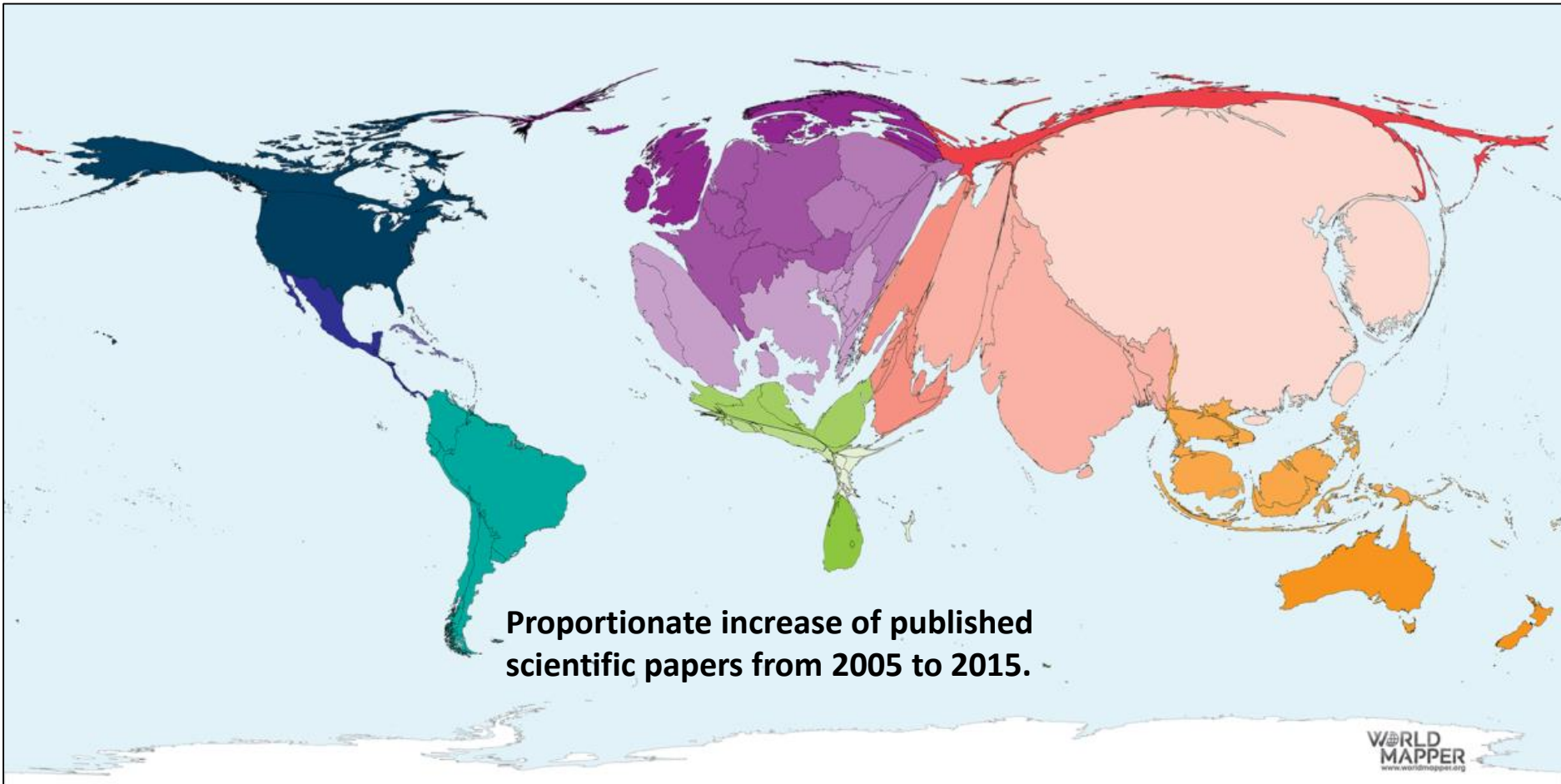


Long-term competitiveness in a challenging and dynamic geostrategic context



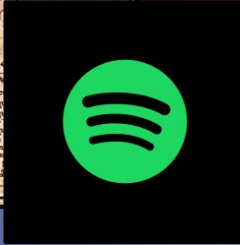
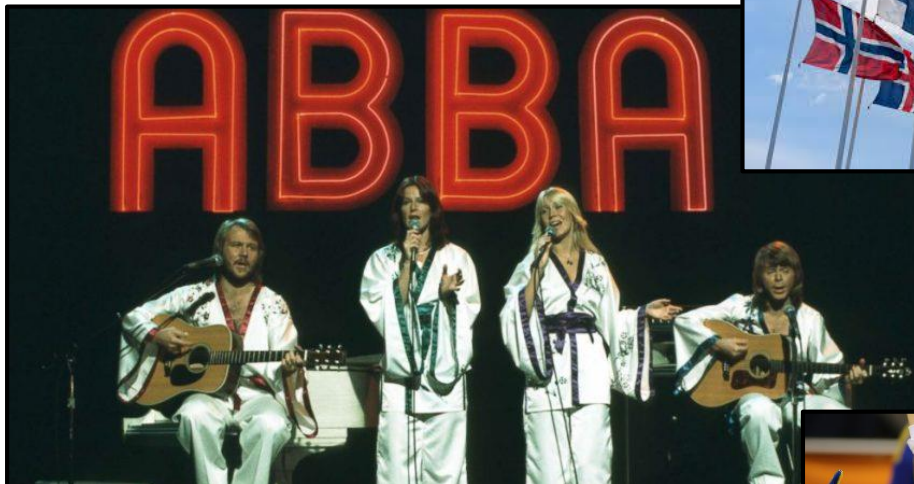
Food for thought

Dr HC Hagman for

The Association of Swedish Higher Education Institutions

November 23, 2021

Sweden is fantastic, but are resting on our laurels?



Food for thought
Dr HC Hagman for SUHF
November 23, 2021

Competitiveness is key

- money does not grow on trees



- **Sweden is a small country. We can never compete with quantity, only quality.**
- **However, most of today's global trends are challenging for small globalist countries such as Sweden and the Nordics.**
 - It's been a great ride, we have security, friends and soft power.
 - **But we need to think hard about our priorities, long-term investments, who we cooperate with and why.**
 - We need more int. cooperation and division of labor, not isolation.
- **From a Government's perspective, competitiveness main purpose is to generate jobs, taxes and growth, which indirectly contributes to national cohesion, security and investments in public goods.**
 - And yes, business/companies are the key vehicle.
 - Academia's ultimate role is to provide qualified labor, research and promote innovation. **Education and R&D is the very foundation.**

Geostrategic trends



- **The West has lost its monopolies.**
 - No longer sole source of institutions, innovation, investments and norms.
- **There is no one global leader.**
- **Big countries will matter more, and their values.**
 - But US, China, India, Russia, EU and multilateralism not in great shape.
- **Globalization, although effective, has increased complexity in international relations.**
 - Globalization has also leveled off; Covid, protectionism, resilience and great power competition has had an impact.
- **Democracy, transparency, universal rights and freedoms in an uphill battle. Social media and information bubbles: where truth is subjective.**
- **Demographics – aging for most, and the rise of the South**
- **Small countries: either we gang together, focus and excel, or we dwindle.**

Global proportions GDP (PPP)

1980



"EU 28" 25.9%



USA 21.4%



China 2.3%



Japan 8%



India 2.8%

2000



"EU 28" 20.3%



USA 20.4%



China 7.3%



Japan 6.9%



India 4%

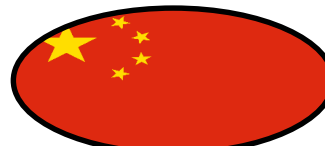
2021



EU 27 12.6%



USA 15.9%



China 18.7%



Japan 3.9%



India 7%

Fact

Estimate

2026

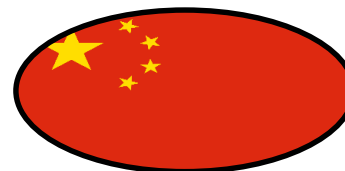
(est IMF)



EU 27 11.9%



USA 15%



China 20.2%



Japan 3.5%



India 8.2%

2040 (ca)

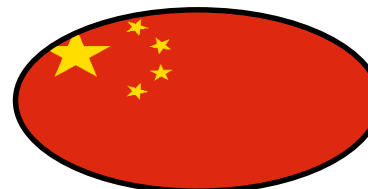
HC guesstimate



EU 27 ca 10%



USA ca 13%



China ca 23%



Japan ca 2%



India ca 12%

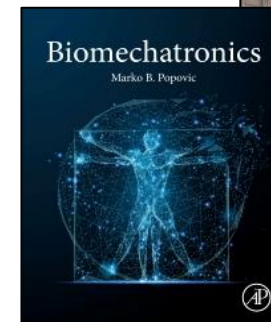
Strategic challenges

- Covid mutations, pandemics, AMR, life-style threats
- Great power competition and the risk of war
- European cohesion, regulation and competitiveness.
 - A more continental EU post Brexit.
 - Not as unified as we hope, and Sweden is not part of the mainstream.
- Climate change
 - Esp. impact on Africa, South Asia, ME: agriculture and migration; integration and national harmony.
 - Decarbonization
 - Winners/losers; non-diversified economies.
- Surprises: US-Chinese war, Trump 2024, European political crisis, Chinese domestic crisis, biblical natural disasters.

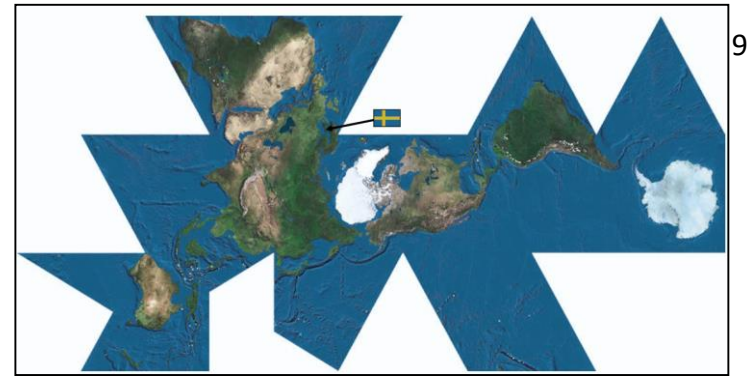


Technology and innovation: solution to many problems - but Europe is rarely seen at the forefront

- Only tech will manage climate challenge.
- Green tech, synthetic biology, machine learning, digitization, quantum, nano, new materials...
 - All elements of new energy, storage and transmission.
- AI: Impact efficiency/speed, jobs, education, security, warfare, social cohesion, research and impact on global issues.
- What are our comparative advantages? Where can we achieve excellence and critical mass?
 - Who should we copy, work with and follow?
 - How do we go from research and innovation to entrepreneurship and commercialization?
 - And ultimately, we are talking about competition: a must have and not always pleasant, fair and yes there are losers.



Vulnerabilities



9

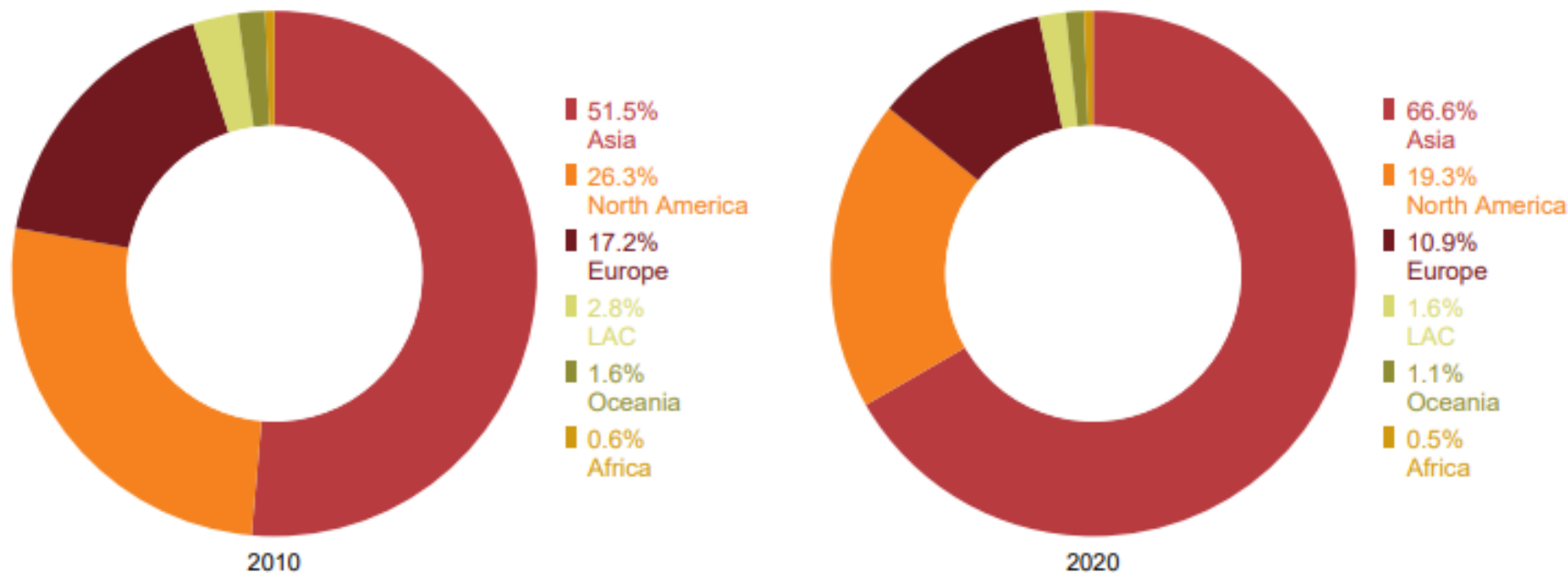
- **All is fair in love and war**
 - Deception, intelligence gathering, theft and hacks in a digital world.
 - Live with it and protect yourself.
- **Governments, companies, terrorists, criminals, disgruntled employees always seek opportunities.**
 - If you are not attracting attention, you may not be doing much interesting.
- **Protect what is secret or sensitive, be quick with publications/patents, don't be naïve and work on the offensive.**
 - Regulation and mediocracy is probably more harmful to competitiveness than espionage.
 - Political polarization, wokeness and fear of doing wrong.
 - Right vs the best solutions and technologies.



Patents	2019	2020	Growth rate (%)	Share of world total (%)
Applications worldwide	3,226,100	3,276,700	1.6	100.0
China	1,400,661	1,497,159	6.9	45.7
U.S.	621,453	597,172	-3.9	18.2
Japan	307,969	288,472	-6.3	8.8

Asia is the global hub of patent filing activity

1.3. Patent applications by region, 2010 and 2020



Mortal sins to creativity

- Process oriented
- Mediocrity
- Pride
- Arrogance
- Smugness
- Protectionism
- Envy
- Caution
- Conformity
- Isolation
- Risk aversion
- Stove pipes
- Bureaucracy
- Corruption

Blessings

- Output oriented
- Excellence
- Consolidation
- Openness
- Curiosity
- Critical thinking
- Humility
- Critical mass
- Infrastructure
- Funding
- Coordination and division of labor



In conclusion



- **Most growth will come from Asia.**
- **There will be disruptions – so have a diversified cooperation portfolio (and neighbors are the most long-term).**
- **Cutting edge is still focused in the US and China. We need to work with *both*.**
 - But both are looking out for #1, as are we. Who should we learn from?
- **Seek critical mass and division of labor to achieve excellence and output among both the like-minded *and* the best.**
 - The days are gone when we can rest on our laurels.
 - We need top S&T and innovation clusters.
 - Stockholm #35; Copenhagen #56.
- **Sensitive technology of national security importance must be protected from external and internal threats.**
 - Let's hope we have a lot to hide and protect in the future...

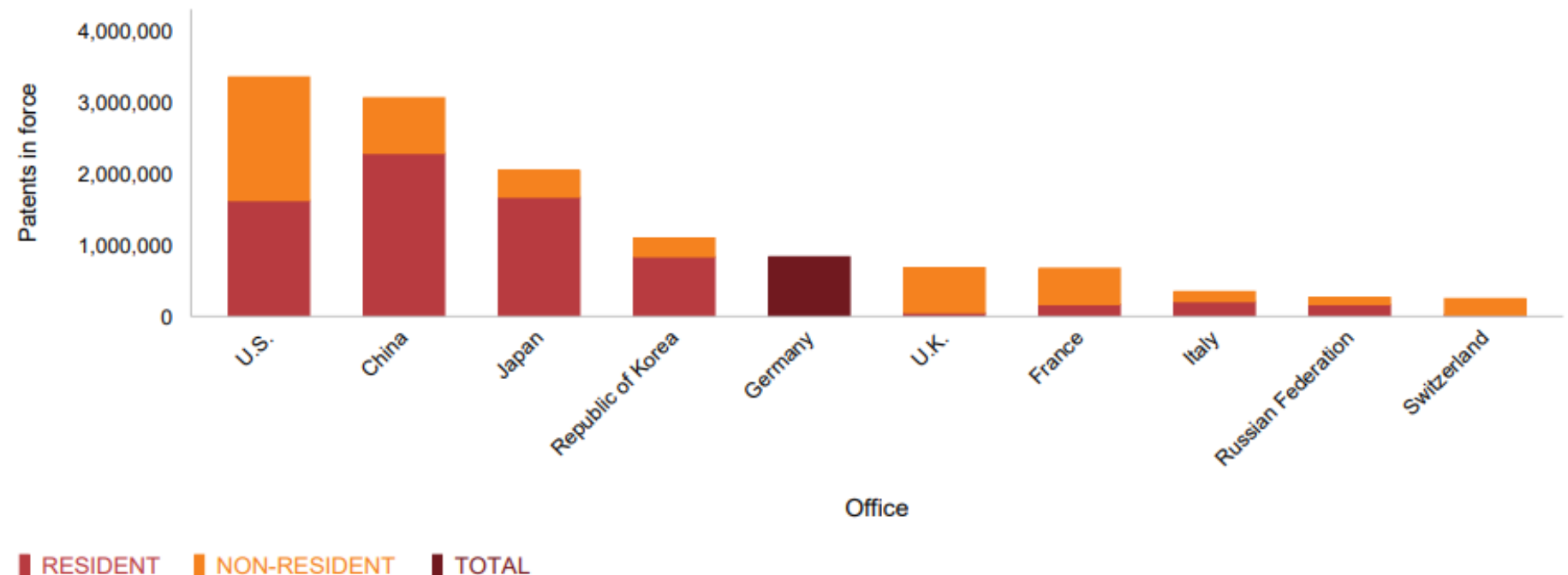


WIPO over all ranking

- **China dominant in applications, thereafter the US.**
 - Then comes Germany, Japan, ROK, France, UK, India, Italy, Switzerland...
 - NL #14, Sweden #17, Canada # 19, Denmark #23.

More than 3 million patents were in force in China and in the U.S. in 2020

1.8. Patents in force at the top 10 offices, 2020



In relative terms, Nordics are doing very well on competitiveness and innovation

IMD Global Competitiveness Ranking 2021



The World's Most Innovative Countries

2021 ranking of the Global Innovation Index
(100 = most innovative)



Takes into account human capital, institutions, technology and creative output, market and business sophistication, among others

Source: World Intellectual Property Organization

WIPO 2021

Top universities

- reflects stock of expertise and investments

- **Shanghai ranking 2021**
 - Top 10 all US + Cambridge and Oxford; US has 40 in top 100; UK has 8.
 - China has 7 in top 100. Tsinghua # 28.
 - Copenhagen #30, Karolinska #42, Aarhus #71, Stockholm #74, Uppsala #78, Helsinki #82.
- **QS World University Ranking 2022 (sic)**
 - US has 24 in top 100; UK 17, China 11, SE 2, DK 2.
- **Times Higher Education World University Ranking 2021**
 - US has 37 in top 100; UK 11, China 9, SE 1, DK 1, Fi 1.

Who are we close to, democratically?

(Updated Feb 2021)

Authoritarian (35.6% pop)

- 120. Nicaragua --
- 123. Ethiopia --
- 124. Russia x--D
- 128. Kazakhstan --
- 130. Cambodia --
- 130. Rwanda --
- 127. Zimbabwe --
- 137. Vietnam --
- 111. Mali -
- 113. Palestine --
- 114. Kuwait -
- 117. Angola --
- 118. Iraq --
- 118. Jordan -
- 138. Egypt --
- 139. Afghanistan
- 140. Cuba --
- 143. Venezuela --
- 144. Djibouti --
- 146. Azerbaijan --
- 148. Belarus --
- 149. Sudan --
- 152. Iran --
- 156. Saudi Arabia --D
- 157. Libya --
- 157. Yemen --
- 162. Turkmenistan --
- 164. Syria --
- 165. CAR --
- 166. DRC --
- 167. DPRK --

Hybrid democracies (15% pop)

- 101. Bosnia Herc. -
- 104. Turkey --
- 105. Pakistan -
- 110. Nigeria -

Global stakeholders (subjective)

151. CHINA x--

Flawed democracies (41% pop)

- 76. Bangladesh -
- 79. Ukraine -
- 87. Hong Kong x-
- 90. Liberia -
- 91. Georgia -
- 93. Tanzania -
- 94. Bolivia -
- 95. Kenya -
- 96. Morocco -
- 98. Uganda --
- 99. Zambia -
- 99. Sierra Leone -

- 45. South Africa
- 46. Colombia -
- 48. Argentina
- 49. Brazil
- 52. Bulgaria
- 53. INDIA** xD
- 54. Tunisia
- 55. Philippines -
- 55. Hungary -
- 57. Peru
- 62. Romania
- 64. Indonesia -
- 66. Serbia -
- 68. Sri Lanka -
- 71. Albania -
- 72. Mexico x-
- 73. Thailand -

- 24. France x*D
- 25. USA** x*
- 26. Portugal

- 27. Estonia
- 29. Israel
- 29. Italy x*
- 31. Czech Rep
- 33. Botswana
- 36. Belgium x*
- 37. Greece
- 38. Latvia
- 39. Malaysia -
- 42. Lithuania
- 50. Poland *
- 74. Singapore x-

- 126. Qatar --
- 136. Oman --
- 145. UAE x--
- 150. Bahrain --

Full democracies (8.4% pop)

- 1. Norway *
- 2. Iceland
- 3. Sweden *
- 4. N Zealand
- 5. Canada x*
- 6. Finland *
- 7. Denmark *
- 8. Ireland x*
- 9. Australia *
- 9. NL x*
- 11. Taiwan x
- 12. Switzerl. x*
- 13. Luxemburg
- 14. Germany x*D
- 15. Uruguay
- 16. UK x*D
- 17. Chile
- 18. Austria *
- 18. Costa Rica
- 20. Mauritius
- 21. JAPAN x*D
- 22. Spain x*
- 23. ROK x*D

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Democracy categories as defined by The Economist Democracy Index 2020 (Feb 2021)

Over 1bn population (UN)
Over 100 million population 2021 (UN)
TOP 2 ECONOMIES NOM OR PP (IMF 2021)
Top 3-4 economies Nom or PP
Top 5-20 economies Nom or PPP
TOP 2 DEFENCE BUDGETS (SIPRI 2020)
D = TOP 3-10 DEF BUDGETS (SIPRI 2020)
"More corrupt" Score <50 (Transparency International, CPI 2020)
X = 20 Largest exporting countries (value) (Statista/CIA/WB 2020)
Top 20 Innovation Index (Global Innovation Index 2019)
* = 20 largest ODA donors (value) (OECD)
- = Partly Free; -- = Not Free (Freedom in the World 2019, Freedom House)