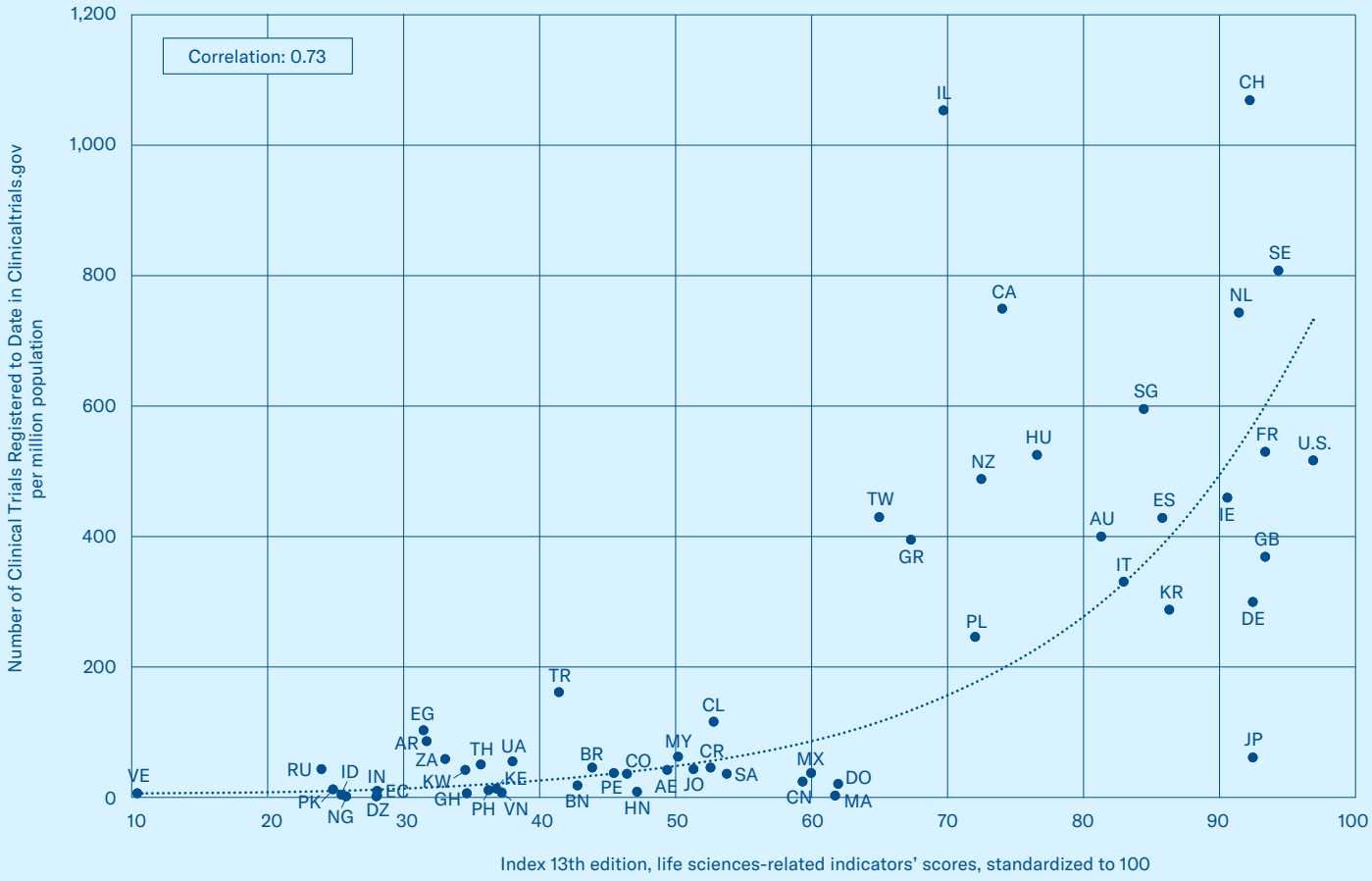


Data NA for Taiwan and Venezuela

- The Index's patent-related indicators exhibit a strong correlation of .75 with knowledge and technology outputs as measured by the *Global Innovation Index's* Innovation Output subindex.
- Economies with strong patent environments, scoring 50% or above on the Index, produce 97% more knowledge and technology outputs compared to economies whose patent environments trail behind.

IP Rights Lead to Biomedical Foreign Direct Investment (FDI)

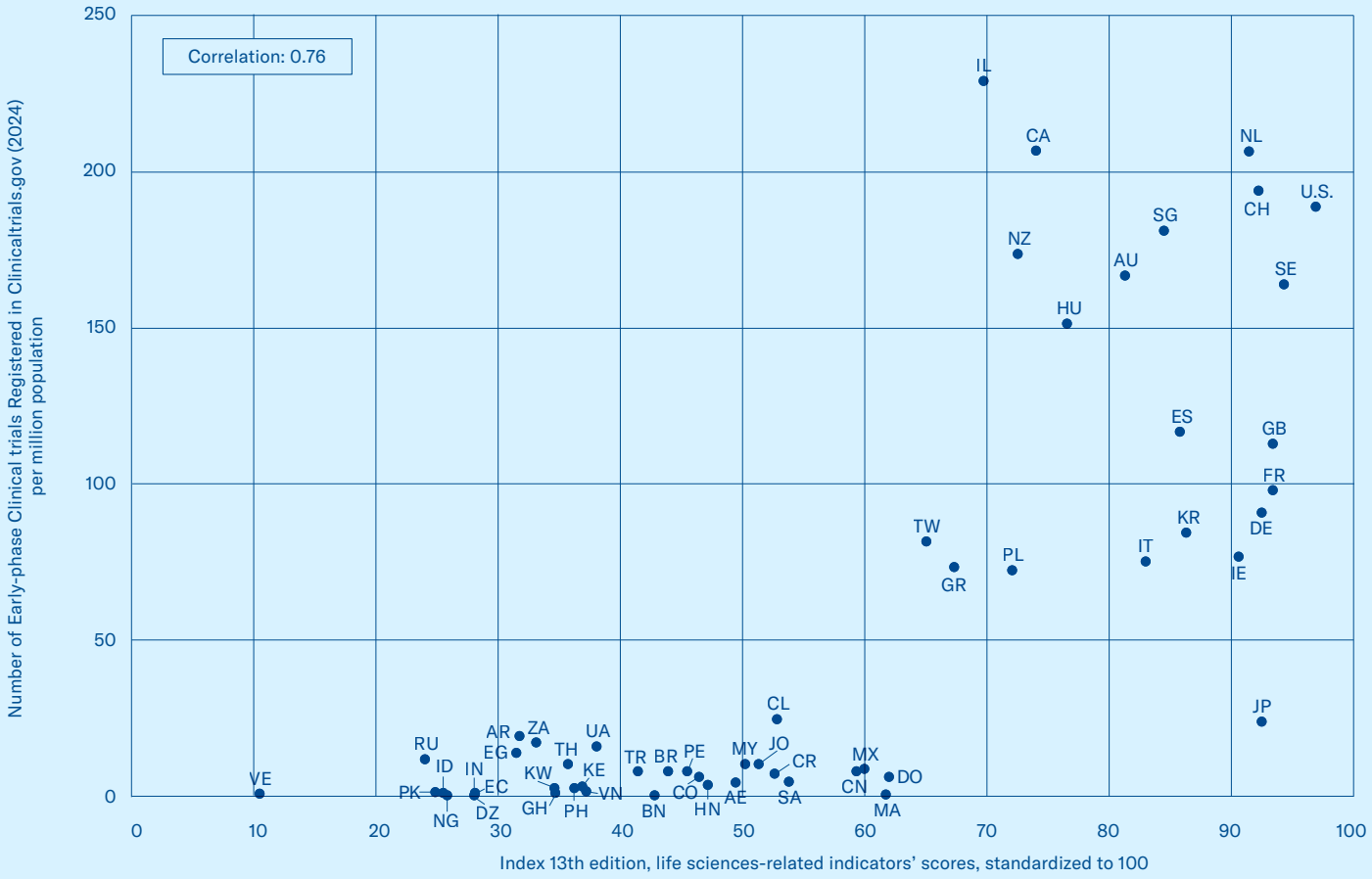
Association between Index life sciences–related indicators scores and the number of clinical trials per million population[35]



- Economies' clinical trial intensity, serving as a proxy for life sciences FDI, displays a strong association (a correlation of .73) with biopharmaceutical IP rights, as measured by the Index's scores on life sciences–related indicators.
- Economies that score 50% or more on the Index's life sciences–related indicator host almost 10 times more clinical trials than low-scoring economies.

IP Protection is Critical to Greater Investment in Cutting-Edge Clinical Research

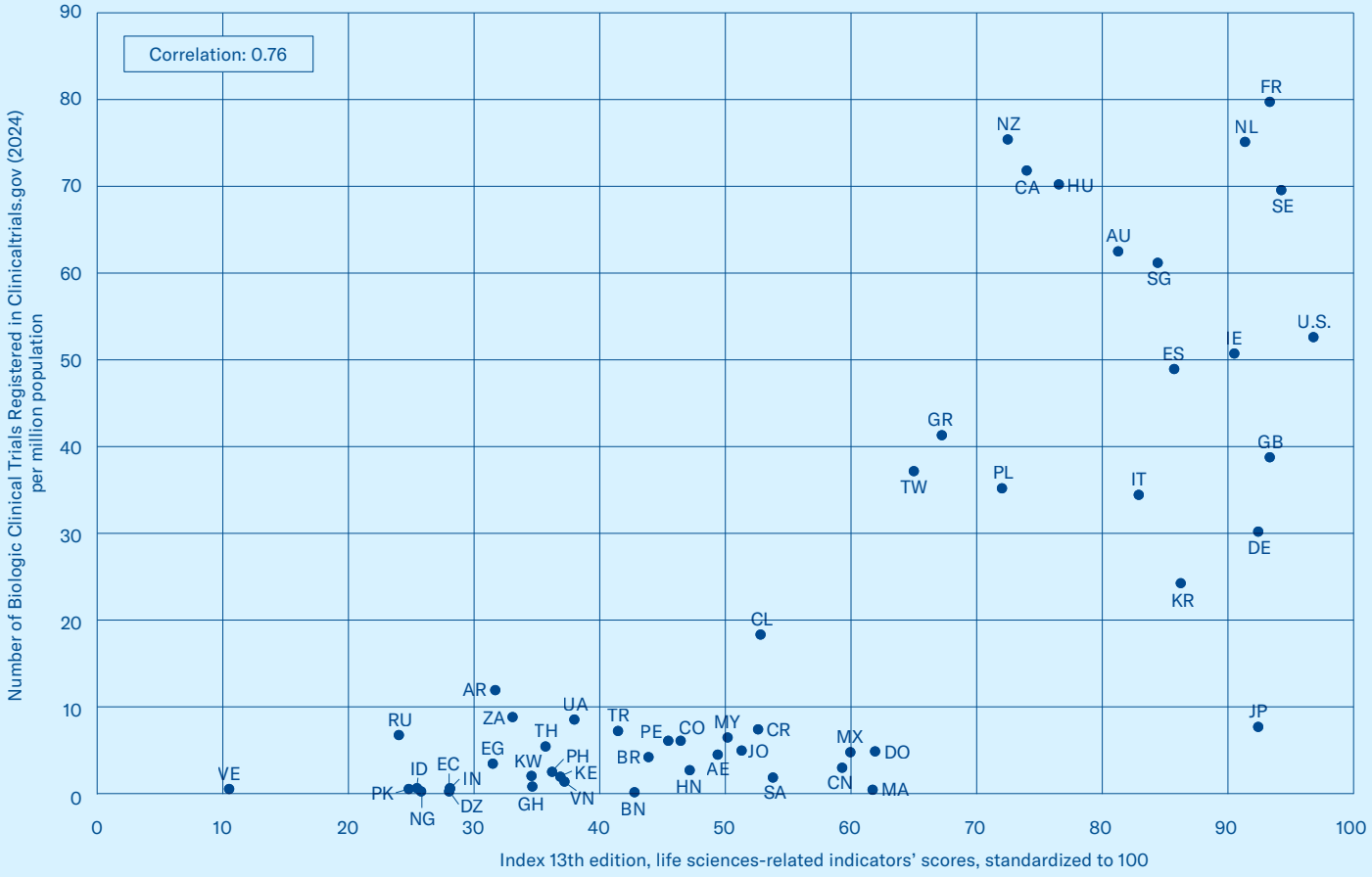
Association between Index life sciences–related indicators scores, and the number of early-phase (I+II) clinical trials per million population[36]



- The Index scores for life sciences–related indicators exhibit a strong correlation of .76 with rates of early-stage (phase I and II) clinical trial activity.
- Economies that maintain robust IP environments tend to see over 16 times more early-phase clinical trials, on average, compared with economies whose life sciences–related IP environments lag behind.

Development of Biological Therapies is Closely Linked to IP Protection

Association between Index life sciences–related indicators scores and the number of biologic clinical trials per million population[37]

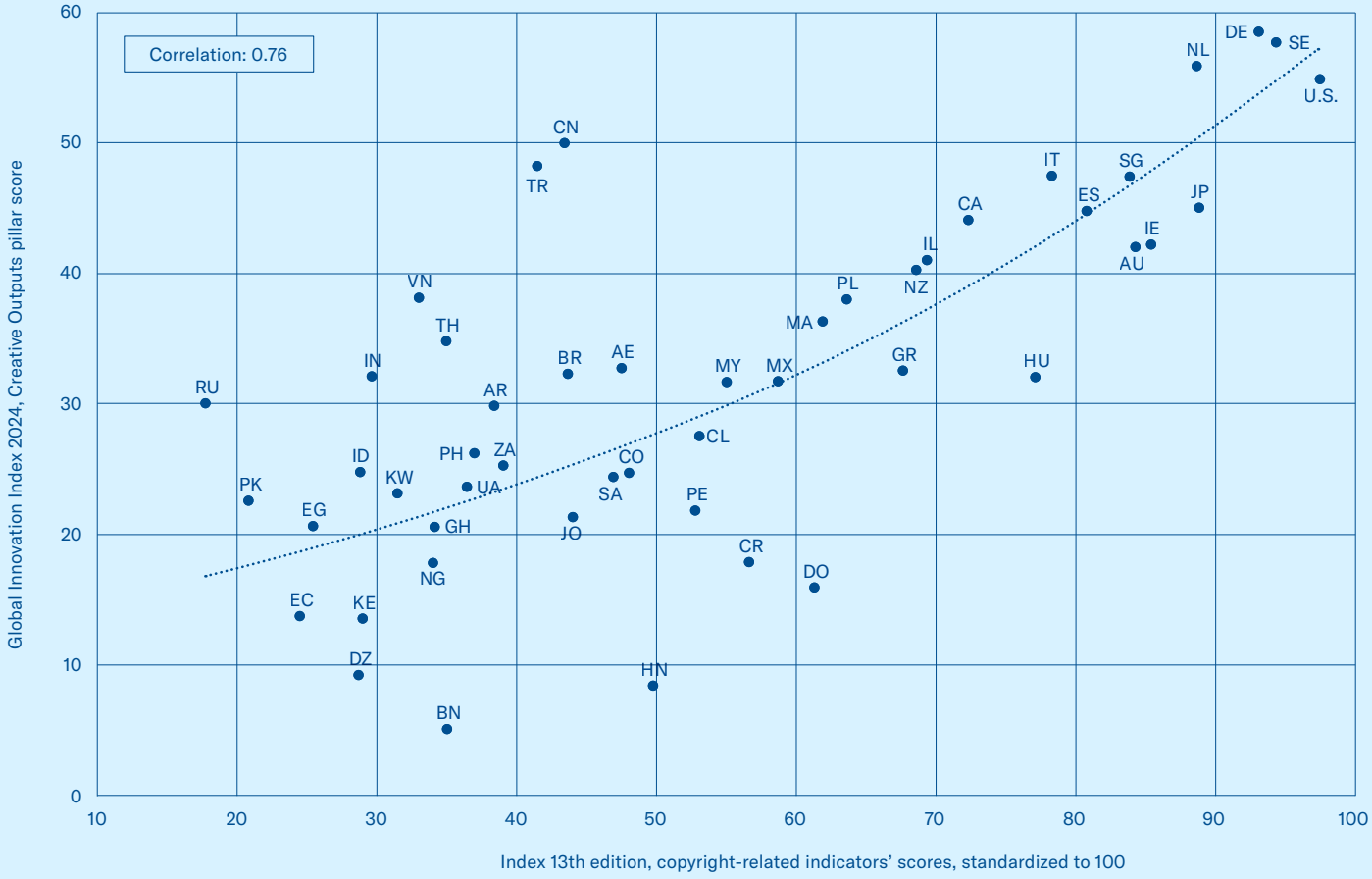


- Biological medicines—gene-, cellular- or protein-based therapies produced from living organisms—are at the forefront of medical research. The trials involved in developing these biologics are highly complex and require high levels of skill and technical infrastructure; this is the high end of the value chain in clinical research.
- There is a strong correlation of .76 between the population-adjusted number of clinical trials on biologic drugs and the Index scores for life sciences-related indicators.
- Economies with strong to robust IP frameworks for the life sciences host over 10 times more clinical trials on innovative biologic drugs compared with economies with a weaker environment.

Value Added and Creativity

Robust Copyright Protection Encourages Creative Activity

Association between Index copyright-related indicators scores, and the *Global Innovation Index 2024*, Innovation Output Subindex, Creative Output pillar scores[38]

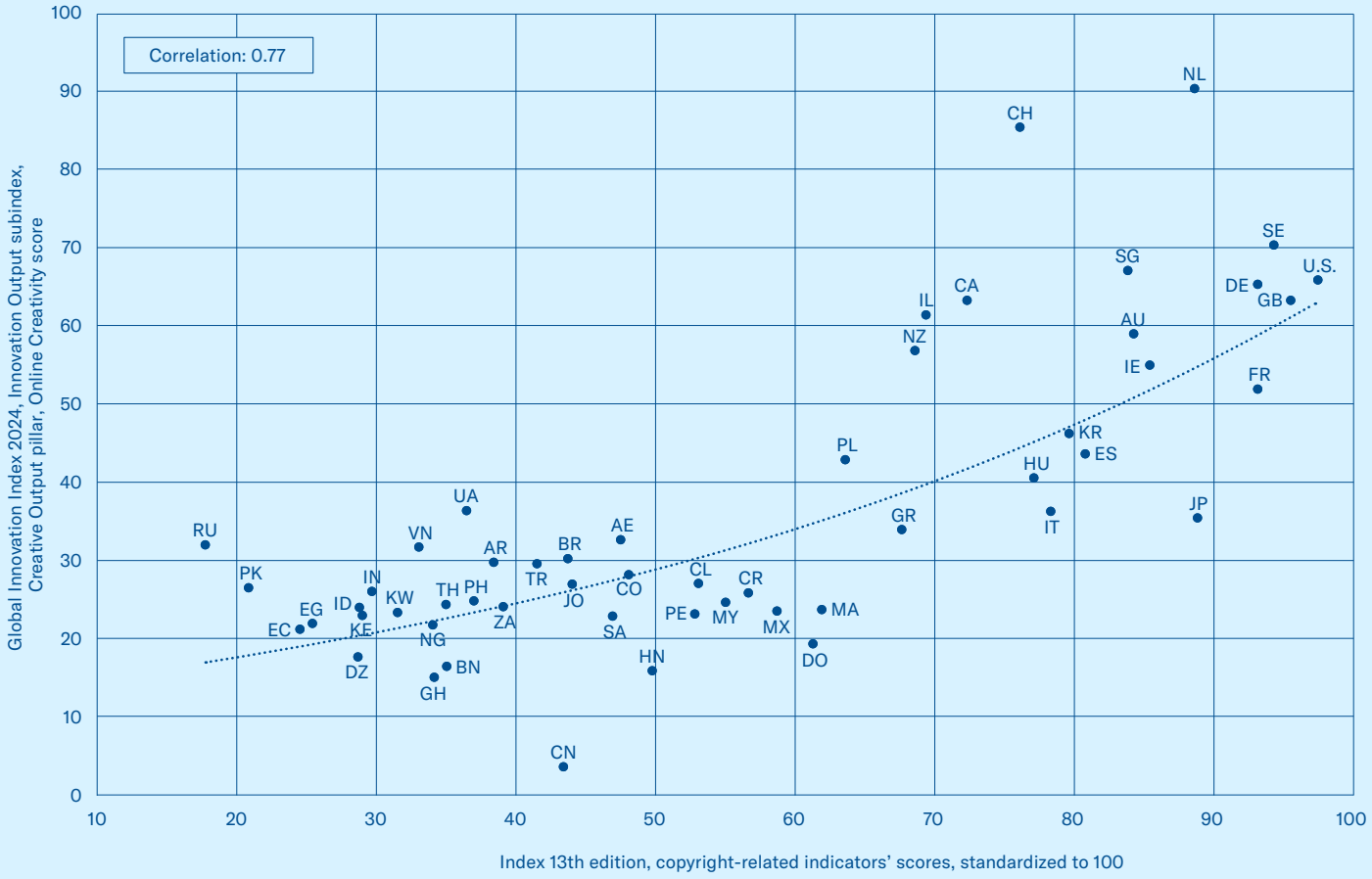


Data NA for Taiwan and Venezuela

- Copyright protection, as measured by the Index's copyrights-related indicators, displays a strong correlation of .76 to the creative outputs pillar within the *Global Innovation Index*.
- Economies scoring above 50% on the Index's copyright-related indicators are 71% more likely to benefit from the growth in both volume and value of the dynamic content and media sectors than economies with weaker national IP environments.

Robust Copyright Protection Encourages Online Creativity

Association between Index copyright-related indicators scores, and the *Global Innovation Index 2024*, Innovation Output Subindex, Creative Output pillar, online creativity scores[39]

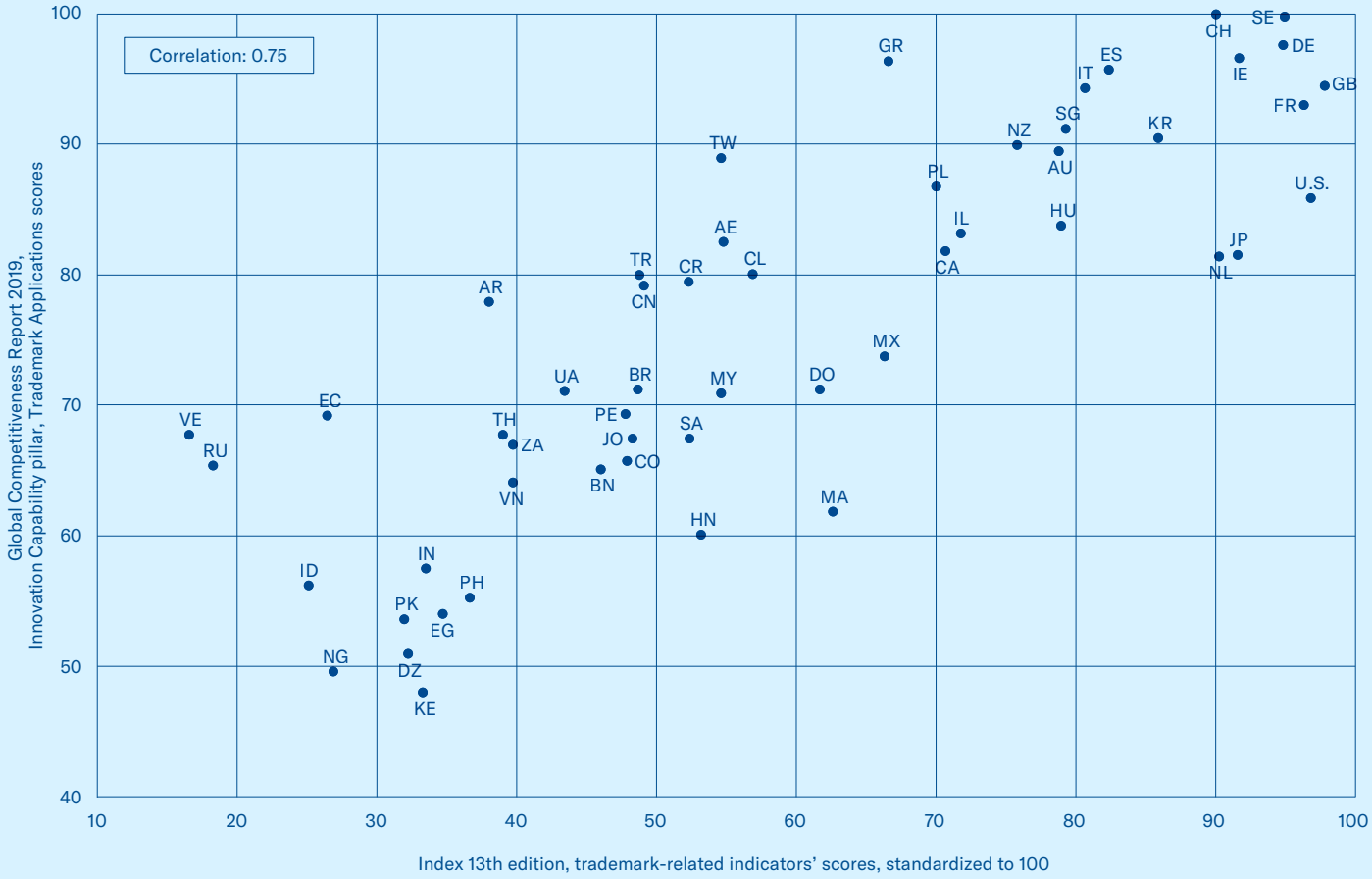


Data NA for Taiwan and Venezuela

- The Index's copyright-related indicators' scores display a strong relationship (at a correlation strength of .77) with online creativity as measured by the *Global Innovation Index*.
- Economies that provide and enforce strong copyright protection, including for digital and online works, generate almost twice as much online and mobile content, such as websites, applications, and audiovisual media.

Strong IP Environments Promote International Brand Use

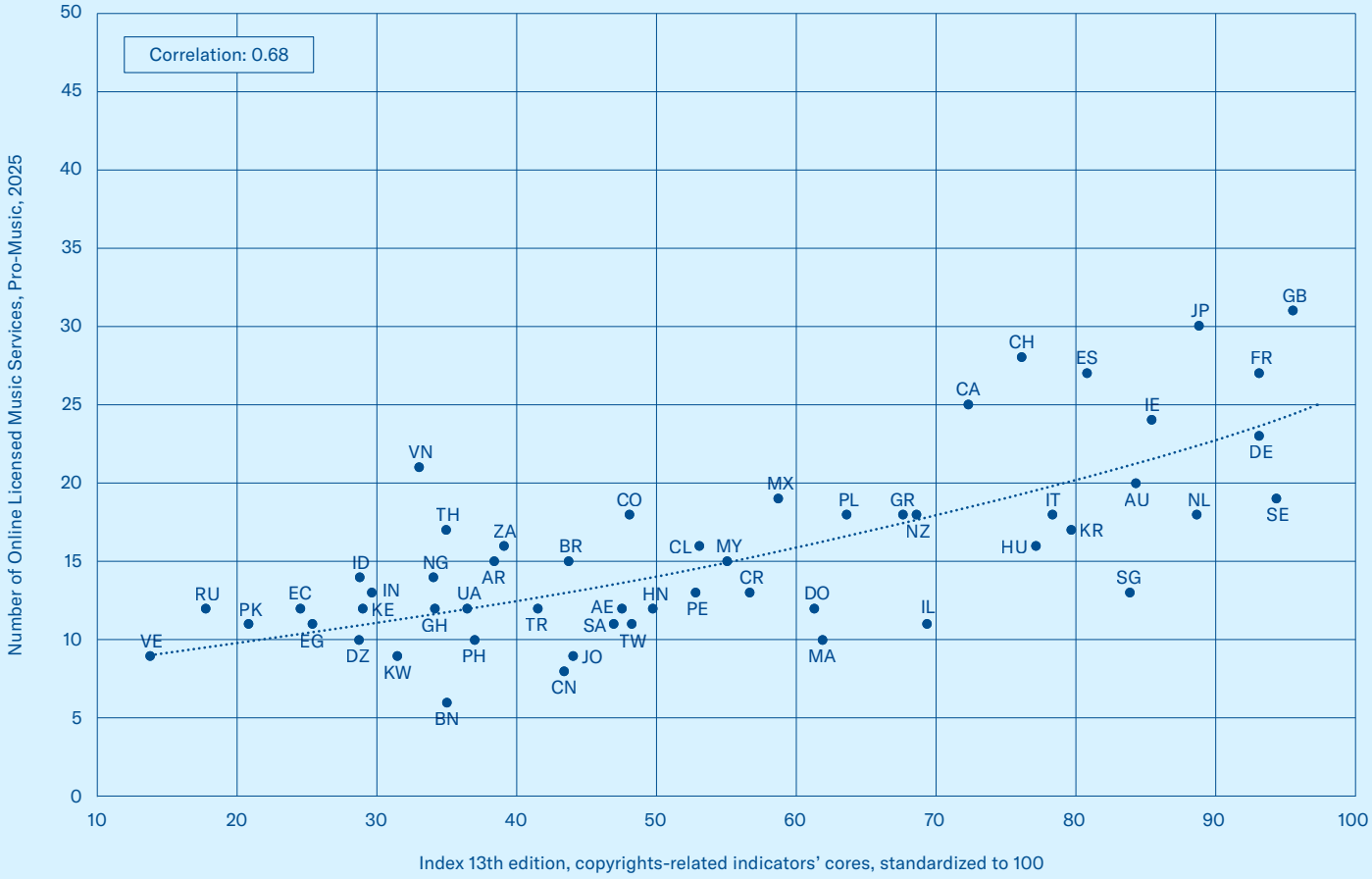
Association between the Index trademark-related indicators' scores and the *Global Competitiveness Report 2019*, Innovation capabilities pillar, Trademark applications scores[40]



- Obtaining international trademark protection and enforcing it across multiple jurisdictions requires significant financial resources; a high rate of international trademark applications provides a good indication of the quality and value of companies and products within a given economy. In other words, high rates of international trademark applications suggest high rates of international competitiveness linked with a given economy.
- The Global Competitiveness Index's Trademark Applications indicator–which offers a population-adjusted, standardized measure of international trademark applications–exhibits a strong relationship (at a correlation strength of 0.75) with the Index's trademark-related indicators scores.
- Economies with effective IP systems have almost 40% higher levels of international trademark applications than those whose IP regimes lag behind.

Strong Copyright Protection Encourages Increased Availability of Legitimate Online Music Outlets

Association between the Index copyright–related indicators scores and volume of licensed online music services[41]



- There is a strong correlation (of .68) between the Index's copyright-related indicators' scores and the number of online licensed music services as measured by Pro-Music.org.
- Economies that maintain robust copyright environments enjoy two-thirds more access to new music through legitimate and secure platforms.

Endnotes

1 WIPO (2003), *Guide on Surveyingthe Economic Contribution of the Copyright-Based Industries*, WIPO.

2 BEA (2022) "Arts and Cultural Production Satellite Account, U.S. and States", March 15, 2022, Table 7, p. 16.

3 Ibid. Table 8, p. 17.

4 UNCTAD STAT, Creative services exports of selected groups of economies and Creative goods matrix, annual, World total, USD millions at current prices.

5 Ibid.

6 Ibid.

7 UNCTAD (2024) *Creative Economy Outlook 2024*, UN publications, NY, NY, p. 27.

8 WTO website, Statistics, Digitally delivered services trade dataset. Accessed April 2025: https://www.wto.org/english/res_e/statis_e/gstdh_digital_services_e.htm

9 BEA (2023) "ReadMe for New Digital Economy Estimates, 2017-2022", Table 1.

10 BEA (2024) BEA data, Table 2.1. U.S. trade in services, by type of services, exports, USD millions, subcategories: telecommunications, computer, and information services; charges for the use of intellectual property; audiovisual services; and research and development services.

11 The 'Innovativeness' pillar within the Future of Growth Framework consists of 21 indicators. See: World Economic Forum, *The Future of Growth Report 2024, January 2024*, Table B3, pp. 259-60.

12 Ibid.

13 The 'Driver of Production' pillar within the Readiness for the Future of Production Index consists of 59 indicators within 11 subpillars nested under six key drivers: Technology & Innovation, Human Capital, Global Trade & Investment, Institutional Framework, Sustainable Resources and Demand Environment. See: World Economic Forum, *Readiness for the Future of Production Report 2018*, pp. 5-9.

14 The 'Technology & Innovation' subpillar within the Readiness for the Future of Production Index measures economies' capacity for innovation and utilization of new technologies in the value chains by gauging ICT availability and usage, digital security levels, R&D spending and innovative outputs as well as availability of venture capital and FDI in innovation. See: World Economic Forum, *Readiness for the Future of Production Report 2018*, p. 21.

15 The 'Global Trade & Investment' subpillar within the Readiness for the Future of Production Index measures economies' trade balance and infrastructure, logistic performance, availability of financial resources for the private sector, and volume of investments. See: World Economic Forum, *Readiness for the Future of Production Report 2018*, pp. 46-47.

16 The Innovation Capability pillar in the World Economic Forum's Global Competitiveness Report 2019 measures a wide array of indicators influencing economies' ability to generate innovative outputs, including R&D spending, multi-stakeholder collaboration in research, dispersion of specialized clusters, inventive activity and buyer sophistication. See: World Economic Forum, *The Global Competitiveness Report 2019*.

17 The *Global Innovation Index's* Business Sophistication pillar is comprised of three subpillars: Knowledge workers–measuring both inputs and outputs for human capital in the public and private sector; Innovation linkages–measuring the levels of collaborative R&D activities; and Knowledge absorption–measuring innovation capacity as well as attractiveness to foreign direct investments. See: Cornell University, INSEAD, and WIPO (2024): *The Global Innovation Index 2024*, Ithaca, Fontainebleau, and Geneva.

18 The company R&D spending score is based on responses to the question, "In your country, to what extent do companies spend on research and development?" where 1 = do not spend on R&D and 7 = spend heavily on R&D (standardized to 100), in the World Economic Forum's *Global Competitiveness Report 2017–18*. As this variable is no longer measured in the latest edition of the *Global Competitiveness Report* series this edition of the Annex continues to use the data from the 2017-18 edition.

19 The *Venture Capital and Private Equity Country Attractiveness Index* measures economies' attractiveness to VC and PE funding by examining a range of factors including the capital market, taxation environment, investor protection, entrepreneurial culture, and deal opportunities. See: Groh, A., Liechtenstein, H., Lieser, K., & Biesinger, M. (2023), *The Venture Capital and Private Equity Country Attractiveness Index 2023*, (IESE Business School and EMYLON Business School).

20 World Bank databank, Researchers in R&D (per million people)

21 The *Global Talent Competitiveness Index* by INSEAD is an international benchmark of 134 economies based on the policies and practices that enable an economy to develop, attract, and empower human capital, measuring both inputs such as enabling landscape, market openness, quality of learning and sustainability, as well as outputs such as mid- and high-level skills and overall talent impact. See: B. Lanvin, and F. Monteiro (Eds.), *The Global Talent Competitiveness Index 2023*, INSEAD.

22 Scientific and technical journal articles refer to the number of scientific and engineering articles published in the fields of physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences in 2020 or latest available year, adjusted per million population. Source: World Bank, World Bank databank.

23 The Impact Subindex of the *Network Readiness Index* measures economic and social impacts of ICT, including value added, employment, and access to public and private services. Source: S Dutta & B Lanvin (2024) *The Network Readiness Index 2024*, Portulans Institute. ICT-related indicators consist of indicators falling under the Patent, Copyright, Trademarks and Trade Secrets categories, as well as relevant indicators in Enforcement and International Treaties.

24 The ICT Development Index measures the level of ICT development across 170 economies. Specifically, it measures "the extent to which a country's connectivity is universal and meaningful". Source: International Telecommunications Union (2024), *Measuring digital development The ICT Development Index 2024*, Geneva, Switzerland. ICT-related indicators consist of indicators falling under the Patent, Copyright, Trademarks and Trade Secrets categories, as well as relevant indicators in Enforcement and International Treaties.

25 IMD–International Institute for Management Development (2024), *IMD WORLD COMPETITIVENESS BOOKLET 2024*, Lausanne, Switzerland.

26 World Economic Forum (2019)

27 IMD–International Institute for Management Development (2024), *IMD World Digital Competitiveness Ranking 2024*, Lausanne, Switzerland.

28 Ibid. p. 30.

29 The Economic Complexity Index (ECI) measures the multiplicity and complexity levels of the knowledge required to produce a given product and the level of its exports. A higher economic complexity coefficient entails higher capabilities to produce knowledge-intensive products as well as higher levels of productive outputs.

30 In 2023 the Observatory of Economic Complexity released two new metrics: the ECI-technology complexity and the ECI-research complexity. These measures apply the ECI and the methodology developed by the Observatory to two separate indicators of technology complexity (patent applications) and research complexity (research publications). See: V Stojkoski et al (2023) "Multidimensional economic complexity and inclusive green growth", *COMMUNICATIONS EARTH & ENVIRONMENT*, 4:130, published by Nature Portfolio.

31 Ibid.

32 Innovative output is measured by the *Global Innovation Index* Innovation Output subindex score. The Innovative Output subindex accounts for knowledge and technology outputs, knowledge impact including labor productivity and high-tech outputs, and the diffusion of knowledge including high-tech and ICT exports as well as licensing fees and FDI outflows.

33 Triadic patenting (patents filed with the three major patent offices in the world– the USPTO, EPO and JPO) is generally considered to be the best indicator of the perceived overall value and quality of a patent. The patent application is filed in those three separate locations and filing costs are quite high. In this edition of the Statistical Annex, the triadic patent rates are calculated as the sum of triadic patents over a 20-year period from 1999 to 2019, adjusted per million population to get a standardized rate of triadic patenting intensity. Source: OECDStat, Patents by technology, Triadic patent families, Total patents, Inventor country of residence, Priority date, 1999 to 2019 inclusive; World Bank (population). Patent-related indicators consist of indicators that fall under the Patent category of the Index, as well as those indicators in Trade Secrets, Commercialization of IP Assets, Enforcement, and International Treaties categories that are relevant to patents.

34 Knowledge creation, impact, and diffusion is measured by the *Global Innovation Index*, Innovation Output subindex, Knowledge and Technology Outputs pillar score. This score comprises variables such as patenting activity, growth of high-tech businesses, and knowledge-based exports.

35 Clinical trial activity is measured as the gross number of clinical trials to date per economy, as registered in the clinicaltrials.gov database housed by the National Institutes of Health in the United States, standardized per million population. Population data is extracted from the World Bank. Life sciences-related indicators consist of indicators falling under the Patent category of the GIPC Index (excluding patentability of computer-implemented inventions), as well as indicators in Trademarks and Market Access, Enforcement and International Treaties categories that are relevant to life sciences.

36 Ibid. Early-phase clinical trial activity is measured as the gross number of phase I and phase II clinical trials to date per economy, as registered in clinicaltrials.gov database, standardized per million population.

37 Ibid. Clinical trial activity on biologics is measured as the gross number of biologics clinical trials to date per economy, as registered in clinicaltrials.gov database, standardized per million population.

38 Creative output is measured by the score of the Creative Outputs pillar of the *Global Innovation Index*, Innovative Output subindex, which captures outputs such as exports of creative services, entertainment, media and ICT spending, and local creation of webpages and audiovisual content. Copyright-related indicators consist of indicators that fall under the Copyright category of the GIPC Index, as well as those indicators in Commercialization of IP Assets, Enforcement, and International Treaties categories that are relevant to copyrights.

39 Online creativity is measured by the score of the Online Creativity subpillar of the Creative Outputs pillar under the Innovative Output subindex of the *Global Innovation Index*, which captures local creation of webpages and online audiovisual content.

40 The Global Competitiveness Index's Trademark Applications indicators measures the number of international trademark applications by country of origin, adjusted per million population and standardized by log transformation to a score of 0-100. See: World Economic Forum (2019) The Index' trademark-related indicators consist of indicators that fall under the Trademark category of the GIPC Index, as well as indicators in Commercialization of IP Assets, Enforcement and International Treaties categories that are relevant to trademarks.

50 The availability of licensed online music services is measured by the number of online licensed music services per country that offer music as a download, stream, or ringtone, based on information from local industry groups that is compiled by the International Federation of the Phonographic Industry. Source: Pro-Music.org (2024).

U.S. Chamber of Commerce
Global Innovation
Policy Center