



CONTRIBUTORS AND DETRACTORS: RANKING COUNTRIES' IMPACT ON GLOBAL INNOVATION

EXECUTIVE SUMMARY

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More innovation will be the determining factor in achieving greater progress. Countries' economic and trade policies can either help or hurt global innovation. For example, policies such as robust investment in and tax incentives for scientific research and education support global innovation. In contrast, policies such as export subsidies or forced localization harm global innovation. If nations increased their supportive policies and reduced their harmful policies, the rate of innovation worldwide would significantly accelerate. This report assesses countries on the extent to which their economic and trade policies either constructively contribute to or negatively detract from the global innovation system.

If the world is going to maximize global innovation, it will need to develop stronger mechanisms to encourage nations to do more contributing and less detracting to innovation.

Most studies comparing countries on innovation rank them on innovation capabilities and outcomes.¹ But no study has assessed the impact of countries' innovation policies on the broader global innovation system. This study assesses this by inquiring whether countries are attempting to bolster their innovation capacities through positive-sum policies such as investments in R&D, education, or tax incentives for innovation that contribute positively to the global body of knowledge and stock of innovation; or if they are trying to compete through negative-sum "innovation mercantilist" policies such as localization barriers to trade, export subsidization, or failing to adequately protect foreign intellectual property (IP) rights (e.g., through the issuance of compulsory licenses or even outright IP theft). Those types of policies are more concerned with expropriating existing knowledge, shifting innovative activity to suboptimal locations, or unfairly propping up inefficient companies. Because of the injurious effect of these policies on innovators (both those living in other nations, and even in-country) the result is less, not more, global innovation, and the world as a whole is hurt by such nations' innovation mercantilist policies.

This issue is of paramount importance, because as countries increasingly vie for leadership in the global innovation economy, they can implement policies that benefit only themselves at the cost of hurting global innovation, or policies that can bolster their own innovation capacity while also generating positive spillovers that benefit the entire global innovation system.

This report assesses the impacts of countries' economic and trade policies on the broader global innovation system. It examines 27 indicators, including 14 "contributors" that constructively spill over to contribute to global innovation, grouped into three categories—taxes, human capital, and R&D and technology—and 13 "detractors" that inhibit greater levels of global innovation, also grouped into three categories—balkanized production markets, IP protection, and balkanized consumer markets.

The report finds that the nations doing the most to support global innovation while doing the least to detract from it, on a per capita basis, are Finland, Sweden, the United Kingdom, Singapore, and the Netherlands, as Table ES-1 shows. The report identifies these countries as “Schumpeterians” for fielding policies—such as robust levels of government investment in scientific research and education and innovation-enabling tax policies—that produce significant spillovers to the global innovation system while generally eschewing use of policies that detract from it. In contrast, the countries making the least constructive impact on the global innovation system—Argentina, Indonesia, India, Thailand, and Ukraine—contribute less to global innovation and at the same time use more innovation mercantilist policies that detract from it. The United States ranks just 10th overall, largely because its innovation-supporting policies (such as funding for scientific research) are lower than those of the leaders (on a per capita basis). China ranks 44th, largely because it fields so many policies that harm global innovation.

Rank	Country	Type	Final Score	Contributions Score	Detractions Score
1	Finland	Schumpeterian	15.6	14.1	13.9
2	Sweden	Schumpeterian	14.2	13.9	11.1
3	United Kingdom	Schumpeterian	13.7	13.7	10.4
4	Singapore	Advanced Asian Tiger	12.3	15.0	5.9
5	Netherlands	Schumpeterian	12.1	9.6	12.4
6	Denmark	Schumpeterian	11.6	13.5	6.2
7	Belgium	EU Continentalist	11.4	9.4	11.3
8	Ireland	EU Continentalist	10.9	8.7	11.2
9	Austria	EU Continentalist	10.5	9.2	9.7
10	United States	Adam Smithian	10.5	8.5	10.4
11	France	EU Continentalist	10.2	10.2	7.8
12	Germany	EU Continentalist	9.4	7.0	10.3
13	Norway	EU Continentalist	9.4	7.8	9.2
14	Japan	Advanced Asian Tiger	9.2	11.3	4.3
15	Taiwan	Advanced Asian Tiger	9.2	12.3	3.1
16	Slovenia	EU Up and Comer	9.0	9.2	6.5
17	Portugal	EU Continentalist	8.8	7.5	8.4
18	Estonia	EU Up and Comer	7.3	4.3	9.5
19	Iceland	EU Continentalist	7.1	9.0	3.0
20	Switzerland	EU Continentalist	6.8	8.8	2.5
21	Korea	Advanced Asian Tiger	5.9	14.7	-6.9
22	Australia	Adam Smithian	5.9	4.7	6.0
23	Israel	Advanced Asian Tiger	5.1	8.2	-0.2
24	Spain	EU Continentalist	5.0	3.1	6.3
25	Canada	Adam Smithian	5.0	8.3	-0.5
26	Czech Republic	EU Up and Comer	4.5	2.1	6.5
27	Hungary	EU Up and Comer	4.4	2.9	5.3
28	New Zealand	Adam Smithian	2.9	-1.4	7.9
29	Hong Kong	Advanced Asian Tiger	1.4	-1.8	5.4

30	South Africa	Innovation Follower	0.1	-3.1	4.2
31	Lithuania	EU Up and Comer	-0.2	-3.9	4.7
32	Slovak Republic	EU Up and Comer	-0.8	-6.3	6.7
33	Italy	Innovation Follower	-1.2	-5.8	5.0
34	Latvia	EU Up and Comer	-1.4	-7.7	7.1
35	Poland	EU Up and Comer	-2.4	-6.1	3.0
36	Bulgaria	Innovation Follower	-5.0	-5.0	-3.9
37	Turkey	Innovation Mercantilist	-7.2	-4.8	-8.6
38	Romania	Innovation Follower	-7.7	-9.8	-3.0
39	Malaysia	Innovation Mercantilist	-7.9	-2.5	-13.1
40	Chile	Innovation Follower	-8.1	-10.9	-2.7
41	Brazil	Innovation Mercantilist	-8.3	-3.2	-12.9
42	Russia	Innovation Mercantilist	-8.9	-0.7	-17.4
43	Greece	Innovation Follower	-10.5	-15.4	-1.5
44	China	Innovation Mercantilist	-10.5	0.7	-22.6
45	Colombia	Innovation Follower	-11.0	-15.5	-2.5
46	Costa Rica	Innovation Follower	-11.3	-16.7	-1.5
47	Philippines	Innovation Follower	-12.1	-13.6	-7.3
48	Peru	Innovation Follower	-12.2	-13.6	-7.4
49	Vietnam	Innovation Mercantilist	-12.9	-8.1	-16.2
50	Mexico	Innovation Follower	-13.5	-16.7	-6.1
51	Kenya	Innovation Follower	-13.7	-14.9	-8.8
52	Ukraine	Traditional Mercantilist	-14.6	-14.3	-11.5
53	Thailand	Innovation Mercantilist	-14.8	-5.6	-23.3
54	India	Innovation Mercantilist	-15.5	-8.3	-21.2
55	Indonesia	Traditional Mercantilist	-17.5	-16.1	-15.2
56	Argentina	Traditional Mercantilist	-20.1	-15.8	-21.0

Table ES-1: Countries' Scores for Contributions, Detractions, and Total Impact on Global Innovation

Assessing countries' scores on just the contributions indicator, Singapore, Korea, Finland, Sweden, and the United Kingdom lead the world. Relative to the size of their economies, these nations invest more in science and human capital, and have stronger innovation-incentivizing tax policies. In contrast, Costa Rica, Mexico, Indonesia, Argentina, and Colombia field policies that contribute the least to the global innovation system. These countries tend to underinvest in research, produce fewer science researchers, and have relatively less-developed toolsets to support innovation policies.

In terms of detractions, Finland, the Netherlands, Belgium, Ireland, and Sweden field policies that do the least to detract from the global innovation system. In general, these countries play by the rules of the international system, implement few trade barriers, ensure strong protections for intellectual property, and do not overtly favor domestic enterprises at the expense of foreign competitors. In contrast, Thailand, China, India, Argentina, and Russia field policies that detract the most from the global innovation system. These countries make the most extensive use of trade barriers and other distortions while providing weaker environments for intellectual property protection. Figure ES-1 plots

countries' contributions to the global innovation economy in terms of both their contributions and detractions, illustrating which nations are making greater or lesser contributions to the global innovation economy.

As the report subsequently elaborates, eight categories of countries emerge from this research: Adam Smithian, Advanced Asian Tiger, European Union (EU) Continentalist, EU Up and Comer, Innovation Follower, Innovation Mercantilist, Schumpeterian, and Traditional Mercantilist. Some of these groups—including the EU Up and Comers and Innovation Followers—contribute relatively little to the global innovation system, but do little to harm it. By contrast, most Advanced Asian Tigers, such as Korea, Japan, and Taiwan, make significant contributions to the global innovation systems (e.g., high levels of investment in scientific research and education) but also enact significant innovation mercantilist policies that detract from it. The Innovation Mercantilists—such as China and Russia—make modest contributions but implement severely detractive trade, competition, and IP policies.



Figure ES-1: Scatterplot of Countries' Contributions to and Detractions from Global Innovation

While on an absolute basis the United States' policies do more to drive global innovation than any other nation because of its sheer size, the United States ranks 10th overall. Along with other "Adam Smithians," such as Australia and Canada, the United States largely avoids the use of innovation mercantilist policies (ranking 6th for detractions), but in its often dogmatic faith in "free markets" does relatively little to proactively support innovation (and thus places just 17th for contributions). To become the number one-

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ranked nation, the United States could take five steps to significantly increase its score on contributions: 1) reduce its effective corporate tax rate to 18.2 percent; 2) increase its R&D tax credit to 24 percent; 3) implement an innovation box; 4) increase government funding of R&D by \$68 billion annually; and 5) increase its number of college science, technology, engineering, and math (STEM) graduates by 20 percent.

Some policymakers may say that this it is all well and good to think about the global innovation system, but their job, after all, is to look out for the innovation welfare of their own country, not to be altruistic. However, this report finds a strong correlation between countries' contributor innovation policies and their levels of domestic innovation success, as evidenced by countries' contributor scores correlating with their innovation output scores on the World Intellectual Property Organization's *2015 Global Innovation Index*. In other words, doing well on innovation policy can also mean doing good for the world.

If the world is going to maximize global innovation, it will need to develop stronger mechanisms to encourage nations to do more contributing and less detracting. Perhaps the most important step needed to move in this direction is for global policymakers, economists, and pundits to begin to treat innovation as though it is as important as trade in optimizing global economic growth and welfare. Even if some policymakers do not believe it, most know they are supposed to repeat the mantra that free trade boosts global economic welfare. But that same intellectual consensus does not exist when it comes to supporting innovation policies, such as robust intellectual property protections, that are a key to maximizing global innovation (and thus global economic welfare). Importantly, this means pushing back against the false narrative advanced by organizations such as the United Nations Conference on Trade and Development (UNCTAD) that developed-nation innovation comes at the expense of developing-nation economies and that an innovation "redistribution" strategy helps, not hurts global innovation.

We also need to develop a better framework for distinguishing between countries' innovation policies that are good (i.e., that help the adopting nation and the world) as opposed to "ugly" (i.e., that purport to help the adopting nation but that hurt global innovation). For example, the World Trade Organization (WTO) should produce its own version of The Information Technology and Innovation Foundation's (ITIF's) *The Global Mercantilist Index*, which would comprehensively document countries' WTO-violating trade barriers as they relate to innovation, while unabashedly ranking the most egregious nations.²

There are also a host of specific actions that national and international development organizations—such as the World Bank—can take to support policies that maximize global innovation. One key step would be for them to stop promoting export-led growth as a solution to development and to tie their assistance to steps taken by developing nations to move away from negative-sum mercantilist policies. Countries that persist in fielding aggressive innovation mercantilist strategies should have their foreign aid privileges suspended.

Finally, we need to encourage more international cooperation in scientific research among nations whose policies on net contribute to global innovation. For example, these nations should establish and support a Global Science and Innovation Foundation (GSIF), whose

Does “innovation altruism” pay? That is, do the nations that rank higher also have better innovation outcomes? The evidence suggests it does, and that doing good for a country usually means doing good for the world.

mission would be to fund scientific research, particularly internationally collaborative research, on key global challenges. Countries should also work collaboratively to support more international cooperative scientific research initiatives and share the research results they produce. For example, in the Transatlantic Trade and Investment Partnership Agreement (T-TIP), the United States and Europe should establish a bilateral research and development (R&D) participation model in order to better coordinate cross-border pre-competitive research partnerships.³

Put simply, the world is not producing as much innovation as is possible—or as is needed. For as Joseph Schumpeter once stated: “technological possibilities are an uncharted sea.” The problem today is that because of the policies of many nations, too many of the boats on this sea are underpowered, and the sea itself is too turbulent. It is time to understand that maximizing global innovation should be the key international trade goal of the 21st century and that, absent new approaches and stricter disciplines, the world will fail to deliver the promise of the future—new technologies, new products and services, new cures or treatments for diseases, and greater social and economic well-being—to the world’s 7 billion inhabitants as quickly as possible.

This report proceeds by articulating what innovation is, why it matters, and the conditions that must prevail in the global economy for the global production of innovation to be maximized before assessing how countries’ innovation and economic growth policies affect the broader global innovation system. It concludes by offering a set of policy recommendations designed to increase the production of innovation globally.