

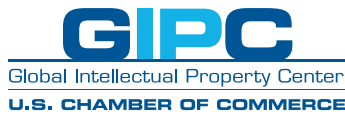
# IP Unlimited Potential

Annex—IP Rights as a Gateway  
to Building Innovative Economies:  
Supplementary Statistical Analysis



**GIPC**

Global Intellectual Property Center  
U.S. CHAMBER OF COMMERCE



The U.S. Chamber of Commerce's Global Intellectual Property Center ([www.theglobalipcenter.com](http://www.theglobalipcenter.com)) is working around the world to champion intellectual property rights as vital to creating jobs, saving lives, advancing global economic growth, and generating breakthrough solutions to global challenges.

The U.S. Chamber of Commerce is the world's largest business federation representing the interests of more than 3 million businesses of all sizes, sectors, and regions, as well as state and local chambers and industry associations.



This report was conducted by Pugatch Consilium ([www.pugatch-consilium.com](http://www.pugatch-consilium.com)) a boutique consultancy that provides evidence-based research, analysis, and intelligence on the fastest growing sectors of the knowledge economy. Authors of this report are Meir Pugatch, Rachel Chu, and David Torstensson.

#### **Professor Meir Pugatch, Managing Director and Founder**

Prof. Pugatch founded Pugatch Consilium in 2008. He specializes in intellectual property policy, management and exploitation of knowledge assets, technology transfer, market access, pharmacoeconomics and political economy of public health systems. He has extensive experience in economic and statistical modeling and indexing, valuation of assets and design of licensing agreements, and providing strategic advice to international institutions, multinational corporations, and SMEs from all sectors of the knowledge economy. In addition to his work at Pugatch Consilium, he is an IPKM Professor of Valorisation, Entrepreneurship and Management at the University of Maastricht in the Netherlands, as well as the Chair of the Health Systems Administration and Policy Division at the School of Public Health, University of Haifa in Israel. He is author and editor of an extensive number of publications and serves as a referee and editorial board member of numerous peer review journals.

#### **David Torstensson, Partner**

Dr. Torstensson specializes in innovation, tax and intellectual property policy, with a particular focus on the health care, information and communication technology and content industries. He has wide experience in policy and economic analysis, as well as data sampling and creation of strategic operational and advocacy plans. He is the author of a number of academic and commissioned reports and publications and is the co-author of both the 2012 Measuring Momentum: The GIPC International IP Index and 2014 GIPC Index.

#### **Rachel Chu, Partner**

Rachel Chu, Partner, Ms. Chu specializes in biomedical innovation and international innovation policy. She has particular experience in sector-specific trend mapping, benchmarking of intellectual property environments and econometric analysis. She has authored several commissioned reports and articles published in academic and trade journals.

### **Annex—IP Rights as a Gateway to Building Innovative Economies: Supplementary Statistical Analysis**

This annex augments the analysis in the Global Intellectual Property Center International IP Index (GIPC Index) concerning the economic benefits of strengthening intellectual property (IP) protection, by comparing the GIPC Index scores with a number of additional variables using correlations (statistical measures of the likelihood of two elements occurring together). In doing so, the annex provides further insight into the role and impact of IP rights on building innovative economies.

The analysis in this annex takes advantage of a key feature of the GIPC Index—its coverage of different types of IP rights as well as different sectors—in two ways. First, the breadth of coverage of the GIPC Index allows for a more comprehensive and precise picture of how IP rights relate to other economic variables. Second, the ability to isolate IP rights and sector-specific scores, and to test their relationships with relevant economic indicators, enables one to drill down into which aspects of economies' IP environments matter most for strengthening specific economic activities.

The 15 correlations in this annex are a compilation of the analysis included in the full report, along with 11 additional correlations. They examine the benefits of IP rights in terms of a wide range of general and sector-specific economic activities, from job creation and innovation to biomedical investment and access to creative content and information and communication technology (ICT)-based services. In doing so, the analysis goes beyond looking at broad measurements of economic activity to measure tangible, deep-rooted benefits to economic that relate to IP rights.

The annex is organized as follows:

- The first set of correlations looks at the relationship between the total IP environment—measured by the overall GIPC Index score—and economy-wide benefits, including research and development (R&D) spending, job growth, and the business climate.
- The second set of correlations focuses on scores specific to patent, copyright, and trademark protection, examining their relationships with technology, creative outputs, and world class brands respectively.
- The third set of correlations looks at indicators specific to three key sectors—life sciences, ICT, and creative content—and shows their relationships with elements such as levels of advanced biopharmaceutical R&D, added value of properly licensed software, and access to creative content.

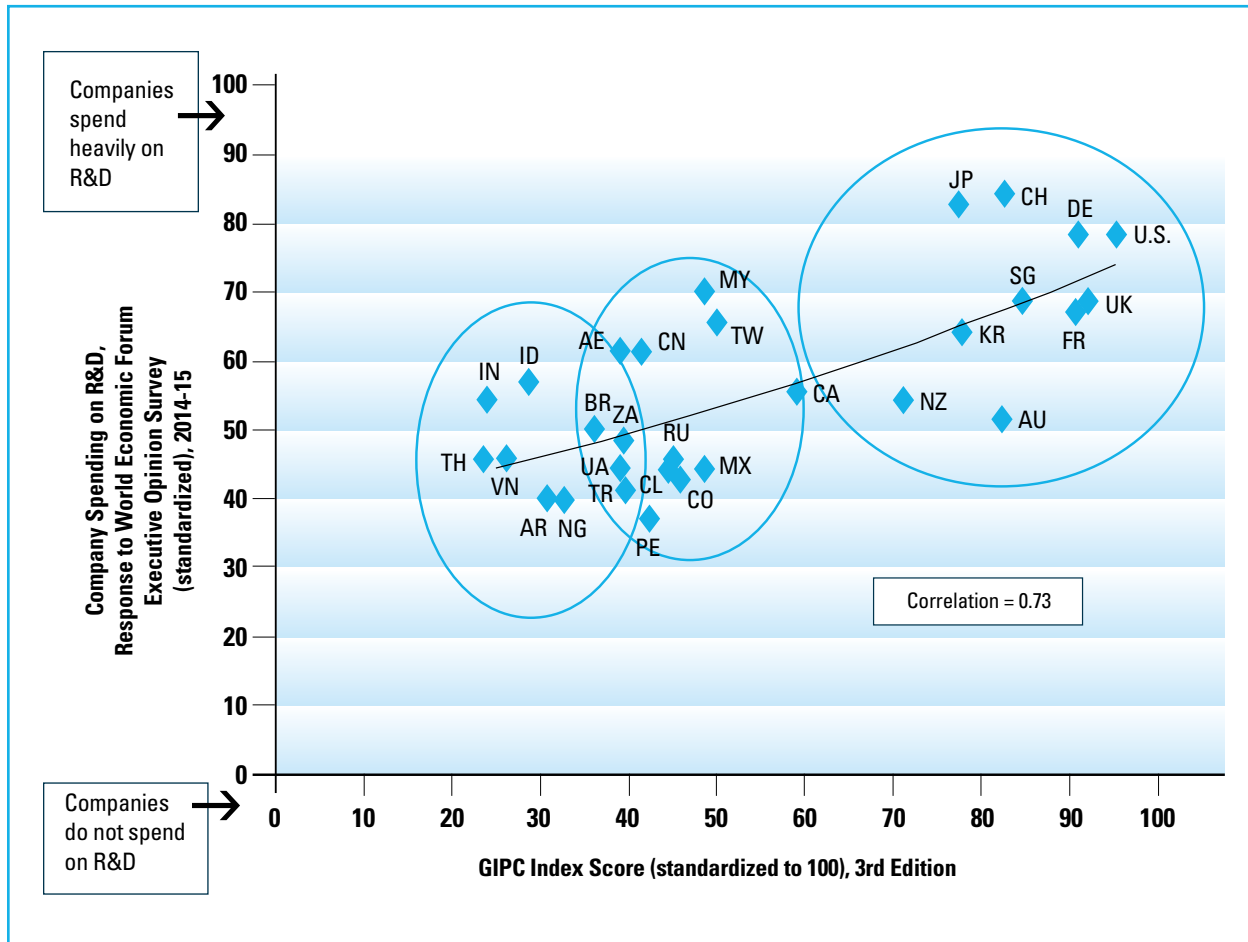
Table 1 presents the main findings of the analysis in this annex.

# Annex – IP Rights as a Gateway to Building Innovative Economies

**Table 1: Economic Benefits of Improving IP Protection: A Sample of Findings from Statistical Analysis**

| THEME  | CENTRAL FINDING  |
|--|--|
| <b>TOTAL IP ENVIRONMENT</b>  |  |
| <b>IP rights and R&amp;D expenditure</b>                                   | Firms in economies with advanced IP rights in place are 40% more likely to invest in R&D activities compared with those whose IP regimes lag behind.   |
| <b>IP rights and innovation</b>  | Economies with state-of-the-art IP environments produce 50% more innovative output compared with those whose environments require significant strengthening.   |
| <b>IP rights and high-value job growth</b>                                 | More than double the workforce is concentrated in knowledge-intensive sectors in economies with favorable IP regimes compared with those that trail in terms of IP protection.   |
| <b>IP protection and the business environment</b>                          | Economies with favorable IP environments are on average 15% more likely to have positive business climates overall compared with economies with a semi-supportive IP environment, which in turn are 30% more likely to have a positive business climate than economies with the most room for improvement. |
| <b>IP rights and access to digital technologies and content</b>            | Economies with strong IP tend to experience on average 20% greater access to digital technologies and content compared with economies whose IP environments trail behind.  |
| <b>TYPE OF IP RIGHT</b>  |  |
| <b>Patent protection and growth of high-tech sectors</b>                   | Economies with advanced patent regimes tend to produce on average 35% more knowledge and technology outputs compared with those with lagging patent regimes.   |
| <b>Copyright protection and creative outputs</b>                           | Economies with supportive copyright environments are more likely to have larger and more dynamic content and media sectors than economies with less favorable IP regimes.  |
| <b>Copyright protection and online creativity</b>                          | Economies with more comprehensive levels of copyright protection exhibit more than double the amount of online creativity than economies with less beneficial environments.  |
| <b>Trademark protection and strong brands</b>                              | Economies with the most favorable IP environments host 2–10 times more high-value brands compared with economies with the least favorable environments.  |
| <b>SECTOR-SPECIFIC ENVIRONMENTS</b>  |  |
| <b>IP rights and biotechnology innovation</b>                              | Economies with higher GIPC Index scores (over 70%) tend to have environments that are more conducive to biotech innovation.  |
| <b>IP rights and biomedical foreign direct investment (FDI)</b>            | IP protection can explain about 40% of life sciences investment (as measured by clinical trial activity). In addition, economies with beneficial IP protection see on average 9–10 times more life sciences investment than do those lacking key aspects of IP protection.                                 |
| <b>IP rights and life science R&amp;D spending</b>                         | Economies with supportive life sciences IP regimes experience roughly 2-6 times more biopharmaceutical R&D investment than do economies with less supportive IP regimes.   |
| <b>ICT-related IP rights and growth of knowledge-based economies</b>       | Economies with higher levels of IP protection tend to have greater capacity to generate positive value from ICTs, such as through job creation, access to public and private services, and creation and use of ICT-based technologies.   |
| <b>ICT-related IP rights and added value of properly licensed software</b> | When economies strongly support ICT-related IP, the positive impact on gross domestic product (GDP) can be up to 10 times greater than in economies with a weaker IP environment.  |
| <b>Content-related IP protection and wider access to creative content</b>  | Top IP performers are likely to see 2-6 times more theater screenings of feature films than economies with average or below average IP environments.   |

**Figure 1. IP Protection Boosts Private-Sector Spending on Research and Development**

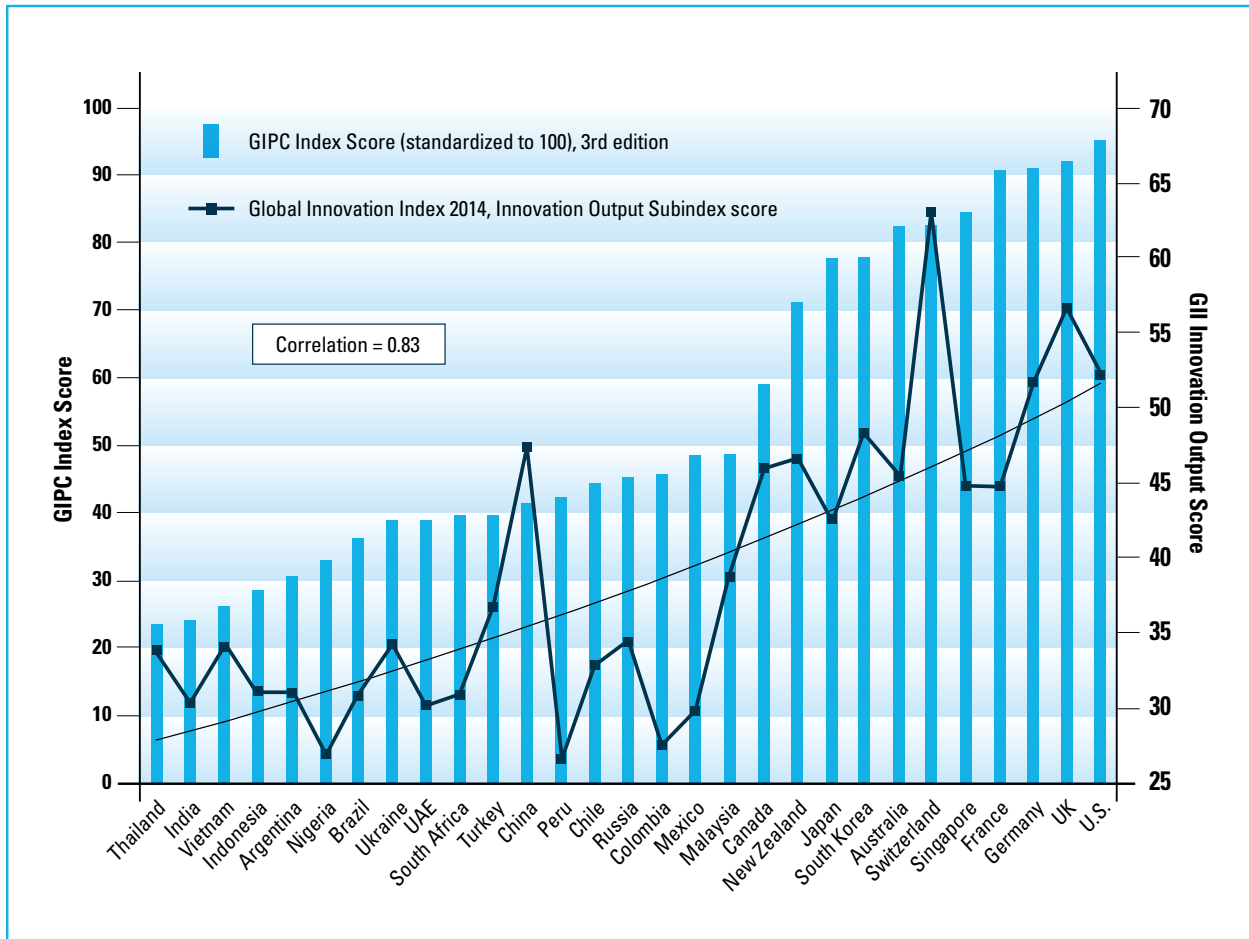


*Legend: AE—UAE, AR—Argentina, AU—Australia, BR—Brazil, CA—Canada, CH—Switzerland, CL—Chile, CN—China, CO—Colombia, DE—Germany, FR—France, ID—Indonesia, IN—India, JP—Japan, KR—South Korea, MX—Mexico, MY—Malaysia, NG—Nigeria, NZ—New Zealand, PE—Peru, RU—Russia, SG—Singapore, TH—Thailand, TR—Turkey, TW—Taiwan, UA—Ukraine, UK—United Kingdom, U.S.—United States, VN—Vietnam, ZA—South Africa*

- A strong correlation of 0.73 exists between the GIPC Index score and levels of company spending on R&D.<sup>1</sup>
- Firms in economies with advanced IP rights in place are more likely to invest in R&D activities and to a greater extent than are economies whose IP regimes lag behind.
- Companies in economies scoring in the middle third of the GIPC Index are about 5% more likely to invest in R&D compared with those in the economies scoring in the bottom third.
- Firms in the economies among the top performers see an even greater amount of private-sector R&D spending—about 40% more than the middle group of economies.

# Annex – IP Rights as a Gateway to Building Innovative Economies

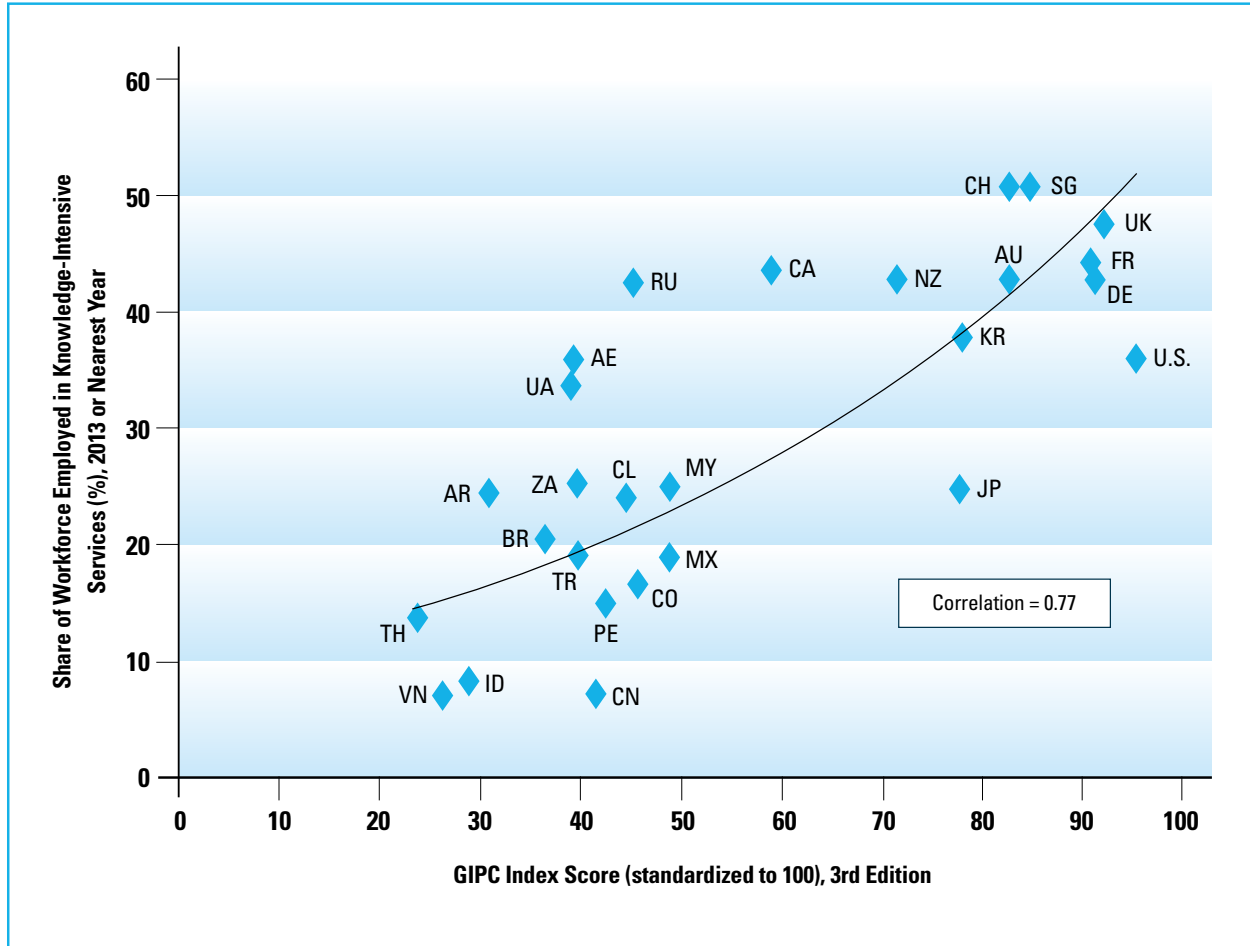
Figure 2. Innovation Relies on IP Rights



- The GIPC Index scores display a very strong correlation with innovative output, as measured by the Global Innovation Index (GII) Innovative Output Sub-Index score—about 0.83.<sup>2</sup>
- Economies with state-of-the-art IP environments produce 50% more knowledge-based and creative outputs compared with those whose environments require significant strengthening (as reflected in a difference in the average GII Output Sub-Index score of the two groups of 49 versus 33).
- China’s relatively high level of innovative output can be explained by its emphasis on production and export of high-tech and creative goods and services, although a large portion of this output centers on end-stage manufacturing and re-shipment, rather than on R&D activities.<sup>3</sup>

**Figure 3. Strengthening IP Rights Supports High-Value Job Creation**

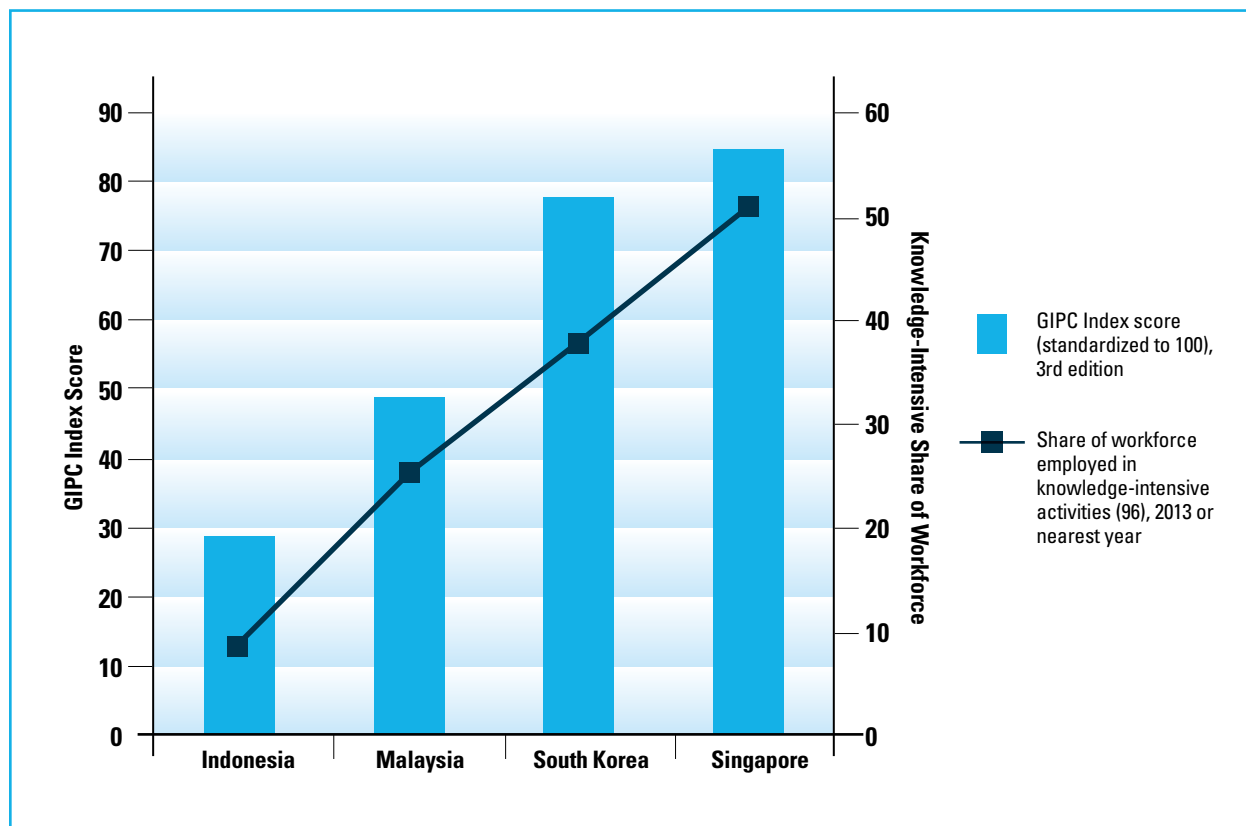
GIPC Index Score and Share of Workforce Employed in Knowledge-Intensive Services<sup>4</sup>



Legend: AE—UAE, AR—Argentina, AU—Australia, BR—Brazil, CA—Canada, CH—Switzerland, CL—Chile, CN—China, CO—Colombia, DE—Germany, FR—France, ID—Indonesia, IN—India, JP—Japan, KR—South Korea, MX—Mexico, MY—Malaysia, NG—Nigeria, NZ—New Zealand, PE—Peru, RU—Russia, SG—Singapore, TH—Thailand, TR—Turkey, TW—Taiwan, UA—Ukraine, UK—United Kingdom, U.S.—United States, VN—Vietnam, ZA—South Africa

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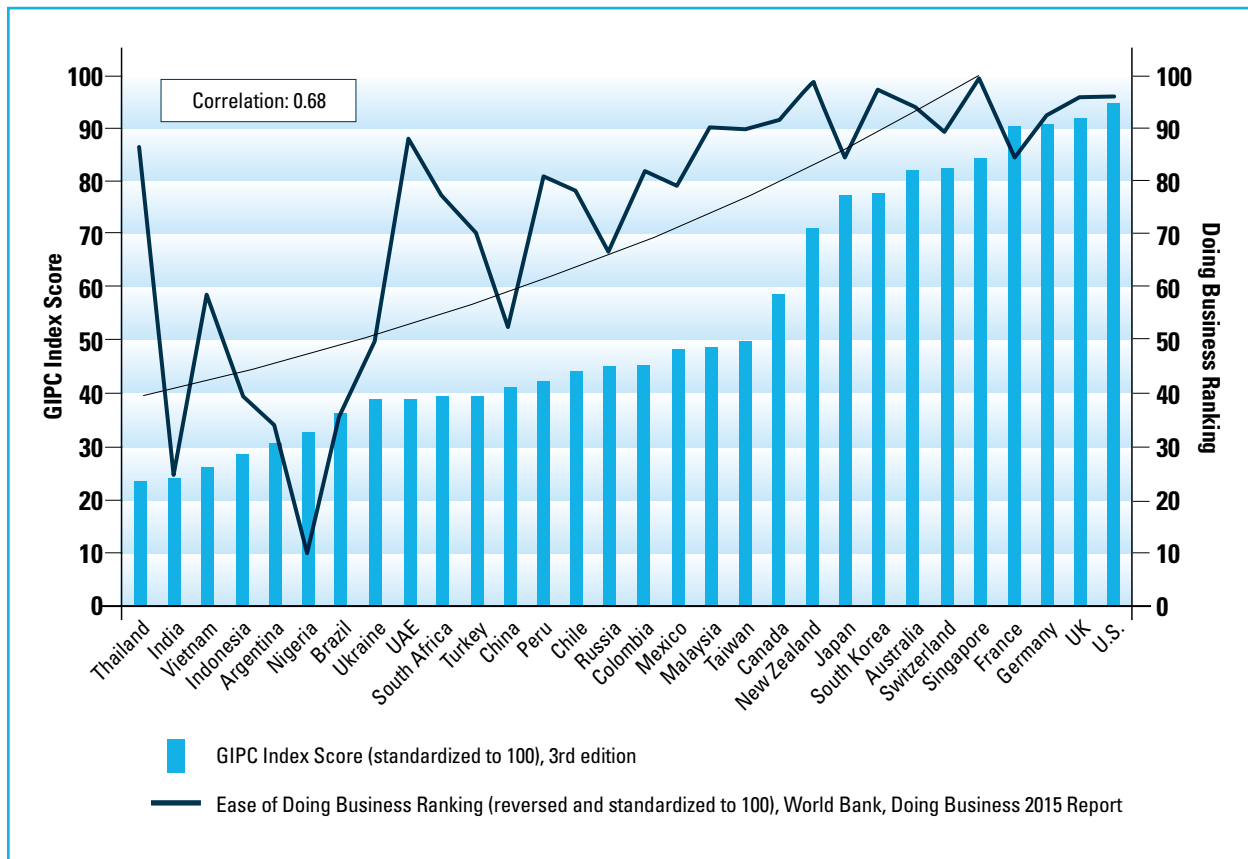
Figure 4: GIPC Index Scores and Share of Workforce Employed in Knowledge-Intensive Services:  
Sample of Asian Economies



- The GIPC Index score exhibits a very strong positive link with rates of employment in knowledge-intensive sectors.
- More than double the workforce is concentrated in knowledge-intensive sectors in economies with favorable IP regimes, compared with those that trail in terms of IP protection.
- A more incremental increase in knowledge-intensive jobs associated with a similar rise in GIPC Index score is visible when looking at a slice of data on a sample of Asian economies.
- There is a remarkable jump in the concentration of knowledge-intensive jobs—about 200%—between Indonesia (scoring below 30% of the total possible score, or less than 9 out of 30) and Malaysia (with a score of about 14.5).
- In addition, displaying relatively high GIPC Index scores, South Korea and Singapore (with scores of about 23 and 25 out of 30, respectively) show close to 40%–50% of the workforce composed of knowledge-intensive jobs.



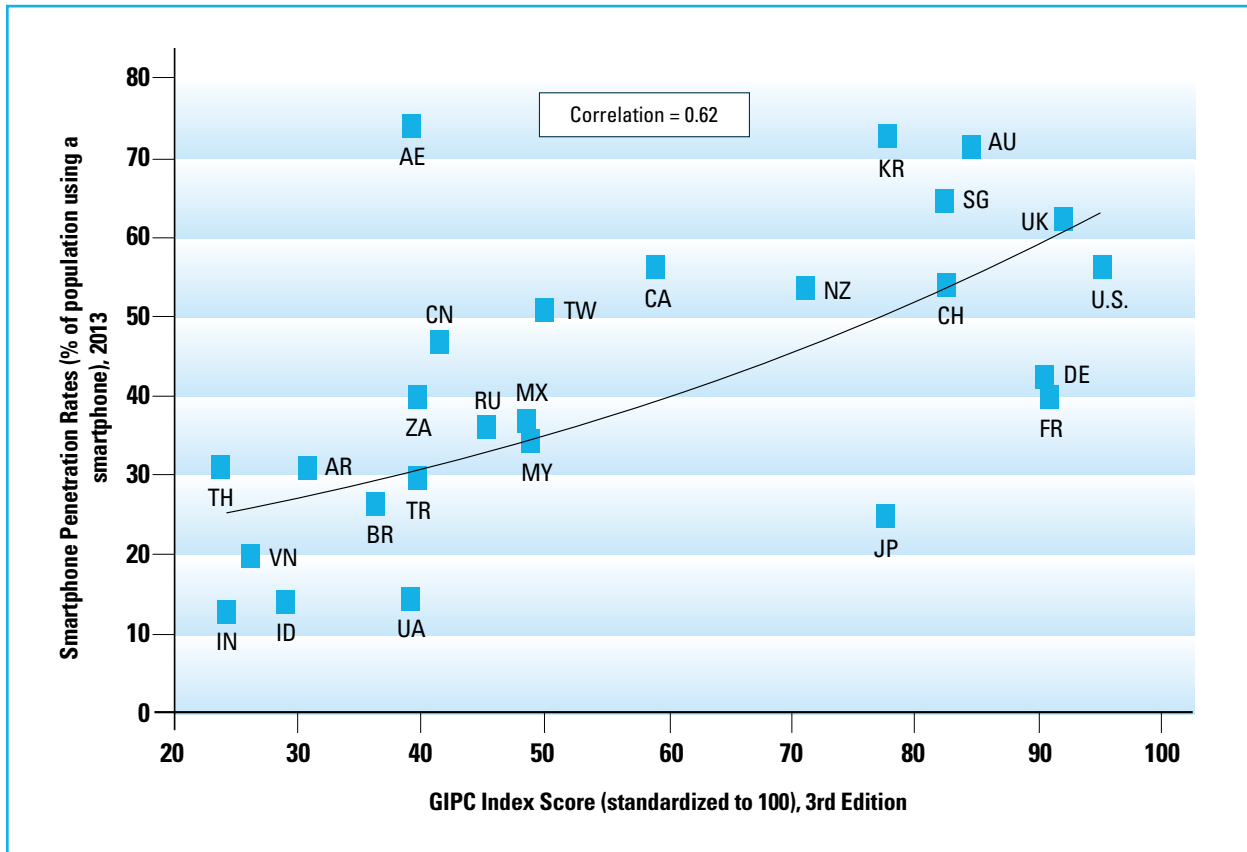
**Figure 5. A Positive Business Environment Depends on IP Protection**



- The GIPC Index score is positively correlated with economy rankings from the World Bank’s *Doing Business 2015* report.<sup>5</sup>
- Economies with favorable IP environments (in roughly the top 30% of the GIPC Index) are on average 15% more likely to have positive business climates overall compared with economies with less supportive IP systems (those with scores of 40%–60% of the total GIPC Index score).
- Nevertheless, economies with semi-supportive IP environments (40%–70% of the GIPC Index score) still tend to be characterized by a more attractive business environment—on average, ranked 33% higher—than economies with the most room for improvement (scoring below 40% of the total possible GIPC Index score).
- Thailand and the UAE rank particularly high in their business climate, mainly due to a dedicated effort by the respective governments to streamline procedures for business start-up and property registration by foreign companies.<sup>6</sup> The UAE’s “free zones,” in which investing companies benefit from tax exemptions, lower costs, and favorable ownership rules, also aid in making its business environment particularly attractive.<sup>7</sup>

# Annex – IP Rights as a Gateway to Building Innovative Economies

Figure 6. IP Rights Enhance Availability of Digital Technologies and Content



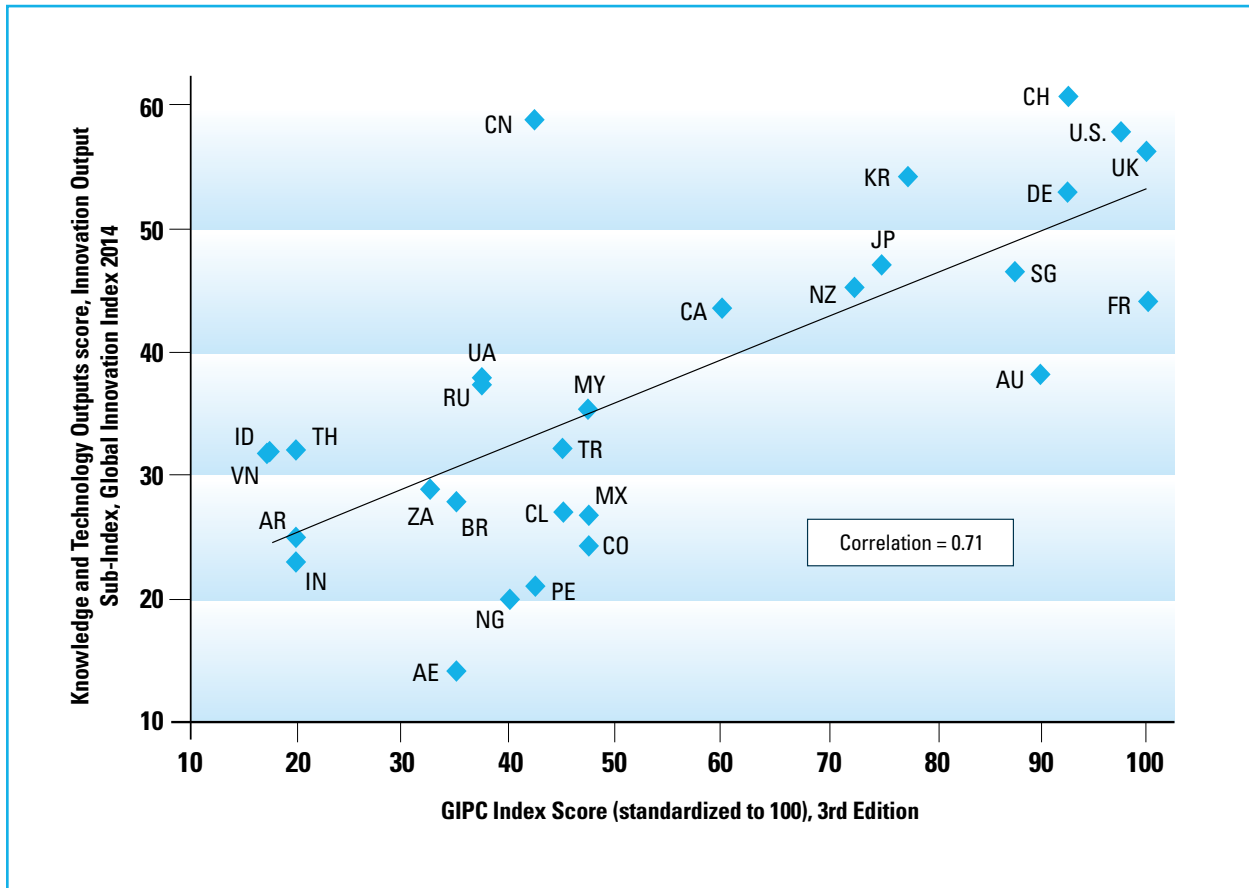
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- There is a fairly strong positive correlation of 0.62 between the GIPC Index scores and smartphone penetration rates as a proxy for availability of, and access to, digital technologies and content.<sup>8</sup>
- Worldwide, smartphone penetration is the fastest-growing platform for Internet usage and accessing digital content, compared with fixed broadband subscriptions (where growth has slowed in recent years).<sup>9</sup>
- In approximately 9 times out of 10, economies with strong IP protection (scoring in the top 30% of the total GIPC Index score) tend to experience on average 20% greater access to digital technologies and content via smartphones, compared with economies whose IP environments trail behind.
- The UAE, Japan, France, and Germany are outliers.

- Although the UAE has the highest level of smartphone penetration of the sampled economies, the vast majority of owners do not use advanced IP rights-dependent features, such as downloading content (music, film, etc.), which may not be available due to IP rights concerns.<sup>10</sup>
- While access to media services is widespread in Japan, it does not occur through smartphones. Being among the first markets for mobile media services in the 1990s, Japan has a tradition of using mobile content on other types of handsets than smartphones.<sup>11</sup>
- France's relatively low smartphone penetration may be explained by a preference for accessing the Internet/content through PCs and laptops over smartphones, and cellular services (making calls, texting, etc.) through other mobile devices.<sup>12</sup> In Germany, although availability of media services is fairly widespread, when it comes to mobile devices, people tend to prioritize cellular services over content and media.<sup>13</sup>

# Annex – IP Rights as a Gateway to Building Innovative Economies

Figure 7. Patent Protection Is Linked to Growth of High-Tech Sectors



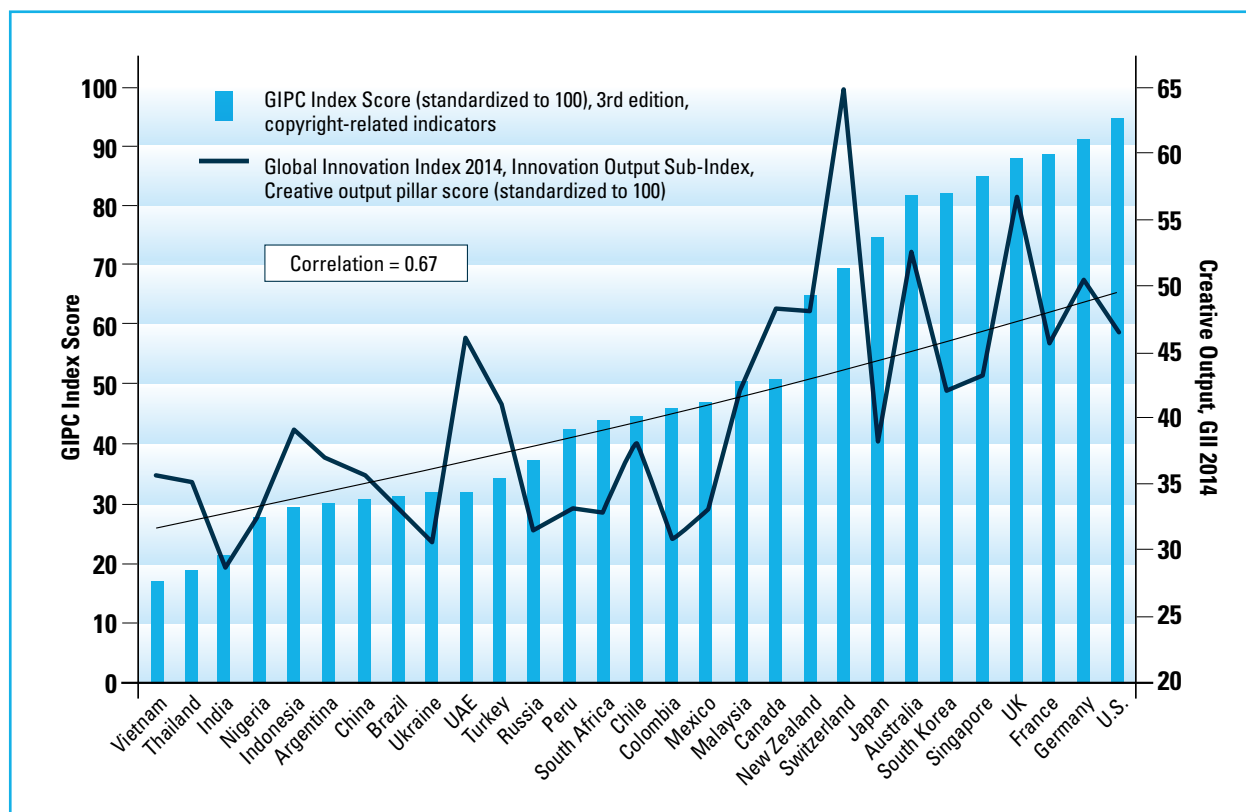
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- A very strong correlation is present between the GIPC Index patent-related indicators' scores and knowledge and technology outputs (as measured by the GII).<sup>14</sup>
- Economies with average IP environments (scoring 40%–70% of the total GIPC Index score) tend to experience about 10% more knowledge and technology outputs than economies whose IP environments lag behind (less than 40% of the GIPC Index).
- Economies with advanced IP regimes (scoring in the top third of the GIPC Index) tend to produce on average an additional 25% (or a total of 35%) in knowledge and technology outputs compared with those with lagging IP regimes.

- Among economies in the top half of the GIPC Index, Canada falls in the bottom 10% in terms of its level of high-tech outputs, which may be related to key gaps in patent protection and enforcement, such as concerning patent utility claims and pharmaceutical patent-term restoration.
- China's disproportionately strong level of high-tech output can partly be explained by its heavy focus on assembly and processing of imported components compared with locally generated innovation; China's value added to its high-tech exports is estimated at only 3% of the total value of the exports.<sup>15</sup>
- Australia and France are outliers among the top IP performers in terms of high-tech output. In Australia's case, this is because, although it has a strong high-tech export sector, this is outweighed by high-tech imports, predominantly computer services.<sup>16</sup> France, on the other hand, lacks high-tech export competitiveness, mainly due to persistently high labor costs.<sup>17</sup>

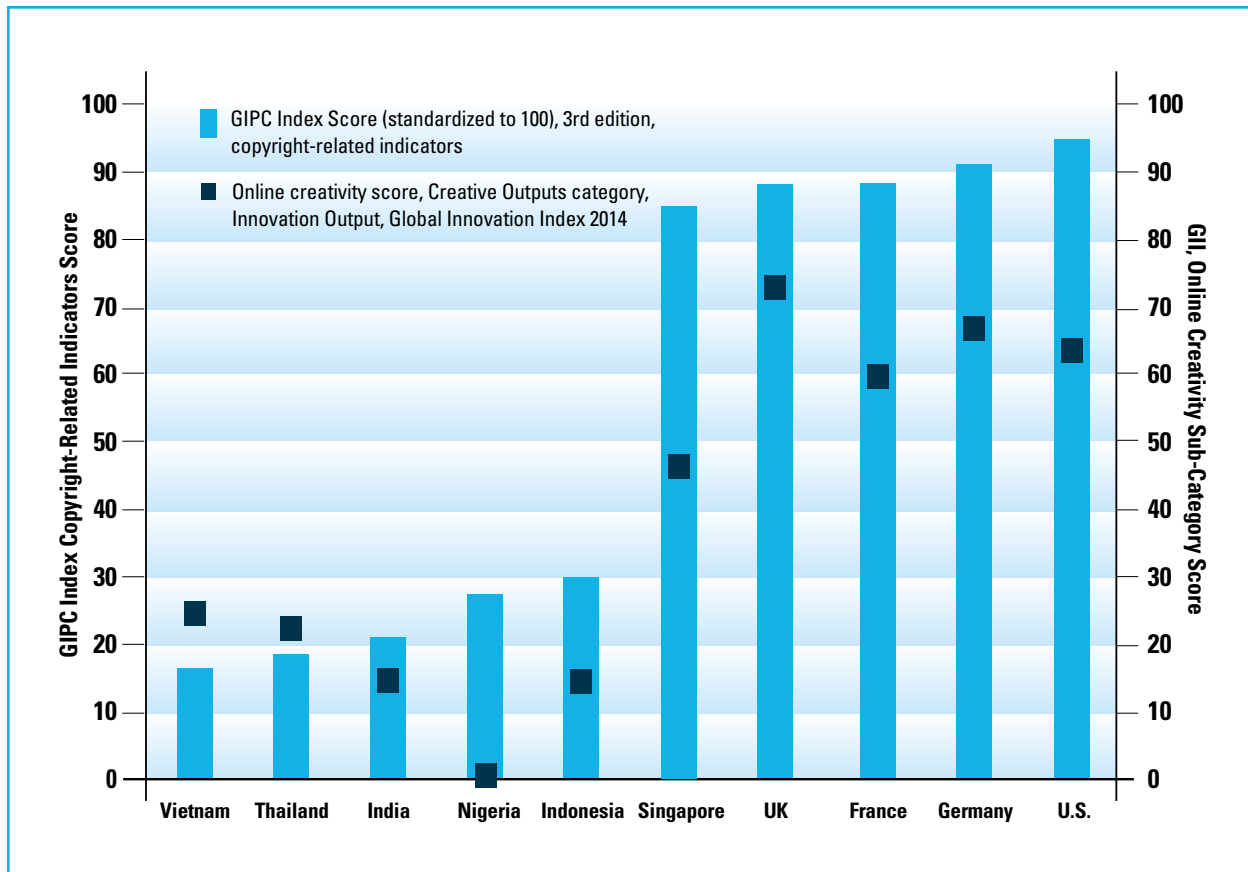
## Annex – IP Rights as a Gateway to Building Innovative Economies

Figure 8. Supportive Copyright Environments Promote Dynamic Content Sectors



- There is a strong positive relationship of 0.67 between the GIPC Index copyright-related indicators' scores and extent of creative outputs as measured by the GII.<sup>18</sup>
- Economies with higher GIPC Index scores related to copyrights (70% of the total possible score or above) are more likely to have larger and more dynamic content and media sectors than economies with less favorable IP regimes.
- Switzerland's score on creative output, where it does quite well relative to its digital copyright environment, is heavily based on spending directed toward infrastructure and advertising, rather than on content itself (reflected in high Internet access rates—90% of the population—relative to the rest of Europe).<sup>19</sup>
- Where entertainment content spending is high in Switzerland, there is a strong emphasis on, and rate of growth in, streaming of audiovisual content, suggesting a shying away from downloaded content (where piracy tends to be particularly problematic in Switzerland).<sup>20</sup>
- The UAE's relatively high level of creative outputs in the GII is mainly derived from a strong performance on integration and use of ICTs in businesses, which is a priority of the government (public sector spending on business IT rose close to 10% in 2014 to over \$1 billion).<sup>21</sup> However, the UAE's performance is substantially weaker in relation to a number of other sectors/activities that rely on copyright protection, such as software development and entertainment/media services.<sup>22</sup>

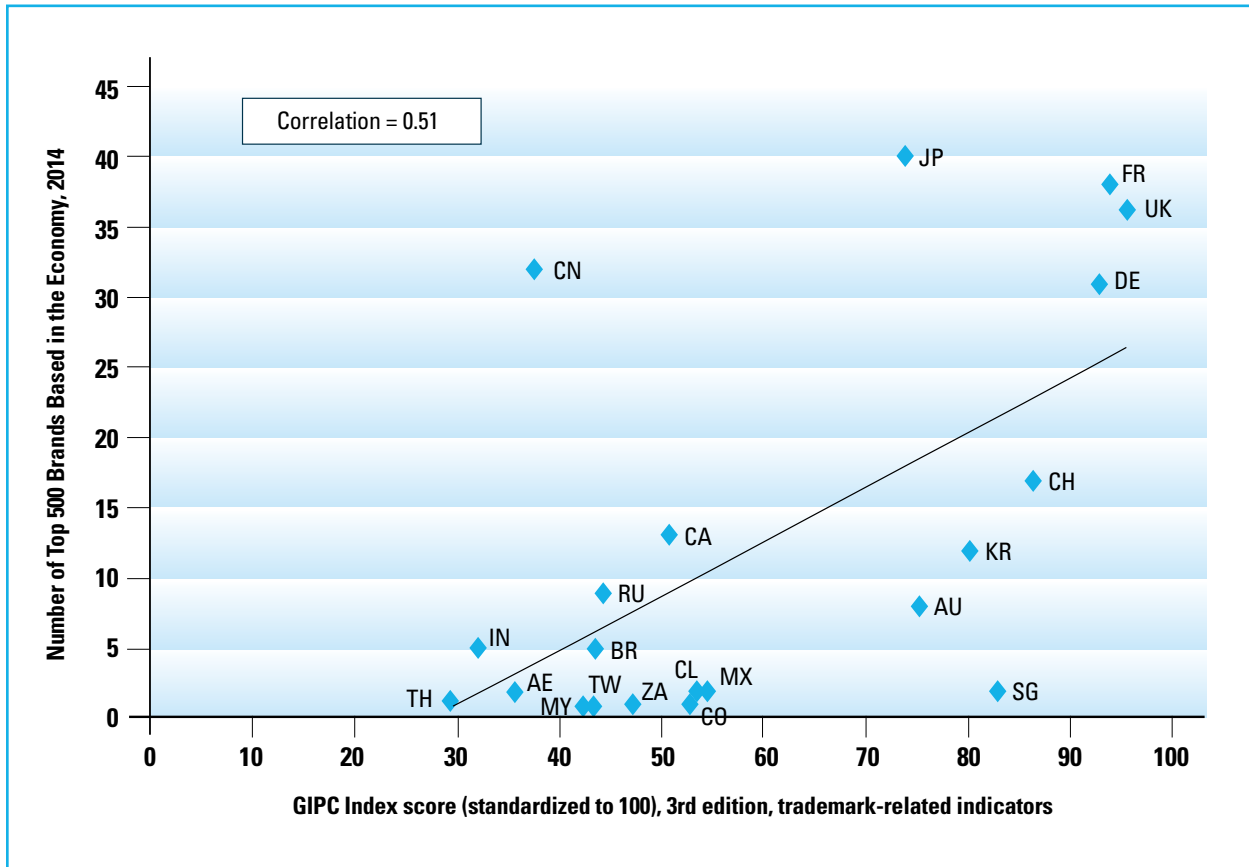
**Figure 9. Copyright Protection Encourages Online Creativity**



- Although there is quite a strong link between copyright protection and creative outputs as described above, the GIPC Index copyright-related indicators' scores bear an even stronger relationship with the area of online creativity (0.78, taking into account all 30 sampled economies).<sup>23</sup>
- Economies that provide and enforce strong copyright protection, including for digital and online works, tend to benefit from greater production and availability of new Web content, such as websites, applications, and audiovisual media.
- Specifically, economies with stronger levels of copyright protection (including the top five economies) exhibit more than double the amount of online creativity than economies with less beneficial environments.

# Annex – IP Rights as a Gateway to Building Innovative Economies

Figure 10. Trademark Protection Promotes Stronger Brands



Legend: AE—UAE, AR—Argentina, AU—Australia, BR—Brazil, CA—Canada, CH—Switzerland, CL—Chile, CN—China, CO—Colombia, DE—Germany, FR—France, ID—Indonesia, IN—India, JP—Japan, KR—South Korea, MX—Mexico, MY—Malaysia, NG—Nigeria, NZ—New Zealand, PE—Peru, RU—Russia, SG—Singapore, TH—Thailand, TR—Turkey, TW—Taiwan, UA—Ukraine, UK—United Kingdom, VN—Vietnam, ZA—South Africa

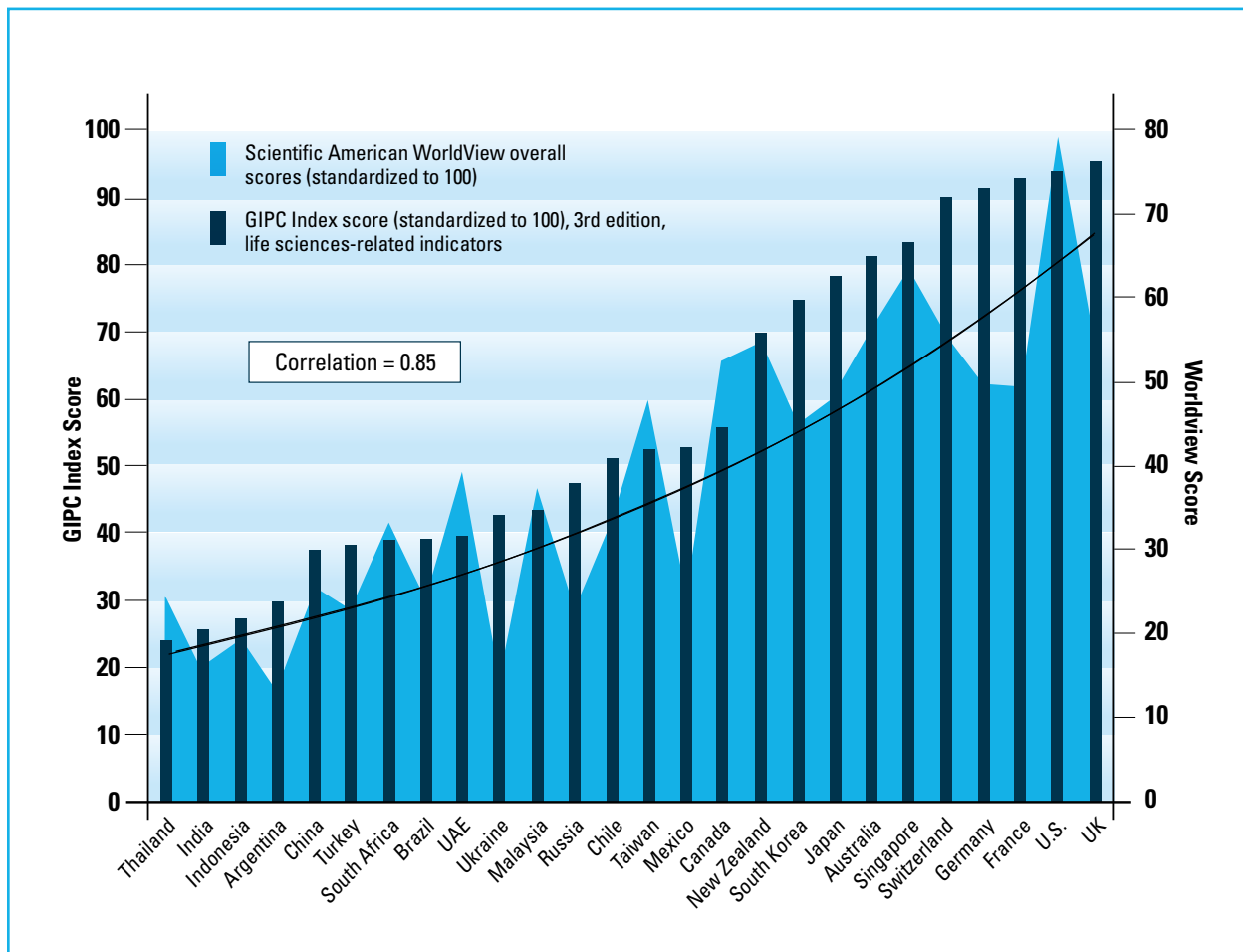
- There is a fairly strong positive relationship between the GIPC Index trademark-related indicators and the number of world-class brands (as measured by Brand Finance’s Top 500 global brands<sup>24</sup>) based in a given economy (excluding the United States).<sup>25</sup>
- Trademark protection is part of an environment that enables companies to build strong brands and maintain brand integrity when licensing trademarks and associated IP to operating companies.
- In general, economies with the most favorable IP environments host 2–10 times more high-value brands compared with economies with the least favorable environments.
- China, Japan, and Singapore are outliers.



- China's high number of top brands relative to its fairly weak trademark environment may be explained by the fact that the global Top 500 brands in China are dominated by state-owned enterprises, whose revenue streams do not necessarily depend on the brand itself and who thus do not rely as much on brand protection as wholly market-based companies.<sup>26</sup>
- Japan's strong performance in the Top 500 global brands list is partially due to the presence of many medium-sized companies with brands in high demand, both globally and locally, particularly in the electronics sector.<sup>27</sup>
- The relatively low number of high-value brands based in Singapore may be because companies in the country have traditionally focused less on intangible assets in the form of trademarks, and more on tangible assets, than in other economies (although this is currently changing, with companies in Singapore putting increasing emphasis on building brands).<sup>28</sup>

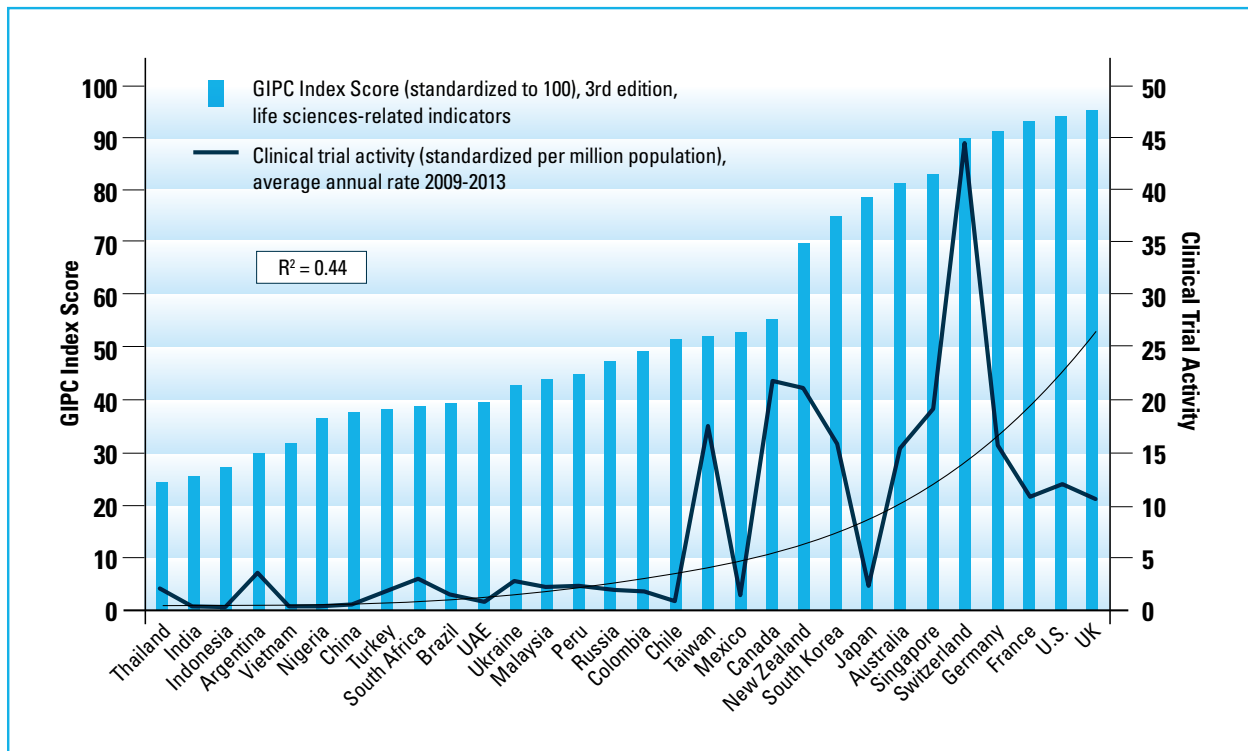
# Annex – IP Rights as a Gateway to Building Innovative Economies

Figure 11. Biotechnology Innovation Depends on Protecting IP



- Protecting IP rights related to the life sciences, such as patents, regulatory data protection (RDP), and patent term restoration, has a very clear and direct correlation with an environment in which biotechnology innovation can thrive.
- The GIPC Index life sciences–related indicators’ scores correlate very strongly with the Scientific American WorldView overall scores (as a measure of biotech innovation).<sup>29</sup>
- Economies with higher GIPC Index scores in relation to life sciences (over 70% of the total possible score) tend also to have environments that are more conducive to biotech innovation.
- While not as strong as fully developed IP environments, even economies with GIPC Index scores under 70% achieve higher WorldView scores than the economies with the weakest GIPC Index scores.

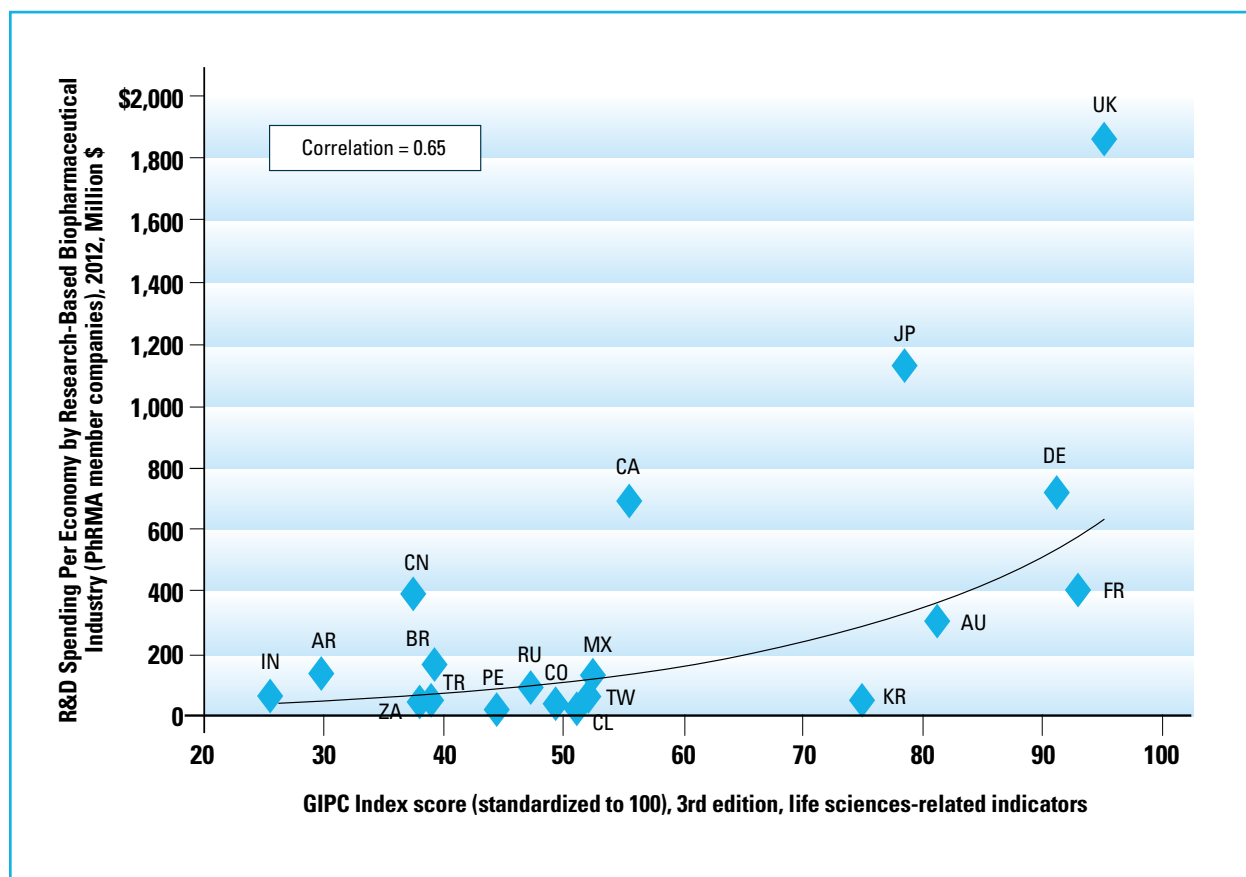
**Figure 12. IP Rights Lead to Biomedical Foreign Direct Investment**



- Biomedical IP rights exhibit a strong link to, and even explanatory power for, clinical trial intensity as a measure of life sciences FDI.
- Regression analysis of the GIPC Index life sciences–related indicators’ score and clinical trial activity suggests that IP protection can explain about 40% of life sciences investment (with an  $R^2$  of 0.44).<sup>30</sup>
- Economies with IP protection beneficial to the life sciences field see on average 9–10 times more biomedical investment than those lacking key aspects of IP protection.
- Switzerland boasts a world-leading life sciences sector and is home to two of the biggest biopharmaceutical companies in the world, Novartis and Roche. For its part, besides providing a relatively low-cost market, Taiwan has made considerable efforts in recent years to raise its clinical environment to international standards and to streamline the regulatory process.<sup>31</sup>
- In contrast, Japan tends to have a relatively weak clinical trial intensity due to a lack of culture of clinical research, specific local regulatory hurdles, and high relative costs.<sup>32</sup>
- Canada and New Zealand host a particularly high number of clinical trials relative to their biopharmaceutical IP environments; one possible explanation for this is that areas of particular concern on IP in these economies primarily affect the market authorization and post-marketing phases (such as patent invalidation, patent term restoration, and RDP), rather than the R&D phases.

# Annex – IP Rights as a Gateway to Building Innovative Economies

Figure 13. Life-Science R&D Investment Benefits from IP Protection



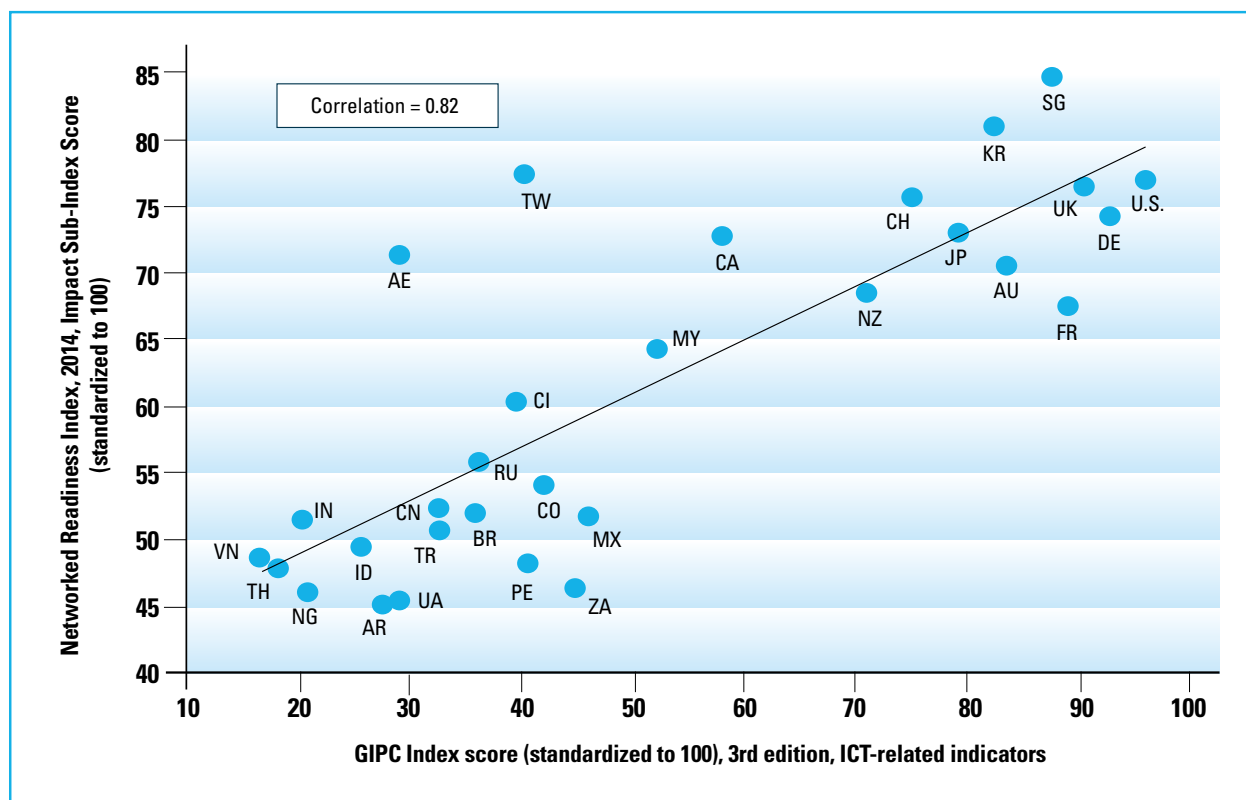
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- There is quite a strong (0.65) correlation between levels of R&D investment by the research-based biopharmaceutical industry and levels of IP protection as measured by the GIPC Index life sciences-related indicators' scores (excluding the United States).<sup>33</sup>
- Ninety percent of the time, economies that score in the top half of the GIPC Index sample experience roughly 2-6 times more biopharmaceutical R&D investment than economies in the bottom half.
- Significant outliers include China, South Korea, and Canada.
- The very large size and growth potential of China's market, as well as fairly strong regulatory standards relative to other emerging markets, help explain its relative attractiveness for biopharmaceutical R&D.

- The relatively high levels of R&D investment in Canada compared with its performance in the GIPC Index is explained by (1) its proximity to the larger U.S. market and (2) the overall sophistication of the Canadian R&D and manufacturing environment relative to the sampled economies.
- Although building an innovative capacity, Korean biopharmaceutical R&D capacity is still developing. There are also hurdles for biopharmaceutical innovators, not least with regard to patentability requirements and submission of large quantities of pharmacological data and the overall restrictive biopharmaceutical pricing environment.

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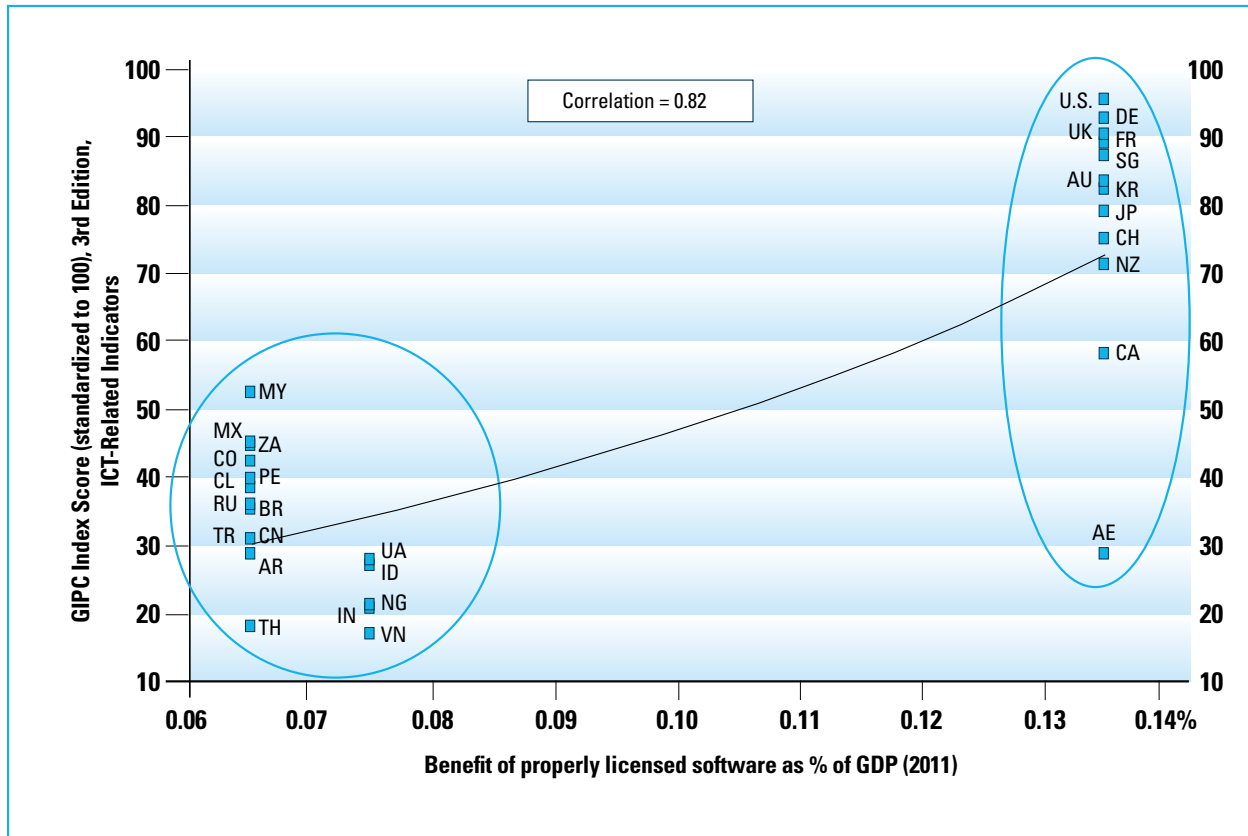
Figure 14. IP rights grow the ICT sector and knowledge-based economies



Legend: AE—UAE, AR—Argentina, AU—Australia, BR—Brazil, CA—Canada, CH—Switzerland, CL—Chile, CN—China, CO—Colombia, DE—Germany, FR—France, ID—Indonesia, IN—India, JP—Japan, KR—South Korea, MX—Mexico, MY—Malaysia, NG—Nigeria, NZ—New Zealand, PE—Peru, RU—Russia, SG—Singapore, TH—Thailand, TR—Turkey, TW—Taiwan, UA—Ukraine, UK—United Kingdom, U.S.—United States, VN—Vietnam, ZA—South Africa

- There is a strong correlation between the ICT-related indicators of the GIPC Index and the extent to which an economy leverages ICTs, as measured by the Networked Readiness Index, Impact Sub-Index score.<sup>34</sup>
- Economies with higher levels of IP protection tend to also have greater capacity to generate positive value from ICTs, such as through job creation, access to public and private services, and creation and use of ICT-based technologies.
- Taiwan and the UAE are the two most pronounced outliers.
- Taiwan's high networked readiness impact score is in part explained by relatively low mobile network and Internet infrastructure costs as well as dedicated government measures, such as funding and tax incentives, aimed at increasing broadband penetration and provision of integrated mobile services.<sup>35</sup>
- Similarly, the UAE has introduced several initiatives targeted toward enabling greater utilization of ICTs, including through the UAE ICT Strategy 2021, which, among other elements, aims to increase broadband speed by 15 times, subscribers by 5 times, and number of safe servers by 20 times by 2021.<sup>36</sup>

**Figure 15. IP Rights = Greater Added Value of Properly Licensed Software**

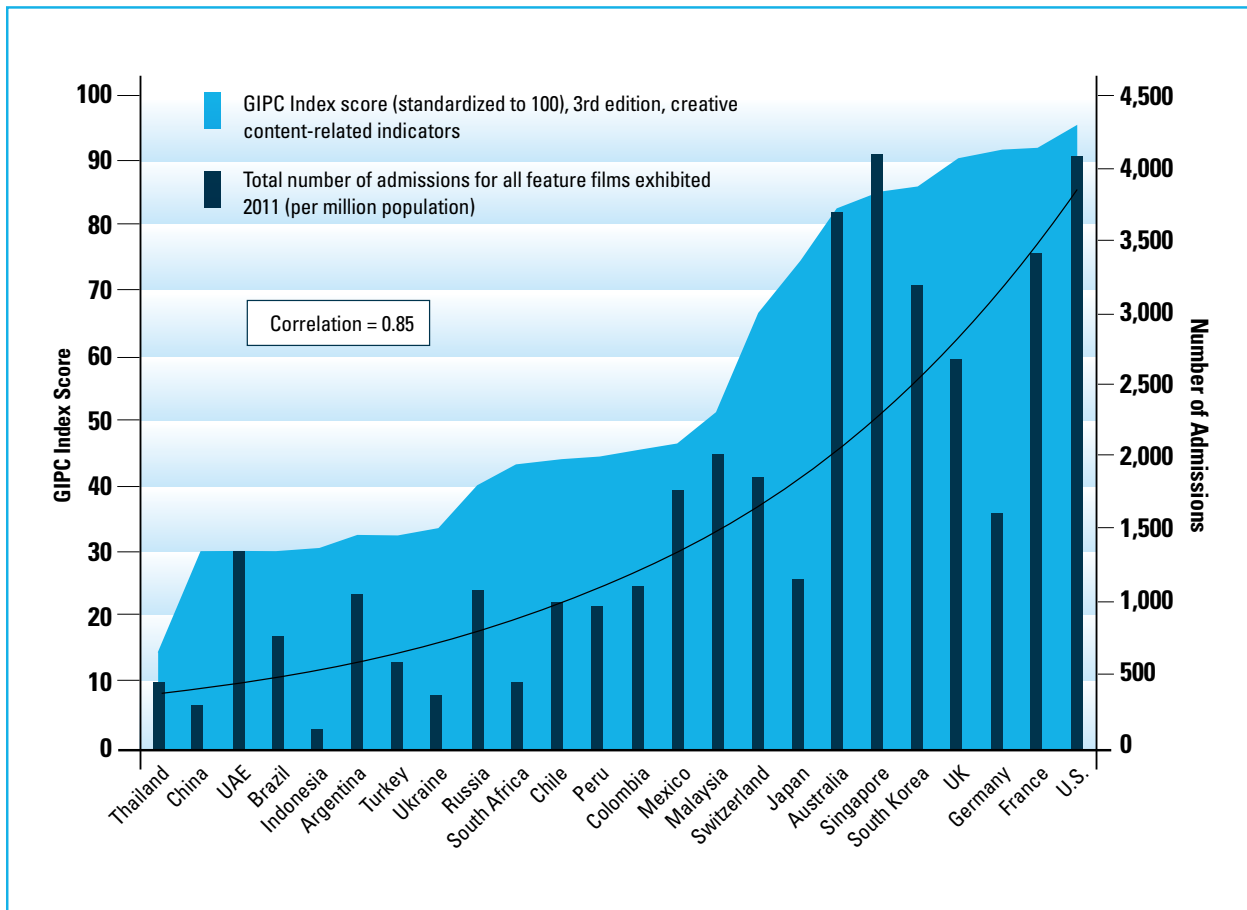


Legend: AE—UAE, AR—Argentina, AU—Australia, BR—Brazil, CA—Canada, CH—Switzerland, CL—Chile, CN—China, CO—Colombia, DE—Germany, FR—France, ID—Indonesia, IN—India, JP—Japan, KR—South Korea, MX—Mexico, MY—Malaysia, NG—Nigeria, NZ—New Zealand, PE—Peru, RU—Russia, SG—Singapore, TH—Thailand, TR—Turkey, TW—Taiwan, UA—Ukraine, UK—United Kingdom, U.S.—United States, VN—Vietnam, ZA—South Africa

- The GIPC Index’s ICT-related indicators’ scores are very strongly related to the benefits of properly licensed software as a percentage of GDP.<sup>37</sup>
- When economies strongly support ICT-related IP (i.e., economies in the top 30% of the GIPC Index), the positive impact on GDP can be up to 10 times greater than in economies with a weaker IP environment (less than 40% of the GIPC Index).
- The economic benefits from licensed software include increased efficiency of firms, reduced exposure to security vulnerabilities, and decreased spending on repairs.<sup>38</sup>
- Each additional dollar invested in properly licensed software has an estimated triple return on investment compared with pirated software.<sup>39</sup>

# Annex – IP Rights as a Gateway to Building Innovative Economies

Figure 16. IP Protection Supports Wider Access to Creative Content



- A very strong correlation exists between the GIPC Index content-related indicators’ scores and the quantity of theater admissions tickets for feature films sold.<sup>40</sup>
- Top IP performers (among the top 30% of the GIPC Index in relation to creative content indicators) are likely to see 2-6 times more theater screenings of feature films—and generate more tax revenue from ticket sales—than average or below average economies (those ranking in the bottom half).
- In economies that provide robust and comprehensive IP protection for creative content (such as films, music, books, etc.), people are more likely to be able to access new content as well as be willing pay for it.
- The low number of feature film admissions in Germany relative to its IP environment reflects a trend of falling attendance (particularly at multiplex and traditional cinemas, in lieu of specialist cinemas screening non-feature films); and in Japan, the large direct-to-video market.



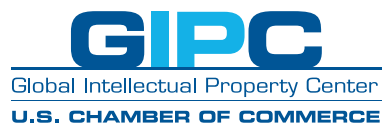
## Endnotes

- 1 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?” In the World Economic Forum’s Executive Opinion Survey, 2014–15, where 1 = do not spend on R&D and 7 = spend heavily on R&D (standardized to 100). Sources: World Economic Forum (2014); Global Intellectual Property Center (GIPC) (2015).
- 2 Innovative output is measured by the GII Innovation Output Sub-Index score. The GII Innovative Output Sub-Index captures the creation of technologies, media, and knowledge-based services, as well their diffusion and use across the economy. Sources: World Intellectual Property Organization (WIPO)/INSEAD/Cornell, Global Innovation Index 2014; GIPC (2015).
- 3 Xing, Y. (2014), “China’s High-Tech Exports: The Myth and Reality,” *Asian Economic Papers*, Vol. 13, No. 1, pp.109–123.
- 4 ILOSTAT data are not available for India, Nigeria, and Taiwan. Sources: International Labor Organization ILOSTAT Database (2013); GIPC (2015).
- 5 World Bank (2014), *Doing Business 2015: Going Beyond Efficiency*, Washington, DC: World Bank; GIPC (2015).
- 6 TMF Group, “Business Confidence and FDI Returning to Post-Coup Thailand,” October 10, 2014, <http://www.tmf-group.com/en/media-centre/news-and-insights/october-2014/business-confidence-and-fdi-returning-to-post-coup-thailand>.
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- 9 International Telecommunication Union (ITU) (2014), “The World in 2014: ICT Facts and Figures”; Fortune, “Smartphones: China’s Next Great Economic Indicator,” January 14, 2013, <http://fortune.com/2013/01/14/smartphones-chinas-next-great-economic-indicator/>.
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- 12 comScore, “France Digital Future in Focus 2013,” pp.15, 22.
- 13 HP, *Review the Highlights: User Preferences and Revenue Drivers for Smartphone Services*, Business White Paper, p. 4.
- 14 Knowledge creation and diffusion is measured by the GII’s Innovation Output Sub-Index, Knowledge and Technology Outputs pillar score. This score comprises variables such as patenting activity, growth of high-tech businesses, and knowledge-based exports. Sources: WIPO/INSEAD/Cornell (2014); GIPC (2015).
- 15 Xing, Y. (2012), *The People’s Republic of China’s High-Tech Exports: Myth and Reality*, *Asian Development Bank Institute Working Paper Series*, No. 357, April.
- 16 IP Australia (2014), Australian Intellectual Property Report 2014, <http://theconversation.com/australia-ranks-on-innovation-but-indolence-could-cost-us-29329>.
- 17 Organisation for Economic Cooperation and Development (OECD) (2013), France: Restoring Competitiveness, OECD “Better Policies” Series.
- 18 Creative output is measured by the score of the Creative Outputs pillar of the GII, Innovative Output Sub-Index, 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 falling under the Copyright category of the GIPC Index, as well as those indicators in Enforcement and International Treaties that are relevant to copyrights (specifically: 8–13, 21–27, and 30). Sources: WIPO/INSEAD/Cornell (2014); GIPC (2015).
- 19 PricewaterhouseCoopers, Swiss Global Entertainment and Media Outlook 2014–2018.
- 20 Ibid.

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- 21 IDC, “IT Spending by UAE Businesses to Top \$4.6 Billion in 2014,” April 30, 2014, <http://www.idc.com/getdoc.jsp?containerId=prAE24765314>,
- 22 GII (2014), pp. 357–369.
- 23 Online creativity is measured by the score of the Online Creativity sub-category of the Creative Outputs pillar of the GII, Innovative Output Sub-Index, which captures local creation of webpages and online audiovisual content. Sources: WIPO/INSEAD/Cornell (2014); GIPC (2015).
- 24 Brand Finance, “Global 500 2014: The World’s Most Valuable Brands,” [http://brandirectory.com/league\\_tables/table/global-500-2014](http://brandirectory.com/league_tables/table/global-500-2014). (Note: brand ranking is based on a proprietary calculation of brand value, derived from royalty income stream, and accounting for size, international presence reputation, and brand rating.)
- 25 The United States is not included in the correlation calculation due to the number of Top 500 global brands (193) being exponentially higher than the rest of the sample. Nevertheless, the U.S. results match the positive correlation of the dataset: the United States scores in the top tier in terms of trademark protection and hosts by far the most high-value brands globally.
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- 28 Brand Finance, *The Brand Finance Top 100 Singapore Brands Report 2014*, p. 18.
- 29 Overall scores of Scientific American WorldView are based on performance in seven categories: Productivity, Intellectual Property Protection, Enterprise Support, Intensity, Education/Workforce, Foundations, and Policy and Stability. Life sciences–related indicators consist of indicators falling under the Patent, Trademark, and Trade Secrets and Market Access categories of the GIPC Index, as well as those indicators in Enforcement and International Treaties that are relevant to the life sciences (specifically: 1–2, 4–7, 14–21, 23–26, and 28–30. Sources: Scientific American WorldView (2014); GIPC (2015).
- 30 Clinical trial intensity is measured as the average annual rate of clinical trials per country over the period 2009–13, standardized per million population, drawn from the Clinicaltrials.gov database. Sources: National Institutes of Health, Clinicaltrials.gov; GIPC (2015).
- 31 Tzou, M.C. (2013), “Recent Trend of Pharmaceutical Regulations in Taiwan,” Taiwan Food & Drug Administration.
- 32 Chiu, Y. (2013), *Conducting Clinical Trials in Japan: A CRO Perspective*, Pharmaceutical Product Development.
- 33 The United States is not included in the correlation calculation due to the level of R&D spending (\$37.5 billion) being exponentially higher than the rest of the sample. Nevertheless, the U.S. results match the positive correlation of the dataset: the United States scores at the top in terms of life sciences IP protection and attracts by far the largest level of private biopharmaceutical R&D investment. Sources: PhRMA Industry Profile 2014; GIPC (2015).
- 34 The Impact Sub-Index of the Networked Readiness Index measures economic and social impacts of ICT, including value added, employment, and access to public and private services. ICT-related indicators consist of indicators falling under the Patent, Copyright and Trade Secrets categories, as well as relevant indicators in Enforcement and International Treaties (specifically: 3, 8–13, 19–20, 21–27, and 30). Sources: World Economic Forum (2014), Global Information Technology Report and Networked Readiness Index 2014; GIPC (2015).
- 35 The China Post, “Taiwan 10th in Networked Readiness Index,” The China Post, April 12, 2013, <http://www.chinapost.com.tw/taiwan/business/2013/04/12/375805/Taiwan-10th.htm>.
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- 40 Data on Canada, India, and New Zealand are not available. Creative content-related indicators consist of indicators falling under the Copyright category, as well as relevant indicators in Enforcement and International Treaties (specifically: 8–12, 21, 23–26, 27, and 30). Sources: UNESCO Institute for Statistics (2011); World Bank Databank (2012); GIPC (2015).





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