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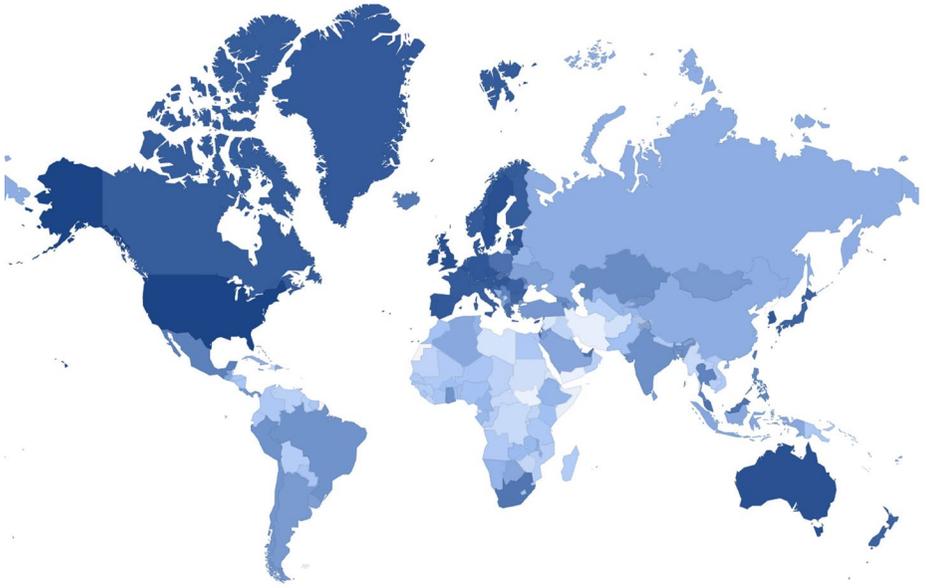


THE

# PEDDLING PERIL INDEX



DAVID ALBRIGHT / SARAH BURKHARD / SPENCER FARAGASSO / LINDA KEENAN



# **THE PEDDLING PERIL INDEX (PPI) 2021/2022**

**RANKING NATIONAL STRATEGIC TRADE CONTROL SYSTEMS**

**DAVID ALBRIGHT, SARAH BURKHARD,  
SPENCER FARAGASSO, AND LINDA KEENAN**

INSTITUTE FOR SCIENCE AND INTERNATIONAL SECURITY  
SEPTEMBER 2021

## **Institute for Science and International Security**

The Institute for Science and International Security is a non-profit, non-partisan institution dedicated to informing the public about science and policy issues affecting international security. Its primary focus is on stopping the spread of nuclear weapons and related technology to additional nations and to terrorists, bringing about greater transparency of nuclear activities worldwide, strengthening the international nonproliferation regime, and achieving deep cuts in nuclear arsenals.

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*World Map: The PPI scores represented by country,  
where darker indicates a higher score.*

*Dedicated to all those who strive to improve strategic trade controls  
and prevent proliferation financing, enhancing global security.*



## CREDITS AND ACKNOWLEDGEMENTS

The *Peddling Peril Index* (PPI) project is a result of thousands of hours of methodological research, data collection, and analysis by Institute for Science and International Security staff, past and present. This version builds on the two previous editions and is forever indebted to those who contributed to earlier versions. For this version, we wish to especially thank Institute staff Junaid Siddiqui, Camilla Zhang, and Michael Frank for their research and contributions, along with several subject matter consultants. We also thank Pacific Northwest National Laboratory staff for their contributions to statistical analysis of the PPI's data, and Anna Lea Albright for computing the cluster analysis and a principal component analysis. We extend special thanks to Michael Rosenthal for his valuable contributions to the PPI, and more specifically to the policy recommendations chapter. Thank you to those who shared their knowledge with us but wish to remain anonymous. This book benefited greatly from the layout and design of Rob Siders of 52 Novels and the cover design by Stewart A. Williams Design.



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## PREFACE TO THE 2021 PPI

A critical strategy to stop Iran's and North Korea's dangerous nuclear endeavors is thwarting their ability to acquire goods needed to build nuclear weapons and other weapons of mass destruction (WMD) and the means to deliver them. Case studies, many of which the Institute has published on its website, have shown that countries seeking nuclear weapons capabilities have depended on acquisition from abroad of a wide range of critical know-how, raw materials, equipment, and components.

Since the creation of the Nuclear Non-Proliferation Treaty (NPT) in 1968,<sup>1</sup> one case after another, from Pakistan to India, Taiwan to North Korea, Iraq to Iran, Argentina to Brazil, and South Africa to Libya have shown that almost all countries that have sought nuclear weapons face an essential challenge in that they cannot produce all that they need domestically or afford to create the indigenous industrial wherewithal to make the thousands of required goods. For example, the dangerous nuclear programs of Iran and North Korea would have ground to a halt without access to goods from abroad.

Strategic trade controls have developed into a critical countermeasure against trafficking in nuclear, missile, WMD, and military-related commodities. Although no one tool can completely stop determined countries like Iran and North Korea from acquiring illicitly the goods they seek, strategic trade controls have proven important in slowing and complicating those efforts. They have also stimulated and provided tools to responsible nations for better and earlier detection of secret efforts to create, for example, the most worrisome nuclear weapons capabilities,

particularly those in regions of tension such as the Middle East, South Asia, and Northeast Asia. By detecting these programs earlier and causing delays, strategic trade control systems have provided more time for diplomacy and other counter-proliferation tools to seek solutions to the fundamental problem of nuclear and other types of proliferation.

Today, strategic trade control laws are well implemented in supplier countries. For example, the Nuclear Suppliers Group (NSG) has established a wide range of norms and principles over several decades for its members, as well as extensive control lists of equipment, materials, and technology relevant to nuclear proliferation. However, cases of nuclear commodity trafficking show that some NSG countries implement and enforce their laws far better than other members. Moreover, about three quarters of all countries and territories are not members of the NSG. These non-NSG states often have far weaker strategic trade control laws, or none at all.

In response to the enactment and improvement of trade controls, states whose aim it is to acquire or maintain weapons of mass destruction have developed increasingly sophisticated national and transnational networks to acquire goods illicitly for covert, unsafeguarded, or sanctioned nuclear programs, as well as other WMD, missile, and military efforts. To stay up to par, supplier states need to continually improve their strategic trade controls. Moreover, case studies of illicit procurement make clear that it is not enough for just a few countries to have adequate controls over the export of key goods.<sup>2</sup> In fact, Iran, North Korea, and others often base their efforts in countries with less effective controls as they seek to acquire goods from countries with advanced technological sectors, such as the United States and Germany. They often declare a false end-user, transship the goods, and route the payment through third-party countries with less effective or nonexistent controls. In essence, proliferators look for the weak links in the fabric of international strategic trade controls. Experience teaches that they find many opportunities to bypass controls and sanctions.

These issues arose at a 2015 Institute for Science and International Security workshop involving a unique range of law enforcement officials, Congressional staff, and non-governmental experts. These experts could not agree on how to better target efforts to prevent the spread of strategic commodities and gauge weak links in global trade controls. There was

agreement that there is little chance of thwarting strategic commodity trafficking efforts without knowing the sufficiency of trade control systems around the world. Participants concluded that there was a deep need for a better way to evaluate trade control systems worldwide, and thereby establish a basis from which policymakers could mitigate gaps and develop counter-proliferation initiatives. The *Peddling Peril Index* (PPI) was envisioned at this workshop as a way to help accomplish this. At the workshop, Mark Dubowitz recommended this name as a follow-on to Albright's 2010 book, *Peddling Peril*, on illicit nuclear trade and the A.Q. Khan network that operated out of Pakistan.<sup>3</sup> As the project developed, it became clear that a biennial review was necessary to measure progress.

In the endeavor to thwart commodity trafficking and bolster strategic trade controls, the passage of United Nations Security Council resolution (UNSCR) 1540 in 2004 was an important milestone. It recognized the need for all nations to put in place appropriate, effective trade controls to prevent the spread of the wherewithal to make weapons of mass destruction. UNSCR 2325, passed in late 2016, lays out many steps and actions to build upon UNSCR 1540. It also highlights the need for higher levels of state compliance, and more attention to enforcement and counter-proliferation financing measures. Yet, these resolutions today remain under-implemented.

Nonetheless, there remains no measure that mandates the evaluation of the effectiveness of national strategic trade controls on a global scale or the creation of a body to perform independent evaluations. This is where the PPI steps in. The PPI ranks 200 countries, territories, and entities according to their adoption and implementation of strategic trade controls and assesses how well those systems are performing at preventing the trafficking in nuclear and other strategic commodities.<sup>4</sup> The ranking is derived from over 100 indicators pertinent to strategic trade controls and nonproliferation. The PPI's data and analysis allow for comprehensive, straightforward assessments on the sufficiency of strategic trade control systems currently and over time.

This 2021/2022 version is the third edition of the index. It encompasses information gathered during 2019 and 2020 and remains the only comprehensive public effort to systematically score and rank national strategic trade control systems.

As in the earlier versions, the PPI measures the effectiveness of strategic trade controls using a set of criteria relating to a country's existing laws, regulations, procedures, practices, international obligations, and actions. Its fundamental purpose is to identify in a measurable manner the relative strengths and weaknesses of national strategic trade control systems throughout the world.

Section I of the book includes information on the index's development, methodology and data. The final chapter introduces the overall scores and rankings. Annex 1 provides a full ranking and lists scores for all 200 countries, territories, and entities. We include a cluster analysis, which divides countries by score into four groups. The cluster analysis allows for quick determination of a country's placement in a high or low-scoring group (or a group in-between), and for easy cross-country comparisons. Annex 2 lists the countries in each of the four clusters.

Section II presents key rankings in the index by grouping countries into three distinct tiers, each of which represents countries that are alike in their supply potential, economic development, and other measures. The usefulness of this type of approach was recognized in UNSCR 2325, when it urged the 1540 Committee, in its work, to take into account "the specificity of States, inter alia, with respect to their ability to manufacture and export related materials, with a view to prioritizing efforts and resources where they are most needed without affecting the need for comprehensive implementation of resolution 1540." In brief, Tier One in the PPI includes those nations that can supply, at least partially but significantly, the wherewithal to make nuclear weapons, other WMD, or the means to deliver them. Tier Two includes countries of transshipment concern, and Tier Three includes the remainder of the countries.

Section III applies the PPI rankings and scores to three special cases, namely nuclear reactor importation, incarceration penalties for export control violations, and corruption.

Section IV discusses approaches aimed at improving scores and strategic trade control implementation. Comparisons to previous rankings are drawn and statistical analysis is applied to the data. Like the 2017 version, the 2021 version contains a chapter listing recommendations. However, the recommendation chapter is not meant to be comprehensive; rather it is a careful selection of the most timely, pressing, and actionable issues relevant to the PPI. For additional recommendations, we encourage

interested readers to explore Chapter 12 in the 2017 version, as well as the PPI webpage on our website, which features additional PPI applications created as external reports.<sup>5</sup>

In many ways, the 2021 PPI paints an improving picture. In comparison with 2017 and 2019 versions, it shows that global trade controls are slowly but steadily headed in the right direction. As a whole, the scores have improved across all areas in the index.

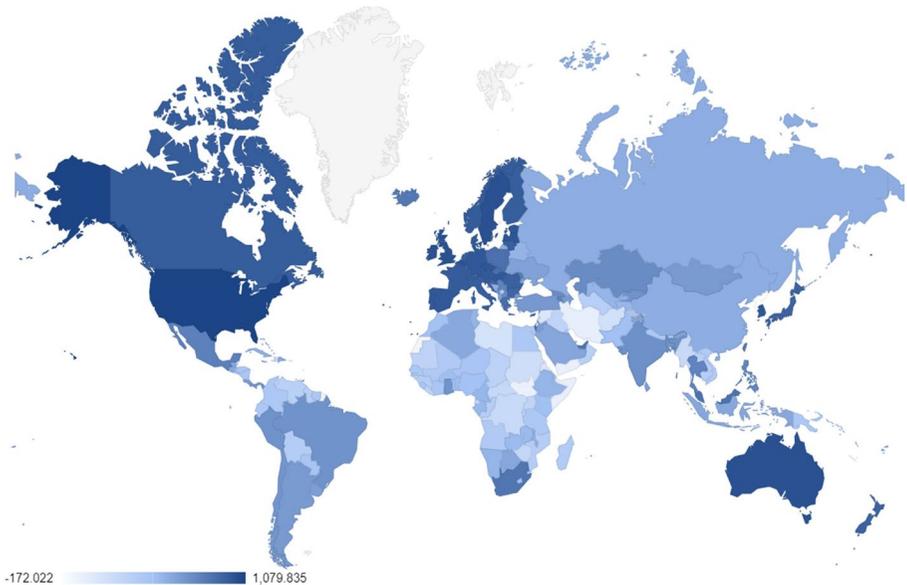
We are thankful for the positive reception to the project and to those who took the time to share their comments and recommendations. We were pleased that several governments reached out to share additional information for this update and to learn more about how they could improve their strategic trade control implementation. As in the previous versions, it is our hope that the PPI will be valuable to states, organizations, researchers, and the general public. We aspire for it to motivate strategic trade control efforts worldwide and reduce the chances that additional states or non-state actors will obtain the wherewithal to fabricate nuclear and other destructive weapons.

## NOTES

1. Countries seeking nuclear weapons prior to the signature of the Nuclear Non-Proliferation Treaty depended on imports for their nuclear weapons efforts, but at that time, there were few laws controlling such trade.
2. David Albright, Sarah Burkhard, Spencer Faragasso, Linda Keenan, and Andrea Stricker *Illicit Trade Networks: Connecting the Dots, Volume 1* (Washington, DC: Institute for Science and International Security, 2020), <https://isis-online.org/books/detail/illicit-trade-networks-connecting-the-dots-volume-1>. Also available as an e-book at Amazon.
3. David Albright, *Peddling Peril: How the Secret Nuclear Trade Arms America's Enemies* (New York: Free Press, 2010).
4. A shortened United Nations-derived name for each country is used throughout the report. We also use an abbreviated name for non-UN recognized territories or entities.
5. See: *Peddling Peril Index*, Institute for Science and International Security, <http://www.isis-online.org/ppi>.

## HIGHLIGHTS

The *Peddling Peril Index's* scores are pictorially represented in Figure I.1 for each country, territory, or entity. Dark blue represents higher scores and light blue represents lower scores. In general, the scores in the northern hemisphere were higher than in the southern hemisphere, and developed nations scored higher than developing countries.



**Figure I.1.** The PPI scores represented by country, where darker blue indicates a higher score.

Countries could receive a total of 1,300 points. The overall average score is 546, up from 489 points in 2019, and the overall median is 508, up from 443 points. The average score thus improved by 57 points from the last PPI edition published in 2019.<sup>1</sup>

Figure I.2 shows that scores varied between about -170 and 1,080, meaning that no country received more than 83 percent of the possible points, and a few countries had very low scores. The figure also shows that the score distribution remains fundamentally bimodal in shape, as in the 2019 ranking. Like the Peddling Peril Indices of 2017 and 2019, the 2021 edition found that only a fraction of the world's national trade control systems received more than 50 percent of the available points.

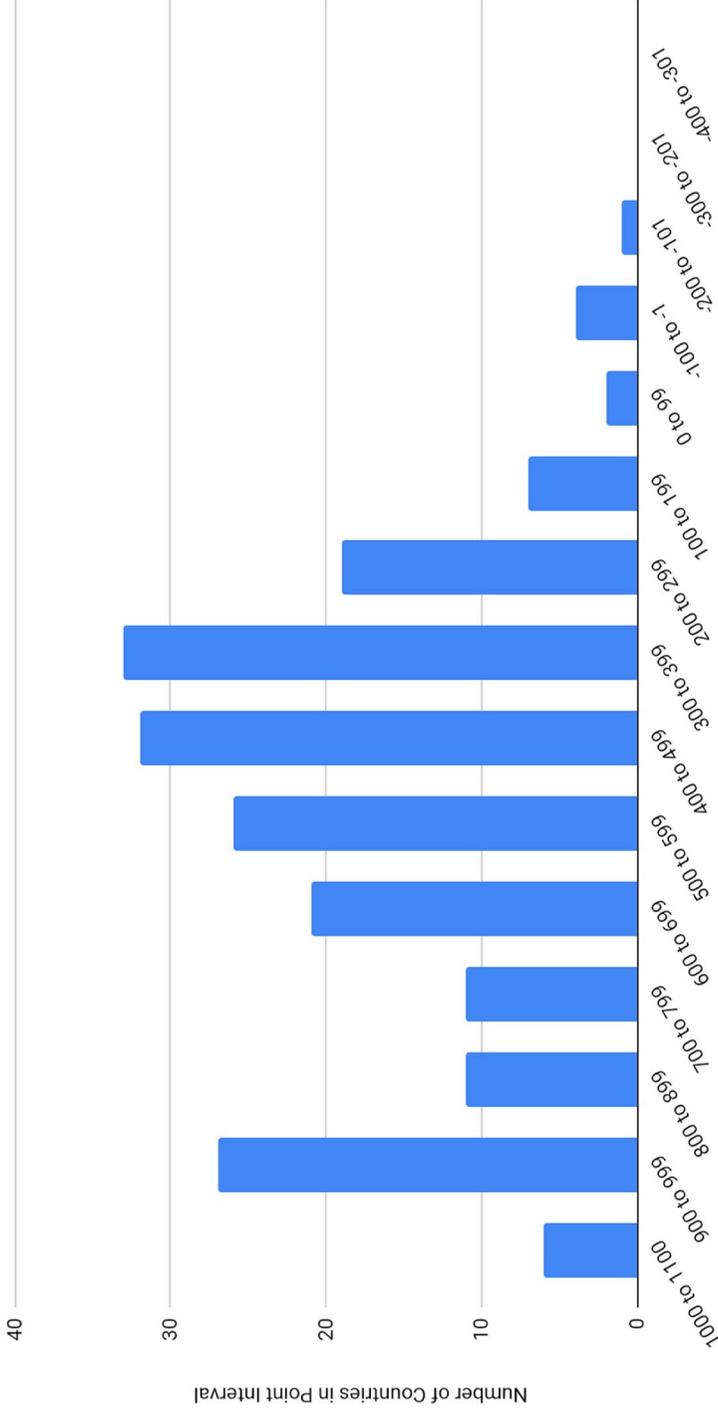
However, an upward trend in points is visible this year. In Figure I.2, this trend is visible in a shift toward the left in the chart, to higher scores, compared to the scores in the equivalent figure in the previous edition. For example, while in 2019 only two countries had a score of 1,000 points or higher, there are six in 2021 that exceeded that mark.

Thirty-six countries, up from twenty-nine in 2019, achieved two-thirds or more of the available points, and an additional 33 countries (up from 21) achieved more than half but less than two-thirds of the possible points. However, the remaining 131 of the 200 evaluated countries received less than half of the available points. Eighty countries (down from 96) received less than one-third of the total points. Given the unstoppable pace of globalization and the central importance of strategic trade controls in stopping proliferation, this wide range of performance is alarming.

A deeper look into the scoring reveals several reasons for the many relatively low scores. The 2021 PPI uses 105 indicators to calculate a final score, which are categorized into five pillars of strategic trade controls:

1. **International Commitment** to preventing strategic commodity trafficking;
2. **Legislation** in place that regulates and oversees trade in strategic commodities, and criminalizes and aims to prevent strategic commodity trafficking;
3. **Ability to Monitor and Detect Strategic Trade;**
4. **Ability to Prevent Proliferation Financing;** and
5. **Adequacy of Enforcement** against strategic commodity trafficking.

## 2021 Total PPI Point Distribution



PPI Point Intervals

Figure I.2. Distribution of total points in intervals of 100 points.

Proliferation financing has not traditionally been considered when debating the efficacy of strategic trade controls. However, the PPI finds that it should be a central part of any such deliberations. In recent years, this view appears to be increasingly adopted by other groups, organizations, and also governments.

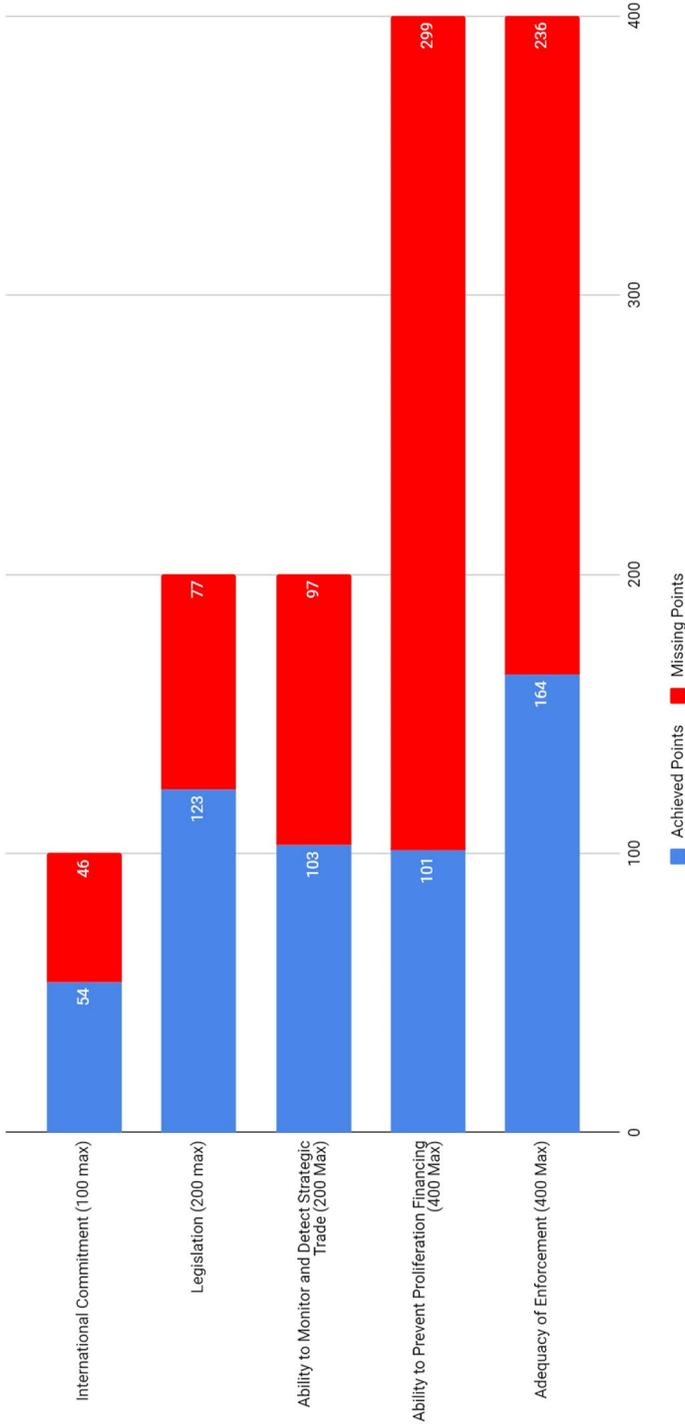
The average scores for all countries together were highest in *Legislation*, followed by *International Commitment*, and lowest in *Ability to Prevent Proliferation Financing*. Yet, only 62 percent of the possible points are collectively achieved under *Legislation*. This number drops to 54 percent in *International Commitment*; 52 percent in *Ability to Monitor and Detect Strategic Trade*; 41 percent in *Adequacy of Enforcement*; and 25 percent in *Ability to Prevent Proliferation Financing*. Compared to 2019, this average percentage increased most in *Ability to Prevent Proliferation Financing* and in *Ability to Monitor and Detect Strategic Trade*.

Figure I.3 shows the fraction of points achieved in each super criterion for all countries, where a stacked blue and red bar represents the total points available in each super criterion, after weighting. The blue portion represents the achieved points by all countries, and the red bar shows the missing points. As can be seen, the *Proliferation Financing* and *Enforcement* super criteria are the most heavily weighted in this analysis, and the super criteria missing the most points.

Beyond the scores, the PPI found that under the *Legislation* super criterion, which examines national laws on import, export, transit, and transshipment controls separately, only 76 countries, up from 74 in 2019, have export control legislation with the desired comprehensiveness in place, covering exports of nuclear direct and dual-use items. That means the majority of countries do not have adequate strategic trade control legislation in place, regardless of how well it is implemented.

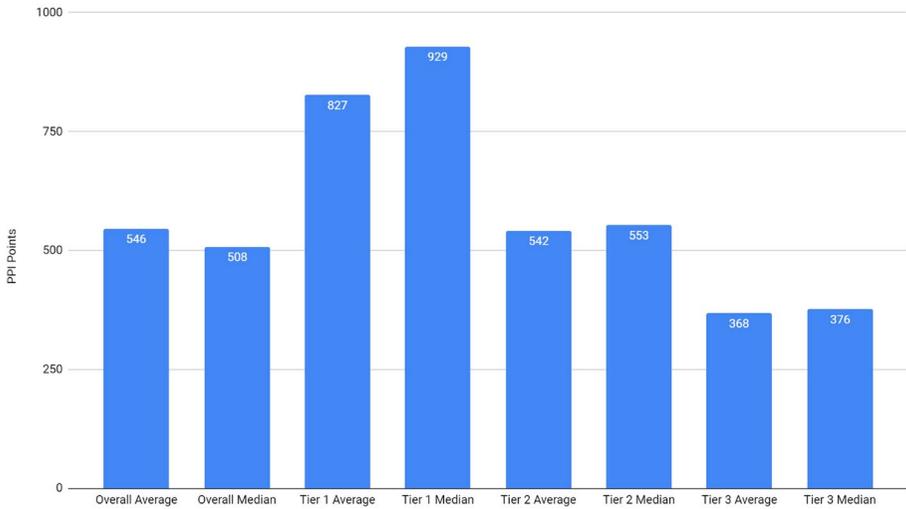
To make more realistic country comparisons, the full ranking is also divided into three distinct sets of countries, termed “tiers,” as discussed above. The three tiers are organized based on their potential for supplying strategic commodities and their likelihood of being exploited by illicit procurement networks as transshipment points. In brief, as discussed in more detail later, Tier One in the PPI includes those nations that can supply, at least partially but significantly, the wherewithal to make nuclear weapons, other WMD, or the means to deliver them. Tier Two includes countries of transshipment concern, and Tier Three includes the

**2021 Globally Achieved PPI Points**



**Figure I.3.** Collective average scores for all countries by super criteria.

## 2021 Average and Median Scores



**Figure I.4.** Average and median scores for the overall PPI and the three tiers. The overall average is 546, up from 489 points in 2019, and the overall median is 508, up from 443 points. As can be seen, Tier One did considerably better than Tiers Two and Three, where a high median in Tier One suggest a bimodal distribution within the Tier as well.

remainder of the countries. Figure I.4 shows the average scores for the three tiers. Tier One scores are, on average, considerably higher than the scores achieved by countries in Tiers Two and Three. The bimodal shape of the score distribution in Figure I.2 can be explained to first order by the difference in the average scores in the tiers.

A natural question is how the scores relate to evaluations of the effectiveness of national strategic trade control systems. This question is complicated by the need to constantly counter more sophisticated efforts to thwart trade controls and sanctions, which necessarily involves improving controls, even in the highest-scoring countries. However, within that context, countries also need to know if they are on the right track.

To address this set of issues, the PPI project decided to identify relatively high-scoring countries which have a strategic trade control system score above a certain point cutoff. The cutoff was weighted toward realistic expectations of the tiers. It was selected at two-thirds of the total points for Tier One countries and one-half for Tiers Two and Three. In Tier One, 33 out of 55 countries, up from 27, achieved over two-thirds of the points,

and in Tier Two, 15 countries out of 59, up from only six in 2019, achieved over half of the total points. In Tier 3, five of the 86 countries met the cut-off of fifty percent. In total, 53 out of 200 countries, or roughly a quarter, satisfied these cutoffs. Table I.1 lists the countries in this group, along with their tier. Table I.2 lists all the countries that scored above 50 percent.

How to choose and characterize these initial cutoffs was intensely debated by the PPI team. It was decided that these levels do not signify adequacy of strategic trade controls but simply serve to highlight the highest-scoring countries. This placement in the leading-score group does not mean that these countries' trade control systems do not need improving or are somehow free of significant gaps. The overall scores do not support that view.

Many other countries with scores lower than those of this high-scoring group are on the right track. However, some countries that scored relatively low likely need significant improvement, and on an expedited basis. For those few countries that fall at the very bottom of the scoring, strategic goods supplier countries need to exercise extreme caution or in some cases avoid trading with these countries.

Despite emphasizing tiers, this edition of the PPI also includes a "cluster analysis" of the scores and ranks. The goal is to better understand the structure of the scores. In essence, this statistical method groups scores around a set of relative peaks in the scores, which in this case numbered four. This method allows for a more effective look at the structure of the scores than the simple bimodal analysis conveyed in Figure I.2.

## LEADING-SCORE COUNTRIES BASED ON CUTOFFS IN SCORES

<b>Tier One</b> (scores met or exceeded two-thirds of the total points)	Australia
	Austria
	Belgium
	Bulgaria
	Canada
	Croatia
	Czech Republic
	Denmark
	Estonia
	Finland
	France
	Germany
	Hungary
	Ireland
	Israel
	Italy
	Japan
	Latvia
	Lithuania
	Luxembourg
	Netherlands
	New Zealand
	Norway
	Portugal
	Republic of Korea
	Romania
	Slovakia
	Slovenia
	Spain
	Sweden
Switzerland	
United Kingdom of Great Britain and Northern Ireland	
United States of America	

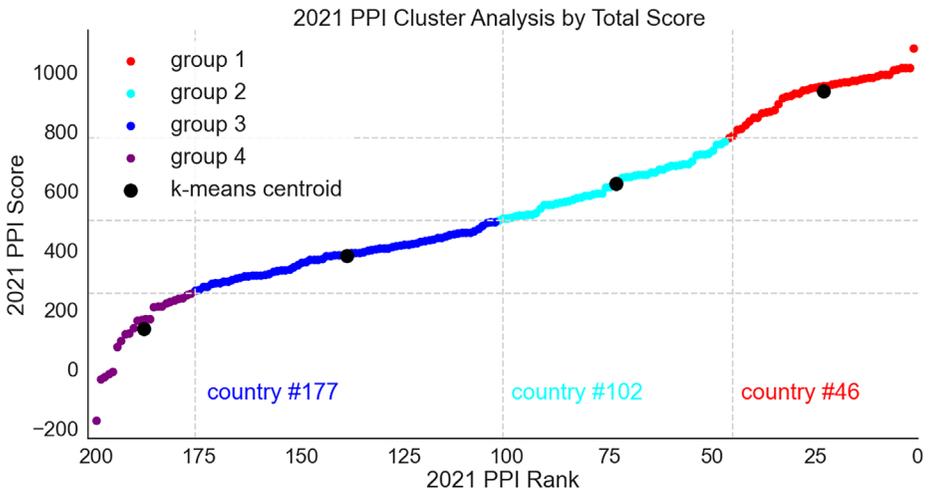
<b>Tier Two</b> (scores met or exceeded half of the total points)	Armenia
	Bangladesh
	Chile
	Cyprus
	Georgia
	Ghana
	Kyrgyzstan
	Malaysia
	Malta
	Moldova (Rep of the)
	Mongolia
	Panama
	Peru
	Philippines
	Singapore
Thailand	
United Arab Emirates	
<b>Tier Three</b> (scores met or exceeded half of the total points)	Andorra
	Bahrain
	Macedonia
	Mauritius
	Montenegro

**Table I.1.** Fifty-three high-scoring countries, based on cutoffs in scores, listed alphabetically and by tier.

## COUNTRIES THAT RECEIVED MORE THAN HALF OF THE AVAILABLE POINTS

Rank	Country	Points (out of 1300)	Rank	Country	Points (out of 1300)
1	United States of America	1080	24	Switzerland	951
2	United Kingdom of Great Britain and Northern Ireland	1015	25	Lithuania	950
3	Sweden	1015	26	Italy	946
4	Australia	1015	27	Malta	941
5	Ireland	1009	28	Romania	938
6	Belgium	1008	29	New Zealand	930
7	Latvia	991	30	Japan	929
8	Estonia	991	31	Croatia	922
9	Czech Republic	991	32	Cyprus	920
10	Republic of Korea	987	33	Bulgaria	915
11	Hungary	983	34	Luxembourg	894
12	Germany	982	35	Israel	873
13	Portugal	980	36	Slovakia	868
14	Spain	978	37	Greece	866
15	Austria	973	38	Poland	864
16	Denmark	972	39	Malaysia	849
17	Slovenia	967	40	United Arab Emirates	847
18	Norway	966	41	South Africa	836
19	Singapore	963	42	Iceland	821
20	France	962	43	Taiwan	810
21	Canada	958	44	Moldova (Rep of the)	808
22	Finland	955	45	Armenia	786
23	Netherlands	955	46	Mexico	779
			47	Serbia	766
			48	Thailand	760
			49	Philippines	755
			50	Andorra	736

**Table I.2.** The top 50 scoring countries in the PPI, all of which achieved more than half of the available points, listed by rank and score.



**Figure I.5.** The 2021 PPI countries plotted by rank and score clustered into four groups. The single appearing red and purple dots at each end of the graph represent the highest and lowest scoring countries.

Figure I.5 shows the results of the cluster analysis. Cluster 1 (Group 1) includes the ranks 1 to 46; Cluster 2 (Group 2) includes the ranks 47 to 102; Cluster 3 (Group 3) includes the ranks 103 to 177; and Cluster 4 (Group 4) includes the ranks 178 to 200. It is noticeable that Group 3 includes 75 countries, which is more than any of the other groups. Group 1 has 46 countries; Group 2 has 56 countries; and Group 4 has 23 countries. The countries in each cluster are listed in Annex 2.

A key value in each cluster is its “centroid,” identified as “k-means centroid” in Figure I.5. Group 1 has a center of 937 points and an average score of 933 points; Group 2 has a center of 625 and an average score of 620 points; Group 3 has a center of 383 and an average of 379 points; and Group 4 has a center of 136 and an average score of 130 points (see Chapter 7). The corresponding score ranges are 1,080 to 779 for Cluster 1, 766 to 500 for Cluster 2, 497 to 255 for Cluster 3, and 249 to negative 172 for Cluster 4.

Of the 46 members of Cluster 1, the highest-scoring cluster, 39 are Tier One countries. Thirty-three of these 39 Tier One countries are leading-score countries as listed in Table I.1. The seven remaining members in Cluster 1 are Tier Two countries, all of which are leading scorers (see Table I.1). Cluster 2 has 56 members and is comprised of a mix of 13 Tier One, 30 Tier Two, and 13 Tier Three countries. Ten Tier Two countries

and five Tier Three countries met the cutoff score of their tier (50 percent of the total points) to be considered a leading-score country in this cluster. Eight of the 13 Tier One countries also received 50 percent or more of the points, but the score cutoff to be considered a high-scoring country in Tier One is two-thirds of the total points. Clusters 3 and 4 have 75 and 23 members, respectively, none of which are listed in Table I.1 as high-scoring countries. In Cluster 3, only one country is from Tier One, 18 are from Tier Two, and 56 from Tier Three. Cluster 4 is comprised of two Tier One, four Tier Two, and 17 Tier Three countries. The Tier One countries in Cluster 4 are Iran and North Korea.

In an ideal world, there would only be one, high-scoring cluster. At least, the cluster with the most countries in it would be the highest-scoring cluster, and not, as is currently the case, Cluster 3, where the mean score is only 379 points, or 29 percent of the total points. As strategic trade controls gradually improve, and PPI scores rise, we hope to see low-scoring clusters shrink in size in future PPI editions. Indeed, a comparison between 2019 and 2021 PPI editions shows that this is happening, consistent with a shift to higher scores overall discussed earlier. High-scoring clusters are growing and at the same time progressing to higher average scores. From 2019 to 2021, Cluster 1 increased by five countries, Cluster 2 by one, and Cluster 3 by three, while Cluster 4 shrank by nine countries. The centroid score in Cluster 1 rose by 58 points, in Cluster 2 by 83 points, and in Cluster 3 by 53 points. The average score in Cluster 1 rose by 45 points, in Cluster 2 by 57 points, and in Cluster 3 by 28 points, while it dropped by 31 points for Cluster 4. Although uncertainties should be borne in mind, placement in the first and second clusters represents possession of more effective strategic trade controls than placement in the third and fourth clusters.

## NOTES

1. From a strict data science standpoint, making direct, quantitative comparisons between the 2019 and 2021 PPI presents challenges due to small changes in the underlying model, such as the elimination and addition of some sub-criteria. However, the PPI evaluated average scores achieved in over 80 sub-criteria that remained exactly the same experienced an increase in global average points, affirming our qualitative conclusion that STC systems worldwide improved slowly but steadily.



**SECTION I**

**PEDDLING PERIL INDEX (PPI)**

**METHODOLOGY AND OVERALL RESULTS**



# CHAPTER 1

## INTRODUCTION TO THE METHODOLOGY

The 2021 edition of the *Peddling Peril Index* (PPI) utilizes 105 different sub-criteria (or indicators) organized under five super criteria, that evaluate and measure the performance and the enforcement capability of strategic trade controls in 200 nations, territories, and entities. The goal of the PPI is to determine not just the existence of strategic trade controls, but also the extent of their implementation and enforcement, and to track progress over time. The indicators primarily concern nuclear and nuclear-related trade, but also factor in other forms of trade controls, such as those covering strategic commodities relevant to the development of missiles, non-nuclear weapons of mass destruction (WMD), and conventional military programs.

The PPI is intended to be a tool and resource that states can utilize to improve their own strategic trade control systems and aid others in capacity building efforts. The PPI also provides an indication of a state's vulnerability to illicit procurement schemes and measures the extent of a country's compliance with international obligations to have a trade control system in place, such as UN Security Council Resolution 1540.

In the first phase of the 18-month development of the first edition of the PPI—the “2017 PPI”—about 150 sub-criteria (or indicators) in 13 major categories (later titled “super criteria”) were identified. A goal was to identify criteria that provide simple answers and are quantifiable, since the PPI assigns points to determine rankings. Another goal was to maximize the use of open-source data and minimize the use of expert

judgment, which can be subjective, although this was not possible to do completely, as will be discussed in subsequent chapters.

When creating the Index, the PPI team was conscious to avoid modeling criteria on the United States' trade control system but instead looked more broadly and with an open mind at trade controls in a wide variety of countries. Many countries do not have trade controls that are as extensive as the United States' but still have effective systems tailored to their level of international trade engagement or have systems that could support the development of effective strategic trade controls in the future.

After the selection of the basic list of sub-criteria, and the initiation of the data collection phase of the project, we found that adequate data were lacking for many sub-criteria, at least at the level needed to be able to use them in the PPI's comprehensive scoring system. In some cases, data were not available for enough countries to warrant using certain sub-criteria. Moreover, as data were sought and found for sub-criteria, some of the definitions needed to be revised or broadened. The first PPI, published in 2017, finally settled on a total of 97 indicators, categorized into five major areas, or overarching "super criteria."

The challenge of optimizing the set of criteria was re-addressed in the development of the subsequent editions, the "2019 PPI" and this latest "2021 PPI." Both began with a comprehensive review of the criteria used in previous editions, where all sub-criteria and corresponding country data were revisited and vetted. Keeping in mind that comparability between PPI versions is essential to track a country's performance over time, improvements were made. The five super criteria remained the same, but new valuable sub-criteria were added, while weaker criteria were strengthened or eliminated. For the 2021 PPI, the project decided on a total of 105 indicators: 89 positive, point-earning sub-criteria, nine negative, point-deducting sub-criteria, five extra credit opportunities, and two rounds of expert judgment where a country could gain or lose points.

The **five major super criteria** are, and include information about, a country's:

1. **International Commitment** to preventing strategic commodity trafficking;
2. **Legislation** in place that regulates and oversees trade in strategic commodities, and criminalizes and aims to prevent strategic commodity trafficking;

3. **Ability to Monitor and Detect Strategic Trade;**
4. **Ability to Prevent Proliferation Financing;** and
5. **Adequacy of Enforcement** against strategic commodity trafficking.

The sub-criteria under each super criterion category are listed and explained in subsequent chapters in Section I, where one chapter is devoted to each super criterion. Each sub-criterion is independently assigned a weight by the project based on its assessed relevance to effective strategic trade controls.

Countries are assigned a final score and a resulting ranking by combining the five super criteria scores. The full ranking and scores included in Annex I compare all 200 countries, entities, and territories. To obtain the ranking, the super criteria are themselves weighted differently as to their significance. The *Ability to Prevent Proliferation Financing* and *Adequacy of Enforcement* super criteria are weighted the most; *Legislation* and *Ability to Monitor and Detect Strategic Trade* are given half the impact of those; and *International Commitment* is given a quarter of the impact of *Ability to Prevent Proliferation Financing* and *Enforcement*. In total, countries could receive a maximum of 1,300 points.

Rankings of countries under each super criterion are not provided, but the scores by super criteria are included in the Annex. The *Legislation* super criterion remains for this update the only super criterion that includes a breakdown into five groups of countries by the comprehensiveness of their export control legislation, using a color-coding scheme. The original goal of the PPI was to qualitatively assign each country to one of four areas of strategic trade control adequacy. This has been accomplished via the cluster analysis. As the project developed, groupings of similar countries were also established, with the aim of guiding the improvement of trade control systems of similar countries. For example, the PPI grouped countries by strategic commodity supply and transshipment potential.

Instead of only assessing countries by a full ranking and comparing them against one another – for example, regardless of whether they are small island nations without much participation in international trade or major world economies, or comparing non-nuclear weapon states without access to domestic nuclear technology to nuclear weapon states that have a higher capacity to transfer this technology – the project decided to

separate countries into three tiers, discussed in the Highlights chapter and detailed in Section II. This manner of evaluating countries acknowledges that smaller countries and countries that trade less, and those that have fewer resources to devote to trade controls, are not realistically expected to match the trade control performance of major world economies. The tiering system shows better how comparable countries rank next to their peers in their potential to prevent the trafficking of strategic commodities. This approach is also consistent with UNSCR 2325 (2016).

Export control legislation (or lack thereof) for almost all of the 200 countries and territories was identified and evaluated. Because many laws were not in English, PPI project staff and consultants performed a great deal of translation from a variety of languages, including Chinese, French, Arabic, Spanish, German, and Hindi, among others.

It is necessary to note that no index is without limitations. The PPI depends on open-source data, in particular information available online. This approach has advantages—especially during a global pandemic—but it also has disadvantages. Many of the sub-criteria that were unfeasible would have depended on data held by governments that are not typically published, or are even classified, such as a government’s knowledge of supply chains in its country; the existence of technical reach-back capabilities; the transfer of internal investigations into trade control enforcement efforts; and internal capabilities of domestic intelligence agencies to detect illicit trade networks.

Sending project staff to visit all 200 countries or even a significant number of them was judged as too costly and time consuming. In-person visits are ideal for an in-depth survey of one country’s capabilities, but not for a biennial assessment of the global state of trade controls. The project also decided not to send out survey questionnaires to all the countries. Part of the reason was that the 1540 matrices and Financial Action Task Force evaluation reports, which were used for proliferation financing data, already contain a considerable amount of national self-reporting that is directly relevant to the PPI sub-criteria. In addition, project staff did not believe that enough countries would have an incentive to respond any differently or more completely than they do to the 1540 Committee and FATE, particularly concerning more sensitive trade control enforcement information. Moreover, the project lacked the resources to verify survey information.

To compensate for some of these limitations, the PPI project sought to confirm, whenever feasible, information gathered via open sources. It confirmed, and as necessary, supplemented, the data in the UN Security Council Resolution 1540 matrices. For example, unless otherwise specified in the sub-criterion definition, the attributes of legislation declared in the 1540 matrices were confirmed individually by looking at primary source documents. If there was no entry in the matrix or it was not possible to confirm the source, government websites and other legislation databases were consulted until the PPI could identify and evaluate each country's export control legislation or approach.

The project utilized the Institute's extensive in-house resources and expertise of staff on strategic commodity controls and trafficking. In particular, the project benefited from hundreds of Institute case studies and a 2020 book on strategic commodity trafficking<sup>1</sup> that shed light on specific countries' capabilities to control trade and to detect, prevent, or prosecute those making illicit exports.

Project staff also conducted a number of interviews with experts from a range of countries. Those interviews focused on gaining information from people with specific, direct knowledge of countries' trade control systems and their implementation. Many had provided capacity building or expert consultation in a number of countries or worked on programs that extended capacity building assistance. Information on over 60 countries was collected from these experts. The interviews helped add to the evaluation of the effectiveness and enforcement efforts of countries' trade control systems.

## NOTES

1. See: David Albright, Sarah Burkhard, Spencer Faragasso, Linda Keenan, and Andrea Stricker, *Illicit Trade Networks—Connecting the Dots, Volume 1* (Washington, D.C.: Institute for Science and International Security, 2020), <https://isis-online.org/books/detail/illicit-trade-networks-connecting-the-dots-volume-1>. Also available as an e-book at Amazon.

# CHAPTER 2

## SUPER CRITERION INTERNATIONAL COMMITMENT

**Super Criterion International Commitment** focuses on a state's international commitment to the nonproliferation of nuclear weapons, other weapons of mass destruction (WMD), missiles, and other weapons capabilities, as well as preventing the spread of sensitive or controlled materials and equipment. This super criterion measures memberships and adherence to a range of nonproliferation conventions, treaties, regimes, and groups. Commitment is not a measure of effectiveness or implementation of the principles or provisions of these instruments on a national level, but it is an important first step. It shows a willingness of a state to follow international standards, potentially improve their own performance, dedicate resources to doing so, share information with other countries and regimes, and allows responsiveness to international pressure.

A state's international commitment to nonproliferation related treaties and conventions is seen in the quality and quantity of the regimes it is party to. Super Criterion *International Commitment* includes 22 sub-criteria, in this case key international regimes or agreements, as indicators of performance. Each of the sub-criteria is weighted as low-, medium-, or high-impact by PPI staff. This super criterion only consists of "positive indicators," where of the 22 sub-criteria, three are considered low-impact, twelve are medium-impact, and seven are high-impact. They are worth five, 10, and 15 points, respectively. A country could receive a raw total of 240 points.

Since *International Commitment* does not assess performance, only membership and participation in international regimes or being a party to legal instruments, it has a relatively low value compared to the other super criteria when the final score is calculated. This choice reflects the greater emphasis placed in the PPI on implementation and effectiveness of trade control systems.

This raw score is used later to arrive at a total, weighted score of 100 possible points used for the final rank. The weighted score is also used to derive a ranking under the three tiers of countries discussed in detail in Section II.

Partial credit (usually half of the possible sub-criterion points) was given if a country has only signed but not yet ratified an agreement. It should be noted that, in general, an individual country might not be able to achieve 100 percent of the available points. For example, membership in export control arrangements such as the Nuclear Suppliers Group is by invitation, which might not be forthcoming for some. A country might also be in a location for which there is no relevant nuclear weapon-free zone, such as most of Europe and the Middle East. In addition, the PPI has been constructed for a number of entities whose status makes them ineligible to adhere formally to international legal instruments, for example, Hong Kong and Taiwan.

## **SUB-CRITERIA<sup>1</sup>**

- **Member of Nuclear Suppliers Group (NSG)<sup>2</sup>**

While not legally binding, NSG members are expected to follow certain guidelines regarding the export of sensitive nuclear and nuclear-related facilities, commodities, and material. Specific membership requirements apply, including the adoption of a comprehensive export control list into national legislation. Members generally have the capability of supplying goods classified as nuclear or nuclear dual-use.<sup>3</sup> Some countries, such as Israel, adhere to the NSG guidelines, but are not official members. Partial points were assigned in this case. Neither Pakistan nor India received points as there is no evidence of continued adherence to the NSG guidelines after their membership applications were denied. NSG membership is a high-impact sub-criterion.

- **Party to the Convention for the Suppression of Acts of Nuclear Terrorism<sup>4</sup>**

This legally binding convention requires countries to actively counter and prevent the possibility of nuclear terrorism. State parties are required to make criminal offenses a wide range of activities related to nuclear and other radioactive material and nuclear facilities, which results in stronger deterrence of illicit conduct by individuals. It is a high-impact sub-criterion.

- **Member of the Missile Technology Control Regime (MTCR)<sup>5</sup>**

Although not legally binding, members of the MTCR commit to adhere to stringent export control measures for a specific set of missile-related technologies. Joining the MTCR shows awareness and openness to being governed by regulations relating to preventing the spread of ballistic and cruise missiles and their technologies. Membership eligibility also depends on a country's Nuclear Non-Proliferation Treaty, Chemical Weapons Convention (CWC), and Biological Weapons Convention (BWC) statuses. Adherents received half points. It is a high-impact sub-criterion.

- **Participant in the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods<sup>6</sup>**

The Wassenaar Arrangement is a voluntary, non-legally binding multi-lateral agreement where states agree to adhere to recommendations and guidelines on their exports of conventional arms and dual-use goods and technology. Specifically, parties agree to control exports in categories of dual-use goods and technologies and munitions contained on control lists to ensure they would not undermine the goal of international security.<sup>7</sup> They also agree to use the guidelines in the drafting of their national export control legislation. Membership eligibility also depends on a country's Nuclear Non-Proliferation Treaty (NPT), Chemical Weapons Convention (CWC), and Biological Weapons Convention (BWC) statuses. Some countries adhere to the arrangement but are not official members. In that case, the 2021 PPI awarded partial points. It is a high-impact sub-criterion.

- **Participant in the Proliferation Security Initiative (PSI)<sup>8</sup>**

Not legally binding, the PSI is a voluntary initiative to network with other states to prevent WMD-related illicit trade by land, sea, or air. States

commit to “impede and stop shipments of WMD, delivery systems, and related materials” based on a set of “Interdiction Principles.” This is arguably one of the most directly relevant international agreements for the PPI. Micronesia and Palau are two of its newest members. It is a high-impact sub-criterion.

- **Member of the World Customs Organization (WCO)<sup>9</sup>**

Being a member of the WCO has no direct legal implications, however, the WCO introduces recommendations, declarations, and initiatives, and sponsors legally-binding conventions administered by its Customs Cooperation Council. State willingness to maintain high customs safeguards and standards plays a crucial role in the prevention of commodity trafficking. WCO membership is a high-impact sub-criterion.

- **Has an International Atomic Energy Agency (IAEA) Additional Protocol (AP) to its Comprehensive Safeguards Agreement (CSA) in force<sup>10</sup>**

Although states are not required to conclude Additional Protocols (AP), the AP is a binding agreement once ratified. It provides the IAEA with enhanced verification tools designed to aid in detecting undeclared nuclear material and activities. According to the IAEA, it is granted legal “expanded rights of access to information and locations in the States. For States with a CSA, the Additional Protocol aims to fill the gaps in the information reported under a CSA.” Export control-related AP provisions include Article 2.a.(ix), under which States need to report exports of Annex II items on a quarterly basis and imports upon IAEA request, and Article 5.b., under which IAEA inspectors have greater physical access to where imported items are located. Reporting requirements create, at a minimum, an incentive for improved record keeping. Overall, bringing an AP into force shows high nonproliferation commitments and will allow a thorough IAEA evaluation of a state’s nuclear program. The AP is therefore a high-impact sub-criterion.

Countries with an AP in force received full points; signature allowed for partial points. Countries that signed the AP more than ten years ago and still have not entered it into force received no points.

- **Party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)<sup>11</sup>**

The NPT is a foundational step for a country in committing never to manufacture, otherwise acquire, or transfer nuclear weapons. Five PPI countries or entities did not receive points. One of the countries, Kosovo, is not recognized by the United Nations as a state. The four states that did not receive points are Israel, India, Pakistan, and South Sudan. The Democratic People's Republic of Korea (DPRK) received points for signing the NPT, even though it withdrew in 2003, only because the IAEA does not recognize its withdrawal reason and still considers the DPRK a party to the NPT. Taiwan, as an original signatory of the NPT, remains committed to its measures. Hong Kong adopted the NPT through China. The PPI grants two states, the Cook Islands and Niue, partial points for considering themselves bound to the NPT, even though they have not signed it. It is a medium-impact sub-criterion.

- **Has an IAEA CSA in force<sup>12</sup>**

A comprehensive safeguards agreement allows the IAEA to safeguard all nuclear facilities and material in peaceful uses within a country to ensure their exclusively non-military use. The CSA allows the IAEA to implement safeguards on all such nuclear material to ensure they are not diverted to the manufacture of nuclear weapons or nuclear explosive devices for purposes unknown. All non-nuclear weapons states that are parties to the NPT are required to conclude a CSA, however, in the previous 2019 PPI, the point assignment was updated such that countries which have an IAEA Small Quantities Protocol (SQP) in force (the following sub-criterion) do not also receive points for having a CSA. Countries that have the CSA and no SQP received full points. Countries with a CSA and SQP received points only in the SQP sub-criterion. This is because a SQP suspends the application of many provisions of the comprehensive safeguards agreement. Countries with an older version of the SQP received half points. Eight nuclear weapon states received full points for their safeguards agreement, independent of what their overseas territories have. The DPRK is the only state with nuclear weapons to not receive points. This is a medium-impact sub-criterion.

- **Has in place a SQP to CSA<sup>13</sup>**

The SQP can be concluded along with a CSA. According to the IAEA, starting in 1974, a standardized small quantities protocol was made available to states with minimal or no nuclear material and no nuclear material in a “facility.” In 2005, the IAEA Board of Governors decided that any future small quantities protocols should use a revised small quantities protocol that reduces the number of provisions of the comprehensive safeguards agreement that are held in abeyance, and makes operative key provisions related to reporting nuclear material and the conduct of inspections. Often, the SQP is in effect for states that use limited quantities of nuclear material at research or academic facilities or at medical venues. In the future, this sub-criterion may be merged with the CSA criterion. It is a medium-impact sub-criterion.

- **IAEA reached a positive Safeguards Conclusion for the country in 2019<sup>14</sup>**

A safeguards conclusion is a public IAEA evaluation made each year for all safeguarded states. If a country has a CSA but no AP in place, the IAEA can reach a “conclusion” that all declared nuclear material remained in peaceful uses. The IAEA can also try to reach the more time-consuming “broader conclusion” for those countries that have ratified the AP, meaning the IAEA confirms that, in general, there is no evidence of diversion of nuclear material and all nuclear material remains in peaceful uses in the state as a whole. No conclusions can be reached for countries that have not signed a CSA or have signed but not ratified it. The 2021 PPI used safeguards conclusion data for 2019, published in 2020. It is a medium-impact sub-criterion.

- **Party to a Nuclear Weapon Free Zone (NWFZ) treaty<sup>15</sup>**

A NWFZ Treaty is a regional, legally binding agreement where individual countries commit to keeping the whole region nuclear weapons-free. While countries in certain zones (North America, the Middle East, and Europe) have not yet established NWFZs, there are five successful, established NWFZs: Treaty of Tlatelolco for Latin America and the Caribbean, Treaty of Rarotonga for the South Pacific, Treaty of Bangkok for Southeast Asia, Treaty of Pelindaba for Africa, and the Central Asian NWFZ. Mongolia maintains its own one-state NWFZ and received full points.

These zones include countries that once pursued or inherited, but then renounced, nuclear weapons programs and indicate a strong commitment to nonproliferation. It is a medium-impact sub-criterion.

- **Party to the Convention on the Physical Protection of Nuclear Material (CPPNM)<sup>16</sup>**

Through this legally binding IAEA convention, states commit to adhere to international standards governing the protection of nuclear facilities and materials during use, storage, and transport. The 2021 PPI awarded full points to countries that ratified the CPPNM and its 2015 CPPNM amendment. Half points were awarded to those that ratified the original CPPNM. If a country only signed the original CPPNM, it did not receive any points. It is a medium-impact sub-criterion.

- **Party to the Chemical Weapons Convention<sup>17</sup>**

Legally binding adherence to the treaty commits countries to not pursue chemical weapons and to collaborate internationally to eliminate them altogether. Adherence to the CWC results in greater information sharing, as well as access to training and equipment in many areas that are applicable to countering broader strategic commodity trafficking, such as improved export and border control measures. For the 2021 PPI, the sub-criterion remains a medium-impact criterion.

- **Party to the Biological Weapons Convention<sup>18</sup>**

Legally binding adherence to the treaty commits countries to not pursue chemical weapons and to collaborate internationally to eliminate them altogether. Adherence to the BWC results in greater information sharing, as well as access to training and equipment in many areas that are applicable to countering broader strategic commodity trafficking, such as improved export and border-control measures. The sub-criterion remains medium impact.

- **Party to the Convention on Combating Bribery of Foreign Public Officials in International Business Transactions<sup>19</sup>**

This convention is administered by the Organisation for Economic Co-operation and Development (OECD) and “establishes legally binding standards to criminalize bribery of foreign public officials in international business transactions.” It also established a Working Group to monitor

implementation and publishes country implementation reports and recommendations. The PPI assessed that signature to the convention would likely ensure more regulated trade of strategic commodities and equipment by reducing corruption and bribery of officials involved in regulating export processes. Information on the convention is available on the OECD's website. It is a medium-impact sub-criterion.

- **Member of the Australia Group (AG)<sup>20</sup>**

The AG is one of the four major global export control and nonproliferation groups. While participation is not legally binding, the group supports strict and streamlined export controls of chemical and biological weapons and their precursors, as well as related equipment and technologies. Not all countries are eligible for membership; prior to joining the AG, a country must fulfill certain criteria demonstrating a firm commitment to nonproliferation of chemical and biological weapons. The group also offers a platform for information sharing and assists countries with their implementation of the BWC and CWC. Adherents received half of the available points. AG membership is a medium-impact sub-criterion.

- **Member of the International Atomic Energy Agency<sup>21</sup>**

The IAEA was granted a mandate in 1957 to work with United Nations member states and other partners to “promote safe, secure and peaceful nuclear technologies”<sup>22</sup> and to “establish and administer safeguards designed to ensure that special fissionable and other materials, services, equipment, facilities, and information... are not used in such a way as to further any military purpose; and to apply safeguards, at the request of the parties, to any bilateral or multilateral arrangement, or at the request of a State, to any of that State's activities in the field of atomic energy.”<sup>23</sup> As of February 2019, 171 states were members of the IAEA, meaning its Board of Governors had recommended them, and they had deposited an instrument of ratification of the IAEA Statute and its terms. However, rather than for nonproliferation reasons, states mainly join the IAEA to benefit from its promotion of the peaceful use of nuclear energy. In the 2021 PPI, this sub-criterion remains a low-impact criterion.

- **Reports to the IAEA Incident and Trafficking Database (ITDB)<sup>24</sup>**

Countries that report incidents involving trafficking of nuclear-related materials or related incidents within their territories increase international

collaboration and help the IAEA and all other countries identify strengths and weaknesses regarding abilities to monitor and secure nuclear equipment and material. It is a low-impact sub-criterion.

- **Party to the Hague Code of Conduct against Ballistic Missile Proliferation (HCOC)<sup>25</sup>**

Not legally binding, this voluntary effort strengthens state efforts against ballistic missile proliferation, specifically the proliferation of missiles capable of delivering WMD. The guidelines set out in the Code of Conduct promote transparency and information sharing; for example, subscribing members voluntarily commit to “provide pre-launch notifications (PLNs) on ballistic missile and space-launch vehicle launches (SLVs) and test flights.” They also commit to submit annual declarations of their national policies on ballistic missiles and SLVs. It is a low-impact sub-criterion.

- **New: Party to the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation and SUA 2005 Protocol<sup>26</sup>**

The Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation (SUA) prohibits acts that threaten the safety and security of ships. The treaty criminalizes the hijacking of ships, the use of explosives on ships, and threats made to passengers and crew. The additional SUA 2005 Protocol is particularly relevant for the PPI. The 2005 Protocol contains language that makes the unlawful use of ships to transport explosive or biological, chemical, or nuclear material (BCN), as well as any “equipment, materials or software or related technology that significantly contributes to the design, manufacture or delivery of a BCN weapon” an offence of the Convention. States party to the treaty are required to prosecute illicit transfers of BCN weapons/materials, which results in an enhanced deterrent for illicit conduct. Full points were assigned for a State that ratified the protocol; half points for being a party to the Convention. It is a medium-impact sub-criterion.

- **New: Party to the Convention of the Suppression of Unlawful Acts Relating to International Civil Aviation (Beijing Convention, 2010)<sup>27</sup>**

The Beijing Convention (2010) mandates that all parties to the Convention agree to implement national legislation that criminalizes the use of

a civilian aircraft “for the purpose of causing death, serious bodily injury, or serious damage to property or the environment.” Pertaining to the PPI, the Convention contains language that binds nations to criminalize the unlawful and intentional transport of BW, CW, and NW and related materials. A signature to the Convention demonstrates a commitment by a country to develop and implement legislation that regulates the use of aircraft and the transport of BCN items/materials. This is a medium-impact sub-criterion.

## **IMPACT OF SUB-CRITERIA**

As discussed above, the PPI assigns a low to high impact for weighting each of the sub-criteria. **Table 2.1** compiles how each indicator is weighted in the evaluation and how much of an impact it therefore has on a country’s score and rank within the super criterion.

## **SCORING**

Of the 22 sub-criteria, three are considered low-impact, twelve are medium-impact, and seven are high-impact. They are worth five, 10, and 15 points, respectively. A country could receive a raw total of 240 points. This raw score is used later to arrive at a total, weighted score and rank. It is also used to derive a ranking under the three tiers.

High Impact (7)	Medium Impact (12)	Low Impact (3)
Nuclear Suppliers Group	Nuclear Non-Proliferation Treaty	IAEA Member
Additional Protocol	Comprehensive Safeguards Agreement	Hague Ballistic Missile Code
Convention for the Suppression of Acts of Nuclear Terrorism	IAEA Safeguards Conclusion 2019	Reporting to IAEA Trafficking
Missile Tech Control Regime	Small Quantities Protocol	
Wassenaar Arrangement	OECD Convention on Bribery	
Proliferation Security Initiative	Nuclear Weapon Free Zone	
World Customs Organization	Chemical Weapons Convention	
	Biological Weapons Convention	
	Australia Group	
	Physical Protection of Nuclear Material & Amendment	
	<b>New:</b> Convention of the Suppression of Unlawful Acts Relating to International Civil Aviation	
	<b>New:</b> Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation and associated 2005 protocol	

**Table 2.1.** The impact of each *International Commitment* sub-criterion.

## NOTES

1. For the 2021 PPI, we discontinued the use of two sub-criteria: “International Maritime Organization – membership,” because it was replaced with the most relevant IMO convention, and “FATF Membership” due to it being used under the *Ability to Prevent Financing of Proliferation* super criterion. Two new sub-criteria were added for the 2019 PPI: “Party to the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation and SUA 2005 Protocol” and the equivalent for aviation, “Convention of the Suppression of Unlawful Acts Relating to International Civil Aviation (Beijing Convention, 2010).”
2. “Participants,” Nuclear Suppliers Group, 2020, <https://www.nuclearsuppliersgroup.org/en/participants1>.
3. According to the NSG, factors taken into account for participation include the following:
  - The ability to supply items (including items in transit) covered by the Annexes to Parts 1 and 2 of the NSG Guidelines;
  - Adherence to the Guidelines and action in accordance with them;
  - Enforcement of a legally based domestic export control system which gives effect to the commitment to act in accordance with the Guidelines;
  - Adherence to one or more of the NPT, the Treaties of Pelindaba, Rarotonga, Tlatelolco, Bangkok, Semipalatinsk or an equivalent international nuclear nonproliferation agreement, and full compliance with the obligations of such agreement(s);
  - Support of international efforts towards nonproliferation of weapons of mass destruction and of their delivery vehicles.
4. United Nations, “International Convention for the Suppression of Acts of Nuclear Terrorism,” *United Nations Treaty Collection*, 2020, [https://treaties.un.org/Pages/ViewDetailsIII.aspx?src=TREATY&mtdsg\\_no=XVIII-15&chapter=18&Temp=mtdsg3&lang=en](https://treaties.un.org/Pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XVIII-15&chapter=18&Temp=mtdsg3&lang=en).
5. “MTCR Partners,” Missile Technology Control Regime, 2020, <https://mtcr.info/partners/>. In addition to Latvia and Estonia, half points were also assigned to Kazakhstan, Israel, Macedonia, Romania, and Slovakia for adhering to the regime.
6. “National Contacts,” Wassenaar Arrangement, 2020, <https://www.wassenaar.org/participating-states/>.
7. “About Us.” Wassenaar Arrangement, 2020, <https://www.wassenaar.org/about-us/>.
8. “Endorsing States List.” Proliferation Security Initiative, 2019, <https://www.psi-online.info/psi-info-en/botschaft/-/2205942>.
9. “Membership,” World Customs Organization, 2019, <http://www.wcoomd.org/en/about-us/wco-members/membership.aspx>.

10. International Atomic Energy Agency, “Status List: Conclusion of Additional Protocol,” *IAEA Office of Legal Affairs*, 2020, <https://www.iaea.org/sites/default/files/20/01/sg-ap-status.pdf>. Taiwan receives full points for its safeguards agreement equivalent to the AP. Countries that newly received points for entering their Additional Protocols into force include Serbia, Benin, Ethiopia, and Liberia.
11. United Nations, “Status of the Treaty: Treaty on the Non-Proliferation of Nuclear Weapons,” *United Nations office for Disarmament Affairs*, 2020, <http://disarmament.un.org/treaties/t/npt>.
12. International Atomic Energy Agency, “Status List: Conclusion of Safeguards Agreements, Additional Protocols and Small Quantities Protocols,” *IAEA Office of Legal Affairs*, 2020, <https://www.iaea.org/sites/default/files/20/01/sg-agreements-comprehensive-status.pdf>.
13. International Atomic Energy Agency, “Status List: Conclusion of Safeguards Agreements, Additional Protocols and Small Quantities Protocols,” *IAEA Office of Legal Affairs*, 2020, <https://www.iaea.org/sites/default/files/20/01/sg-agreements-comprehensive-status.pdf>.
14. “A Safeguards Statement for 2019,” International Atomic Energy Agency, 2019, <https://www.iaea.org/sites/default/files/20/06/statement-sir-2019.pdf>.
15. United Nations Office for Disarmament Affairs, “Nuclear-Weapon-Free Zones,” *United Nations Office for Disarmament Affairs*, 2020, <https://www.un.org/disarmament/wmd/nuclear/nwzf/>.
16. “Convention on the Physical Protection of Nuclear Material,” International Atomic Energy Agency, 2020, [https://www-legacy.iaea.org/Publications/Documents/Conventions/cppnm\\_status.pdf](https://www-legacy.iaea.org/Publications/Documents/Conventions/cppnm_status.pdf). The CPPNM entered into force in 1987. It addressed international transport of nuclear material. It was amended in 2005 to extend its reach to nuclear material in domestic use and to nuclear facilities. The amendment entered into force in 2016. The amendment calls for the amended treaty to be named the Convention on Nuclear Material and Facilities. However, “the IAEA Secretariat, in line with established depositary practice, will continue to refer to the ‘CPPNM’ and to the ‘Amendment to the CPPNM’ until all States Parties to the CPPNM have consented to be bound by the Amendment” in order to not give the impression that, “alongside the original convention, there is now a new convention and that states could join one or the other.” Amendment to the Convention on the Physical Protection of Nuclear Material,” *International Atomic Energy Agency*, 2020, [https://www-legacy.iaea.org/Publications/Documents/Conventions/cppnm\\_amend\\_status.pdf](https://www-legacy.iaea.org/Publications/Documents/Conventions/cppnm_amend_status.pdf). To correct a comment in the 2019 PPI, the withdrawal or lack thereof of an initial reservation to the convention by a number of countries does not make a difference for point assignment in the 2021 PPI.

17. United Nations, “Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction,” *United Nations Office for Disarmament Affairs*, 2020, <http://disarmament.un.org/treaties/t/cwc>.; United Nations, “Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction,” *United Nations Treaty Collection*, 2020, [https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg\\_no=XXVI-3&chapter=26](https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVI-3&chapter=26).

18. United Nations, “Membership of the Biological Weapons Convention,” *United Nations Geneva*, 2020, [https://www.unog.ch/\\_\\_80256ee600585943.nsf/\(httpPages\)/7be6cbbea0477b52c12571860035fd5c?OpenDocument&#38;ExpandSection=1](https://www.unog.ch/__80256ee600585943.nsf/(httpPages)/7be6cbbea0477b52c12571860035fd5c?OpenDocument&#38;ExpandSection=1). Central African Republic, Niue, and Tanzania newly received points for becoming official state parties to the BWC.

19. “OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions,” *Organisation for Economic Co-operation and Development*, 2020, <https://www.oecd.org/corruption/oecdantibriberyconvention.htm>. Peru newly received points.

20. Australian Department of Foreign Affairs and Trade, “AG Participants/ AG Adherents,” *The Australia Group*, 2020, <https://www.dfat.gov.au/publications/minisite/theaustraliagroupnet/site/en/participants.html>.

21. “The Members of the Agency,” International Atomic Energy Agency, February 2019, <https://www.iaea.org/sites/default/files/publications/documents/infcircs/1959/infcirc2r84.pdf>. In 2019, St. Lucia became a member of the IAEA and newly received full points. Taiwan is an observer to the IAEA and received partial points. Hong Kong received full points through China.

22. “IAEA History,” *International Atomic Energy Agency*, <https://www.iaea.org/about/overview/history>.

23. “IAEA Statute, as amended up to December 28, 1989,” International Atomic Energy Agency, <https://www.iaea.org/sites/default/files/statute.pdf>.

24. “IAEA Incident and Trafficking Database (ITDB),” International Atomic Energy Agency, 2020, <https://www.iaea.org/sites/default/files/20/02/itdb-factsheet-2020.pdf>. Benin, Comoros, Congo, El Salvador, and Liechtenstein newly received points.

25. “List of HCoc Subscribing States,” *Hague Code of Conduct*, 2020, [https://www.hcoc.at/?tab=subscribing\\_states&page=subscribing\\_states](https://www.hcoc.at/?tab=subscribing_states&page=subscribing_states). Four states newly received points: Togo, Equatorial Guinea, Saint Vincent and the Grenadines, and Somalia.

26. "Status of Conventions by State," International Maritime Organization, 2020, <http://www.imo.org/en/About/Conventions/StatusOfConventions/Pages/Default.aspx>.; "Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation," International Maritime Organization, 1988, <https://treaties.un.org/pages/showDetails.aspx?objid=08000002800b9bd7>.; "Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation: Protocol for the Suppression of Unlawful Acts Against the Safety of Fixed Platforms Located on the Continental Shelf," International Maritime Organization, 2005, <http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/SUA-Treaties.aspx>.
27. "Status of Conventions by State," International Maritime Organization, 2020, <http://www.imo.org/en/About/Conventions/StatusOfConventions/Pages/Default.aspx>.; United Nations, "Convention on the Suppression of Unlawful Acts Relating to International Civil Aviation Done at Beijing on 10 September 2010," International Civil Aviation Organization, 2020, [http://www.icao.int/secretariat/legal/List%20of%20Parties/Beijing\\_Conv\\_EN.pdf](http://www.icao.int/secretariat/legal/List%20of%20Parties/Beijing_Conv_EN.pdf).



# CHAPTER 3

## SUPER CRITERION LEGISLATION

**Super Criterion Legislation** assesses whether a country has legislation, authorities, and regulations in place to control trade in strategic commodities, with a focus on nuclear and nuclear-related goods. It assesses 14 sub-criteria, or indicators of performance, one of which is an extra credit opportunity. The ability of a country to act to prevent strategic commodity trafficking lies at the heart of the PPI. Without the legal basis and tools to act against illicit procurement, such efforts cannot be detected, investigated, and shut down, and key actors cannot be prosecuted. Legislation does not need to be the same for each country, but legislation that is adequate to achieve its mission should include provisions addressing import and export controls including licensing of controlled goods, the transfer and transport of sensitive commodities, and those necessitating financing regulations to prevent illicit purchases. It should also provide for the national use of proper documentation to control imports and exports and information sharing systems that help with regulation.

Experts were consulted in the development of the list of legislative sub-criteria. The goal was to develop a list of key indicators of strategic trade control laws, which could show the extent of control legislation and differentiate between countries' controls.

All countries, and not only major economies involved in international trade or NSG member countries, have an opportunity to score highly under this super criterion if the state has strong enforcement mechanisms on imports and exports in general, rather than only strategic

commodities. Of the 14 sub-criteria, four are considered low-impact, five are medium-impact, and four are high-impact, worth five, 10, and 15 points respectively, and one is an extra credit opportunity. Excluding the extra credit opportunity, a country could receive a raw total of 130 points under this super criterion. This raw score is used later to arrive at a total, weighted score out of 200 possible points and a rank for each country. It is also used to derive a ranking for the country under the three tiers. In addition, the project scores the comprehensiveness of all 200 countries', territories', and entities' export control legislation (not including import, transit, and transshipment) and divides them into five sub-categories of comprehensiveness.

Significant effort was put into finding all relevant legislation or confirming its existence by a reliable third party (such as the IAEA or European Parliament). Effort was made to ensure that non-English legislation and scanned documents, which are non-searchable, were detected and included. In addition to government websites, helpful resources were: the UN Office for Disarmament Affairs database, the 2020 round of Committee-approved Resolution 1540 matrices, the International Labour Organization database, the Arms Trade Treaty Baseline Assessment Project, and GunPolicy.org.<sup>1</sup>

## SUB-CRITERIA<sup>2</sup>

- **National export control legislation includes a catch-all clause<sup>3</sup>**

A catch-all clause is a component of legislation that is designed to “catch” the export of goods that may not be listed on export control lists but that may be destined for use in sensitive military, sanctioned, or unsafeguarded programs. As such, they require authorization for export. The 1540 matrix provides information on which countries include a catch-all clause as a part of their national export control legislation. For countries that did not report a catch-all clause to the 1540 Committee, an effort was made to individually verify whether similar legislation exists in the country. The last edition of the PPI identified Thailand and the United Arab Emirates (UAE) as two countries working to implement an export catch-all clause. Thailand has approved legislation to implement a catch-all clause and received full points; however, the UAE has yet to implement its relevant law and did not receive points. This is a high-impact sub-criterion.

- **Comprehensiveness of export control legislation such as encapsulating NSG Parts 1 and 2 lists<sup>4</sup>**

The most rigorous national export control legislation encapsulates a comprehensive list of controlled items that include the NSG Parts 1 and 2 lists and goes even further by adding additional items. An attempt was made to find a list of export-controlled items for each country. However, in some cases, national legislation refers to a set of controlled items without a country making a detailed list easily and publicly available. In that case, the PPI looked at the comprehensiveness of the law referring to the list. This is a high-impact sub-criterion.

- **Transit control legislation is in place<sup>5</sup>**

This indicator sought to collect trade regulations for each country addressing the treatment of nuclear weapons-related materials<sup>6</sup> in transit. Many countries have reported the existence of such regulations to the 1540 Committee. For the PPI, the data are taken from the 1540 committee-approved matrices and 1540 National Reports from 2019 and 2020, These data are corroborated by information already collected under export control legislation. This is a high-impact sub-criterion.

- **Transshipment control legislation is in place<sup>7</sup>**

This indicator sought to collect trade regulations for each country addressing the treatment of nuclear weapons-related materials<sup>8</sup> that are being transshipped through the country. For the PPI, the data are taken from the 1540 committee-approved matrices and 1540 National Reports from 2019 and 2020, and cross-examined with information already collected under export control legislation. This is a high-impact sub-criterion.

- **Presence of a licensing process for export licenses**

The presence of a licensing process for export licenses refers to whether a country has a formal process to adjudicate decisions on making or rejecting applications for export permits or licenses for companies to export any type of controlled good. Information for this sub-criterion was collected through individual internet searches on a country-by-country basis. This is a medium-impact sub-criterion.

- **Country has a criminal investigation agency**<sup>9</sup>

This criterion, previously named “An Authority Regarding Civil and Criminal Investigations is Designated by Law,” was changed to focus on criminal investigations only. The Institute identified national criminal investigation agencies around the world and assigned full points (10) for each country that has one. An agency tasked with the investigation of criminal violations of the law sets the basis for the enforcement of intentional violations or conspiracies to violate strategic trade controls. While all countries have at least a small police force, some countries have larger forces with specialized sub-units for investigating trade or customs violations, such as the Customs Criminal Agency (Zollkriminalamt) in Germany, or the National Directorate of Intelligence and Customs Investigations (Direction Nationale du Renseignement et des Enquêtes Douanières) in France. This is a medium-impact sub-criterion.

- **Import control legislation includes a list of controlled goods**

This indicator refers to legislation in place that lists all controlled and banned imports, especially with regard to nuclear direct-use goods, radioactive materials, or goods that are capable of being used in weapons of mass destruction (WMD). These data include an itemized list of controlled imports for countries. Sufficient import controls are especially relevant for countries in Tiers Two and Three, which pose a transit or diversion concern rather than a supplier concern for strategic commodity trafficking. This is a medium-impact sub-criterion.

- **End-use statements are required for export licenses**<sup>10</sup>

An end-use statement is a legal declaration made by an importing party and discloses the final destination and intended use of a good. This is especially important to have in place for countries that can supply WMD direct- and dual-use goods or those countries in Tier One. End-use statements can be used to later check whether the good is being used by the intended party and for the authorized use. This is a medium-impact sub-criterion.

- **Import license or declaration is required to import goods**<sup>11</sup>

This indicator refers to whether or not an import license or declaration is required to import goods. This is especially important for countries that

are heavily involved in the re-export of goods, or Tier Two countries, because it allows authorities the chance to detect illicit goods crossing their territories. The PPI assigned the same points for those countries that require an import permit or license, and those that only require an import declaration at customs. As the requirement is not specifically for nuclear direct- or dual-use goods, but all goods in general, this indicator was weighed as having low impact. Of note, rigorous import controls seemed more common than rigorous export controls.

- **Certificates of Origin are required for imports or re-exports<sup>12</sup>**

The International Chamber of Commerce defines a Certificate of Origin as “an important international trade document that certifies that goods in a particular export shipment are wholly obtained, produced, manufactured or processed in a particular country.”<sup>13</sup> The World Bank’s “Ease of Doing Business” database provides information for almost all countries on whether a Certificate of Origin is required for the import or re-export of certain goods. As the requirement is not specified for nuclear direct- or dual-use goods, but all goods in general, this indicator was weighed as having low impact.

- **Bills of Lading (BOL) are required for carriers during transport<sup>14</sup>**

A BOL assigns legal responsibility for goods during transport. According to a definition published by *The Economic Times*, a BOL “...acts as a receipt and a contract. A completed BOL legally shows that the carrier has received the freight as described and is obligated to deliver that freight in good condition to the consignee.”<sup>15</sup> It is relevant for preventing strategic commodity trafficking as it adds accountability and monitoring of goods during transport. The World Bank’s “Ease of Doing Business” database provides information for almost all countries on whether a Bill of Lading is required for the shipment of goods. This sub-criterion also assigned points for countries that utilized what are typically called “CMR notes.” A CMR note is a document prepared by an exporter and a freight forwarder “that govern[s] the responsibilities and liabilities of the parties to a contract for the carriage of goods,” requiring the consignee to sign the form on delivery, which enables the carrier to confirm the delivery of the goods.<sup>16</sup> Countries that require a BOL or CMR received full points if both import and export were covered. No points were given to countries if the BOL or CMR covered only imports or only exports. As the requirement

is not specifically for nuclear direct- or dual-use goods, but all goods in general, this indicator was weighed as having low impact.

- **Intellectual Property is protected<sup>17</sup>**

The protection of sensitive information is highly valuable in sectors that both use and export strategic commodities. Ideally, the PPI authors would want to compare how countries protect from unintended use, in particular, weapons-related knowledge and expertise, including, for example, electronic information, designs, or calculations. This was not possible to determine for each country. In addition, there is no international agreement, even among the United States and its allies, as to what constitutes classified or sensitive weapons information. In the nuclear area, the NSG is also struggling with establishing controls on the export of information. As a result, the PPI settled on a far lesser criterion, namely the assessment of the regulation and protection of know-how in general using data from the World Economic Forum Global Competitiveness Report, indicator 1.15 “Intellectual Property Protection.” The source was judged to be more relevant than the previously used Intellectual Property Rights score from the Property Rights Alliance. Since these scores are used for their potential implications only, this indicator was determined to be low-impact.

- **New: 1540 matrix has an “X” under intangible technology transfer<sup>18</sup>**

Intangible technological transfer is the transfer of non-physical technological goods from one location to another. Intangible technology comes in the form of software packages, technical assistance, and expertise and knowledge. Illicit intangible technology transfers are used by proliferating actors to obtain sensitive or controlled information. The PPI consulted the 2020 round of UN Security Council Resolution committee-approved 1540 matrices for information pertaining to a state’s regulations on intangible technological transfers. Those states with confirmed reported regulations to the 1540 Committee pertaining to intangible technological transfers received full points. This is a medium-impact sub-criterion.

### CONSIDERED SUB-CRITERIA

Project staff considered additional sub-criteria but were unable to find enough information for a sufficient number of countries; thus they were not included in scoring:

- The form or format for end-use statements is comprehensive, requires detailed descriptions of the end user and the end-use, and contains a non-re-export clause. The UN Office for Disarmament Affairs (UNODA) Occasional Paper, Study on the Development of a Framework for Improving End-Use Control Systems, No. 21, December 2011, provides valuable insights on the topic of end-user controls, however, the PPI decided this source is too dated to be used for scoring in the PPI.
- Physical end-use verification for dual-use goods. This type of verification is made by a government or company at the site of the good's stated end destination and can have significant impact on detecting the unintended diversion of exported goods. It seeks to determine that the stated buyer is an actual physical entity and that it is using the good for the stated end-use. While many exporters require an end-use statement prior to finalizing a sale and making an export, few countries (or their companies) use end-use verification as a monitoring tool against the illicit diversion of sensitive goods. Germany and the United States stand out as two of few countries that use this tool. Tier 1 countries should especially use end-use verification to check the location and use of nuclear-related goods. Few other countries have the financial and technical resources that would be needed to carry out such checks. A risk-based approach should be used to determine priority goods and destinations for post-shipment end-use verification.
- A specific nuclear-related licensing agency exists within the country. This authority refers to a government body in charge of granting export licenses for the export of nuclear-related goods. An attempt was made to assign points for countries that have a specific nuclear-related export body or office, but the majority of countries use a general export control or customs agency, so this sub-criterion was dropped.
- Implementation of additional, unilateral sanctions. The PPI attempted to assign points for countries that employ and implement additional sanctions against known proliferant states or illicit networks that supplement UN sanctions. Not enough countries deployed additional unilateral sanctions to make this sub-criterion usable.
- A license or authorization is required for holding technical and potentially sensitive talks and presentations abroad. This is one way of implementing controls on intangible technology transfer.

## EXTRA CREDIT INDICATOR

- Party to nuclear cooperation agreement containing provision to forgo reprocessing and enrichment<sup>19</sup>

Countries that have a “gold standard” condition in a section 123 peaceful nuclear cooperation agreement (named after section 123 in the Atomic Energy Act) with the United States or another supplier country are awarded extra credit points. This so-called “gold standard” nuclear cooperation provision requires a country to agree to strict nonproliferation requirements that it forego seeking or developing enrichment and reprocessing capabilities. The country has an added incentive to apply additional scrutiny to the movement of strategic goods entering and exiting the country, which is often expressed in the form of strong strategic trade control laws. The United Arab Emirates and Taiwan are the only two PPI entities to date with such an agreement, but because this is an extremely important condition, this sub-criterion is used as extra credit.

## IMPACT OF SUB-CRITERIA

The PPI assigned a low to high impact for weighting each of the sub-criteria. **Table 3.1** shows how each indicator was weighted in the evaluation and how much of an impact it therefore had on a country’s score within the super criterion.

## SCORING

Of the 14 sub-criteria, four are considered low-impact, five are medium-impact, and four are high-impact, worth five, 10, and 15 points respectively, and one is an extra credit opportunity. Excluding the extra credit opportunity, a country could receive a raw total of 130 points under this super criterion. This raw score is used later to arrive at a total, weighted score and rank for each country. It is also used to derive a ranking for the country under the three tiers.

Under the sub-criterion *Comprehensive export control legislation*, the PPI team evaluated the quality and comprehensiveness of the export control legislation of the 200 countries, territories, and entities. The results were used to assign points towards a country’s final PPI score, but also to

High-Impact (4)
Catch-all clause in legislation
Comprehensive export control legislation
Transit control legislation
Transshipment control legislation
Medium-Impact (5)
Licensing process for export licenses
End-use statements required for exports
Civil and criminal investigations authority
Import control legislation incl. list of controlled goods
<b>New:</b> 1540 matrix has an X under Intangible Technology Transfer
Low-Impact (4)
Import license or declaration required
Certificates of Origin required
Bills of Lading required
Intellectual property rights protected
<b>Extra Credit:</b> Nuclear cooperation agreement that forgoes enrichment/reprocessing

**Table 3.1.** High, Medium, and Low Impact of Legislation sub-criteria.

place countries in one of the following five sub-categories. Existence of comprehensive legislation is not to be confused with its effective implementation, which will be discussed in subsequent super criteria chapters.

- **Dark Green (legislation is comprehensive):** Legislation or agreements includes controls or clauses relating to export of nuclear direct-use and nuclear dual-use goods, (nuclear and nuclear-dual use commodity controls such as implementation of NSG Parts 1 & 2 or their equivalent), in addition to conventional weapons. The most commonly used lists are the European Union (EU) Control List and Wassenaar Arrangement list. This category counted 77 countries.
- **Light Green (legislation is somewhat comprehensive):** Legislation or agreements includes controls or clauses relating to export of nuclear direct-use goods (nuclear commodity controls such as implementation of NSG Part 1 list or an equivalent), in addition to conventional weapons. This category counted 6 countries.

- **Yellow (legislation is deficient):** Countries have comprehensive, overarching nuclear safety and security laws which place transfer controls on nuclear material and equipment. If the PPI was unable to locate relevant legislation, the 2020 Nuclear Threat Initiative (NTI) Nuclear Security Index was consulted, specifically its data on whether a country has or does not have a national legal framework for the Convention on the Physical Protection of Nuclear Material.<sup>20</sup> These countries are not viewed as having effective trade control laws governing the export of nuclear and nuclear-related commodities, but their existing legislation is viewed as better in a relevant trade control sense than the legislation or lack of legislation in the Red and Orange categories. This category counted 28 countries.
- **Orange (legislation has serious deficiencies):** Legislation covers only exports of conventional weapons as laid out under the Arms Trade Treaty. This is not considered comprehensive trade control legislation for the PPI. This category counted 39 countries.
- **Red (legislation is non-existent or severely deficient):** Legislation includes exports of small arms and light weapons (SALW), and/or radioactive materials under environmental laws. This is not considered comprehensive trade control legislation for the PPI. This category counted 50 countries.

The project, in general, collected data on legislation from the summer of 2019 into the summer of 2020, but included the 2020 round of 1540 committee-approved matrices published in December 2020. Important developments occurring during this time included the adoption of comprehensive export control legislation in China, Kenya, and Panama. While China was already in the dark green category, the 2021 PPI newly adds Kenya and Panama to the dark green category. The two countries are notable for their potential as new regional export-control leaders in Africa and Latin America. A development that occurred earlier during the 2019 PPI was the introduction of the Caribbean Control List and the WMD Focus List, whose status is unknown to PPI staff. This initiative will hopefully, over time, lead to the implementation of a dual-use control list customized for the Caribbean countries. The PPI welcomes the targeted approach that was taken by the participants and hopes it is progressing.

<b>Dark Green (legislation is comprehensive)</b>
Albania, Andorra, Argentina, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Brazil, Bulgaria, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Holy See, Hong Kong, Hungary, Iceland, India, Iraq, Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Kosovo, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malaysia, Malta, Mexico, Moldova (Rep of the), Monaco, Montenegro, Netherlands, New Zealand, Norway, Pakistan, Panama, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, San Marino, Serbia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, Ukraine, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, United States of America
<b>Light Green (legislation is somewhat comprehensive)</b>
Brunei Darussalam, Cambodia, Myanmar, Tajikistan, Uzbekistan, Viet Nam
<b>Yellow (legislation is deficient)</b>
Algeria, Bangladesh, Botswana, Cameroon, Cape Verde, Chile, Cuba, Ghana, Guatemala, Indonesia, Jamaica, Malawi, Mauritania, Morocco, Mozambique, Namibia, Nicaragua, Nigeria, Niue, Peru, Qatar, Rwanda, Saudi Arabia, Sierra Leone, Sri Lanka, Tanzania (United Republic of), Uganda, Uruguay
<b>Orange (legislation has serious deficiencies)</b>
Barbados, Bhutan, Bolivia, Burkina Faso, Costa Rica, Côte d'Ivoire, Dominican Republic, Ecuador, El Salvador, Eritrea, Ethiopia, Fiji, Gabon, Gambia, Grenada, Kuwait, Lao People's Democratic Republic, Lebanon, Lesotho, Libya, Mongolia, Nauru, Niger, Palau, Paraguay, Saint Kitts and Nevis, Samoa, Senegal, Seychelles, Solomon Islands, Suriname, Syrian Arab Republic, Timor-Leste, Togo, Turkmenistan, Tuvalu, Vanuatu, Venezuela (Bolivarian Republic of), Zambia
<b>Red (legislation is non-existent or severely deficient)</b>
Afghanistan, Angola, Antigua and Barbuda, Bahamas, Bahrain, Belize, Benin, Burundi, Central African Republic, Chad, Colombia, Comoros, Congo (Dem Rep of the), Congo (Rep of the), Cook Islands, Djibouti, Dominica, Democratic People's Republic of Korea (DPRK), Egypt, Equatorial Guinea, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Iran (Islamic Republic of), Kiribati, Liberia, Madagascar, Maldives, Mali, Marshall Islands, Mauritius, Micronesia (Federated States of), Nepal, Oman, Palestine (State of), Papua New Guinea, Saint Lucia, Saint Vincent and the Grenadines, Sao Tome and Principe, Somalia, South Sudan, Sudan, Swaziland, Tonga, Trinidad and Tobago, Tunisia, Yemen, Zimbabwe

**Table 3.2.** Export control legislation comprehensiveness by color category.

## NOTES

1. Unfortunately, some countries report environmental laws or similar as WMD-relevant export control laws to the 1540 Committee.
2. The 2021 PPI added one new sub-criterion, "1540 matrix has an X under intangible technology transfer."
3. "Committee Approved Matrices row 18 of Table OP3 (c) and (d)," *United Nations Security Council Committee established pursuant to resolution 1540 (2004)*, <https://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>; National Reports, *United Nations Security Council Committee established pursuant to resolution 1540 (2004)*, <https://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>.
4. Individual searches; "Committee Approved Matrices row 5 of Table OP3 (c) and (d)," *United Nations Security Council Committee established pursuant to resolution 1540 (2004)*, <https://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>; "2018 NTI Nuclear Security Index: indicator 4.2 Domestic Nuclear Materials Security Legislation, sub-indicator 4.2.2 National legal framework for CPPNM," Nuclear Threat Initiative, 2018, [https://media.nti.org/documents/NTI\\_2018\\_Index\\_FINAL.pdf](https://media.nti.org/documents/NTI_2018_Index_FINAL.pdf); "Table 2: National Control System," *ATT Monitor*, 2019, <https://attmonitor.org/the-2019-report/>.
5. "Committee Approved Matrices row 20 of Table OP3 (c) and (d)," *United Nations Security Council Committee established pursuant to resolution 1540 (2004)*, <https://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>; National Reports, *United Nations Security Council Committee established pursuant to resolution 1540 (2004)*, <https://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>. A "X" in the "National Legal Framework" cell relating to NW (nuclear weapons) was taken as confirmation that sufficient legislation exists. A question mark was given partial credit. An empty cell received no points.
6. The UN 1540 Committee defines "related materials" in the matrices as: "materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included on national control lists, which could be used for the design, development, production or use of nuclear, chemical and biological weapons and their means of delivery."
7. "Committee Approved Matrices row 21 of Table OP3 (c) and (d)," *United Nations Security Council Committee established pursuant to resolution 1540 (2004)*, <https://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>; National Reports, *United Nations Security Council Committee established pursuant to resolution 1540 (2004)*, <https://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>. In row

21 of a specific country's matrix, a "X" in the "National Legal Framework" cell relating to NW (nuclear weapons) was taken as confirmation that sufficient legislation exists. A question mark was given partial credit. An empty cell received no points.

8. The UN 1540 Committee defines "related materials" in the matrices as: "materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included on national control lists, which could be used for the design, development, production or use of nuclear, chemical and biological weapons and their means of delivery."

9. Individual internet searches. "World—A global presence," Interpol, 2020, <https://www.interpol.int/Member-countries/World>.

10. Individual internet searches.

11. "Ease of Doing Business Report: Measuring Business Regulations," The World Bank, 2020, <https://www.doingbusiness.org/en/data>. Which import documents are required by a country can be found in the World Bank's "Ease of Doing Business" database. Documents needed for import and export are listed for each country in its respective country profile, see for example, "Details – Trading across Borders in Afghanistan – Trade Documents," [http://www.doingbusiness.org/en/data/exploreconomies/afghanistan#DB\\_tab](http://www.doingbusiness.org/en/data/exploreconomies/afghanistan#DB_tab).

12. "Ease of Doing Business Report: Measuring Business Regulations," The World Bank, 2020, <https://www.doingbusiness.org/en/data>. Whether a Certificate of Origin is required can be found in the World Bank's "Ease of Doing Business" database. Documents needed for import and export are listed for each country in its respective country profile, see for example, "Details – Trading across Borders in Afghanistan – Trade Documents." [http://www.doingbusiness.org/en/data/exploreconomies/afghanistan#DB\\_tab](http://www.doingbusiness.org/en/data/exploreconomies/afghanistan#DB_tab).

13. "Ease of Doing Business Report: Measuring Business Regulations," The World Bank, 2020, <https://www.doingbusiness.org/en/data>.

14. "Ease of Doing Business Report: Measuring Business Regulations," The World Bank, 2020, <https://www.doingbusiness.org/en/data>. Whether a BOL is required can be found in the World Bank's "Ease of Doing Business" database. Documents needed for import and export are listed for each country in its respective country profile, see for example, "Details – Trading across Borders in Afghanistan – Trade Documents," [http://www.doingbusiness.org/en/data/exploreconomies/afghanistan#DB\\_tab](http://www.doingbusiness.org/en/data/exploreconomies/afghanistan#DB_tab).

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17. Klaus Schwab and the World Economic Forum, “The Global Competitiveness Report,” World Economic Forum, 2019, [http://www3.weforum.org/docs/WEF\\_TheGlobalCompetitivenessReport2019.pdf](http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf).

18. “Committee Approved Matrices row 19 of Table OP3 (c) and (d),” *United Nations Security Council Committee established pursuant to resolution 1540 (2004)*, <https://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>.

19. “123 Agreements for Peaceful Cooperation,” *United States Department of Energy National Nuclear Security Administration*, 2020, <https://www.energy.gov/nnsa/123-agreements-peaceful-cooperation>; Richard Nephew, “Reconsidering U.S. Nuclear Cooperation Agreements,” Columbia University Center on Global Energy Policy, 2020, <https://www.energypolicy.columbia.edu/research/report/reconsidering-us-nuclear-cooperation-agreements>; Mary Beth Nikitin, Mark Holt, and Mark Manyin, “U.S.-Vietnam Nuclear Cooperation Agreement: Issues for Congress,” *Congressional Research Service*, 2014, <https://fas.org/sgp/crs/nuke/R43433.pdf>.

20. See indicator 4.2 “Domestic Nuclear Materials Security Legislation,” sub-indicator 4.2.2 “National legal framework for CPPNM,” by Nuclear Threat Initiative and The Economist Intelligence Unit, “EIU Methodology,” *NTI Nuclear Security Index*, 2020, <https://www.ntiindex.org/>.

# CHAPTER 4

## SUPER CRITERION ABILITY TO MONITOR AND DETECT STRATEGIC TRADE

**Super Criterion Ability to Monitor and Detect Strategic Trade** assesses the mechanisms that allow a state to monitor and control strategic or sensitive trade, and the hospitableness of the state environment to achieving the mission. It focuses mostly on tangible outcomes under 19 sub-criteria, rather than simply on the theoretical abilities of a country, by factoring in various performance metrics or views about performance such as statistics, surveys, and rankings conducted by other non-governmental organizations or international organizations. For example, quantitative assessments about countries' internal stability, use of electronic trade documentation, customs diligence, and customs inspection rates are included. These factors can significantly add to or take away from a country's ability to monitor and detect strategic trade.

This super criterion is one of the most challenging for countries to score highly on as it measures tangible outcomes rather than pledges or intentions made in treaties or laws. It measures under the 19 sub-criteria actions, efficiencies, transparencies, and stability. Most countries can only improve their performance under this super criterion through systematic and long-term improvements. Of the 19 sub-criteria, three are considered low-impact, eleven are medium-impact, and four are high-impact, worth five, 10, and 15 points, respectively, and one is an extra-credit opportunity.

A country could receive a total of 185 points under this super criterion. This raw score is used later to arrive at a total, weighted score out of 200 points and rank for each country. It is also used to derive a ranking for the country under the three tiers.

## **SUB-CRITERIA<sup>1,2</sup>**

- **Has ability to track and trace consignments<sup>3</sup>**

The 2018 Logistics Performance Index (LPI) produced by the World Bank provides a score for countries on their ability to track and trace consignments. Countries with higher scores under “tracking and tracing” demonstrate a greater capacity to perform this function, which indicates a country’s capacity to monitor and control the movement of strategic goods inside and outside of the country. As such, this indicator is given a high impact.

- **Physical inspection of shipments<sup>4</sup>**

The 2018 Logistics Performance Index by the World Bank also estimates the percentage of import shipments that are inspected in each country. Points were assigned proportionally to the percentage of shipments inspected, where 100 percent resulted in full points. As inspecting each container or every shipment is neither practical nor realistic for many countries, the 2021 PPI also assigned full points to countries identified by the Global Express Association to use risk management as primary reason for inspection. This is a high-impact sub-criterion.

- **Percentage of import shipments physically inspected multiple times<sup>5</sup>**

The 2018 Logistics Performance Index estimates the percentage of shipments that are physically inspected multiple times by each country. In cases where the 2018 LPI did not contain data on a specific country, data from the 2016 LPI were utilized. The World Bank finds multiple inspections to be a poor means of policing imports because it renders the entire customs system inefficient; on the other hand, the PPI found that multiple inspections increase the chances that a sensitive commodity will be detected in transit. This sub-criterion allows countries that are weak in their

*Ability to Monitor and Detect Strategic Trade* a chance to attain points. It is assessed as high-impact.

- **Use of electronic export declarations<sup>6</sup>**

This sub-criterion draws on a combination of information from the World Customs Organization annual report for 2019–2020. The PPI uses the percentage of electronically filed export declarations as an indicator of whether a country has rigorous and modern export control mechanisms. Strong and modern export control mechanisms make it easier for countries to monitor strategic trade and detect illicit imports and exports; therefore, it is categorized as a high-impact sub-criterion.

- **Use of automated customs system<sup>7</sup>**

Having an automated or electronic customs system, versus one that uses paper documents, typically indicates a more efficient and advanced customs system. It usually implies that a country inspects packages or cargo based on information about shipments that optimizes inspections using a risk-based approach. A majority of countries use automated customs systems, particularly since the UN Conference on Trade and Development started to promote and assist with the implementation of its ASYCUDA (Automated System for Customs Data) software. The PPI collected information for each country individually, but did not differentiate among the different types of electronic systems when assigning the points. It is a medium-impact sub-criterion.

- **Ease of starting a business<sup>8</sup>**

Countries that make starting a business straightforward generally have a transparent and well-regulated process in place, such as obtaining legitimate licenses and documents. The PPI assessed that those countries with such a process in place may be less likely to have companies engaged in illicit activities. The World Bank ranks 190 countries on the ability to start a business. This is a medium-impact sub-criterion.

- **Efficiency of customs clearance process<sup>9</sup>**

The data for this sub-criterion were drawn from the 2018 World Bank Logistics Performance Index “Customs” Score. Countries were given a score for the efficiency of their customs clearance process on a scale from 1 to 5, with 5 being the most efficient. Countries with efficient clearance

processes have the mechanisms in place to clear imports and exports, and thus, would be more likely to have trained and knowledgeable customs officials able to identify illicit imports and exports. This is a medium-impact sub-criterion.

• **Internal stability/Absence of violence/terrorism – World Bank estimate<sup>10</sup>**

Countries that are described by the World Bank as more stable and having a lower presence of violence and terrorism are correlated by the PPI as more able to effectively implement mechanisms to monitor exports and imports and detect illicit activity. These processes and related organizations are less likely to be negatively influenced by corruption, high official turnover, and other disrupting factors. The World Bank 2018 Worldwide Governance Indicator on internal stability and absence of violence/terrorism is used to assign points for this sub-criterion. It is assigned a medium impact.

• **Government Outreach (three separate sub-criteria under this heading)<sup>11</sup>**

To prevent strategic commodities from being mistakenly or purposefully exported to sanctioned or nefarious end-users, government agencies must conduct outreach to train and inform officials at companies about the country's laws and procedures for licensing, as well as on detecting and preventing illicit procurement attempts. Government agencies should also have a point of contact to deal with Resolution 1540 implementation. Countries with greater outreach efforts are more likely to effectively monitor and detect illicit trading activity. The 1540 Committee's 2015 matrix includes resources that would be needed to carry out such checks, and information about countries' implementation of these sub-criteria. The 2021 PPI also consulted 1540 National Reports from 2019 and 2020 for information. Points are assigned separately for the following three sub-criteria:

- State works with and informs industry about strategic trade
- State works with and informs the public about strategic trade
- State has point of contact for 1540 implementation

Each of these three sub-criteria is assigned a medium impact by the PPI.

• **Party to the Convention on Transit of Land-locked States/Party to the UN Convention on the Law of the Sea<sup>12</sup>**

These two conventions are taken as a single sub-criterion. They have similar provisions regarding transshipment regulations. They are relevant for the PPI since they add clarity to countries' legal responsibilities and rights regarding the transport of goods through one or more countries. According to the Convention on the Law of the Sea, Article 125 *Right of access to and from the sea and freedom of transit*:

1. *Land-locked States shall have the right of access to and from the sea for the purpose of exercising the rights provided for in this Convention including those relating to the freedom of the high seas and the common heritage of mankind. To this end, land-locked States shall enjoy freedom of transit through the territory of transit States by all means of transport.*
2. *The terms and modalities for exercising freedom of transit shall be agreed between the land-locked States and transit States concerned through bilateral, subregional or regional agreements.*
3. *Transit States, in the exercise of their full sovereignty over their territory, shall have the right to take all measures necessary to ensure that the rights and facilities provided for in this Part for land-locked States shall in no way infringe their legitimate interests.*

Additionally, the Convention on the Law of the Sea introduces language in Article 25 that gives transit countries the legal authority for interdicting cargo. Specifically, the coastal state (transit country) may "take the necessary steps in its territorial sea to prevent passage which is not innocent." This language could be used as a basis to learn more about shipments of controlled strategic goods.

This sub-criterion is of medium impact.

• **Interagency review required for licensing transfers of nuclear weapons-related materials<sup>13</sup>**

Legislation requiring interagency review for licenses and licensing regulations regarding "border crossings, export/import and other transfers" of nuclear weapons and related materials<sup>14</sup> ensures that they are consistent

and compatible across multiple agencies and that there are not duplicate policies that slow down or confuse the process. Countries with legislation that requires interagency review of licenses can better monitor licenses given out and nuclear-related trade in general. This is a medium-impact sub-criterion.

- **Level of state control of the economy**<sup>15</sup>

The Heritage Foundation's Index of Economic Freedom for 2020 measures the level of state control of the economy, or "economic freedom," based on 12 factors in four categories: Rule of Law (property rights, government integrity, judicial effectiveness); Government Size (government spending, tax burden, fiscal health); Regulatory Efficiency (business freedom, labor freedom, monetary freedom); and Open Markets (trade freedom, investment freedom, financial freedom). These pillars support an efficient and reliable trade control system. Since they support, but do not guarantee efficiency and reliability, this indicator was judged by the PPI as having a low impact on overall *Ability to Monitor and Detect Strategic Trade*.

- **Percentage of firms that export directly or indirectly**<sup>16</sup>

The percentage of firms that export directly and indirectly at least one tenth of their total sales is used as an indirect measure of a government's knowledge of its supply potential. A low percentage of firms that export more than ten percent of their total sales reduces the number of suppliers of potentially sensitive goods. This, in turn, may make it easier for the government to conduct industry outreach, as well as to detect and prevent the existence and activities of shell companies. Indirect exporting means that a firm uses a third party to sell its products. The firm has little to no involvement in the export process. Direct exporting means the firm sells and exports its product directly to a customer. In this case, the firm is responsible for exporting the product. This score measures the fraction of potential exporting suppliers in a country, where a low fraction is rewarded. This is a low-impact sub-criterion.

- **Registration is required for a company to export goods or to apply for an export license for controlled goods**<sup>17</sup>

A country may require registration before a company can make any exports, or at least, before it can apply for an export license. Such procedures help avoid the creation of shell companies and prevent illicit exports and

eventual transshipment of strategic goods. Ideally, the PPI sought to assign points only for countries that require a company to register specifically as a dual-use supplier. However, this information was difficult to find for many countries, and the registration as a dual-use supplier may occur later in the export registration or license application process. This is a low-impact sub-criterion.

- ***New: Country has a closed ship registry***<sup>18</sup>

Ship registries are important tools states use to monitor, tax, and regulate the ownership and registration of vessels. Ship registries can be open or closed. A closed registry requires the vessel and its principal owner to both be incorporated in the country of registration. Countries with an open registry enable any vessel, regardless of the original country of ownership, to be registered under that country's flag and to be assessed under that country's regulations and taxes. A business does not have to be incorporated in that country in order to qualify for the open registry. Open registries have been criticized for being "Flags of Convenience," (FOC) where businesses will register a vessel in that country because of its "cheap registration fees, low or no taxes, and freedom to employ cheap labor." Vessels registered in FOC states have been criticized for promoting poor vessel operating and safety standards. More than half of all current vessels registered are registered in FOC states. Many FOC vessels have been documented to have participated in illicit trade schemes. The International Transport Workers' Federation (ITF) Fair Practices Committee ("a joint committee of ITF seafarers' and dockers' unions") maintains a comprehensive list of all known FOC states. The list contains 35 countries.

This criterion assigns points to those countries that do not have an open registry. It is a medium-impact sub-criterion.

- ***New: Country has a Single Window system for trade facilitation (as a measure of interagency cooperation)***<sup>19</sup>

The United Nations Economic Commission for Europe (UNECE) defines a single window system as "a facility that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfill all import, export, and transit-related regulatory requirements."<sup>20</sup> Single Window systems have the capability to increase processing efficiency by reducing export/import administrative processing time drastically. It is important to note that having a Single Window

system does not necessarily imply enhanced export control capabilities for that country, however, it is a steppingstone towards a streamlined process and creates potential for important interagency cooperation.

The 2021 PPI collected data on whether a country has an operational Single Window system and assigned full points to those that did. This is a medium-impact sub-criterion.

- ***New Extra Credit: PSI ship boarding agreement***<sup>21</sup>

The Proliferation Security Initiative (PSI) is a tool used by the international community “to break up black markets, detect and intercept WMD materials in transit, and use financial tools to disrupt this dangerous trade.”<sup>22</sup> PSI member states are encouraged to sign bilateral agreements that enable states to interdict shipments that are suspected to carry biological, chemical, or nuclear materials or other illicit goods. Countries with active PSI ship-boarding agreements were deemed to demonstrate a strong commitment to nonproliferation and bilateral cooperation with states to detect and prevent illicit shipments. Due to the small number of countries that have entered this ship-boarding agreement, this sub-criterion is an extra credit opportunity. Countries with a PSI ship-boarding agreement received full extra credit points equivalent to a high-impact sub-criterion.

## IMPACT OF SUB-CRITERIA

The PPI assigned a low to high impact for weighting each of the sub-criteria. **Table 4.1** shows how each indicator was weighted in the evaluation and how much of an impact it therefore had on a country’s score and rank within the super criteria.

## SCORING

Of the 18 sub-criteria, three are considered low-impact, eleven medium-impact, and four high-impact. They are worth five, 10, and 15 points, respectively, leading to a total of 185 points under this super criterion. This raw score is used later to arrive at a total, weighted score and rank for each country. It is also used to derive a ranking for the country under the three tiers.

High-Impact (4)
Track & Trace Consignments
Physical Inspection of Imports
Multiple Inspections of Imports
Strength of Export Control Mechanisms per WCO data
Medium-Impact (11)
Automated Customs System
Ease of Starting Business
Customs Clearing Efficiency
Political Stability
State Works with Industry on Strategic Trade Control
State Works with the Public
State has Point of Contact
Landlocked States/Law of the Sea
<b>New:</b> Country Has Exclusively Closed Ship Registry
<b>New:</b> Single Window User
<b>Extra Credit:</b> New: PSI ship boarding agreements
Low-Impact (3)
State Control of Economy
Percentage of Firms that Export Directly or Indirectly (at least 10% of their total sales)
Registration Required for a Company to Export or to Apply for a License

**Table 4.1.** The impact of each sub-criterion under Super Criterion *Ability to Monitor and Detect Strategic Trade*.

## NOTES

1. Project staff considered additional sub-criteria but were unable to find enough information, so they were not included in scoring: 1) Existence of an export control fusion center or similar, which enables interagency cooperation in export control-related matters; 2) Licensing officials and authorities conduct industry outreach; 3) Level of customs awareness and involvement in strategic trade control; and 4) Existence of national databases containing cases of nuclear-related trafficking that were detected or prosecuted by authorities.
2. The 2021 PPI removed three indicators, “World Economic Forum Ranking,” “Logistics Performance Index Rank,” and “A low number of documents is required to import.” This edition of the PPI added two new sub-criteria: “Country has a closed ship registry” and “Country has a single window system as a measure for interagency cooperation.”
3. “Logistic Performance Index: 2018,” The World Bank, 2018, <https://lpi.worldbank.org/international/global/2018>. In cases where the 2018 LPI did not contain data on a specific country, data from the 2016 LPI were utilized.
4. Jean-Francois Arvis, Lauri Ojala, Christina Wiederer, et-al, “Connecting to Compete 2018 Trade Logistics in the Global Economy: The Logistics Performance Index and its Indicators,” The World Bank, 2018, <https://openknowledge.worldbank.org/bitstream/handle/10986/29971/LPI2018.pdf>; Jean-Francois Arvis, Daniel Saslavsky, Christina Wiederer, et-al, “Connecting to Compete 2016 Trade Logistics in the Global Economy: The Logistics Performance Index and its Indicators,” The World Bank, 2016, <https://lpi.worldbank.org/report>; “Customs Map Search,” *Global Express Association*, Category B, Customs Efficiency, Question 8, What is the primary basis of physical inspection of shipments?, <https://global-express.org/index.php?id=904>.
5. Jean-Francois Arvis, Lauri Ojala, Christina Wiederer, et-al, “Connecting to Compete 2018 Trade Logistics in the Global Economy: The Logistics Performance Index and its Indicators,” The World Bank, 2018, <https://openknowledge.worldbank.org/bitstream/handle/10986/29971/LPI2018.pdf>.
6. “Annual Report 2019–2020,” World Customs Organization, 2020, [http://www.wcoomd.org/-/media/wco/public/global/pdf/media/annual-reports/annual\\_report\\_2019\\_2020\\_en.pdf](http://www.wcoomd.org/-/media/wco/public/global/pdf/media/annual-reports/annual_report_2019_2020_en.pdf).
7. Individual internet searches; “User Countries,” *ASYCUDA*, 2020, <https://asycuda.org/user-countries/>; “WCO Annual Report 2019-2020,” World Customs Organization, 2020, <http://www.wcoomd.org/en/about-us/what-is-the-wco/annual-reports.aspx>.
8. “Starting a Business,” The World Bank, 2019, <http://www.doingbusiness.org/data/exploretopics/starting-a-business>.

9. “Logistic Performance Index: 2018: Customs,” The World Bank, 2018, <https://lpi.worldbank.org/international/global/2018>. “Customs” score of 2018: ”The efficiency of customs and border management clearance.” In previous PPI editions, the data were drawn from the World Economic Forum’s “Global Enabling Trade Report,” which has since been discontinued.
10. “Worldwide Governance Indicators,” The World Bank, 2018, <http://databank.worldbank.org/data/reports.aspx?source=worldwide-governance-indicators>.
11. Individual internet searches; “Committee Approved Matrices Row 7 of Tables 6, 7 and 8(d),” *United Nations Security Council Committee established pursuant to resolution 1540 (2004)*, <https://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>; “National Reports,” *United Nations Security Council Committee established pursuant to resolution 1540 (2004)*, <https://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>.
12. “Convention on Transit Trade of Land-locked States,” *United Nations*, 2020, [https://treaties.un.org/pages/viewdetails.aspx?src=treaty&mtdsg\\_no=x-3&chapter=10&lang=en](https://treaties.un.org/pages/viewdetails.aspx?src=treaty&mtdsg_no=x-3&chapter=10&lang=en); “Convention on the Law of the Sea,” *United Nations*, 2020, [https://treaties.un.org/pages/ViewDetailsIII.aspx?src=IND&mtdsg\\_no=XXI-6&chapter=21&Temp=mtdsg3&clang=\\_en](https://treaties.un.org/pages/ViewDetailsIII.aspx?src=IND&mtdsg_no=XXI-6&chapter=21&Temp=mtdsg3&clang=_en).
13. “Committee Approved Matrices: Table OP 3c and d, row 12,” *United Nations Security Council Committee established pursuant to resolution 1540 (2004)*, 2015, <http://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>. Of note, the corresponding cell is missing in the consolidated committee-approved matrices for 2020. Information supplementing the 2015 matrices was obtained directly from National Reports.
14. The UN 1540 Committee defines “related materials” in the matrices as: “materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included on national control lists, which could be used for the design, development, production or use of nuclear, chemical and biological weapons and their means of delivery.” See also Section IV, Chapter 16, for recommendations to the UNSCR 1540 Committee.
15. “2020 Index of Economic Freedom,” The Heritage Foundation, 2020, <https://www.heritage.org/index/ranking>.
16. “Enterprise Survey: Trade,” The World Bank, 2020, <https://www.enterprisesurveys.org/en/data/exploretopics/trade#—1>.
17. Individual internet searches.
18. “ITF Seafarers: Current registries listed as FOCs,” International Transport Workers’ Federation, 2019, <https://www.itfseafarers.org/en/focs/current-registries-listed-as-focs>.
19. Individual internet research.

20. “Trade Facilitation Implementation Guide: The Single Window Concept.” *United Nations Economic Commission for Europe* (UNECE), 2020, <http://tfig.unece.org/contents/single-window-for-trade.htm>.

21. “About Proliferation Security Initiative,” *United States Department of State*, 2020, <https://www.state.gov/about-the-proliferation-security-initiative/>.

22. “About Proliferation Security Initiative.”

# CHAPTER 5

## SUPER CRITERION ABILITY TO PREVENT PROLIFERATION FINANCING

**Super Criterion Ability to Prevent Proliferation Financing** evaluates a country's ability to prevent the raising and using of funds for WMD proliferation, encompassing a relatively new approach to detecting and preventing strategic commodity trafficking. Overall, international effort devoted to assessing and countering proliferation financing is slowly increasing. Moreover, states are increasingly accepting proliferation financing as a key part of strategic trade controls. This is visible in an initiative by the Australia Group to add proliferation financing to its agenda in the 2019 Australia Group Plenary conference,<sup>1</sup> in the inclusion of proliferation financing in the 2019 EU Export Control Forum, and in proliferation financing becoming a new priority in bilateral export control related trainings.

This super criterion mainly uses evaluations conducted by the Financial Action Task Force (FATF), the major international organization seeking to establish standards and assess efforts at preventing money laundering and other financial crime. In the PPI sub-criteria development process, experts with knowledge of proliferation financing advised the project on the most relevant FATF-collected data and ways to extrapolate proliferation financing data from broader FATF reporting. In addition to FATF data, the super criterion *Ability to Prevent Proliferation Financing*

utilizes measures and information about countries' susceptibility to being exploited or involved in proliferation financing, such as the prevalence of corruption or the size of a country's trade value gap. Of note, this super criterion is the one under which countries collectively performed the worst.

This super criterion first *assigns* points to countries based on sub-criteria derived mostly from the FATF determinations. These sub-criteria assess countries' theoretical capabilities to prevent proliferation financing and financial crime more generally based on their financial regulatory systems and counter-illicit financing programs. These thirteen sub-criteria are characterized as "positive indicators." The PPI then *takes away* points according to five "negative indicator" sub-criteria, or concrete information and examples of poor controls, such as when countries are known to have been hubs for money laundering or have entities on the U.S. Treasury Department's Office of Foreign Assets Control (OFAC) List of Specially Designated Nationals and Blocked Persons (SDN). The positive and negative indicators are assigned a low, medium, or high impact for scoring purposes. The project next assigns or takes away available "extra credit" points according to three other FATF-related sub-criteria. Finally, the judgment of experts in proliferation financing who were consulted for the PPI is used to take away or assign points based on their knowledge of proliferation financing in certain countries. This super criterion contains a total of 22 sub-criteria, of which 13 are positive, five are negative, three are extra-credit opportunities, and one is an expert judgment. Of the 13 positive sub-criteria, one is considered low-impact, ten are medium-impact, and two are high-impact. They are worth 5, 10, and 15 points, respectively. Absent extra credit and expert knowledge points, a country could receive a total of 135 points under this super criterion. This raw score is used later to arrive at a total, weighted PPI score out of 400 possible points and a rank for each country. It is also used to derive a ranking for the country under the three tiers.

Because there remain relatively few independent, direct measures of the capabilities of countries to prevent proliferation financing, the PPI continues to rely heavily on FATF evaluations, including drawing relevant proliferation financing information from more general FATF data. FATF, however, added language on proliferation financing in 2012, but only to two out of forty FATF recommendations (and to an additional one in

October 2020.)<sup>2</sup> The recent FATF evaluations, based on the modified 2012 and later recommendations, include evaluations of a country's theoretical ability to implement international financial sanctions and of the effectiveness of its controls against those countries under international financial sanctions, including investigation and enforcement actions. A limitation is that not all countries have yet undergone a FATF mutual evaluation process since the 2012 recommendations were introduced. Therefore, to avoid penalizing those states which are still in the process of conducting a post-2012 evaluation report, these evaluation data were used in the PPI as extra credit information.

## **POSITIVE INDICATORS<sup>3,4</sup>**

- Compliance with selected FATF recommendations. The FATF provides the most data regarding a country's banking regulations and practices. The FATF's objectives are to set standards and promote effective implementation of legal, regulatory, and operational measures for combating money laundering, terrorist financing, and other related threats to the integrity of the international financial system. It publishes a periodically updated set of recommendations that all member countries should follow to prevent financial crimes and subsequently publishes evaluations of individual countries' compliance with each of those recommendations. Evaluations are conducted by the FATF or its regional bodies and are titled "Mutual Evaluation Reports." For each recommendation, potential deficiencies are listed, and a final conclusion is drawn, which can be that the country is Not Compliant, Partially Compliant, Largely Compliant, or Compliant with the specific recommendation. With the emergence of additional threats to the international financial system, including terrorist financing, and subsequently proliferation financing, the FATF recognized the need to update its recommendations in 2003, and again in 2012. The 2003 guidelines versus the 2012 guidelines often number their recommendations differently, and as a result, the PPI lists a recommendation and its associated year, such as FATF Recommendation 2 (2012), meaning it is the one from the 2012 guidelines. As of August 2020, 96 countries have undergone an evaluation based on the 2012 standards.<sup>5</sup> To establish common ground between countries that have undergone a FATF evaluation before and after 2012, the PPI took into consideration recommendations

found in both the new and old guidelines, and used data only found in the new round of evaluations for the extra credit indicators. The following FATF recommendations (FATF R.'s) have been carefully evaluated and selected by consulting financing of proliferation experts as most relevant to preventing proliferation financing, based on their experience with what governments need the most to prevent this illicit activity<sup>6</sup>:

- **FATF Recommendation 2 (2012) 31 (2003) National Coordination**<sup>7,8</sup>: “Countries should have national [anti-money laundering/counter-terrorist financing] policies [...]. Countries should ensure that [...] relevant competent authorities, at the policymaking and operational levels, have effective mechanisms in place which enable them to cooperate, and, where appropriate, coordinate domestically with each other concerning the development and implementation of policies and activities to combat money laundering, terrorist financing and the financing of proliferation of weapons of mass destruction.” This is a high-impact indicator.
- **FATF Recommendation 40 (2012 and 2003) International Cooperation / Other Forms of Cooperation**:<sup>9</sup> “Countries should ensure that their competent authorities can rapidly, constructively, and effectively provide the widest range of international cooperation in relation to money laundering, associated predicate offences and terrorist financing.” This is a high-impact sub-criterion.
- **FATF Recommendation 10 (2012) 5 (2003) Customer Due Diligence (CDD)**:<sup>10</sup> “Financial institutions should be prohibited from keeping anonymous accounts or accounts in obviously fictitious names. [...] The principle that financial institutions should conduct CDD should be set out in law. [...] Financial institutions should be required to verify the identity of the customer and beneficial owner before or during the course of establishing a business relationship or conducting transactions for occasional customers.” This is a medium-impact indicator.
- **FATF Recommendation 13 (2012) 7 (2003) Correspondent Banking**:<sup>11</sup> Financial institutions should collect additional information before conducting cross-border correspondent banking, and they “should be prohibited from entering into,

or continuing, a correspondent banking relationship with shell banks.” It is a medium-impact sub-criterion.

- **FATF Recommendation 26 (2012) 23 (2003) Regulation and Supervision:**<sup>12</sup> Financial institutions should be licensed, registered, regulated, and subject to monitoring. “[...] Countries should not approve the establishment, or continued operation, of shell banks.” This is a medium-impact sub-criterion.
- **FATF Recommendation 30 (2012) 27 (2003) Law Enforcement Responsibilities:**<sup>13</sup> “Countries should ensure that designated law enforcement authorities have responsibility for money laundering and terrorist financing investigations [...]” This is a low-impact indicator.

The PPI assigned up to 65 raw points based on country compliance with this selected set of FATF recommendations, which encapsulate critical elements or essential features of a system that prevents proliferation financing.

#### • **Low Trade-Related Illicit Financial Flows Identified**<sup>14</sup>

This indicator, formerly titled “Low average illicit financial outflows as percentage of total trade,” measures the sum of the value gaps identified between a developing country and all of its trading partners in 2017. A value gap represents a mismatch in reported bilateral trade data to UN Comtrade. For example, if country X reports exporting USD 10 million of goods to country Y, but country Y only reports receiving USD 5 million of goods from country X, then there is a value gap of USD 5 million. Data for 135 developing countries are collected and published by Global Financial Integrity (GFI).

Countries with a lower total trade value gap were awarded more points. The 2021 PPI assigned points based on the rank of a country in relation to all other countries included in the GFI report. This sub-criterion measures one aspect of the inadequacy of national financial oversight and is indirectly related to proliferation financing. It is deemed a medium-impact sub-criterion.

• **Country has FATF or FATF Regional Body Membership<sup>15</sup>**

The FATF has established eight regional bodies to promote global dissemination and coordination to promote better understanding and implementation of its international standards, as highlighted in the FATF 40 (49 for post-2003) recommendations. Most countries are either FATF members or members of a FATF-style regional body. Some are members of both. The level of organization and dynamic varies within the different groups. Before being able to become a FATF member, countries undergo a rigorous review process. Full points are awarded to countries that are members of both FATF and a FATF-style regional body, as this demonstrates a level of commitment on a regional and global level. The regional bodies are:

- The Eurasian Group (EAG)
- Asia/Pacific Group (APG)
- Caribbean Financial Action Task Force (CFATF)
- Committee of Experts on the Evaluation of Anti-Money Laundering Measures and the Financing of Terrorism of the Council of Europe (MONEYVAL)
- Eastern and Southern Africa Anti-Money Laundering Group (ESAAMLG)
- Financial Action Task Force on Latin America (GAFILAT)
- Intergovernmental Action group Against Money Laundering in West Africa (GIABA)
- Middle East and North Africa Financial Action Task Force (MENAFATF)
- The Task Force on Money Laundering in Central Africa (GABAC)

This is a medium-impact indicator.

• **FATF compliance score<sup>16</sup>**

The FATF compliance score is available for 133 jurisdictions (118 of which are evaluated by the PPI) on the 2020 Financial Secrecy Index (FSI), published by the Tax Justice Network. In the FSI, FATF compliance is indicator 17, “Anti-Money Laundering.” According to the FSI report, compliance with all available recommendations (49 recommendations post-2003, or 40 recommendations plus 11 Immediate Outcomes

post-2012) was calculated as a percentage of non-compliance with the recommendations, where a 100 percent score rating “indicates that all recommendations have been rated as ‘non-compliant’ or ‘low level of effectiveness,’” whereas a 0 percent rating “indicates that the jurisdiction is ‘entirely compliant/highly effective.’”<sup>17</sup> In line with this, the PPI assigned points inversely proportional to a country’s percentage score. Working with FATF to comply with general recommendations by implementing regulations and best practices is the first step for a country to prove its full commitment to financial transparency and anti-money laundering efforts. Despite some degree of duplication with the FATF recommendations above, this is a good indicator of general ability to prevent financial crimes. This is a medium-impact indicator.

- **Public Registry of Company Beneficial Ownership**<sup>18</sup>

Having a public registry of companies and their beneficial ownership helps ensure that front companies and shell companies cannot exist and operate. Transparency is important in countering proliferation, and therefore beneficial ownership information should be made public. Not many countries have a public registry of companies, but several countries have an internal list for law enforcement and other purposes. Recent developments include the European Union’s new anti-money laundering requirements, obligating its member states to collect information on the beneficial ownership of corporate entities and establish a registry where the information will be deposited. A free and publicly accessible beneficial ownership registry served as the ideal standard; however, states also received points if the registry was limited to “legitimate interest parties” or if access was blocked behind a paywall. This is a medium-impact sub-criterion.

- **Member of the Egmont Group**<sup>19</sup>

The Egmont Group works to prevent money laundering and terrorist financing by providing a secure space for the exchange of financial intelligence. It is made up of 165 “Financial Intelligence Units” from various countries. It works to support the international efforts of the UN Security Council and FATF at combatting money laundering and terrorist financing. This is a medium-impact sub-criterion.

- **New: Financial intelligence units (FIU) websites or annual report mentions proliferation<sup>20</sup>**

Financial intelligence units, as collectors of analysis of information relevant to financial crimes, are the natural responsible party to gather information on proliferation financing activities. While many states have FIUs, their involvement in counter-proliferation varies. The PPI assessed countries' most recent FIU annual reports, and if unavailable, the FIU's website, to determine if counter-proliferation measures were addressed. For example, points were assigned if the country has conducted, participated in, or trained in any counter-proliferation finance activities. In some cases, FIUs were contacted directly via email to obtain information. The impact of the criteria is medium.

- **New: FATF MER references 1540 resolution<sup>21</sup>**

Mutual Evaluation Reports (MER) are peer-reviewed assessments conducted by the Financial Action Task Force (FATF) and FATF-style regional bodies. The goal of a MER is to evaluate the progress made by states in implementing FATF recommendations and to analyze a state's system to prevent financial crimes. This sub-criterion evaluated a country's MER and its respective follow-up report (if available) to determine if 1540 resolution measures are included. References to the 1540 resolution demonstrate that a state is actively considering or acting to implement the resolution. MER or MER follow-up reports that did include information pertaining to the UNSCR 1540 received full points. This is a medium-impact sub-criterion.

## **NEGATIVE INDICATORS**

Because the number of positive sub-criteria based on FATF information is relatively low and FATF information is not complete, an additional set of negative indicators was added to more effectively rank countries under this super criterion. These sub-criteria focus on negative outcomes, such as having significant trade-related illicit financial flows, countries identified by governments as posing financial risk, or countries having sanctioned entities. A negative sub-criterion means that points are subtracted instead of added. Ten or 15 points are subtracted for a negative performance under these indicators since they are all medium or high impact.

- **Presence of denied parties by United States<sup>22</sup>**

Countries with entities on the U.S. Office of Foreign Assets Control (OFAC) Specially Designated Nationals and Blocked Persons (SDN) List likely failed to detect illicit activity until after it occurred. While entities are added as a penalty for a range of U.S. foreign policy and national security reasons, entities on the list include, among others, “those engaged in activities related to the proliferation of weapons of mass destruction.”<sup>23</sup> It is measured as a negative indicator with high impact, since it indicates actual instances where illicit activities have been detected.

- **Appearance on the 2020 State Department published list of countries posing money laundering and financial crime concerns<sup>24</sup>**

The State Department Bureau for International Narcotics and Law Enforcement Affairs identified in its March 2020 report “Countries/Jurisdictions of Primary Concern” for “Money Laundering and Financial Crimes.” Using country profiles, the report points out weaknesses in those countries’ enforcement or justice systems which pose challenges to the implementation of financial regulations. Examples of observed implementation challenges include “limited resources, lack of technical expertise, and poor infrastructure” as well as “administrative hurdles” and “corruption.” This sub-criterion has a medium impact.

- **Significant trade-related illicit financial flows<sup>25</sup>**

This indicator, formerly named “Significant average illicit financial outflows as percentage of total trade,” used data collected and published by Global Financial Integrity (GFI) measuring total trade value gap as a percentage of total trade data between developing countries and all trade partners over the period 2008-2017. A value gap represents a mismatch in reported trade data. For example, if county X reported exporting US\$15 million of goods to county Y, but country Y only reported receiving US\$10 million of goods from country X, then there is a value gap of US\$5 million. The 2021 PPI deducted points from the top ten countries with the largest total trade value gaps percentagewise and absolute, as identified by GFI. Data are only collected for developing countries; countries not included by GFI cannot be rewarded in the positive criterion, but also not penalized in the negative criterion. Beneficial for the PPI is that this

criterion aids in setting apart developing countries that otherwise cluster together in the PPI final scores. It is a medium-impact indicator.

- **Influence of corruption**<sup>26</sup>

Corruption can interfere significantly in the implementation of financial controls and their implementation. Companies engaged in exporting may ignore any legal export or financial requirements if they believe there is little likelihood of being investigated or prosecuted. Corruption would likely inhibit strong financial controls and enforcement. For this sub-criterion, the 2019 Global Corruption Index is used as a measure for corruption in 195 countries. This index was selected from a variety of corruption measures and indices, mainly because this index lists the most countries among the alternatives to the popular Corruption Perceptions Index, which is used in the *Enforcement* super criterion. The points in this sub-criterion were deducted in an inversely proportional way to their relative rank, where rank 1 got 0 points deducted. If the country or entity did not appear on the index, it was not deducted any points. This sub-criterion has a medium impact.

- ***New Negative Indicator: Country is on a monitored jurisdiction list (FATF or EU)***<sup>27</sup>

The 2021 PPI deducted points from states that appeared on the following lists: the FATF “Jurisdictions under Increased Monitoring (2020),” the FATF “High-Risk and Other Monitored Jurisdictions (2020),” and the European Union “High-Risk Third Countries.” Appearing on any of these lists indicates that a state is deficient in its capabilities to prevent financial crime and therefore at risk for illicit actors and other groups to utilize for proliferation financing purposes, requiring extra vigilance by international authorities and competent organizations.

## “EXTRA CREDIT” OPPORTUNITIES

For the 96 countries that were evaluated according to post-2012 FATF standards, the PPI offered three “extra credit opportunities,” which allowed for the addition (or in a few cases the subtraction) of points. Information on those countries is included in the PPI scoring because the 2012 standards are of higher relevance than the previous sets of recommendations. For the first time, a recommendation specifically addresses a country’s

ability to implement targeted financial sanctions related to proliferation as laid out under relevant UN Security Council resolutions. Because of the direct relevance and importance of these post-2012 evaluations, the PPI adjusted its methodology to include the data in a way that did not punish the other 104 countries. Therefore, the above-mentioned 96 countries were able to obtain extra points (or suffer subtractions) on top of the 135 total possible unweighted or 400 total possible weighted points.

## **EXTRA CREDIT INDICATORS:**

- **Compliant or largely compliant with FATF Recommendation 7 (2012)**<sup>28</sup>

FATF Recommendation 7 (2012) refers to implementation of targeted financial sanctions related to proliferation. It states, “Countries should implement targeted financial sanctions to comply with United Nations Security Council resolutions relating to the prevention, suppression and disruption of proliferation of weapons of mass destruction and its financing. These resolutions require countries to freeze without delay the funds or other assets of, and to ensure that no funds and other assets are made available, directly or indirectly, to or for the benefit of, any person or entity designated by, or under the authority of, the United Nations Security Council under Chapter VII of the Charter of the United Nations.” A largely compliant (LC) or compliant (C) score for Recommendation 7 would allow a country to receive five (LC) or ten (C) additional points, respectively. Non-compliant countries had ten points deducted.

- **FATF Immediate Outcome (IO) 11: Proliferation financial sanctions**<sup>29</sup>

Immediate Outcome 11 states, “Persons and entities involved in the proliferation of weapons of mass destruction are prevented from raising, moving and using funds, consistent with the relevant UNSCRs.” As such, IO 11 also refers to implementation of targeted financial sanctions related to proliferation. IO 11 is measured in terms of a low, moderate, substantial, or high level of effectiveness, where a country only received points for “substantial” or “high.” Examples of outcomes evaluated by the FATF are concrete actions that have been taken, including investigations and prosecutions relating to sanctions. A substantial or high rating for IO 11

allows a country to gain five or ten points, respectively. Five points were deducted if a country achieved a rating of “low” effectiveness. Of note, in all currently available mutual evaluation reports including IO 11, only two countries have received a “high” rating.

- **Effectiveness of National Coordination: FATF Immediate Outcome 1 (IO 1)**<sup>30</sup>

FATF Immediate Outcome 1 requires, “[...] where appropriate, actions [are] coordinated domestically to combat money laundering and the financing of terrorism and proliferation.” The creation or involvement of relevant authorities, assessment of necessary policies, implementation of said policies, and cooperation between any and all relevant authorities are necessary to combat those three types of financial crime. IO 1 is measured in terms of low, moderate, substantial, or high effectiveness. This sub-criterion is extra credit as well as a penalty. Five points were given if a country achieved “substantial” and 10 points for “high” effectiveness, but five points were deducted if a country achieved “low” effectiveness. Of note, in all currently available mutual evaluation reports including IO 1, only one country has received a “high” rating.

## EXPERT JUDGMENT

One final modification to the super criterion score resulted from extensive expert discussions. The PPI considered the fact that there may be missing data relevant to the sub-criteria and experts often have the best, first-hand information about a country performing significantly better or worse than scored. In some cases, experts judged that a country had received too many or too few points based on specific knowledge and information about that country. Thirteen countries were affected by this evaluation.

## IMPACT AND FLOW CHART OF SUB-CRITERIA

The PPI assigned a low to high impact for weighting each of the positive and negative sub-criteria. **Table 5.1** shows how each indicator was weighted in the evaluation and how much of an impact it therefore had on a country’s score and rank within the super criteria. The steps of the process are indicated in the flow chart where negative indicators take away

points, extra credit takes away or adds points, and expert judgment is factored in.

## SCORING

The *Ability to Prevent Proliferation Financing* super criterion incorporates 13 positive sub-criteria, five negative sub-criteria, three extra credit opportunities, and finally expert judgment, where countries could receive or lose additional points. The positive and negative sub-criteria are evaluated in terms of low, medium, or high impact. Of the 13 positive sub-criteria, one is considered low-impact, ten are medium-impact, and two are high-impact. They are worth five, 10, and 15 points, respectively. Of the five negative sub-criteria, four are medium-impact and one is high-impact. Absent extra credit and expert knowledge points, a country could receive a total of 135 unweighted points under this super criterion. This raw score is used later to arrive at a total, weighted score and rank for each country. It is also used to derive a ranking for the country under the three tiers.

The pie chart below (Figure 5.1) shows the fraction of countries that have scores exceeding fifty percent of the total, between fifty percent and twenty five percent of the total, less than 25 percent down to a score of 0, and below a score of 0. Thirty-five countries achieved more than half of the available points, while twenty-eight countries received negative scores. Sixty-five countries received a new FATF mutual evaluation report since the 2017 PPI, and thirty-five since the 2019 PPI, which can be a significant source of new PPI points.

## OBSERVATIONS

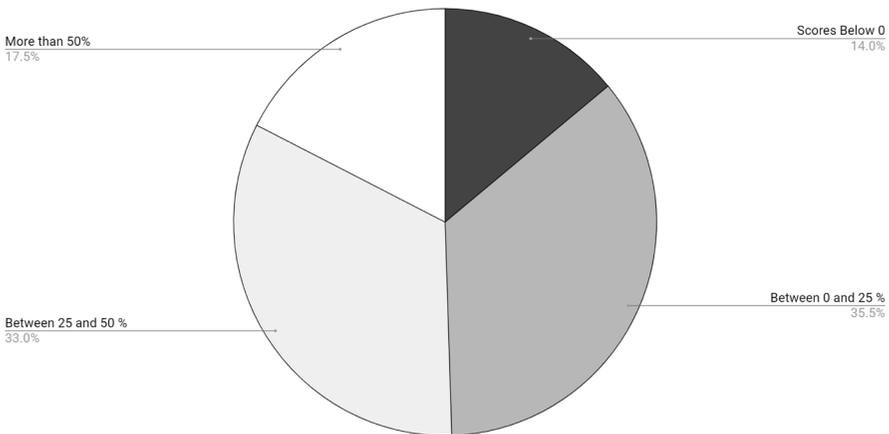
During the initial vetting process for the proliferation financing sub-criteria, the PPI noted that, for an accurate ranking, it cannot rely only on data extracted from FATF mutual evaluation reports. The PPI found that the way compliance judgments are made is not standardized throughout the regional FATF bodies. While some FATF bodies appear very strict and require that all deficiencies are removed before awarding a country with the two highest levels of compliance (largely compliant and compliant), other evaluating bodies seem to be more generous in assigning compliance levels. For example, the PPI found that the European regional FATF

body tended to be harsher in its assessments. The CFATF, or Caribbean regional body, and GAFILAT, or Latin American regional body, seemed more generous in their assessments.<sup>31</sup>

Additionally, compliance judgments published in follow-up FATF reports, for example, are derived based on a less rigorous evaluation process than the full reports. In follow-up reports, self-reporting plays a much greater role.<sup>32</sup>

Through PPI research and consulting with experts, an overriding conclusion is that most countries do not do well on preventing proliferation financing, including countries that are otherwise widely considered to have some of the best export control systems. Several of the usual “white knights” do poorly due to having excessive bank secrecy, providing tax havens, and being places where front companies find it easier to finance nefarious activities. Other countries simply lack regulations and effective institutions.

2021 Countries' score distribution in Super Criterion Ability to Prevent FoP



**Figure 5.1.** The pie chart shows the score distribution of countries in their Ability to Prevent Proliferation Financing. Nearly half the countries score less than 25 percent of the available points.

SUPER CRITERION ABILITY TO PREVENT PROLIFERATION FINANCING

High Impact (2)	Medium Impact (10)	Low Impact (1)
<b>Positive Indicators</b>		
FATF R: National Coordination	FATF R: Customer Due Diligence	FATF R: Law Enforcement Responsibilities
FATF R: International Cooperation	FATF R: Correspondent Banking	
	FATF R: Regulation and Supervision	
	Low Trade-Related Illicit Financial Flows Identified	
	FATF Compliance Score	
	FATF/Regional Body Member	
	Member of Egmont Group	
	Public Registry of Company Beneficial Ownership	
	<b>New:</b> FIU Website or Annual Report Mentions Proliferation	
	<b>New:</b> FATF MER References 1540 Resolution	
<b>Negative Indicators</b>		
Denied Parties by the U.S. and EU	2020 State Department List of Countries Posing Money Laundering and Financial Crime Concerns	
	Influence of Corruption	
	Significant Trade-Related Illicit Financial Flows	
	<b>New:</b> Country is on Monitored Jurisdiction List (FATF or EU)	
<b>Extra Credit</b>		
	FATF Recommendation 7 (2012)	
	FATF Immediate Outcome 1	
	FATF Immediate Outcome (IO) 11: Proliferation Financial Sanctions	
<b>Expert Judgement</b>		

**Table 5.1.** A flow chart with the assigned impacts for all sub-criteria for the Super Criterion *Ability to Prevent Proliferation Financing*.

## NOTES

1. “Statement by the Chair of the 2019 Australia Group Plenary,” Australia Group, 2019, <https://www.dfat.gov.au/publications/minisite/theaustraliagroupnet/site/en/2019-ag-plenary-statement.html>.

2. FATF Recommendations 2 and 7. A proliferation financing component was added to Recommendation 1 in October 2020.

3. Project staff considered an additional sub-criterion but were unable to find enough information, so it was not included in scoring: 1) Extent of training and knowledge of financial officials: Ideally, the PPI would measure whether a country has access to and participates in training and outreach programs relating to proliferation finance. However, information on this topic proved difficult to find. The U.S. State Department EXBS program has conducted bilateral training on countering proliferation financing. Bilateral trainings to prevent financial crimes in general are conducted by the United States Federal Reserve System, Department of Homeland Security, Department of Justice, Federal Bureau of Investigation, Department of State, and Department of Treasury.

4. The 2021 PPI removed two sub-criteria, “Unavailability of Trade Finance,” and “Worldwide Biggest Black Markets Ranking,” due to the discontinuity of the sources. This edition of the PPI added two new positive sub-criteria: “FIU website or annual report mentions proliferation,” and “FATF MER references 1540 resolution.” One negative sub-criterion was added: “Country is on a monitored jurisdiction list (FATF or EU).”

5. These 96 countries are: Albania, Andorra, Antigua and Barbuda, Armenia, Australia, Austria, Bahamas, Bahrain, Bangladesh, Barbados, Belgium, Bhutan, Botswana, Cambodia, Canada, Cape Verde, China, Colombia, Cook Islands, Costa Rica, Cuba, Cyprus, Czech Republic, Denmark, Dominican Republic, Ethiopia, Fiji, Finland, Ghana, Greece, Guatemala, Haiti, Honduras, Hong Kong, Hungary, Iceland, Indonesia, Ireland, Israel, Italy, Jamaica, Jordan, Kyrgyzstan, Latvia, Lithuania, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mauritius, Mexico, Moldova (Republic of), Mongolia, Morocco, Myanmar, Nicaragua, Norway, Pakistan, Palau, Panama, Peru, Philippines, Portugal, Republic of Korea, Russian Federation, Samoa, Saudi Arabia, Senegal, Serbia, Seychelles, Singapore, Slovenia, Solomon Island, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tajikistan, Thailand, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, UK, US, Uruguay, Vanuatu, Zambia, and Zimbabwe.

6. For the full text of recommendations see: FATF, *International Standards on Combating Money Laundering and the Financing of Terrorism and Proliferation—The FATF Recommendations*, Paris, France, published February 2012, updated October 2016, [http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF\\_Recommendations.pdf](http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf).

7. This formulation reflects the fact that Recommendation 2 in 2012 standards is the equivalent of Recommendation 31 in 2003 standards.

8. “Consolidate Assessment Ratings, 4th Round Ratings, FATF Recommendations 2012: R.2.,” Financial Action Task Force, 2012, <https://www.fatf-gafi.org/publications/mutualevaluations/documents/assessment-ratings.html>.
9. “Consolidate Assessment Ratings, 4th Round Ratings, FATF Recommendations 2012: R.40.,” Financial Action Task Force, 2012, <https://www.fatf-gafi.org/publications/mutualevaluations/documents/assessment-ratings.html>.
10. “Consolidate Assessment Ratings, 4th Round Ratings, FATF Recommendations 2012: R.10.,” Financial Action Task Force, 2012, <https://www.fatf-gafi.org/publications/mutualevaluations/documents/assessment-ratings.html>.
11. “Consolidate Assessment Ratings, 4th Round Ratings, FATF Recommendations 2012: R.13.,” Financial Action Task Force, 2012, <https://www.fatf-gafi.org/publications/mutualevaluations/documents/assessment-ratings.html>.
12. “Consolidate Assessment Ratings, 4th Round Ratings, FATF Recommendations 2012: R.26.,” Financial Action Task Force, 2012, <https://www.fatf-gafi.org/publications/mutualevaluations/documents/assessment-ratings.html>.
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15. “FATF Countries: Find a Country,” Financial Action Task Force, 2020, <https://www.fatf-gafi.org/countries/>.
16. “Financial Secrecy Index 2020 Methodology: Annex C, KI 17,” Tax Justice Network, 2020, <https://fsi.taxjustice.net/PDF/FSI-Methodology.pdf>.
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18. Individual internet research. The following sources were helpful: “Anti-corruption pledge tracker 2020,” Transparency International UK, 2020, <https://www.anticorruptionpledgetracker.com/>; “Financial Secrecy Index Database: Country Profiles,” Tax Justice Network, 2020, [https://fsi.taxjustice.net/database/dbr\\_Jurisdiction.php?Juris=DZ&Per=20](https://fsi.taxjustice.net/database/dbr_Jurisdiction.php?Juris=DZ&Per=20); “Ultimate Beneficial Ownership,” *ACAMS Today*, 2017, <https://www.acamstoday.org/ultimate-beneficial-ownership/>; “Disclosure of Beneficial Ownership in Selected Countries,” Library of Congress, 2017, <https://www.loc.gov/law/help/beneficial-ownership/disclosure-beneficial-ownership.pdf>; “Commitments on Beneficial Ownership Transparency at Anti-Corruption Summit,” *Wilton Park UK*, 2016, <https://www.wiltonpark.org.uk/wp-content/uploads/WP1502-Comments-on-beneficial-ownership-transparency-and-open-contracting-and-public-procurement-at-Anti-Corruption-Summit.pdf>.

19. “List of Members,” Egmont Group, 2020, <https://egmontgroup.org/en/membership/list>.
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21. Individual research and analysis of Mutual Evaluation Reports (MER).
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25. “Trade Related Illicit Financial Flows in 135 Developing Countries: 2008-2017,” *Global Financial Integrity*, *March 3*, 2020, <https://gfin integrity.org/report/trade-related-illicit-financial-flows-in-135-developing-countries-2008-2017/>.
26. “Global Corruption Index,” *Global Risk Profile*, 2019, <https://risk-indexes.com/global-corruption-index/>. PPI entities for which a rank was not available: Andorra, Holy See, Monaco, Palestine, San Marino.
27. “Jurisdictions under Increased Monitoring–30 June 2020,” *Financial Action Task Force*, June 30, 2020, <http://www.fatf-gafi.org/publications/high-risk-and-other-monitored-jurisdictions/documents/increased-monitoring-june-2020.html>; “High-Risk and Other Monitored Jurisdictions,” *Financial Action Task Force*, 2020, <http://www.fatf-gafi.org/countries/#high-risk>; “New Delegated Act on High-Risk Third Countries,” *European Commission*, May 7, 2020, [https://ec.europa.eu/info/business-economy-euro/banking-and-finance/financial-supervision-and-risk-management/anti-money-laundering-and-counter-terrorist-financing/eu-policy-high-risk-third-countries\\_en](https://ec.europa.eu/info/business-economy-euro/banking-and-finance/financial-supervision-and-risk-management/anti-money-laundering-and-counter-terrorist-financing/eu-policy-high-risk-third-countries_en).
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32. See Organisation for Economic Co-operation and Development, Annex 2. A1, “A Note on FATF Data,” *Illicit Financial Flows from Developing Countries: Measuring OECD Responses*, 2014, [https://www.oecd.org/corruption/Illicit\\_Financial\\_Flows\\_from\\_Developing\\_Countries.pdf](https://www.oecd.org/corruption/Illicit_Financial_Flows_from_Developing_Countries.pdf).



# CHAPTER 6

## SUPER CRITERION ADEQUACY OF ENFORCEMENT

**Super Criterion Adequacy of Enforcement** assesses the adequacy of a state's enforcement activities or efforts against strategic commodity trafficking. It assesses a range of 28 sub-criteria, including the national legal basis to act to penalize strategic commodity trafficking. The *Enforcement* super criterion also assesses participation or lack thereof in applicable treaties, cooperation with countries that are strong on enforcement, and participation in foreign trainings and outreach. It factors in issues that could inhibit enforcement. Of the 23 positive sub-criteria, eight are considered low-impact, eleven are medium-impact, and four are high-impact. They are worth five, 10, and 15 points, respectively. In five negative sub-criteria, points are subtracted from countries. For example, point deductions were made if a country was involved in violations of international sanctions on North Korea, as documented by the UN Panel of Experts on North Korea, and analyzed by the Institute. Further, if there was a prevalence of expert opinions about government undermining of strategic trade controls and regime guidelines, points were subtracted, as well as for countries where enforcement is assessed to be affected by militia groups, corruption, and widespread organized crime. A country could receive up to 210 points under this super criterion. This raw score is used later to arrive at a total, weighted score of 400 possible points and a rank for each country. It is also used to derive a ranking for the country under the three tiers.

## SUB-CRITERIA<sup>1</sup>

- **Existence of legal basis or entity ensuring enforcement of the laws on transit of nuclear weapons and related materials<sup>2</sup>**

Data for this sub-criterion come from matrices developed by the oversight committee of UN Security Council Resolution 1540. The Committee provides information on the status of a country's implementation of this sub-criterion. Specifically, relevant data are from individual 1540 country matrices, namely Table OP 3 (c) and (d).<sup>3</sup> Just over half of all countries have reported to the Committee on this matter. Roughly 100 countries' reported enforcement mechanisms have been confirmed by the Committee.<sup>4</sup> This sub-criterion is judged as high-impact.

- **Existence of legal basis or entity ensuring transshipment law enforcement**

As above, these data are from the 1540 status of implementation matrix, namely Table OP 3 (c) and (d).<sup>5</sup> About 15 fewer countries have reported to the Committee in this sub-criterion than the above one, despite many countries referencing the same piece of legislation in both sub-criteria. Roughly half of all countries have reported some data to the Committee for this sub-criterion, and 73 countries' reported enforcement mechanisms have been confirmed by the Committee. In some cases, PPI research revealed that other countries met this sub-criterion but had not reported that fact to the Committee. This sub-criterion is judged as high-impact.

- **Participant in international legal assistance mechanisms**

Countries that take advantage of existing international legal assistance mechanisms were awarded points. This is a high-impact indicator, as certain international assistance agreements are considered especially effective by the PPI.

The international legal assistance mechanisms considered are:

1. Customs Mutual Assistance Agreements, a bilateral agreement with the United States;<sup>6</sup>
2. Nairobi Convention, a WCO legally binding convention on customs assistance;<sup>7</sup>
3. Program of Measures, EU countries only. The full name of the program is Programme of Measures to Implement the Principle of

Mutual Recognition of Decisions in Criminal Matters. It supports judicial cooperation within the European Union, facilitating investigations and prosecutions;<sup>8</sup>

4. Inter-American Convention on Mutual Assistance in Criminal Matters. States agree to “render to one another mutual assistance in investigations, prosecutions, and proceedings that pertain to crimes;”<sup>9</sup>
5. ASEAN Treaty on Mutual Assistance in Criminal Matters, which is similar to the Inter-American Convention above;<sup>10</sup> and
6. Mutual Legal Assistance (MLA) agreements with the United Kingdom.<sup>11</sup>

- **Ability to conduct investigations**

The World Justice Project scores countries’ ability to conduct investigations, a critical process for successful enforcement of national and international law. The results are part of the annual publication of the Rule of Law Index for 2020. The score is extracted from each country’s profile and can be found under Criminal Justice, indicator 8.1, “Effective investigations.”<sup>12</sup> It is considered a high-impact sub-criterion.

- **Has own sanctions list<sup>13</sup>**

This sub-criterion refers to a country having established its own nationally binding list of sanctioned persons, entities, and groups that are denied exports. EU countries without their own national list received half points for establishing the EU denied parties list, since it is difficult to determine which countries contribute most to administering and maintaining that list. Countries that enshrined the UN sanctions list into their national legislation also received points. This is a medium impact sub-criterion.

- **Party to the Arms Trade Treaty and brokering controls<sup>14</sup>**

The Arms Trade Treaty acts to control international trade in conventional weapons. Unlike most treaties, it has brokering controls. It requires parties of the treaty to establish stringent systems to control and monitor the “export, import, transit, trans-shipment and brokering” of conventional arms, which, if implemented, would have an overarching positive effect on a country’s general trade control. Although not specifically related to brokering for all strategic items, these controls indirectly indicate the ability of a country to control brokering. Countries with an implementation

record of the brokering provisions under the ATT received full points. Countries that ratified the ATT but have no public implementation record received half points. This is a medium impact sub-criterion.

- **Participates in foreign training and outreach on improving trade control efforts<sup>15</sup>**

Combating illicit trade is an international effort. Many countries that have been identified as lacking sufficient trade controls reach out to the international community for training and assistance with the goal of improving their practices. Different forms of training and outreach exist, many of which are facilitated by the 1540 Committee. Trainings range from hour-long online courses to week-long on-site drills and exercises. Since there is not necessarily a direct correlation of the amount of training received with enforcement effectiveness, points were only awarded for completion of specific sets of training programs. Points were awarded if a country participated in one or more key training programs that were deemed as the most effective and applicable to this sub-criterion. This sub-criterion has a medium impact in scoring.

- **Lack of influence of corruption**

Corruption can interfere significantly in the implementation of trade controls and their enforcement. Companies engaged in exporting may think they can simply ignore any legal export requirements if they believe there is little likelihood of being investigated or prosecuted. Corruption would likely inhibit strong enforcement, just as it does in countering the financing of proliferation, which is why a measure of corruption is also used in Super Criterion *Ability to Prevent Proliferation Financing*. This sub-criterion uses the 2019 Corruption Perceptions Index, or CPI, by Transparency International.<sup>16</sup> This index was selected from a variety of corruption measures and indices, mainly because this index lists the most countries and is widely respected. The PPI used the rank of a country in the CPI to assign points, rather than the score derived by Transparency International. The points in this sub-criterion were assigned in an inversely proportional way to their relative rank. If the country or entity did not appear on the CPI, it was not assigned points. This sub-criterion has a medium impact.

- **Member of Interpol<sup>17</sup>**

Cross-border investigations are crucial to preventing, detecting, and dismantling commodity trafficking and activities of their procurement networks. Interpol aims to “facilitate international police cooperation even where diplomatic relations do not exist between particular countries.” As such, being a member of Interpol is an indicator of a willingness and openness to prevent transnational crime such as import and export violations. As of the summer of 2020, 192 PPI entities had Interpol membership. It is a medium-impact sub-criterion.

- **Legal authority in place to conduct undercover investigations<sup>18</sup>**

The legal authority to conduct undercover operations to detect, arrest, and prosecute those involved in illicit exports or to stop trade control violations is important to enforcement efforts. The PPI assessed whether undercover police operations pertaining to money-laundering (ML), terrorist-financing (TF), trade violations, or corruption have a legal basis in a country. The 2019 PPI assessed countries on the basis that relevant laws provided legal authority explicitly to export control violations; however, the number of countries where relevant legislation was identified was small, and the 2021 PPI broadened the criteria to include legal authority to investigate ML, TF, corruption, and trade violations (including narcotics and cross-border operations). This is a medium-impact indicator.

- **Lack of parties on select United States and European Union screening lists<sup>19</sup>**

Many countries have individuals or companies listed on one of the following screening and sanctions lists: U.S. Commerce Department Bureau of Industry and Security (BIS) Entity List, State Department Bureau of International Security and Nonproliferation (ISN) Nonproliferation Sanctions list, or the EU Restrictive Measures list. A country was awarded points under this sub-criterion if it does not appear on any of the three lists. When assigning points for this criterion, the number of entities was not taken into consideration, and points were only awarded if a country does not have a single entity on any of those sanctions or screening lists. Most countries have either no sanctioned or flagged entities, or they have many. For example, Iran has 38 active entities on the ISN Nonproliferation Sanctions list alone, followed by China with 29 (4 additional for Hong Kong),

and Russia with seven. The BIS Entity List was selected, rather than the BIS Denied Persons List, because the former has entities sorted by country instead of by name. This sub-criterion is measured as medium-impact.

- **National law requires or incentivizes Internal Compliance Programs (ICPs) for companies<sup>20</sup>**

An ICP is a set of procedures that companies use to help ensure their adherence to national export control laws. Establishing and maintaining an ICP requires company resources, but it is incentivized by many governments with the promise of privileges, such as fast-tracked approval for global export authorization, and bulk licensing. Few countries require ICPs, but many incentivize it. This is a medium-impact sub-criterion.

- **Dual-use export control list is readily accessible<sup>21</sup>**

This sub-criterion was only applied to countries known to have a dual-use export control list, i.e., PPI countries that fall under the dark green category for export control legislation. A control list that is available online is useful in readily determining what, if any, license is required to export a good. It also helps governments to hold suppliers accountable since licensing requirements are easily accessible. The link to the control list should be easily found on at least one government website, not only on a third-party website, such as a consulting group. Full points were awarded if a PPI staff member was able to find the control list in roughly ten minutes or less. This sub-criterion is judged as medium-impact.

- **Contracting party to the Revised Kyoto Convention and acceptance of customs controls in Free Trade Zones (FTZs)<sup>22</sup>**

Chapter 2 of Specific Annex D to the Revised Kyoto Convention addresses FTZs and calls for streamlined controls. Specifically, recommendation 4 states that “customs shall have the right to carry out checks at any time on the goods stored in a free zone.”<sup>23</sup> Of the 121 contracting countries, only 21 have accepted Annex D2, Recommendation 4. Full points were assigned if a country is a contracting party to the convention and accepts Specific Annex D, Chapter 2, Recommendation 4. Half points were assigned if a country is only a contracting party. This is a medium-impact sub-criterion.

- **Has Border Guard Agency<sup>24</sup>**

Formerly titled, “Has border seizure authority,” the Institute assigned full five points to states that have an identifiable designated border guard agency for a green/land border. Countries without a green/land border were able to receive points for a coast guard which is tasked with border security. A border guard agency is charged with enforcing the security of a country’s border. Ideally it is part of a broader border management strategy with the aim of securing areas that are not official points of entry, with one goal being preventing illicit trade. In a future version, the PPI may attempt to identify border management strategies. In the 2021 PPI, countries with an identifiable border guard agency, with or without broader strategy, received the full points, which is why this is a low impact sub-criterion.

- **Enacts criminal penalties for illegal transportation of nuclear weapons by non-state actors<sup>25</sup>**

These data are from the 1540 status of implementation matrices for individual countries, in this case from Table OP 2. The PPI awarded points for having in place legislation enacting criminal penalties, because making the transport of a readily deployable nuclear weapon a crime is part of the bare minimum that any country can do to prevent the proliferation of nuclear weapons. A total of 112 countries or entities were individually confirmed by the PPI to have this legislation. It is assigned a low impact.

- **Enacts criminal penalties for illegal transfer of nuclear weapons by non-state actors<sup>26</sup>**

These data are from the 1540 status of implementation matrices for individual countries, and as above, from Table OP 2. The PPI awarded points for having legislation in place enacting criminal penalties, because making the transfer of a readily deployable nuclear weapon a crime is also part of a minimum that any country can do to prevent the proliferation of nuclear weapons. A total of 121 countries or entities were confirmed to have this legislation. It is assigned a low impact.

- **Has an extradition treaty with the United States or United Kingdom<sup>27</sup>**

Extradition treaties with the United States and United Kingdom, both strong trade control enforcement states, are a good indicator of willingness to subject citizens to and participate in the rule of law. The signatory country must surrender U.S. or UK nationals, in this case, for trade control violations, and the United States or the United Kingdom can ask for the extradition of foreign nationals who are suspected of violating or have violated trade control laws, to be investigated and prosecuted. This serves not only as a deterrent to foreign nationals who would violate U.S. and UK trade control laws, but also as a deterrent for proliferators against setting up illegal procurement channels in the signatory country. Many countries, especially developing countries, have signed and ratified U.S. or UK extradition treaties. Countries that have ratified the European Convention on Extradition also received full points. Importantly, in all extradition cases there must be “dual criminality” for the treaty to be honored; the violation for which a person can be extradited must also be a violation in the signatory country. Some countries, such as Georgia, have not signed a U.S. extradition treaty but are known to extradite upon request. As more countries with extradition treaties adopt strategic trade control laws, this criterion may gain importance. In the 2021 PPI, this is a low-impact criterion.

- **Utilizes voluntary tax disclosure procedures, as an indicator of voluntary WMD/dual-use proliferation disclosure procedures<sup>28</sup>**

The PPI ideally sought to identify whether each country has a procedure for companies to voluntarily disclose to the government that an inadvertent or deliberate export of controlled or sensitive strategic goods occurred in violation of the laws or regulations.<sup>29</sup> However, no such information could be systematically found. As a result, another indicator, voluntary tax disclosure procedures, or self-disclosures of issues with tax filings, was identified as indirectly measuring the potential use or existence of voluntary disclosures for commodities. The assumption is that a country employing tax disclosure procedures increases the likelihood of there being a self-disclosure procedure involving commodities. Because of the assumption in deriving points in this sub-criterion, it is assigned a low impact.

- **Member of the Harmonized System (HS)<sup>30</sup>**

The harmonized system is a multipurpose international product nomenclature developed by the World Customs Organization. The system is used by participants as a tool for international trade and customs. Use of the system is an indirect measure for interagency cooperation and coordination. However, the HS product classification codes are very broad, and they need further development, especially with respect to strategic commodities. Therefore, it is a low-impact sub-criterion.

- **Existence of national regulatory authority to account for nuclear weapons/related material production<sup>31</sup>**

A national regulatory authority accounts for, secures, and protects nuclear weapons and related materials.<sup>32</sup> About two-thirds of all countries have legislation in place that requires such an authority. This information is taken from the 2020 round of Committee-approved Resolution 1540 matrices. It is a low-impact sub-criterion.

- **Nuclear industry association with nonproliferation role<sup>33</sup>**

This indicator assesses whether an industry association exists specifically for suppliers of nuclear-related goods and technologies in the country and whether it assumes an active nonproliferation role. The PPI assigned full points for nuclear industry associations that take an active role to prevent proliferation, as indicated on their website or through hosted events. Many of the associations serve as platforms for workshops, awareness building, and information exchange, including the promotion of nonproliferation measures. For example, FORATOM is an umbrella nuclear association for European countries, with a membership of fifteen national nuclear associations. FORATOM lists nonproliferation as one of the key topics it deals with (among others, such as energy supply and nuclear safety)<sup>34</sup> and as such, FORATOM members received full points. Countries that are members of the International Framework for Nuclear Energy Cooperation (IFNEC) also received full points. The IFNEC is an important international organization that works to build cooperation among participating states to ensure the peaceful use of nuclear energy and related technology. As with other criteria, the PPI is willing to assign points to other countries that come forward and show that they have a

nuclear industry association that takes an active role in nonproliferation. This is a medium-impact indicator.

- **Positive record of submitting sanctions implementation reports on North Korea<sup>35</sup>**

UN Security Council Resolution 1718 (2006) is a key resolution in a series of resolutions imposing sanctions on the DPRK. The sanctions prohibit UN member states from engaging in direct or indirect supply, sale, or transfer of certain goods to the DPRK, including “items, materials, equipment, goods and technology [...] which could contribute to DPRK’s nuclear-related, ballistic missile-related or other weapons of mass destruction-related programmes.”<sup>36</sup> Previously, the PPI assigned points to countries for having submitted at least one of several required reports on the implementation of the resolutions. This was changed in the 2021 PPI to only assign full points for consistent submission of required reports. The PPI evaluated the records for states submitting reports for the following United Nations Security Council Resolutions: 2397 (2017), paragraph 8, midterm and final report; 2397 (2017), paragraph 17; 2375 (2017), paragraph 19; 2371 (2017), paragraph 18. These reports represent the five most recent UNSC resolutions. The consistent submission of implementation reports is important as it is a representation of the commitment made by states to enforce international sanctions on the DPRK. Points are assigned proportionally to the number of reports submitted, meaning if a country submitted five of the evaluated resolution reports, that country received the full five points. This is a low-impact sub-criterion.

## **NEGATIVE INDICATORS**

- **Government unwillingness or inability to enforce trade controls**

Points were deducted for 44 countries based on several measures, including expert judgment and direct knowledge of a country’s efforts to hinder enforcement, history of large-scale illicit procurements by state entities, and multiple, significant cases of illicit exports ignored by the state or known to be missed by the state. Further, points are subtracted from states that are plagued by government corruption, experience terrorism, civil war, or are controlled partially by militia or gangs, to an extent that would prevent the government from controlling trade effectively.

- **Percentage of firms expected to submit bribes to obtain an import license**<sup>37</sup>

Providing a bribe to acquire an import license is associated with the activities of front or shell companies in illicitly importing controlled goods. This indicator, based on World Bank data, measures the percentage of total firms estimated to provide “gifts” to import goods, pointing to systemic corruption within a country and specifically among trade control officials. In some countries, 20 percent or more of firms are expected to provide official bribes to obtain an import license. In 52 PPI entities, more than 10 percent of firms are expected to provide gifts or bribes for imports. These entities lose five points. This is a low-impact, negative sub-criterion.

- **New: North Korea-related UNSC sanctions violations**<sup>38</sup>

For this sub-criterion, the 2021 PPI drew on the Institute’s annual analyses of UNSC Panel of Experts reports on DPRK sanctions violations, and deducted points from states that were involved in documented violations.<sup>39</sup> For example, the Institute’s 2020 report on North Korea-related sanctions violations revealed that thirty-nine of the sixty-two states identified in the report were allegedly involved in multiple (two or more) documented sanctions violations. Nine countries were allegedly involved in military-related cooperation with the DPRK, including the training and procurement of military related supplies, and aiding the DPRK in establishing supply chains for ballistic missile development: Congo DR, Egypt, Eritrea, Iran, Myanmar, Rwanda, Syria, Uganda, and Ansar Allah Houthi movement of Yemen.<sup>40</sup> As a basis, if a country was involved in one or two violations in the 2020 annual report, five points were deducted. If a country was involved in three to six violations, 10 points were deducted, and for more than six, 15 points were deducted. Countries identified by the Institute as repeat violators had an *additional* five points subtracted. If a country was involved in a military-related DPRK sanctions violation, *additional* 10 points were deducted, where a country identified as repeat military-offender had 15 points subtracted. The possible maximum of subtracted points is 35. The actual maximum points subtracted for a country was 30 points for Syria; it committed three to six violations documented (-10), was identified as a repeat offender (additional -5) and was identified as involved in repeat military-related violations (additional -15).

### **SUB-CRITERIA CONSIDERED BUT NOT INCLUDED**

The project considered additional sub-criteria but was unable to find enough information, so these sub-criteria were not included in scoring:

- A customs or domestic intelligence unit exists which devotes resources and expertise to knowing their countries' supply potential and understanding the strategic commodity trafficking networks and agents targeting the industry. Ideally, the intelligence unit also conducts industry outreach and serves as a point of contact for industry members to report suspicious inquiries or orders.
- Licensing agency has authority within Free Trade Zones (FTZs). No data were collected for this indicator because a general lack of transparency, conformity, and regulations exist within FTZs and similar economic zones. To successfully prevent commodity trafficking, many countries need to drastically improve controls and regulations inside FTZs. For the same reason, another sub-criterion, "A designated authority to inspect and detain goods exists in FTZs," was considered but not used.
- Has produced successful trade control prosecutions. Successful prosecutions as an indicator of sound enforcement of trade control systems were only considered on a case-by-case basis due to the difficulty of finding information for all countries. Only a few countries have specialized prosecution units for export control-specific violations, such as Germany, Sweden, and the United States. Some countries, such as Japan, are known to have a high rate of successful prosecutions.
- Has "technical reachback capacity," or access to expert knowledge on trade control enforcement. This sub-criterion attempted to measure the ability of trade control officials and companies to obtain technical information from the government or contractors about the potential misuse of goods. Not enough information could be found to assign points.
- Country is known to act upon information from foreign intelligence sharing specifically for addressing strategic trade control cases. As it is difficult to determine the extent to which countries act upon foreign information for the majority of countries, no points were assigned for the PPI ranking. Nevertheless, it is an important aspect of combating strategic commodity trafficking. For some countries, such as South Korea, Germany, Britain, and Israel, cases

of successful intelligence sharing and subsequent actions to thwart illegal activities are publicly known. In general, all Proliferation Security Initiative and North Atlantic Treaty Organization (NATO) members officially share intelligence among the members of these arrangements; nevertheless, the extent to which this is done in practice could not be systematically determined.

- A country has sufficient criminal or civil penalties to deter trade control violations. It is especially important to have criminal penalties in cases where the violation is willful and of a significant nature with respect to nonproliferation. Criminal or civil penalties for trade control violations can serve as deterrent for potential proliferators. Finding, comparing, and quantifying penal codes for all 200 countries was infeasible. Additionally, since not all countries have strategic trade control systems in place, many countries' penal codes for trade control violations would not apply to strategic goods. Instead, the PPI looked for the countries with a trade control system in place, e.g. green legislation, where trade control violations can lead to incarceration of convicted individuals. Guidelines for maximum prison sentencing following export control violations were found for approximately a quarter of all countries. Some countries with otherwise strong trade controls showed a trend of having relatively short maximum prison sentences, many five years or less, for export control violations. This trend in sentencing was strikingly apparent in Europe (see Chapter 13).
- Uses information technology (IT) data system for licensing procedures. Ideally, when export license requests are submitted or granted, all information should be collected electronically. This not only helps investigators, but also allows for risk-based decision-making by licensing officials. The PPI was unable to collect sufficient data on which countries collect licensing data electronically and which do not, therefore, no points were assigned. Pilot e-licensing of dual-use exports is conducted in Latvia, Italy, Romania, Greece, and Belgium.
- Agency exists that investigates trade control violations. The existence of such an authority was considered on a case-by-case basis. Only a few countries have a specialized criminal investigation unit for trade control violations. In most countries, investigations are conducted by police or customs.

- **New: Country has Conducted Hostage for Prisoner Swaps with Iran**<sup>41</sup>

The 2021 PPI deducted points from countries that have conducted one or more hostage for prisoner swaps with Iran, where Iran has seized individuals arbitrarily as hostages and holds them to be swapped in return for Iranian agents or nationals investigated, indicted, and/or sentenced for violating national export control laws or sanctions. The release of the duly convicted individuals not only disrupts the pursuit of justice, but also incentivizes Iran to seize additional foreign nationals as bargaining chips. Three countries are reported by the media to have engaged in such swaps: Australia, France, and the U.S.

- **Expert Judgment**

In the 2019 PPI, based on expert judgment, about two dozen countries that had been sanctioned by the United States and European Union had points subtracted on a one-time basis. These subtractions did not change in the 2021 PPI and affected countries the most with known strategic trade control issues, such as Belarus, China, Hong Kong, and Russia. They also affected a range of countries in Tier Two and a few countries in Tier Three. In about half of the cases, subtractions were relatively small (less than 10 points in the final PPI score, which is out of 1,300 points).

## IMPACT OF SUB-CRITERIA

The PPI assigned a high to low impact for weighting each of the sub-criteria. **Table 6.1** shows how each indicator was weighted in the evaluation and how much of an impact it therefore had on a country's score within the super criterion.

## SCORING

Of the 23 positive sub-criteria, eight are considered low-impact, eleven are medium-impact, and four are high-impact. They are worth five, 10, and 15 points, respectively. There are five additional, negative indicators, including expert judgment where points were subtracted on a one-time basis in 2019. A country could receive up to 210 points under this super criterion. This raw score is used later to arrive at a total, weighted out of 400 possible points score and a rank for each country. It is also used to derive a ranking for the country under the three tiers.

High-Impact (4)
Transit Enforcement
Transshipment Enforcement
Ability to Conduct Investigations
International legal Assistance Mechanisms
Medium-Impact (11)
Own Sanctions List
Brokering Controls for WMD and Small Arms
Training/Outreach Participant
Lack of Denied Parties by the U.S. and EU
Lack of Corruption Influence
Interpol Member
Undercover Investigations
Existence of Nuclear Industry Association and International Framework for Nuclear Energy Cooperation member
Incentivize ICP (favorable treatments)
Control List Readily Available
Contracting Party to the Revised Kyoto Convention
Low-Impact (8)
Extradition Agreement with US or UK
Voluntary Tax Disclosure Procedures
Criminal Penalties-NW transport
Criminal Penalties-NW transfer
Identifiable Border Guard Agency
Member of Harmonized System
National Regulatory Authority for NW
Positive Record of Submitting Sanctions Implementation Reports on North Korea
Negative indicators (5)
Government Unwillingness or Inability to Enforce Trade Controls
Percentage of Firms Expected to Submit Bribes to Obtain an Import License
<b>New:</b> North Korea-Related UNSC Sanctions Violations
<b>New:</b> Prisoner Swaps with Iran
Expert Judgment

**Table 6.1.** The impact of each sub-criterion under Super Criterion *Adequacy of Enforcement*.

## NOTES

1. For the 2021 PPI, the sub-criterion “Submitted Sanctions Implementation Report on North Korea” was changed to “Positive record of submitting sanctions implementation reports on North Korea” in order to reward countries’ ongoing commitment to aid the UNSC in implementing sanctions effectively. The 2021 PPI removed one sub-criterion, “A low number of documents is required for exports due to discontinuity of the source report. Two new, negative sub-criteria were added: “North Korea-related UNSC sanctions violations,” and “Country Conducts Prisoner Swaps.”

2. The UN 1540 Committee defines “related materials” in the matrices as: “materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included on national control lists, which could be used for the design, development, production or use of nuclear, chemical and biological weapons and their means of delivery.”

3. “Committee Approved Matrices Row 20 of Tables OP 3 (c) and (d),” *United Nations Security Council Committee established pursuant to resolution 1540* (2004), <https://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>. For example, see the 1540 Committee Matrix of Afghanistan, row 20, <http://www.un.org/en/sc/1540/documents/Afghanistan%20revised%20matrix.pdf>. In row 20 of a specific country’s matrix, a “X” in the “Enforcement: civil/criminal penalties, and measures of implementation, etc” cell relating to NW (nuclear weapons) was taken as confirmation that sufficient enforcement mechanisms exist. A question mark was given partial credit. An empty cell received no points.

4. “Committee Approved Matrices Row 21 of Tables OP 3 (c) and (d),” *United Nations Security Council Committee established pursuant to resolution 1540* (2004), <https://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>.

5. Ibid. In row 21, a “X” in the “Enforcement: civil/criminal penalties, and measures of implementation, etc” cell relating to NW (nuclear weapons) was taken as confirmation that sufficient enforcement mechanisms exist. A question mark was given partial credit. An empty cell received no points.

6. “Customs Mutual Assistance Agreements,” *U.S. Customs and Border Protection*, 2020, <https://www.cbp.gov/border-security/international-initiatives/international-agreements/cmaa>.

7. “International Convention on Mutual Administrative Assistance For The Prevention, Investigation and Repression of Customs Offences: Nairobi,” World Customs Organization, June 9, 1977, <http://www.wcoomd.org/~media/wco/public/global/pdf/about-us/legal-instruments/conventions-and-agreements/nairobi/naieng1.pdf?la=en>; “Position as Regards Ratifications and Accessions: International Convention on

Mutual Administrative Assistance For The Prevention, Investigation and Repression of Customs Offences: Nairobi,” World Customs Organization, August 8, 2012, <http://www.wcoomd.org/-/media/wco/public/global/pdf/about-us/legal-instruments/conventions-and-agreements/conventions/eg0019e1.pdf?la=en>.

8. “Programme of Measures to Implement the Principle of Mutual Recognition of Decisions in Criminal Matters,” European Union, 2001, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32001Y0115%2802%29>.

9. “Inter-American Convention on Mutual Assistance in Criminal Matters,” Organization of American States, 1992, <http://www.oas.org/juridico/english/treaties/a-55.html>.

10. “Treaty on Mutual Assistance in Criminal Matters,” ASEAN, 2004, <http://agreement.asean.org/media/download/20160901074559.pdf>.

11. “International MLA & Extradition Agreements the UK is Party To,” Government of the United Kingdom and Northern Ireland, April 2016, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/516418/Treaty\\_List.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/516418/Treaty_List.pdf).

12. “Rule of Law Index: Factor 8: Criminal Justice, Indicator 8.1: Criminal Investigation System is Effective,” World Justice Project, 2020, [https://worldjusticeproject.org/sites/default/files/documents/WJP-ROLI-2020-Online\\_0.pdf](https://worldjusticeproject.org/sites/default/files/documents/WJP-ROLI-2020-Online_0.pdf).

13. Individual research. Examples of denied parties lists: Government of Canada, “Consolidated Canadian Autonomous Sanctions List,” updated June 21, 2021, [https://international.gc.ca/world-monde/international\\_relations-relations\\_internationales/sanctions/consolidated-consolide.aspx?lang=eng](https://international.gc.ca/world-monde/international_relations-relations_internationales/sanctions/consolidated-consolide.aspx?lang=eng); European Commission, European Union – Restrictive Measures (Sanctions) In Force, updated April 26, 2017, [https://eeas.europa.eu/sites/eeas/files/restrictive\\_measures-2016-10-11-clean.pdf](https://eeas.europa.eu/sites/eeas/files/restrictive_measures-2016-10-11-clean.pdf).

14. Individual research. “ATT: Status of Ratifications and Accessions,” *Arms Trade Treaty*, 2018, <https://s3.amazonaws.com/unoda-web/wp-content/uploads/2018/06/ATT-status-table-WebReport-June-2018.pdf>; “2019 Annual Report,” *Arms Trade Treaty Monitor*, 2019, <https://attmonitor.org/en/the-2019-report/>.

15. The trainings considered included:

1. The Export Control and Related Border Security (EXBS) Program, assisting countries to “develop and improve their strategic trade and related border control systems,” from “Export Control and Related Border Security Program,” *United States Department of State*, 2020, <https://www.state.gov/export-control-and-related-border-security-program/>;
2. EU P2P (Partner-to-Partner) Dual-use Export Control Program, assisting countries to “enhance the effectiveness of export control systems of dual-use items,” from “EU P2P Export Control Programme for Dual Use Goods,” *European Commission*, 2020, <https://ec.europa.eu/jrc/en/research-topic/chemical-biological-radiological-and-nuclear-hazards/eu-p2p-outreach-programmes-export-control/dual-use-goods>;

3. International Criminal Investigative Training Assistance Program (ICITAP), assisting countries to “to develop professional and transparent law enforcement institution,” from “International Criminal Investigative Training Assistance Program (ICITAP),” *United States Department of Justice*, 2020, <https://www.justice.gov/criminal-icitap/our-programs>;
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# CHAPTER 7

## TOTAL WEIGHTED SCORE AND RANK

This chapter explains how the PPI arrives at the final score, presents key results of the PPI, and introduces other methods used to describe a country's performance.

For the final score, a key remaining methodological question for the PPI was how to combine the raw super criteria scores to derive final country scores, and subsequently the final PPI rank. The team considered using simple addition of the raw super criteria scores (or scaling them, for example, where each super criterion score is scaled to 100 points and then added with the other super criteria scores) to achieve a total score. However, such an approach would imply that each super criterion is equal in value or weight. Moreover, the project found that the *Ability to Prevent Proliferation Financing* and *Adequacy of Enforcement* super criteria are two of the most important due to their action-oriented or implementation-based nature; the *International Commitment* and *Legislation* super criteria are of reduced importance because the PPI measures the *implementation* of strategic trade controls. The PPI is different than other indices since it focuses on tangible outcomes rather than strictly capacities or legislative capabilities, although these are certainly important. Nonetheless, simply adding the raw super criteria scores, or even scaling each to 100 points and adding, would undermine the intent of the index.

For the presentation of the results, the PPI team decided that in addition to a full, final rank, other ways to present performance are needed.

It developed ways to chart individual country performance and statistical analyses to group countries by performance.

## WEIGHTING ARRANGEMENT

The project considered several weighting options for the super criteria. Based on discussions among experts, a favored weighting option emerged. The project decided to scale each super criterion score to 100 points and then apply a weighting factor. Under this methodology, the *Ability to Prevent Proliferation Financing* and *Adequacy of Enforcement* super criteria each received double the scaled points of the *Legislation* and *Ability to Monitor and Control Strategic Trade* super criteria, which in turn received double the scaled points of the *International Commitment* super criterion. For *International Commitment*, *Legislation*, *Ability to Monitor and Detect Strategic Trade*, *Ability to Prevent Proliferation Financing*, and *Adequacy of Enforcement*, the weighting factors are, after scaling each to 100 points, 1, 2, 2, 4, and 4, respectively. The conversion of the raw possible super criteria scores from the earlier sections into scaled, weighted scores is summarized in Table 7.1.

	Int'l Commit- ment	Legislation	Ability to Monitor & Detect Strategic Trade	Ability to Prevent Prolif- eration Financing	Adequacy of Enforce- ment	PPI Total (Points)
Raw Points Possible	240 Points	130 Points	185 Points	135 Points	210 Points	900
Scaled, Weighted Points Possible	100 Points	200 Points	200 Points	400 Points	400 Points	1300
Scaled, Weighted Percentage	7.7	15.4	15.4	30.8	30.8	100

**Table 7.1.** Raw points are scaled and weighted for each super criterion before they are added to derive the final PPI scores and rank. (The percentages in this table do not add up to exactly 100 percent due to rounding.)

**Super Criterion International Commitment:** The points received under *International Commitment* count toward **7.7 percent** of the total score. As discussed earlier, the *International Commitment* super criterion incorporates 22 sub-criteria—three are considered low-impact, twelve are medium-impact, and seven are high-impact, giving a total raw score of 240 points. This raw score was scaled to 100 and multiplied by its weight factor, in this case one, to contribute up to 100 points or 7.7 percent of the possible 1,300 points.

**Super Criterion Legislation and Super Criterion Ability to Monitor and Detect Strategic Trade: 15.4 percent each**

The *Legislation* super criterion incorporates 13 sub-criteria—four are considered low-impact, five are medium-impact, and four are high-impact, with a total raw score of 130 points. This score was scaled to 100 and multiplied by its weight factor of two to contribute up to 200 points or 15.4 percent of the possible 1,300 points.

The *Ability to Monitor and Detect Strategic Trade* super criterion incorporates 18 positive sub-criteria—three are considered low-impact, 11 are medium-impact, and four are high-impact, with a total raw score of 185 points. This score was scaled to 100 and multiplied by its weight factor of two to contribute up to 200 points or 15.4 percent of the possible 1,300 points.

**Super Criterion Ability to Prevent Proliferation Financing and Super Criterion Adequacy of Enforcement: 30.8 percent each**

The *Ability to Prevent Proliferation Financing* super criterion incorporates 13 positive sub-criteria—one is considered low-impact, 10 are medium-impact, and two are high-impact, for a total raw score of 135 points. This score was scaled to 100 and multiplied by its weight factor of four to contribute up to 400 points or 30.8 percent of the possible 1,300 points.

The *Adequacy of Enforcement* super criterion incorporates 23 positive sub-criteria—eight are considered low-impact, 11 are medium-impact, and four are high-impact for a total raw score of 210 points. This score was scaled to 100 and multiplied by its weight factor of four to contribute up to 400 points or 30.8 percent of the possible 1,300 points.

After weighting, the PPI obtains a total point score and rank for each of the 200 countries, territories, and entities. Because of the possibility of subtractions, negative scores are possible. The maximum possible score is

1,300. The lower bound is not fixed, but in this version the lowest score is -172.

## PERFORMANCE FRACTIONS

Although a country's total score is the fundamental measure of the effectiveness of its strategic trade control system, it is difficult to use it to prescribe a way for countries to improve. As a result, the "performance fraction" graphs were developed to chart the extent to which countries have met the sub-criteria. For example, if the PPI assigned zero, five, or 10 points for a country's adherence to the Additional Protocol (zero would entail no signature or ratification, five would denote signature but not ratification, and 10 would be for full ratification), the performance fraction would assess the fraction of possible points achieved, independent of whether the criterion was judged as low (five possible points), medium (10 possible points), or high impact (15 possible points). Performance fractions allow for a basic assessment of where criteria were not fulfilled and provide a straightforward road map for where countries can improve. In essence, performance fractions are calculated to locate omissions or deficiencies in a country's fulfillment of the PPI sub-criteria. Because of space limitations, we are not publishing individual country performance fractions in this report, but they are available for all countries upon request.

Figure 7.1 is an example that shows how Argentina either fulfilled, partly fulfilled, or did not fulfill the sub-criteria in the *International Commitment* super criterion. Argentina, for example, received all 10 out of 10 points for being a member of the IAEA. It therefore has a performance fraction of 1 in the IAEA Membership sub-criterion. With respect to the IAEA Safeguards Conclusion for 2019, by contrast, Argentina received only five points out of a possible 10 points, and therefore its performance fraction is 0.5 (because it only received the IAEA's "conclusion" instead of the more ideal "broader conclusion.")

FIG 07-01

## POINT DEFICIT CHART

Since performance fractions show the extent to which sub-criteria and super criteria were fulfilled, but not how the performance in each criterion impacts the final PPI score, PPI point deficit charts were developed.

**Argentina: International Commitment Performance Fractions 2021**



**Figure 7.1.** Example of a performance fraction graph for Argentina.

Factoring in the sub-criteria impacts (high, medium, or low) and the super criteria weights (100, 200, or 400 points), these charts show where final PPI points were received and where points are missing. Figure 7.2 shows an example of a point deficit chart for Argentina. Points that Argentina received toward its final PPI score under *International Commitment* are visualized in blue, while points that are still missing are visualized in red.

## UNCERTAINTIES IN THE PPI METHODOLOGY

The PPI has a number of uncertainties that affect the accuracy of the rankings. The largest uncertainty is created by a lack of publicly available data and the difficulty in determining specific, measurable criteria that accurately evaluate the effectiveness of trade controls. As modern WMD illicit procurement continues to evolve, so will the PPI and its methodology in order to accurately measure and assess the realities of the world. Constructive comments are always welcomed.

The project initially developed vastly more sub-criteria for each super criterion than staff could find data for, a particularly difficult endeavor when one must find data for the bulk of 200 countries before deciding to include the sub-criterion in the scoring system. In many cases, countries do not provide relevant information to the United Nations agencies, or the 1540 Committee does not collect relevant information in the 1540 matrices or other data sources. In other cases, countries do not publicly release relevant information and thus may receive zero points on that sub-criterion.

The project depended on expert judgment in the adding and subtracting of points under the *Ability to Prevent Proliferation Financing* super criterion and in subtracting points under the *Adequacy of Enforcement* super criterion. Although a wide variety of experts were consulted, this approach ultimately entails some subjectivity. On balance, the use of experts was viewed as making the PPI sounder and more credible.

Several countries are difficult to rank because of their dependence on other countries or their non-state status. Monaco relies on France's trade control system, and San Marino on Italy's. Kosovo is a disputed territory. Palestine is under the authority of Israel. The Holy See is difficult to rank as well because of its small size and lack of any industrial capability or exports. Taiwan's non-state status complicates developing a reliable rank

2021 Argentina Points and Deficits: International Commitment

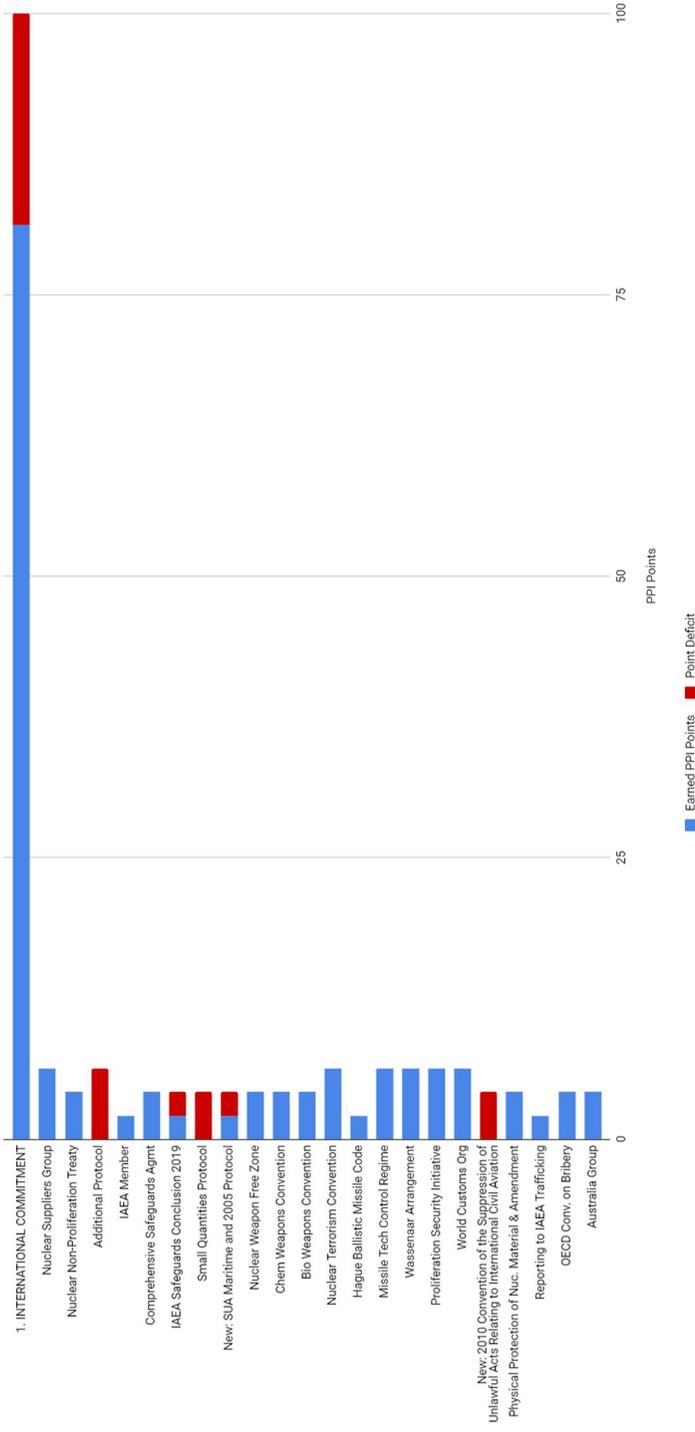


Figure 7.2. Example of a Point Deficit Chart for Argentina in Super Criterion International Commitment.

for it. Overseas territories of countries, such as the British Virgin Islands and Aruba, were not evaluated or ranked individually, and in most cases, the trade control situation of an overseas territory was not considered in developing the rank of the state proper. Hong Kong is a special administrative region of China, and many sub-criteria cannot be filled in. For Hong Kong, another question is whether it should continue to have its own rank separate from China, given China's National Security Law, removing much of Hong Kong's independence. Following the passage of the Law of the People's Republic of China on Safeguarding National Security in the Hong Kong Special Administrative Region in 2020, the Institute carefully considered the status of Hong Kong and its relationship with China. The Institute determined that after the implementation of this new law the export control systems of Hong Kong and China are effectively inseparable, a view shared by the U.S. Commerce Department and the European Union. While the 2021 PPI still has a separate entry for Hong Kong, future PPI editions may have to equate the rank of Hong Kong, which so far has ranked better than China, with that of China to reflect the impact of the 2020 law.

Despite the difficulties in finding all the desired data and other uncertainties, the project staff believe they collected enough data involving 105 indicators to rank the 200 countries, territories, or entities in the PPI. However, the total scores, and thus the ranks, should not be considered without due acknowledgement of the uncertainties. Overall, a variation in the total PPI point score by an individual country of up to plus or minus 50 points is not viewed as significant. This equates to a percentage uncertainty of almost seven percent, where the total possible point range is taken as  $-200$  to  $1,300$  points.

## TOTAL POINTS AND RANKINGS

The result of the weighting is a total point score and rank for each of the 200 countries, territories, and entities evaluated in the PPI. The scores varied widely, but no country received more than 83 percent of the total points (the highest score is 1,080 out of 1,300 points). Because points were deducted, scores below zero occurred. The lowest score is minus 172 points. Figure 7.3 shows a distribution of the scores. The median is 508 (up from 443 in 2019) points, and the average is 546 (up from 489 points in 2019). The relatively low median suggests that, overall, countries

### 2021 Total PPI Point Distribution

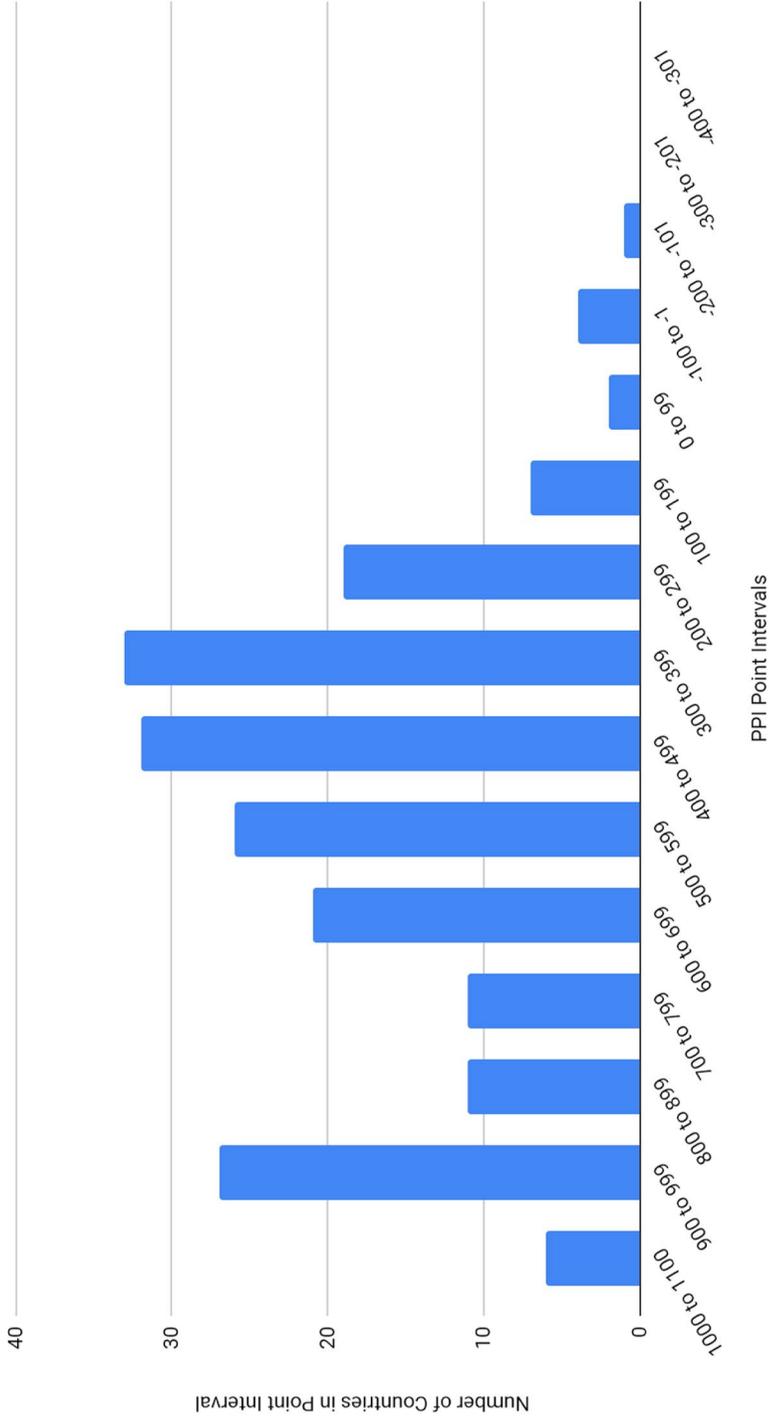


Figure 7.3. Distribution of total points in intervals of 100 points.

did not score overly high. The average remains somewhat greater than the median, suggesting that the global performance in implementation of trade controls remains bimodal. In Figure 7.3, one peak illustrates that about one quarter of countries have fairly robust strategic trade controls, i.e., comprehensive legislation and effective implementation, and the other shows that about three quarters of countries have far less effective systems.

The highlights chapter contains a list of high scoring countries, which is not repeated here. Annex 1 contains the full PPI ranking, with total points for each country. A cluster analysis, which clusters countries into four groups, is presented below.

Because countries vary so widely on their need for strategic trade controls and the nature of their economies, the project opted to include a discussion of the results in terms of tiers of similar countries (see Section II, Three Fundamental Tiers).

## CLUSTER ANALYSIS

To group countries by similar performance, the PPI includes a cluster analysis of the scores and ranks. This analysis is a multivariate method to classify a sample of subjects, in this case nations or territories, on the basis of a set of measured variables into a number of different clusters, such that similar subjects are placed in the same cluster. In essence, this statistical method groups scores around a set of relative peaks in the scores. This allows for a more effective look at the scores than the simple bimodal analysis conveyed in Figure 7.3.

The cluster analysis, created with the programming language Python, shows the 200 countries and entities evaluated in the PPI clustered into four groups (see Figure 7.4). The number of clusters was set to four after generating the probability density of the scores (Figure 7.5). The probability density graph visualizes the probabilities of a country to receive a certain score. Table 7.2 summarizes statistical details of the four clusters or groups.

Cluster 1 (Group 1) includes the ranks 1 to 46; Cluster 2 (Group 2) includes the ranks 47 to 102; Cluster 3 (Group 3) includes the ranks 103 to 177; and Cluster 4 (Group 4) includes the ranks 178 to 200. The corresponding score ranges are 1,080 to 779 for Cluster 1, 766 to 500 for

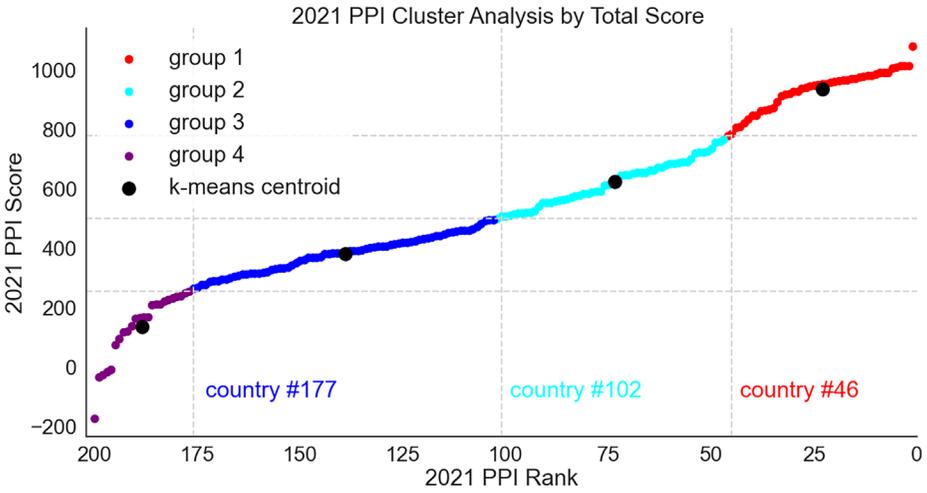
Cluster 2, 497 to 255 for Cluster 3, and 249 to negative 172 for Cluster 4. It is noticeable that Group 3 includes 75 countries, which is more than any of the other groups. Group 1 has 46 countries; Group 2 has 56 countries; and Group 4 has 23 countries. The countries in each cluster are listed in Annex 2.

In this case, the four clusters emerge around four relative centers in scores (k-means centroids), represented here as an ordered pair: Group 1: (rank 23, score 937); Group 2: (74, 625); Group 3: (139, 383); and Group 4: (189, 136). These centers appear to correlate with additional relative peaks in the probability distribution function, and this analysis provides more insight into the structure of the data (Figure 7.5). The highest peak of the probability distribution function is in Group 3, which has the largest number of countries.

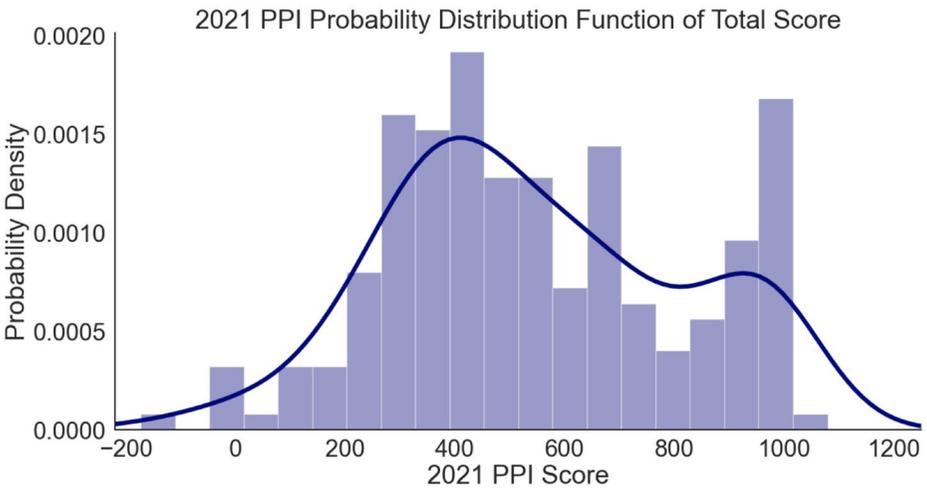
While the average score of 933 for Cluster 1 lies above two-thirds of the available points (72 percent), the mean score for Cluster 2 at 620 points falls just short of half the available points (48 percent). The mean score as percentage of available points drops to just 29 percent for Cluster 3, and 10 percent for Cluster 4. Thus, while the gap between the averages of Clusters 2 and 3, and Clusters 3 and 4, is about equal (roughly 19 percent of available points), the gap between the mean of Clusters 1 and 2 represents 24 percent of the available points.

	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Number of countries	46	56	75	23
Tier One countries	39	13	1	2
Tier Two countries	7	30	18	4
Tier Three countries	-	13	56	17
Rank range	1 to 46	47 to 102	103 to 177	178 to 200
Score range	1,080 to 779	766 to 500	497 to 255	249 to -172
k-means centroid (rank, mean score)	(23, 937)	(74, 625)	(139, 383)	(189, 136)

**Table 7.2.** Summarized details of the four clusters.



**Figure 7.4.** The 2021 PPI countries plotted by rank and score clustered into four groups.



**Figure 7.5.** The probability distribution function (PDF) of the PPI 2021 scores. Three relative peaks are discernible in clusters 1, 2, and 3. The peak of the fourth cluster appears visible near a score of 200–250.

The 2021 cluster sizes and average scores represent a welcome improvement. High-scoring clusters are growing and at the same time progressing to higher average scores. From 2019 to 2021, Cluster 1 increased by five countries, Cluster 2 by one, and Cluster 3 by three, while Cluster 4 shrank by nine countries. The center score in Cluster 1 rose by 58 points, in Cluster 2 by 83 points, and in Cluster 3 by 53 points. The average score in Cluster 1 rose by 45 points, in Cluster 2 by 57 points, and in Cluster 3 by 28 points, while it dropped by 31 points for Cluster 4.

## GLOBAL ACHIEVEMENTS BY SUPER CRITERION

Figure 7.6 shows the global performance as percentage of possible points achieved in each super criterion for all countries, where the length of the blue bar indicates the percentage achieved, out of 100 percent. As can be seen, the global average is highest under *Legislation*, and lowest under *Proliferation Financing*.

Figure 7.7 shows the points achieved in each super criterion for all countries, where a stacked blue and red bar represents the total points available in each super criterion, after weighting. The blue portion represents the achieved points by all countries, and the red bar shows the missing points. As can be seen, the *Proliferation Financing* and *Enforcement* super criteria are the most heavily weighted in this analysis, and the super criteria missing the most points.

2021 PPI: Percentage of Possible Points Globally Achieved

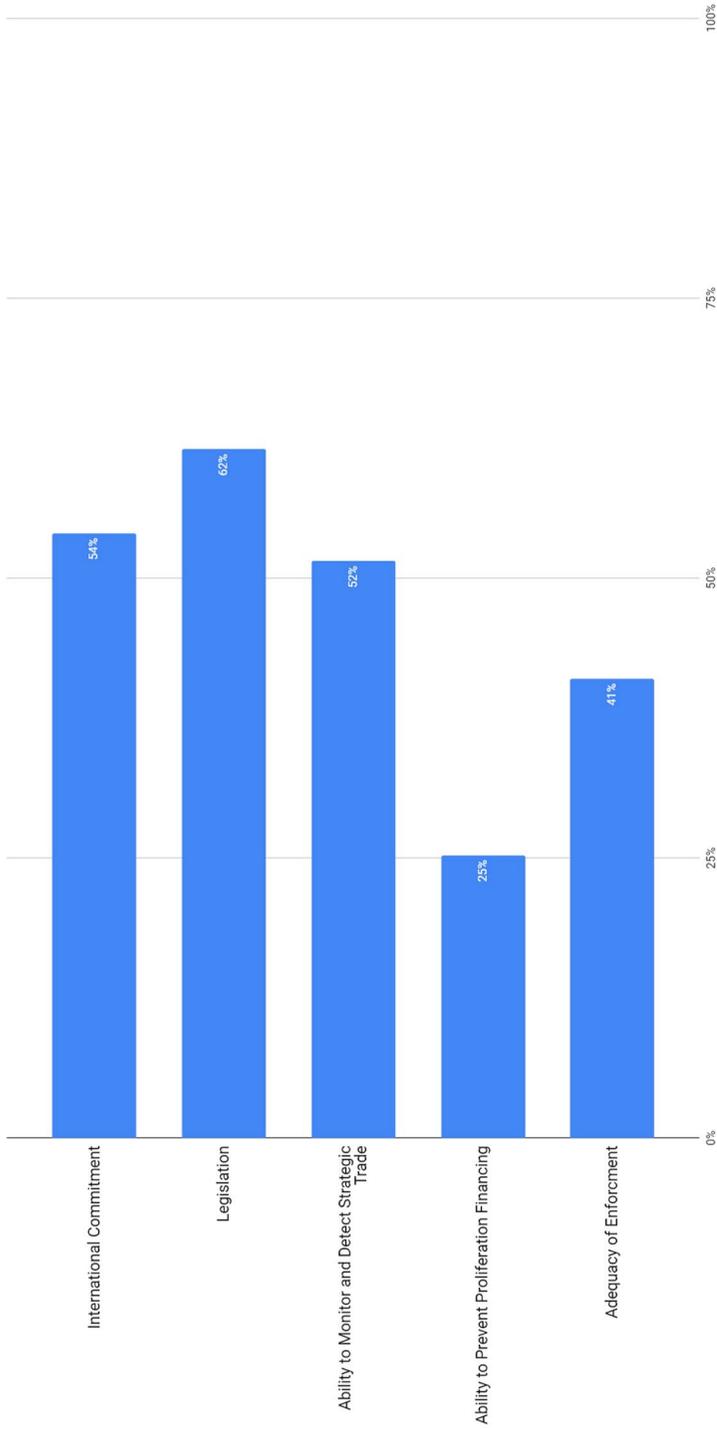


Figure 7.6. Global Percentage of Points Achieved by Super Criterion.

2021 Globally Achieved PPI Points

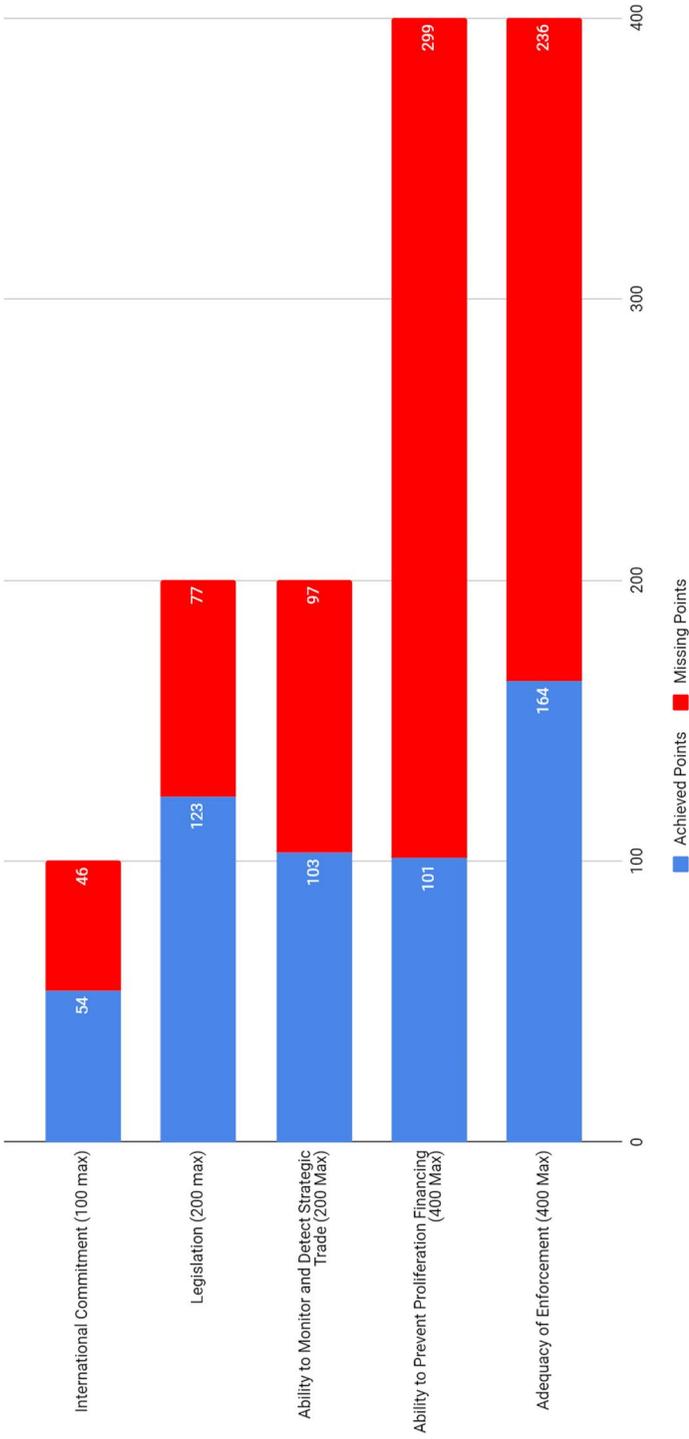


Figure 7.7. Collective average scores for all countries by super criteria.



**SECTION II**

**THREE FUNDAMENTAL TIERS**



# CHAPTER 8

## DEFINING THE THREE TIERS

The PPI generates a score for each of the 200 countries, territories, and entities to measure the effectiveness of strategic trade control systems. However, not all countries face the same challenges and priorities in creating and implementing trade control systems. Resources available for doing so also vary. As a result, the PPI project presents its findings in terms of tiers of similar countries with respect to trade control challenges and requirements. This tiering approach is unique in its categorization of countries compared to other indices. Instead of assessing countries only by a full ranking and then comparing them against one another—for example, regardless of whether they are a small island nation without significant international trade or a major world economy—the project separates countries into three basic, mutually-exclusive tiers. This manner of evaluating countries acknowledges that smaller countries, and countries that trade less and have fewer resources to devote to trade controls, cannot realistically be expected to match the performance of major world economies. The tiering system allows for a more relevant comparison of countries’ ranks among peers in their potential to prevent strategic commodity trafficking. It also serves to create a more transparent method to improve trade controls among peer countries.

The PPI tiering system supports, and hopes to assist, the work of the 1540 Committee, which is urged under Resolution 2325 (2016) to “continue to explore and develop an approach, with regard to implementation and reporting, that takes into account the specificity of States, inter alia,

with respect to their ability to manufacture and export related materials, with a view to prioritizing efforts and resources where they are most needed without affecting the need for comprehensive implementation of resolution 1540 (2004).”<sup>1</sup> The tiering by system requirements is further in line with maturity models used by many assistance providers to plan and track progress (see Chapter 15).

The definitions of the three tiers have remained the same as in the previous version of the PPI. However, the tier assignments changed for two countries, as discussed below.

The three tiers are defined in broad terms as:

**Tier One:** Major suppliers of, or capability to supply, nuclear facilities and components, and nuclear-related commodities and ballistic missile programs, other WMD programs, and related strategic commodities.

**Tier Two:** Potential nuclear, ballistic missile, WMD, and related strategic commodity transshipment countries with limited supply potential. These countries may have limited capabilities to manufacture dual-use items, or they may have limited nuclear infrastructure in place, such as nuclear research or power reactors or uranium mines.

**Tier Three:** All other countries.

## **TIER ONE COUNTRIES:**

Tier One is comprised of 55 countries, namely the countries known to possess nuclear weapons, other countries or entities that are members or adherents of the Nuclear Suppliers Group, and a few additional countries with otherwise extensive nuclear capabilities. NSG membership is considered under Tier One because membership requires that a country be a supplier of at least some goods on the NSG nuclear direct- and dual-use lists. This tier also includes countries with past nuclear weapons or extensive unsafeguarded programs, such as Argentina, Brazil, South Africa, and Taiwan. As a group, Tier One countries pose the greatest risk of being suppliers of some of the most sensitive WMD and ballistic missile commodities.

Countries in Tier One include the following:

*Argentina, Australia, Austria, Belarus, Belgium, Brazil, Bulgaria, Canada, China, Croatia, Czech Republic, Denmark, DPRK, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Mexico, Monaco, Netherlands, New Zealand, Norway, Pakistan, Poland, Portugal, Republic of Korea, Romania, Russia, San Marino, Serbia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan, Turkey, Ukraine, the United Kingdom, and the United States.*

Monaco, Liechtenstein, and San Marino are considered part of Tier One because of their close legal association with France, Switzerland, and Italy, respectively. Taiwan is included, despite its non-state status.

## **TIER TWO COUNTRIES:**

Tier Two is comprised of 59 countries that are broadly defined as potential strategic commodity transshipment countries. They do not have extensive nuclear or other sensitive commodity supply capabilities, but nevertheless pose a risk of illicit or unauthorized supply, facilitation, or transfer of such commodities. Tier Two countries include those that (1) are major traffic locations for land, sea, and air containers; (2) are major financial hubs; (3) possess significant manufacturing capabilities; (4) have small nuclear facilities under safeguards; or (5) are exporters of uranium.<sup>2</sup> Many Tier One countries would also meet these conditions, such as Canada and the United States, but they have greater nuclear, WMD, and missile supply potential that qualify them for Tier One.

Based on these criteria, the 59 countries in Tier Two are the following, alphabetically:

*Afghanistan, Albania, Algeria, Armenia, Azerbaijan, Bahamas, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, Chile, Colombia, Costa Rica, Cyprus, Dominican Republic, Ecuador, Egypt, Ethiopia, Georgia, Ghana, Hong Kong, Indonesia, Iraq, Jamaica, Jordan, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Lebanon, Libya, Malawi, Malaysia, Malta, Moldova (Rep of the), Mongolia, Morocco, Namibia, Nicaragua, Niger, Nigeria, Oman, Panama, Paraguay,*

*Peru, Philippines, Qatar, Saudi Arabia, Singapore, Sri Lanka, Syrian Arab Republic, Tajikistan, Thailand, Tunisia, Uganda, United Arab Emirates, Uzbekistan, Vanuatu, Venezuela (Bolivarian Republic of), Viet Nam, and Zambia.*

Syria's placement continues to be subject to extensive discussion and comments but remained in Tier Two in this version, despite its WMD capabilities, including the use of chemical weapons against its own people. As the civil war persists and the situation in Syria continues to change, its placement will be reassessed in future versions of the PPI.

### **TIER THREE COUNTRIES:**

This tier encapsulates all the remaining countries that are not included in Tiers One or Two.

The 86 countries in Tier Three are the following:

*Andorra, Angola, Antigua and Barbuda, Bahrain, Barbados, Belize, Benin, Bhutan, Bolivia, Botswana, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Dem Rep of the), Congo (Rep of the), Cook Islands, Côte d'Ivoire, Cuba, Djibouti, Dominica, El Salvador, Equatorial Guinea, Eritrea, Fiji, Gabon, Gambia, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Holy See, Honduras, Kenya, Kiribati, Kosovo, Lesotho, Liberia, Macedonia, Madagascar, Maldives, Mali, Marshall Islands, Mauritania, Mauritius, Micronesia (Federation of), Montenegro, Mozambique, Myanmar, Nauru, Nepal, Niue, Palau, Palestine (State of), Papua New Guinea, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Solomon Islands, Somalia, South Sudan, Sudan, Suriname, Swaziland (Eswatini), Tanzania (United Republic of), Timor-Leste, Togo, Tonga, Trinidad and Tobago, Turkmenistan, Tuvalu, Uruguay, Yemen, and Zimbabwe.*

Madagascar and Tanzania were moved from Tier Two to Tier Three, as it was determined that the existing graphite production methods do not match the standard and quality needed to produce nuclear-grade graphite. The Institute continues to monitor uranium mine developments, including developments in Tanzania. In 2018, Swaziland changed its name to "Eswatini." To maintain the previous alphabetical order, in

this PPI version, the name change is reflected in parentheses whenever Swaziland is listed.

## **DISTRIBUTION OF TIERS' AVERAGE AND MEDIAN SCORES**

The results for each tier are discussed in the next three chapters. Here, it is useful to summarize the tiers' average and median scores (Figure 8.1).

The average for Tier One is 827 points out of 1,300 points. Tiers Two and Three have averages of 542 and 368 points, below half of the maximum points possible.

The Tier One average is almost 300 points higher than the Tier Two average. This difference reflects the participation of Tier One countries in the major trade control arrangements, such as the Nuclear Suppliers Group, as well as their adherence to the major international nonproliferation treaties, conventions, and other relevant instruments. The NSG demonstrates the value of such groups of suppliers advancing shared values and creating, improving, and promoting effective strategic trade controls. Non-NSG member countries in Tier One that adhere or seek to adhere to regime guidelines help contribute to the advancement of these values and to the effective systems of control that normally accompany them.

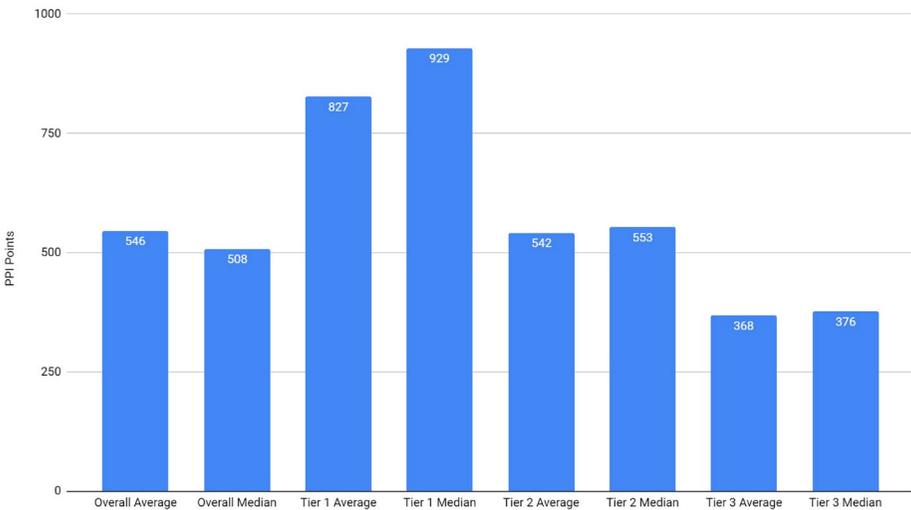
Figure 8.1 showcases an underlying problem in the global effort to combat strategic commodity trafficking. For developed countries, controlling trade is a matter of national security to which they accordingly dedicate resources; for many other countries, however, trade is mainly regulated for economic reasons. Compared to Tier One countries, Tier Two and Three countries moreover have fewer available financial and technical resources. Items crossing borders are controlled mainly to collect tariffs. For example, in many developing economies, import controls are in place, while export controls are minimized in order to increase income and decrease trade deficits.

To an extent, lower scores in Tiers Two and Three result from those countries' lack of perceived need for substantial trade control systems and claims of having fewer resources available to adopt and implement such controls. However, this perception is challenged by UN Security Council resolution 1540. As a result, all countries in Tiers Two and Three should create or improve viable, albeit minimal in some cases, strategic

trade control systems by adopting the legislation necessary to control the export, transit, transshipment, and re-export of strategic goods, and by putting in place the appropriate control lists.

No country received more than 83 percent of the total points, and five countries received negative scores. The former indicates that even those states with above-average strategic trade controls can improve the effectiveness of their controls. For those countries that received less than 10 percent of the points—Eritrea, Libya, Palestine, Iran, Somalia, South Sudan, Syria, North Korea, and Yemen, responsible suppliers and transshipment countries should exercise extreme caution when trading with them.

#### 2021 Average and Median Scores



**Figure 8.1.** Average and median scores in the overall PPI and the three tiers. The overall average is 546 points, and the overall median is 508 points.

## NOTES

1. See: United Nations Security Council, *Security Council Resolution 2325 (2016)*, S/RES/2325, December 15, 2016, [https://undocs.org/S/RES/2325\(2016\)](https://undocs.org/S/RES/2325(2016)).
2. The major land and air transshipment locations were measured in terms of freight in metric tonnes, and the top sea locations were measured in terms of twenty-foot equivalent units (TEU). The major financial hubs were determined in 2017 by picking the countries with the largest amount of illicit money outflows. Uranium producing countries were ranked based on the operational status of uranium deposit mines. The major graphite producing countries were ranked based on production capacity in terms of metric tonnes. The top twenty to thirty entries were selected from each list. “Railway Statistics,” International Union of Railways, 2019, <https://uic.org/support-activities/statistics/#Statistics-Group>; “Top 50 World Container Ports,” World Shipping Council, 2019, <http://www.worldshipping.org/about-the-industry/global-trade/top-50-world-container-ports>; “International Freight Traffic Monthly Ranking,” Airports Council International, 2016, <http://www.aci.aero/Data-Centre/Monthly-Traffic-Data/International-Freight-Traffic/Monthly>; “Industrial Development Report 2020-Industrializing in the digital age,” *United Nations Industrial Development Organization*, 2020, <https://www.unido.org/resources-publications-flagship-publications-industrial-development-report-series/idr2020>; “Illicit Financial Flows to and from 148 Developing Countries: 2006-2015,” Global Financial Integrity, 2019, <https://gointegrity.org/report/2019-iff-update/>; “Numbers of Uranium Deposits by Country and Status,” International Atomic Energy Association, 2020, <https://infcis.iaea.org/UDEPO/Statistics/bycountryandstatus>; and “Mineral Commodity Summaries 2020,” U.S. *Department of the Interior and United States Geological Survey*, 2020, <https://minerals.usgs.gov/minerals/pubs/mcs/2015/mcs2015.pdf>.



# CHAPTER 9

## TIER ONE RANKING

Tier One is composed of 55 countries capable of supplying countries with goods needed to create the wherewithal to build nuclear weapons:

*Argentina, Australia, Austria, Belarus, Belgium, Brazil, Bulgaria, Canada, China, Croatia, Czech Republic, Denmark, DPRK, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Mexico, Monaco, Netherlands, New Zealand, Norway, Pakistan, Poland, Portugal, Republic of Korea, Romania, Russia, San Marino, Serbia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan, Turkey, Ukraine, the United Kingdom, and the United States.*

Figure 9.1 (and Table 9.1 at the end of the chapter) show the rankings of the countries in Tier One. The average score in Tier One is 827 points (up from 769 in 2019 and 710 in 2017) out of a possible 1,300 points. The median is 929, also up from 2019 and 2017, where it was 857 and 822, respectively. The difference between the average and median scores reflects the large range of points achieved by members of the tier.

The reader is cautioned not to assign too much precision to close rankings between countries in the table. Countries ranked close to one another do not differ substantially in the effectiveness of their trade control systems.

Large differences in total points matter in the Tier One ranking. A country that achieved at least two-thirds of the total points, or about 870 points out of the total 1,300 possible points, is viewed as having a high-scoring trade control system (32 countries, up from 27 in 2019), although improvements are always necessary. A score below 50 percent of the total points means that these countries need to do significant work to improve their trade control systems (8 countries, down from 11 in 2019). Those in between need to take some steps to improve their controls (15 countries). Figure 9.2 shows the number of countries in each of these percentage ranges.

Out of a total possible score of 1,300 points, the highest scorer in Tier One (and also in the full ranking of all 200 countries) was, as in 2019 and 2017, the United States, with 1,080 points.<sup>1</sup> It received 83 percent of the total possible points. Other top scorers were mostly Western countries.

## TIER ONE IN THE OVERALL RANKING

Forty of the 55 countries in Tier One rank in the top 25 percent of the overall PPI ranking, down from 44 in 2019. The full ranking of all 200 countries is included in Annex I of this report. This result shows that Tier One countries have, in general, the most developed trade controls of the 200 countries, territories, or entities, but Tier Two countries are slowly catching up. Of the remaining countries, 12 countries only achieved a ranking between 51 and 100 in the PPI overall, and three ranked below 100 in the total ranking.

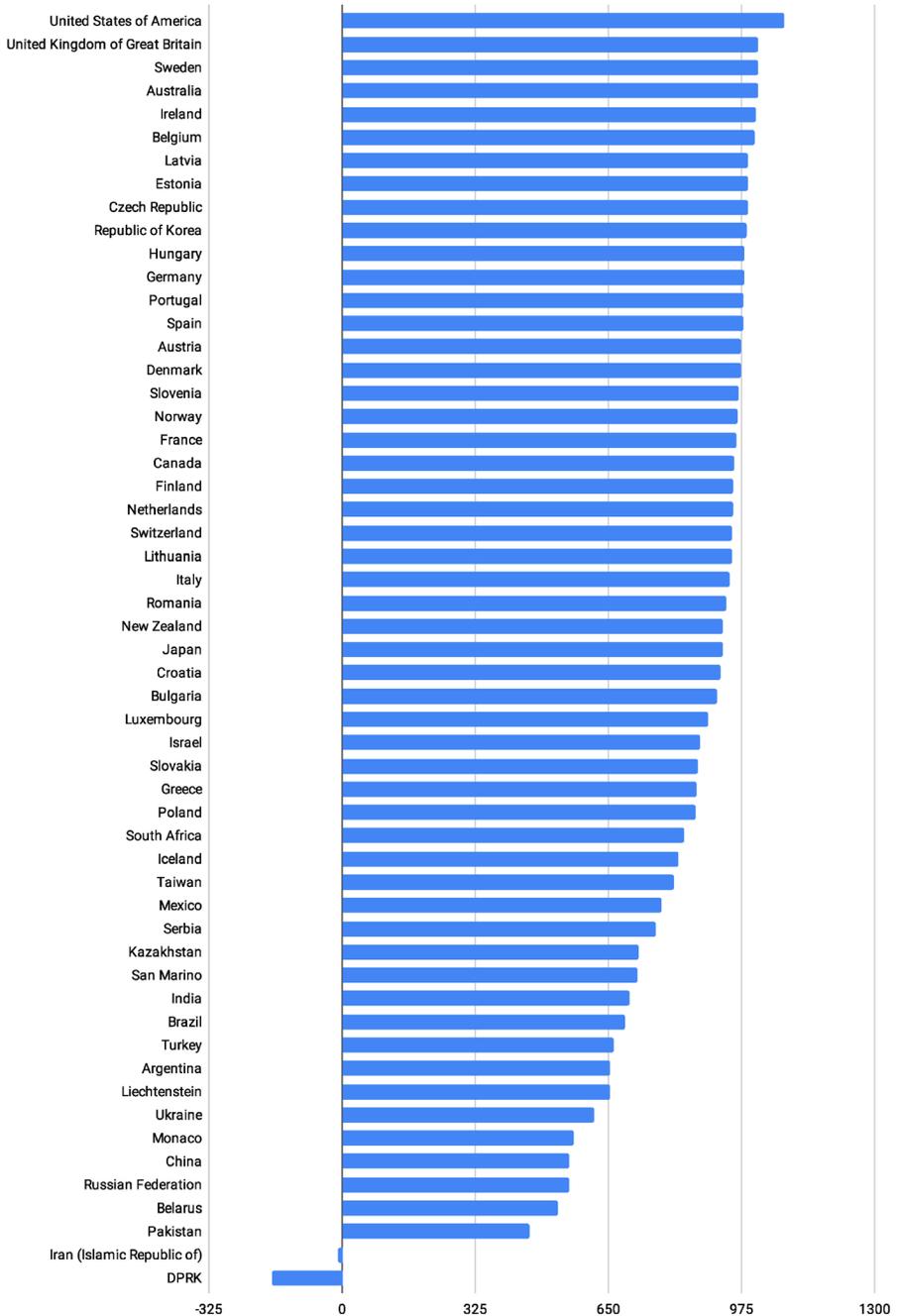
Tier One countries that ranked in the bottom half of the overall ranking included, from higher to lower ranking: Pakistan, Iran, and the DPRK.

Iran and North Korea are the only Tier One countries to receive negative scores. These scores reflect their trade control systems not meeting international standards and their wide-scale illicit procurements.

## SCORE AND PERFORMANCE BY SUPER CRITERIA

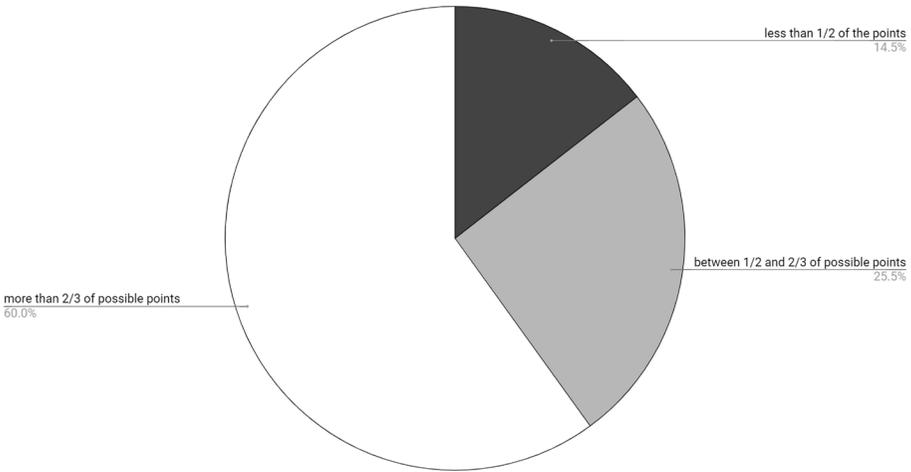
The Tier One countries varied in their scores under each super criterion. Collectively, Tier One performed best in the *Legislation* super criterion, achieving 94 percent of the total possible points. *International Commitment* had the next best performance, falling right at 75 percent. Under

## 2021 Tier One Rank



**Figure 9.1.** Total points received by each country in relation to the total possible points (1,300). The vertical line at 650 represents the 50 percent marker.

2021 Scores of Tier One Countries



**Figure 9.2.** Distribution of scores. Thirty-two, more than half of the Tier One countries, received more than two-thirds of the points. A quarter of Tier One countries received between one half and two-thirds of the total points, and about one-seventh of these countries received less than half of the points.

*Ability to Monitor and Detect Strategic Trade*, and *Adequacy of Enforcement*, Tier One collectively reached more than half, but less than three-quarters of the possible points (70 percent and 63 percent, respectively.) Tier One performed worst in its *Ability to Prevent Proliferation Financing*, with only 43 percent of the possible points achieved. Figure 9.3 is a bar diagram visualizing the performance of Tier One as a group in the five super criteria.

## TIER ONE PERFORMANCE FRACTIONS—HOW COUNTRIES CAN IMPROVE

Although a country's total score is the fundamental measure of the effectiveness of its trade control system, it is difficult to use it to prescribe a way for countries to improve. As a result, the performance fraction charts the extent to which countries have fulfilled the sub-criteria. For example, if the PPI assigned zero, five, or ten points for a country's adherence to the Additional Protocol (zero would entail no signature or ratification, five would signify signature but not ratification, and ten would signify points

2021 Tier One: Percentage of Possible Points Collectively Achieved by Tier One

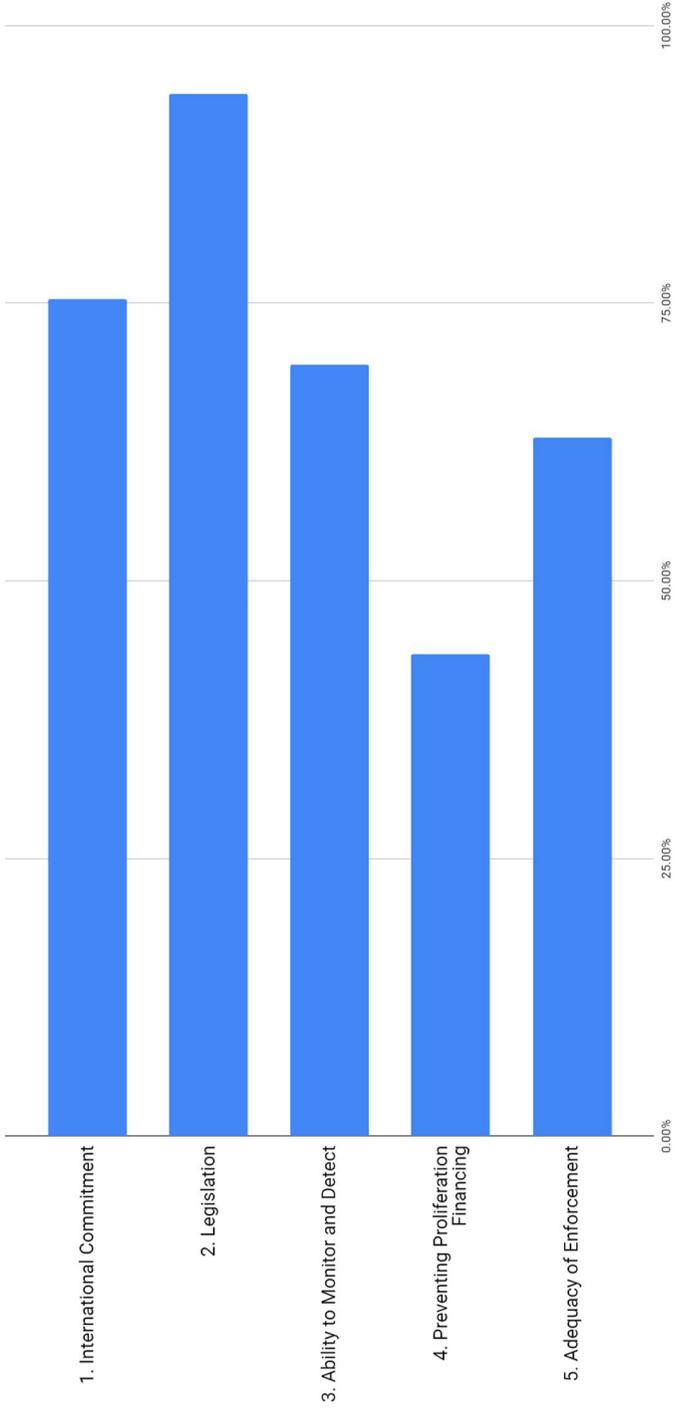


Figure 9.3. Extent to which the super criteria were fulfilled by Tier One as a group.

for full ratification), the performance fractions would assess the fraction of possible points achieved, regardless of the sub-criterion having low, medium, or high impact.

For the first time in 2021, negative criteria are included in the performance fraction graphs to acknowledge their importance and the great impact deficiencies can have on a country's final score and rank. Please refer to Chapter 7: Total Weighted Score and Rank for a longer discussion of performance fractions.

The performance fraction can also be tabulated for the entire tier. Given that two out of the 55 countries in Tier One are countries under international sanctions for proliferation-related activities (the DPRK and Iran), one hundred percent performance by the countries in this tier is not possible. These two countries account for 0.04 in the performance fraction, meaning in Figures 9.3-9.8, Tier One countries can maximally achieve a performance percentage of 96 percent, or performance fraction of 0.96. Nevertheless, as seen in Figure 9.3, near-perfect performance is not achieved, in any case, by Tier One under any super criterion.

## INTERNATIONAL COMMITMENT

Tier One countries, in general, are committed to international conventions, bodies, and regimes relating to non-proliferation. Forty-three of the 55 countries achieved two-thirds or higher of the possible points under this super criterion.<sup>2</sup> Five countries received less than two-thirds but more than half of the possible points. Seven countries received less than half of the possible points; notably amongst those seven were Pakistan, Iran, and the DPRK.

The performance fractions show that under the *International Commitment* super criterion, strong performance (90 percent) is achieved under eight sub-criteria (see Figure 9.4). Based on sub-criteria that are less than 75 percent fulfilled, Tier One, as a group, would benefit from more states becoming party to the OECD Convention on Bribery and the Conventions of the Suppression of Unlawful Acts Relating to International Civil Aviation and Maritime Navigation.

2021 Tier One: International Commitment Performance Fractions



**Figure 9.4.** Extent to which sub-criteria making up the *International Commitment* super criterion were fulfilled by Tier One as a group. An asterisk next to the sub-criterion indicates that a methodological change occurred in 2021.

2021 Tier One: Legislation Performance Fractions



Figure 9.5. Extent to which sub-criteria making up the *Legislation* super criterion were fulfilled by Tier One as a group.

## LEGISLATION

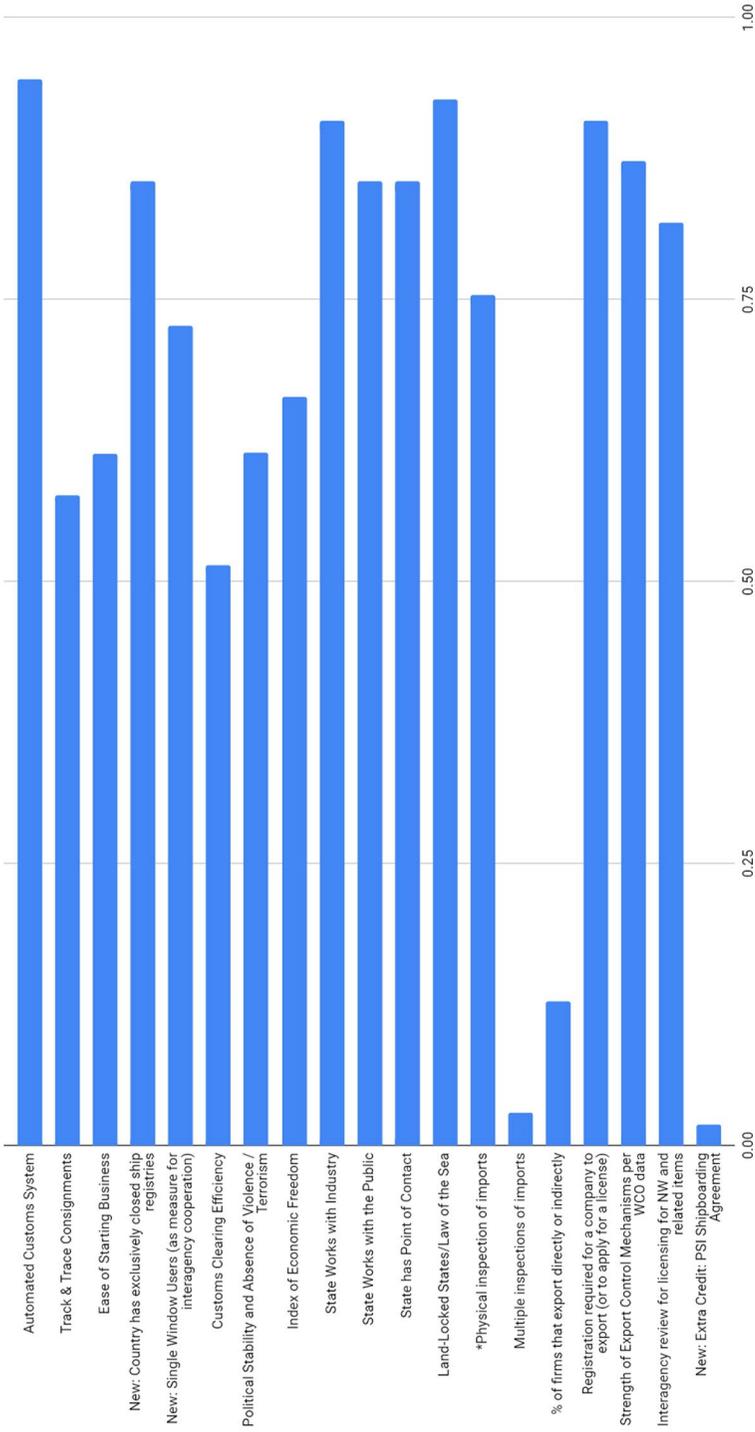
Overall, countries in Tier One did well in their enactment of trade control-relevant legislation, with 47 of the 55 countries receiving 90 percent or more of the possible points in this super criterion. Looking at the quality of export control legislation, all except two countries have legislation that placed them in the most developed category, namely Dark Green (see Chapter 3, Table 3.2, for a discussion of how quality of legislation is characterized.) The notable exceptions are Iran and the DPRK, which lack robust export control legislation and are categorized as Red. As expected, Figure 9.5 shows that the performance fraction exceeds 0.75 or 75 percent under all but one sub-criterion: Intellectual Property Protection. Additionally, the extra credit opportunity is limited to only two countries; Taiwan and the United Arab Emirates are the only countries with a “Gold Standard” 123 Agreement with the United States.

## ABILITY TO MONITOR AND DETECT STRATEGIC TRADE

Tier One did not perform as well under this super criterion as compared to super criteria *International Commitment* and *Legislation*. Here, the top country, Finland, received 84 percent of the possible points. However, 42 of the 55 countries achieved at least two-thirds of the possible points under this super criterion. The next seven countries in the ranking garnered at least half of the possible points but did not reach the two-thirds threshold. The remaining six countries scored less than half of the possible points under this super criterion. This suggests that while Tier One countries generally have the legislative basis for trade controls, many lack the ability to effectively monitor and detect illicit trade.

In terms of performance fractions, Figure 9.6 shows that half of all sub-criteria (11 out of 19) reached or exceeded a fraction of 75 percent. Examples of sub-criteria that need improvement across the tier are related to multiple physical inspections of cargo; improved interagency cooperation as measured by single window software usage; ability to track and trace consignments; and overall efficiency of customs clearance processes.

**2021 Tier One: Ability to Monitor and Detect Strategic Goods Performance Fractions**



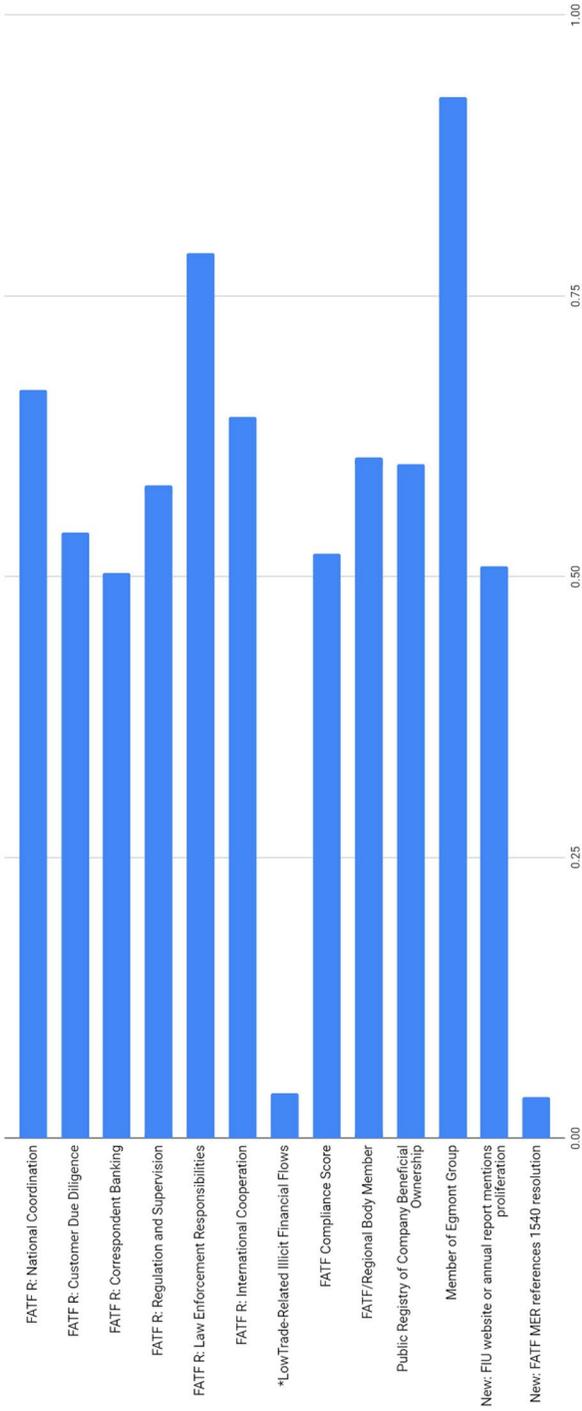
**Figure 9.6.** Extent to which sub-criteria making up the *Ability to Monitor and Detect Strategic Trade* super criterion were fulfilled by Tier One as a group.

## ABILITY TO PREVENT PROLIFERATION FINANCING

Countries scored the worst in their *Ability to Prevent Proliferation Financing*. The top country, the United States, received only 73 percent of the possible points in this criterion, with the second country, Israel, achieving 69 percent of the possible points. The top 27 countries received more than half of the possible points. Twenty-one countries received less than half of possible points, but more than a quarter possible points. Four countries scored less than 25 percent of the possible points, but more than zero. The bottom three countries had negative scores: Pakistan, the DPRK, and Iran. Similar to Super Criterion *Ability to Monitor and Detect Strategic Trade*, while countries appear to have the legislative basis to prevent illicit trade, many lack the ability to prevent the flow of money that finances it.

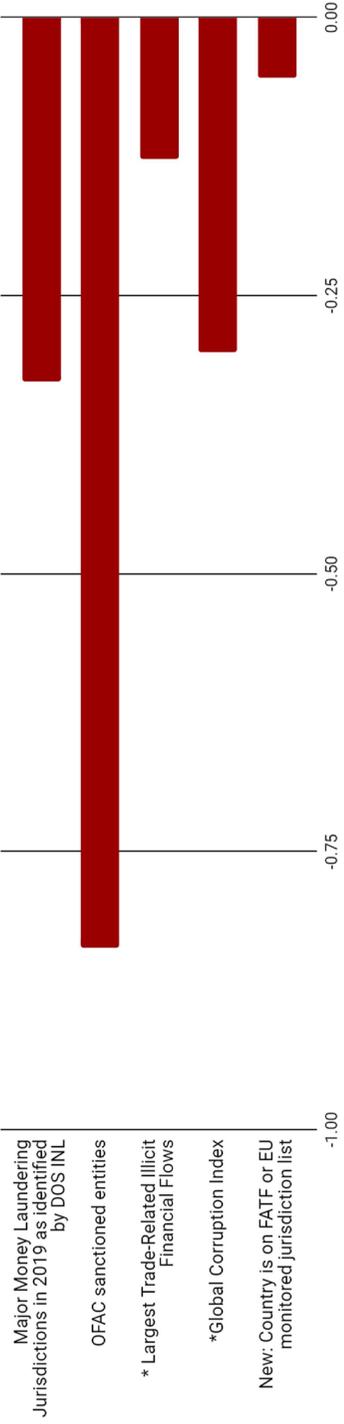
Figure 9.7A shows that Tier One countries fulfilled only two of the sub-criteria to 75 percent, namely Egmont Group membership and fulfilling FATF Recommendation 30: Law Enforcement Responsibilities. A general observation is that Tier One countries need to work more closely with the FATF and its regional bodies on proliferation financing, and improve compliance with the remaining proliferation financing-relevant FATF recommendations. A new sub-criterion documents counter-proliferation financing efforts mentioned in Financial Intelligence Unit (FIU) publications. It shows that FIUs need to be more actively involved in half of all Tier One countries. The performance fractions of the negative criteria further show that over 75 percent of Tier One countries have entities sanctioned by OFAC (see Figure 9.7B). Performance within the three extra credit criteria falls well below 50 percent (see Figure 9.7C).

2021 Tier One: Ability to Prevent Proliferation Financing Performance Fractions



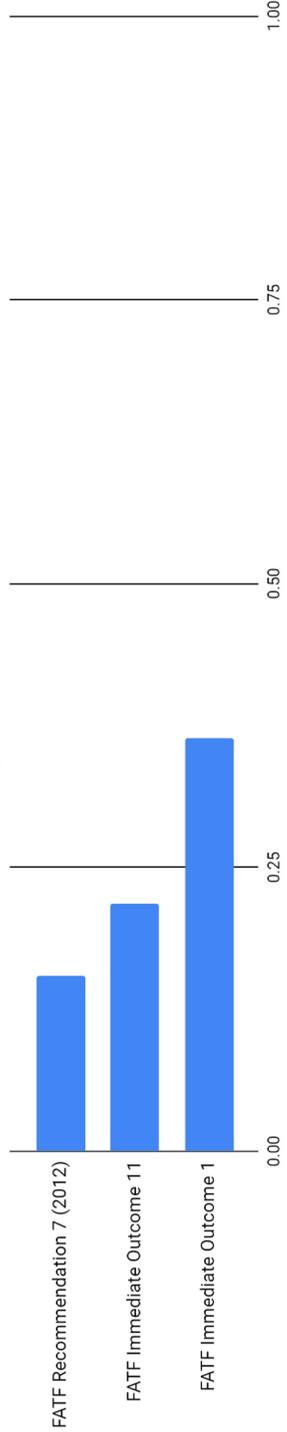
**Figure 9.7A.** Extent to which positive sub-criteria under *Ability to Prevent Proliferation Financing* super criterion were fulfilled by Tier One as a group.

**2021 Tier One: Ability to Prevent Proliferation Financing Performance Fractions - Negative Criteria**



**Figure 9.7B.** Extent to which negative sub-criteria under *Ability to Prevent Proliferation Financing* super criterion affected Tier One as a group.

**2021 Tier One: Ability to Prevent Proliferation Financing Performance Fractions - Extra Credit**



**Figure 9.7C.** Extent to which extra credit sub-criteria under *Ability to Prevent Proliferation Financing* super criterion were fulfilled by Tier One as a group.

## ADEQUACY OF ENFORCEMENT

Generally, the data show that Tier One countries have the capacity and the willingness to enforce trade control regimes. Thirty-two of the 55 countries garnered at least two-thirds of the possible points under this super criterion, with the top five countries achieving 85 percent or higher. Eleven countries received at least half, but not two-thirds, of the points under this super criterion. Iran, Russia, Belarus, and the DPRK remain the lowest scoring countries in the *Enforcement* super criterion in Tier One. Many of the poorly performing countries appear to lack either the will or capacity to enforce their trade control regimes, which is particularly concerning given their potential for proliferating nuclear-related goods.

The performance fraction for the *Adequacy of Enforcement* super criterion shows that half of the sub-criteria (12 out of 24) are fulfilled to more than 0.75 (see Figure 9.8A). Areas where countries can improve are putting in place better voluntary disclosure procedures for trade control violations, allowing customs checks in Free Trade Zones, making their national control lists easily accessible, incentivizing internal compliance programs for exporters and importers, engaging national nuclear industry associations, and developing better abilities to conduct investigations. The negative performance fractions show that prevalence of North Korea sanctions violations exists also in this otherwise high-performing Tier. Fifteen out of the 55 Tier One countries had points subtracted under this sub-criterion, with most points being subtracted for China and Russia for being large-scale and repeat offenders, and Iran for repeated involvement in military-related sanctions violations. Roughly half of the countries only had a small amount of points subtracted for being involved in one or two cases. Prevalence of corruption is relatively low compared to the other two Tiers (see Figure 9.8B).

2021 Tier One: Enforcement Performance Fractions

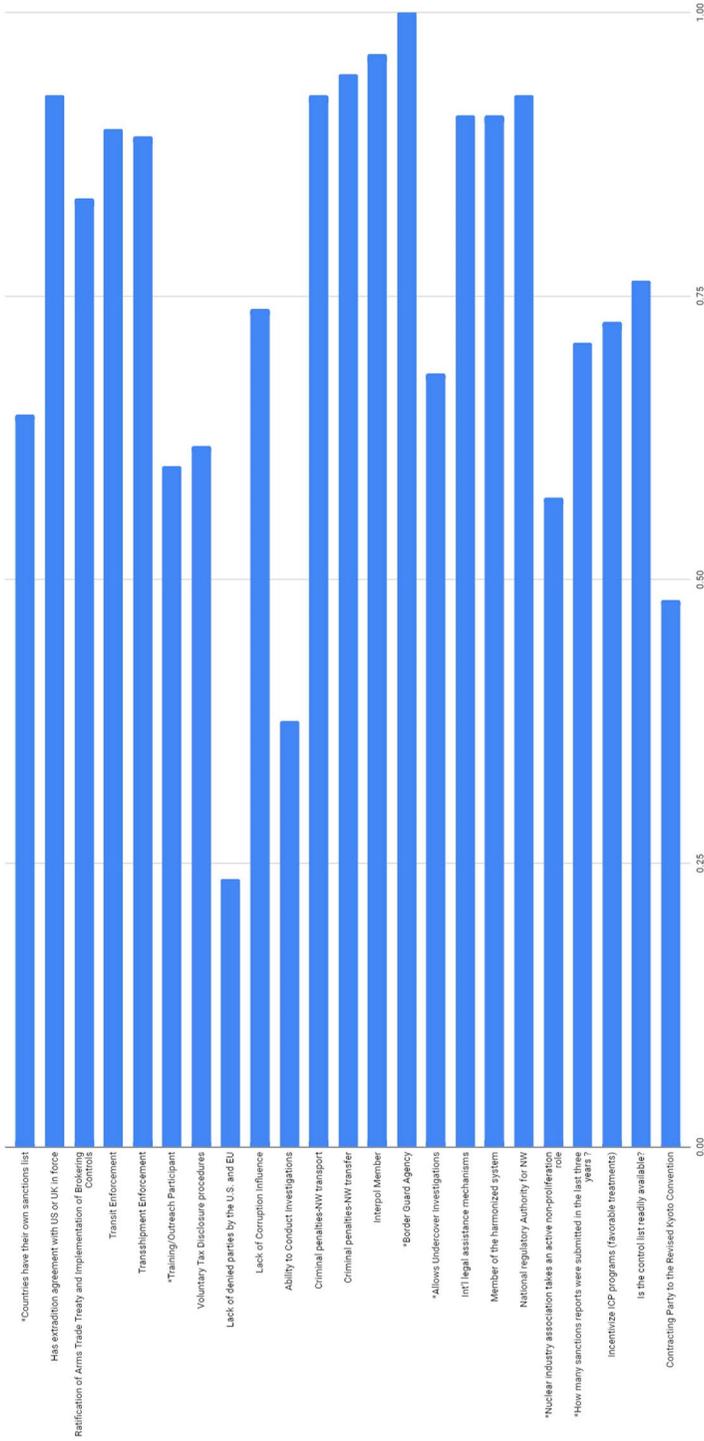


Figure 9.8A. Extent to which positive sub-criteria under *Adequacy of Enforcement* super criterion were fulfilled by Tier One as a group.

2021 Tier One: Enforcement Performance Fractions - Negative Values

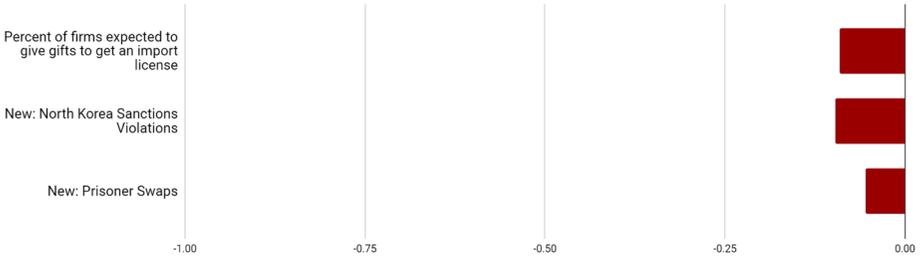


Figure 9.8B. Extent to which Tier One was affected by negative sub-criteria under *Adequacy of Enforcement*.

Tier Rank	Country	Total Points	Tier Rank	Country	Total Points
1	United States of America	1080	27	New Zealand	930
2	United Kingdom of Great Britain & Northern Ireland	1015	28	Japan	929
3	Sweden	1015	29	Croatia	922
4	Australia	1015	30	Bulgaria	915
5	Ireland	1009	31	Luxembourg	894
6	Belgium	1008	32	Israel	873
7	Latvia	991	33	Slovakia	868
8	Estonia	991	34	Greece	866
9	Czech Republic	991	35	Poland	864
10	Republic of Korea	987	36	South Africa	836
11	Hungary	983	37	Iceland	821
12	Germany	982	38	Taiwan	810
13	Portugal	980	39	Mexico	779
14	Spain	978	40	Serbia	766
15	Austria	973	41	Kazakhstan	724
16	Denmark	972	42	San Marino	721
17	Slovenia	967	43	India	701
18	Norway	966	44	Brazil	689
19	France	962	45	Turkey	663
20	Canada	958	46	Argentina	655
21	Finland	955	47	Liechtenstein	655
22	Netherlands	955	48	Ukraine	615
23	Switzerland	951	49	Monaco	566
24	Lithuania	950	50	China	554
25	Italy	946	51	Russian Federation	553
26	Romania	938	52	Belarus	526
			53	Pakistan	457
			54	Iran (Islamic Republic of)	-9
			55	DPRK	-172

**Table 9.1.** 2021 Rank of Tier One countries, including total points received. Scores are rounded to the nearest whole number.

## NOTES

1. We note that as a U.S.-based organization, our ranking of the United States as first in Tier One and in the overall rankings is awkward, as we strive to determine rankings without bias toward our national system. However, this result is not surprising given the United States' strong focus on counter-proliferation financing and enforcement, and given the PPI's own strong focus on proliferation financing and enforcement in determining rankings. The United States' score is high particularly on enforcement of trade controls. However, it is important to point out that the U.S. trade control system overall is not ideal by any means, as its total score shows, and even the top scorer can improve its system. For a set of recommendations on ways in which the United States can improve its trade control system, particularly in light of an earlier reform process, see: Stricker with Albright, *U.S. Export Control Reform: Impacts and Implications for Controlling the Export of Proliferation-Sensitive Goods and Technologies: A Policy Document for the New President and Congress* (Washington, D.C.: Institute for Science and International Security, May 17, 2017), <http://isis-online.org/isis-reports/detail/u.s.-export-control-reform-impacts-and-implications/20>.

2. As noted above, in general, it is not feasible for an entity or country to achieve 100 percent of available points under this super criterion. For example, membership in export control arrangements such as the Nuclear Suppliers Group is by invitation. In addition, some countries with even small amounts of nuclear material or small nuclear facilities cannot have an IAEA Small Quantities Protocol.

# CHAPTER 10

## TIER TWO RANKING

Tier Two is composed of 59 countries that pose a risk of illicit or unauthorized trade facilitation, transshipment, or transfer of sensitive commodities and have limited supply potential:

*Afghanistan, Albania, Algeria, Armenia, Azerbaijan, Bahamas, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, Chile, Colombia, Costa Rica, Cyprus, Dominican Republic, Ecuador, Egypt, Ethiopia, Georgia, Ghana, Hong Kong, Indonesia, Iraq, Jamaica, Jordan, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Lebanon, Libya, Malawi, Malaysia, Malta, Moldova (Rep of the), Mongolia, Morocco, Namibia, Nicaragua, Niger, Nigeria, Oman, Panama, Paraguay, Peru, Philippines, Qatar, Saudi Arabia, Singapore, Sri Lanka, Syrian Arab Republic, Tajikistan, Thailand, Tunisia, Uganda, United Arab Emirates, Uzbekistan, Vanuatu, Venezuela (Bolivarian Republic of), Viet Nam, and Zambia.*

For the 2021 PPI, Tanzania and Madagascar were moved from Tier Two to Tier Three.

Figure 10.1 (and Table 10.1) show the rankings of the countries in Tier Two. The average score in Tier Two is 542 points. The median is 553. The scores are more clustered than in Tier One (see Chapter 9).

As with Tier One countries, the reader is cautioned not to assign too much precision to close rankings between countries in Table 10.1. It is the

large differences in total points between Tier Two countries that matter, not a country's particular numerical rank.

Tier Two countries by their nature have not developed trade control systems as extensive as countries in Tier One. This is reflected in the overall scores. However, Tier Two countries cannot be expected to develop trade controls as robust as those of Tier One countries. As a result, in this tier, a cutoff is established for countries that achieved a score of at least half of the total points (650 points out of a total possible 1,300 points). This accounts for seventeen countries. It should be noted that having surpassed this cutoff does not mean that improvements are not needed. A score below one-third of the total possible points, which includes seventeen countries, indicates that countries need to do considerable work to improve their trade control systems. Those between one-third and half of the total possible points need to improve their systems somewhat (25 countries). This is shown by the pie chart in Figure 10.2.

## TIER TWO IN THE OVERALL RANKING

Tier Two countries did not do as well as Tier One countries in the overall PPI ranking. Nine countries ranked among the top 50 countries. Half of the remaining countries ranked between 50 and 100, and the other half ranked below 100. The highest-ranked Tier Two country was Singapore, which ranked 19<sup>th</sup> overall and achieved 74 percent of the possible points. The second-highest rank in Tier Two, Malta, which placed 27<sup>th</sup> in the overall rank, achieved 72 percent of the possible points.

## SCORE AND PERFORMANCE BY SUPER CRITERIA

Collectively, Tier Two performed best in the *Legislation* super criterion, achieving 60 percent of the total possible points. Performance in *International Commitment* and *Ability to Monitor and Detect Strategic Trade* was similar at just above 50 percent (53 percent and 54 percent, respectively). Under *Adequacy of Enforcement*, Tier Two collectively reached less than half, but more than one-quarter of the possible points (40 percent); the average score under *Ability to Prevent Proliferation Financing* is the lowest at 25 percent of possible points. Figure 10.3 is a bar diagram visualizing the performance of Tier Two as a group in the five super criteria. The average scores confirm that collective Tier Two performance has

## 2021 Tier Two Rank

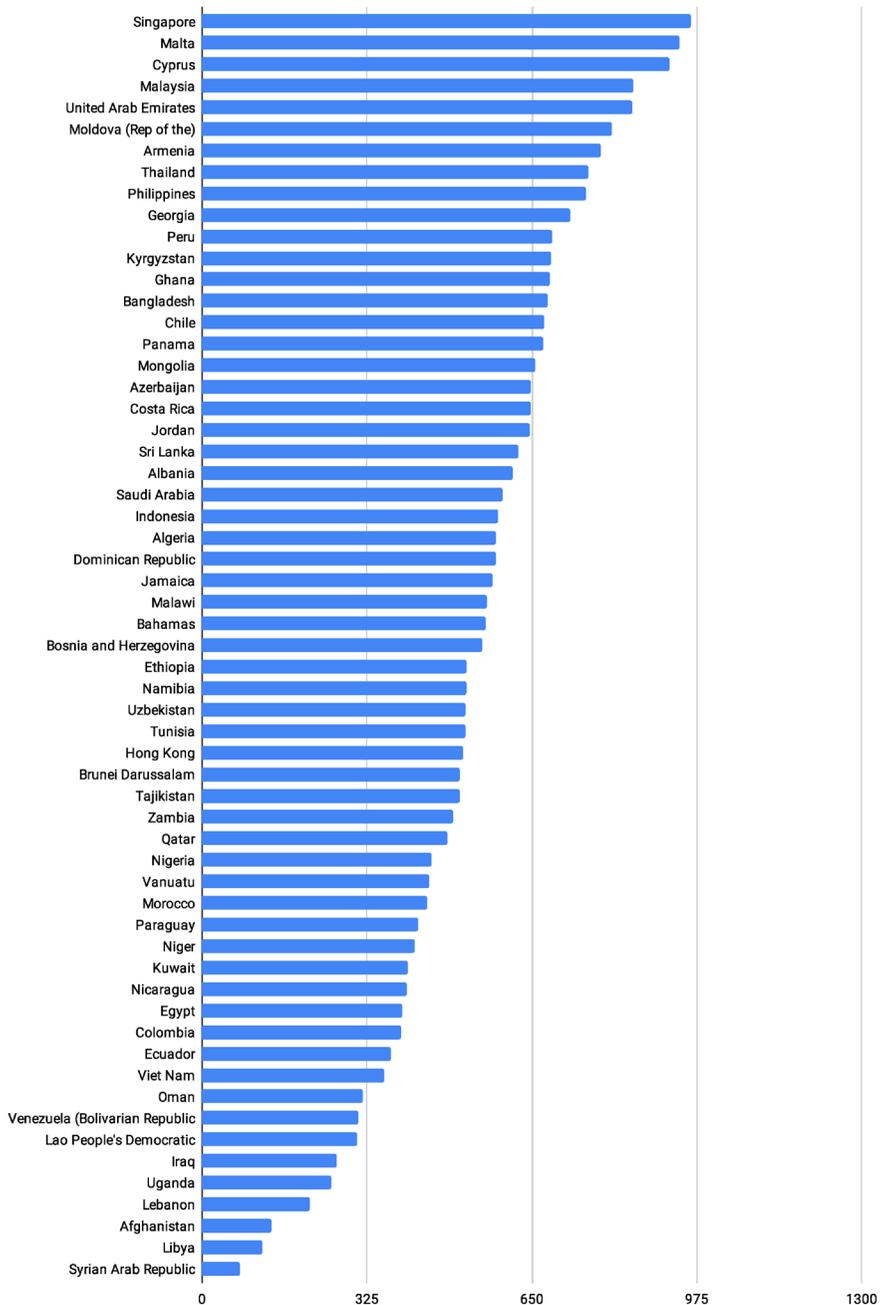
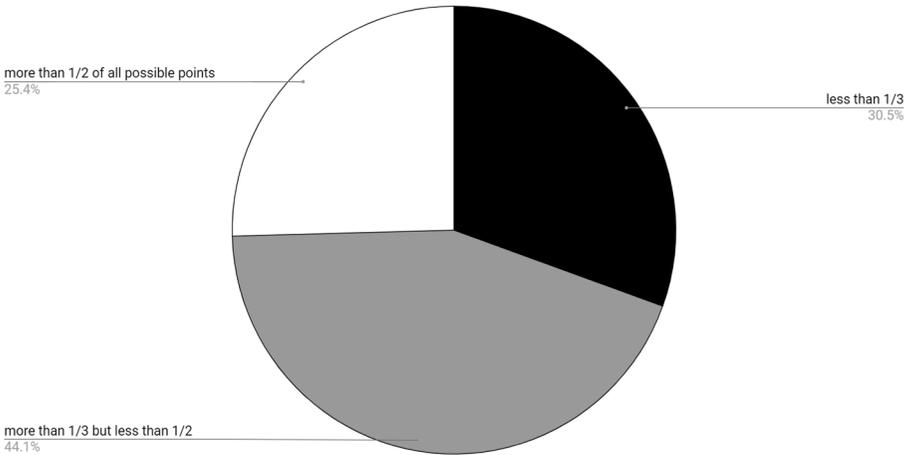


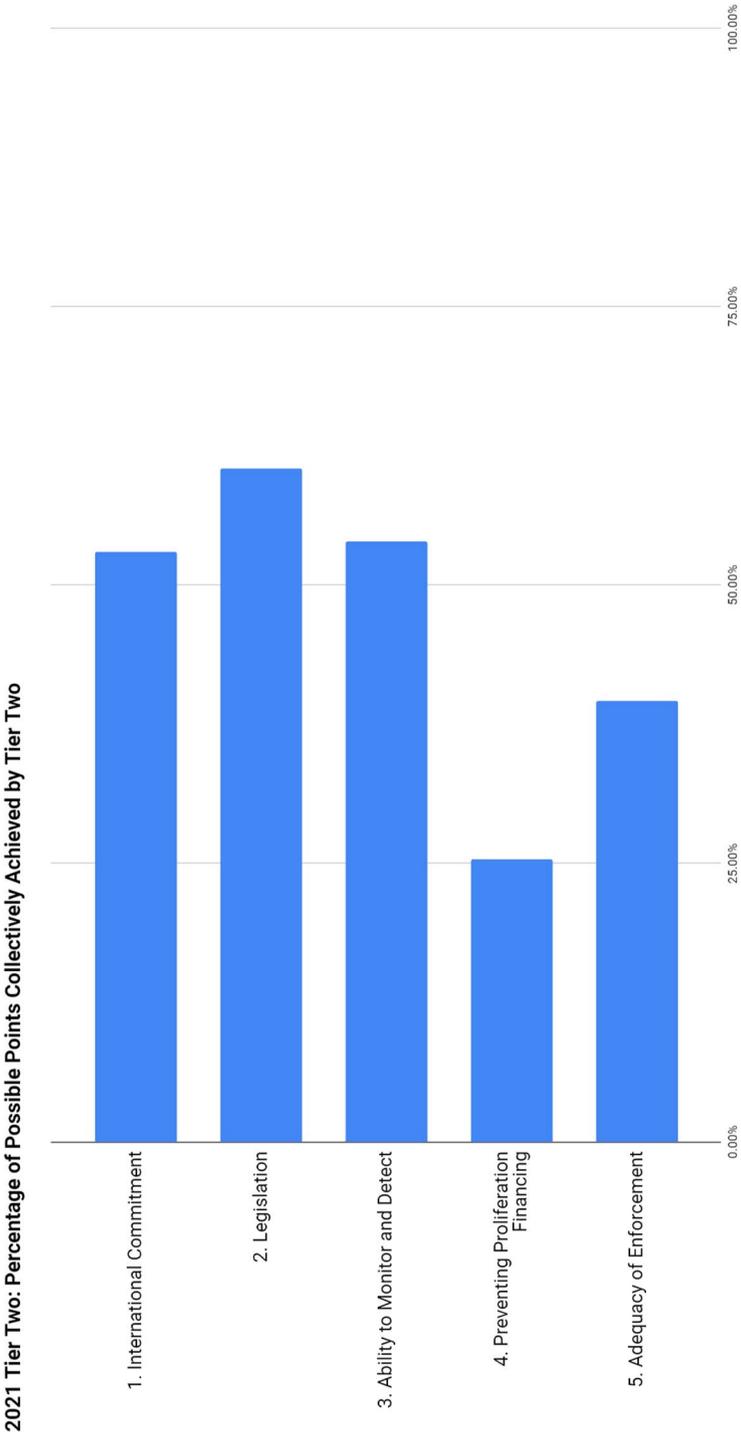
Figure 10.1. Total points received by each country in relation to the total possible points. The points result in the rank

considerable room for improvement (Figure 10.3). As described below, in the super criteria breakdown, there are many basic steps that Tier Two countries can take. The top five performing countries, Singapore, Malta, Cyprus, the United Arab Emirates, and Malaysia, could play a role in assisting their peers in this tier.

**2021 Scores of Tier Two Countries**



**Figure 10.2.** Almost half of all Tier Two countries need significant work on their trade controls and more than a third need some work.



**Figure 10.3.** The extent to which the super criteria were fulfilled by Tier Two as a group.

## TIER TWO PERFORMANCE FRACTIONS—HOW COUNTRIES CAN IMPROVE

Although a country's total score is the fundamental measure of the effectiveness of its trade control system, as discussed before, it is difficult to use it to prescribe a way for countries to improve. As a result, the performance fraction charts the extent to which countries have met each sub-criterion. For example, if the PPI assigned zero, five, or 10 points for a country's adherence to the Additional Protocol (zero would entail no signature or ratification, five would signify signature but not ratification, and ten would be points for full ratification), the performance fractions would assess those base points awarded to each country before weighting as low-, medium-, or high-impact. Negative criteria are also included in the performance fraction graphs to acknowledge their importance and the great impact deficiencies can have on a country's final score and rank. Performance fractions, in fact, allow for a basic assessment of where points were *not* received. Please refer back to Chapter 7: Total Weighted Score and Rank for a longer discussion of performance fractions.

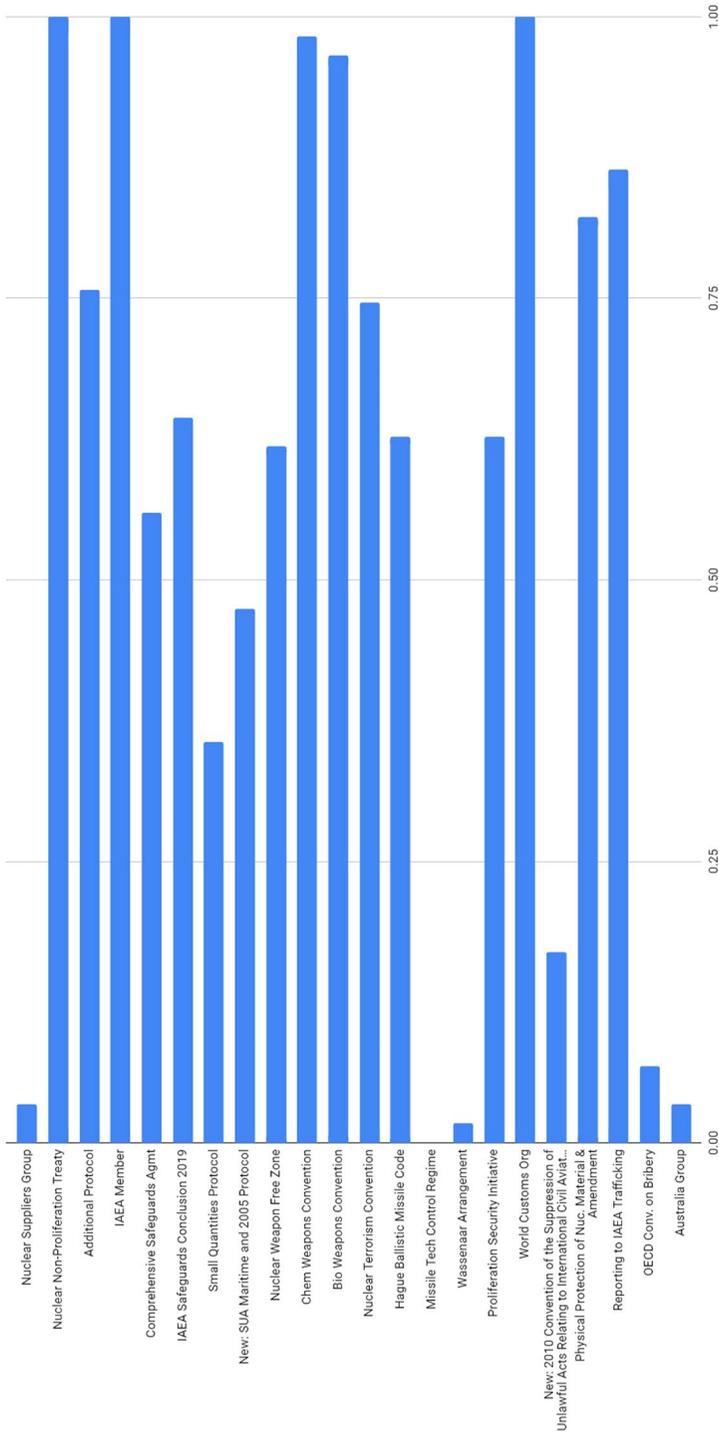
## INTERNATIONAL COMMITMENT

Five of the 59 countries received two-thirds of the total possible points in this super criterion. Thirty-eight countries received more than half, but less than two-thirds, of the points. The bottom 16 countries, which received less than 50 percent of the possible points, are, listed from higher to lower ranking: Saudi Arabia, Namibia, Uganda, Bahamas, Malaysia, Zambia, Ethiopia, Lebanon, Sri Lanka, Brunei Darussalam, Oman, Lao People's Democratic Republic, Venezuela (Bolivarian Republic of), Syrian Arab Republic, Egypt, and Hong Kong.

The performance fractions show that satisfactory performance (75 percent of the total points) was achieved under only eight sub-criteria (Figure 10.4). Tier Two countries had a perfect performance in three of those eight sub-criteria: being a party to the Treaty on the Non-proliferation of Nuclear Weapons (NPT), being an IAEA member, and being a member of the World Customs Organization.

However, stronger commitment can be shown by joining initiatives such as the Proliferation Security Initiative, and by adhering to the standards of global export control groups such as the NSG or the Wassenaar

2021 Tier Two: International Commitment Performance Fractions



**Figure 10.4.** The extent to which sub-criteria making up the *International Commitment* super criterion were fulfilled by Tier Two as a group. An asterisk next to the sub-criterion indicates that a methodological change occurred in 2021.

Arrangement. Signed treaties should be implemented, and ratifications should be adopted in a timely manner. Many of the Tier Two countries offer trade benefits to major global economies, including inexpensive and fast transshipment opportunities. Therefore, Tier Two countries should not hesitate to take advantage of international organizations and assistance mechanisms.

## LEGISLATION

Overall, Tier Two countries were nearly equal in distribution among those “doing well,” “less than adequate,” and “poorly” at having in place trade control-relevant legislation. Nineteen countries received more than two-thirds of the points, and 17 received more than half but less than two-thirds of the points. The remaining 23 countries received less than half of the possible points. Looking at the evaluation of the quality of export control legislation, Tier Two countries were mixed in their performance as well (see Chapter 3 for a discussion of how quality of legislation is characterized). Sixteen countries were Dark Green, which denotes comprehensive export control legislation, five are Light Green, 16 are Yellow, 16 are Orange, and six are Red.

The following lists countries by the quality of their export control legislation, alphabetically:

**Dark Green (16):** Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Cyprus, Georgia, Hong Kong, Iraq, Jordan, Kyrgyzstan, Malaysia, Malta, Moldova, Singapore, United Arab Emirates, Philippines

**Light Green (5):** Brunei Darussalam, Thailand, Tajikistan, Uzbekistan, and Viet Nam

**Yellow (16):** Algeria, Bangladesh, Chile, Ghana, Indonesia, Jamaica, Malawi, Morocco, Namibia, Nicaragua, Nigeria, Peru, Qatar, Saudi Arabia, Sri Lanka, and Uganda

**Orange (16):** Costa Rica, Dominican Republic, Ecuador, Ethiopia, Kuwait, Laos, Lebanon, Libya, Mongolia, Niger, Panama, Paraguay, Syria, Venezuela, Vanuatu, and Zambia

**Red (6):** Afghanistan, The Bahamas, Colombia, Egypt, Oman, and Tunisia

Non-Green categorized countries in this tier should improve their legal basis for export controls and thereby enable more effective implementation and enforcement. Sixty-four percent of Tier Two countries (including Yellow countries) lack relevant and adequate dual-use and nuclear-related export controls, which is related to their poor performance in the remaining super criteria.

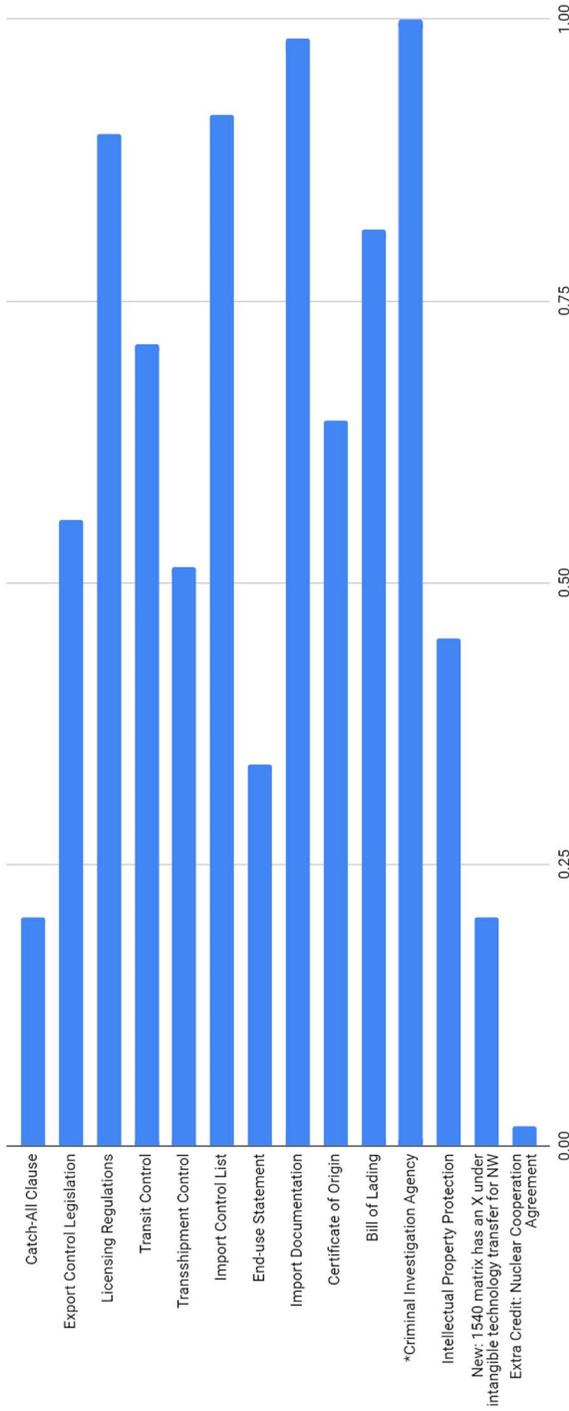
The performance fractions show that these countries need to significantly strengthen their trade control laws and lists (Figure 10.5). Only twelve countries include a catch-all clause in their export control legislation. Moreover, legislative controls on transit and transshipment of nuclear-related goods were only found for roughly seventy and fifty percent of Tier Two countries, respectively. Additionally, Tier Two countries with nuclear infrastructure in place especially should protect intellectual property better to ensure that nuclear-related knowledge and information are not proliferated. Only 20 percent of Tier Two countries currently have legislation in place addressing intangible technology controls.

## ABILITY TO MONITOR AND DETECT STRATEGIC TRADE

Tier Two countries performed better in their *Ability to Monitor and Detect Strategic Trade* in 2021 compared to 2019, a significant improvement since this tier is comprised of transshipment countries. The highest-scoring country, Armenia, achieved 80 percent of the available points. Thirty-seven countries scored more than 50 percent; the remaining 22 countries, down from 40 in 2019, fell below the half mark of possible points.

The performance fractions show that three sub-criteria were fulfilled to 75 percent: using an automated customs system, being a party to the UN Convention on the Law of the Sea, and having a closed ship registry (see Figure 10.6). The first two measures are supported and promoted by the United Nations. For example, the United Nations ran a global campaign to implement the ASYCUDA automated customs software, showing that international organizations can help individual countries to increase their ability to monitor and control trade. Six sub-criteria were fulfilled to less than 75 but to 50 or more percent: the ranking by the World Bank

**2021 Tier Two: Legislation Performance Fractions**



**Figure 10.5.** The extent to which sub-criteria making up the *Legislation* super criterion were fulfilled by Tier Two as a group.

of the ease of starting a business; the country has a single window system as a measure for interagency cooperation; the state has a Point of Contact for 1540 implementation; level of economic freedom; and registration is required for a company to export or to apply for an export license for controlled goods. The remaining ten sub-criteria are not fulfilled to even 50 percent. While it may take a long time to move up in a World Bank ranking, countries can start improving interagency cooperation in the licensing process, and working with the public and industry to increase awareness of export-controlled items and often-used illicit trade schemes on their own. Additionally, countries should increase the use of risk-management systems for customs inspections to supplement random physical inspection of imports and make it a requirement for companies applying for an export license to register in a company database. This way, a country's government can more easily keep track of companies involved in sensitive trade.

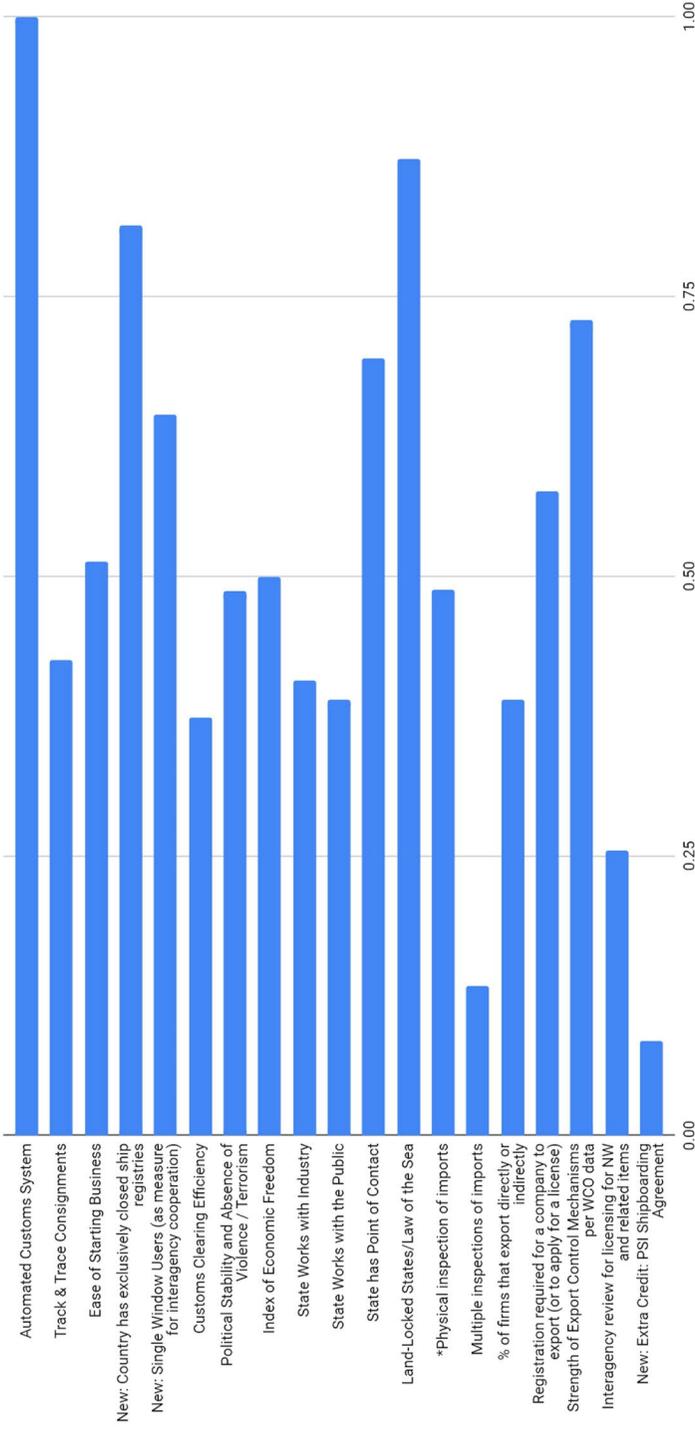
## **ABILITY TO PREVENT PROLIFERATION FINANCING**

Like Tier One countries, Tier Two countries performed the worst in their *Ability to Prevent Proliferation Financing*, but progress over time is visible in this super criterion. Because Tier Two countries include important financial hubs, improvements are highly relevant.

The top-ranking country, Armenia, received 69 percent of the possible points, the only country to pass the two-thirds mark. Singapore, Costa Rica, Cyprus, Malta, and Moldova (Republic of) are the only Tier Two countries to score more than 50 percent but less than two-thirds of possible points under this super criterion. Sixteen countries received at least one-third of possible points, but less than 50 percent, followed by 33 countries (52 in 2019) that scored under 33 percent but more than zero points. The remaining four countries, down from 12 in 2019, received negative points and included the following, listed from higher to lower ranking: Iraq, Afghanistan, Libya, and Lao People's Democratic Republic.

Considering that many of these countries ranked toward the bottom of the 2020 Global Corruption Index, it is particularly concerning that as transshipment states, they also lack the ability to prevent proliferation financing. Since the availability or ease of illicit financing facilitates strategic commodity trafficking, it is significant that a majority of Tier Two

**2021 Tier Two: Ability to Monitor and Detect Strategic Goods Performance Fractions**



**Figure 10.6.** The extent to which sub-criteria making up the *Ability to Monitor and Detect Strategic Trade* super criterion were fulfilled by Tier Two as a group.

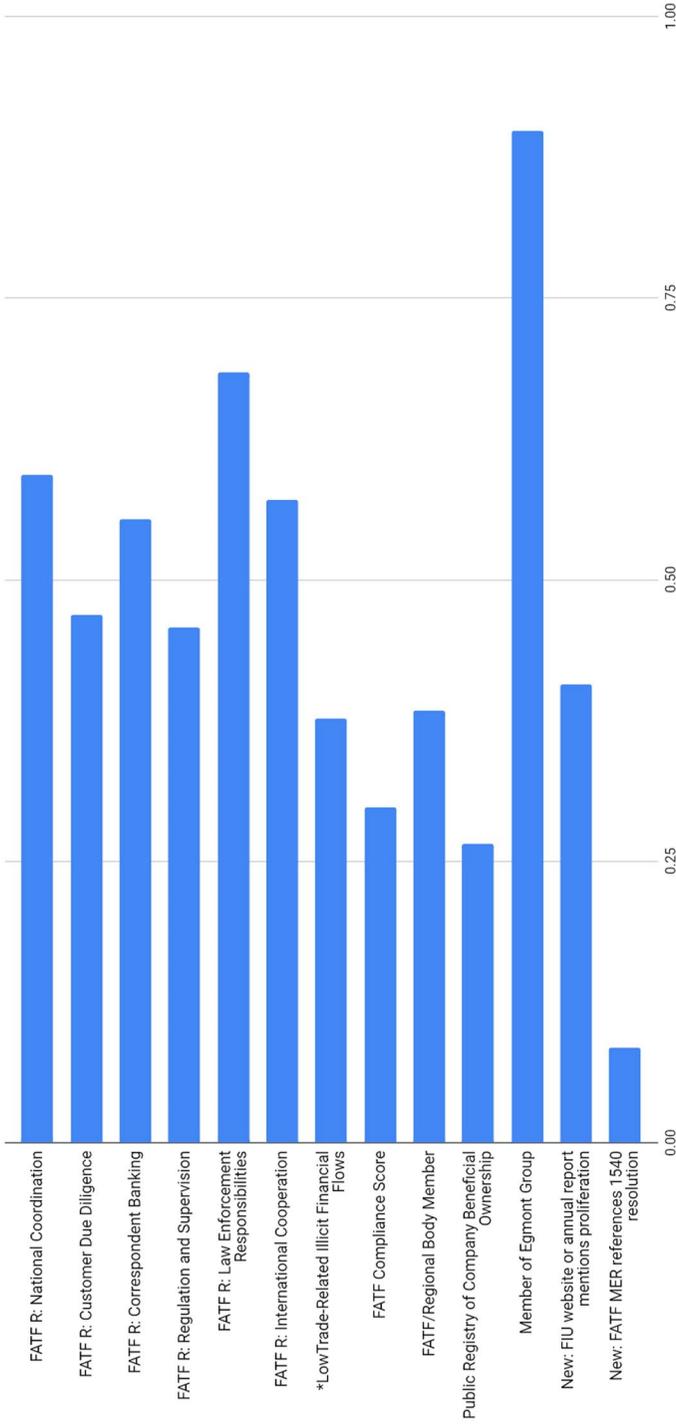
countries perform so poorly, in general, under Super Criterion *Ability to Prevent Proliferation Financing*, coupled with poor performance under Super Criterion *Ability to Monitor and Detect Strategic Trade*.

The performance fractions reveal why Tier Two countries performed worst at preventing proliferation financing. Only one sub-criterion reached performance of 75 percent or more: being a member of the Egmont Group. Less than half (5 out of 12) of the sub-criteria passed the 50 percent mark (see Figure 10.7A). A positive development is represented by FATF Recommendation 30: Law Enforcement Responsibilities, where Tier Two countries reached 68 percent fulfillment. Overall, Tier Two countries are more affected by the negative criteria than countries in Tier One (see Figure 10.7B). FATF compliance overall and compliance with the selected recommendations and outcomes remains deficient, especially with respect to countries' abilities to implement financial sanctions (see Figure 10.7C, Immediate Outcome 11).

Financial crime in general continues to be a significant issue in many Tier Two countries, in some cases the reason a country was categorized as Tier Two rather than Tier Three, when the Tiers were first established in 2017. More than half the countries (33 countries) are on the U.S. State Department List of Countries of Money-Laundering Concern, while 12 are on a FATF or EU monitored jurisdiction list. Tier Two countries also continue to have significant numbers of OFAC sanctioned entities.

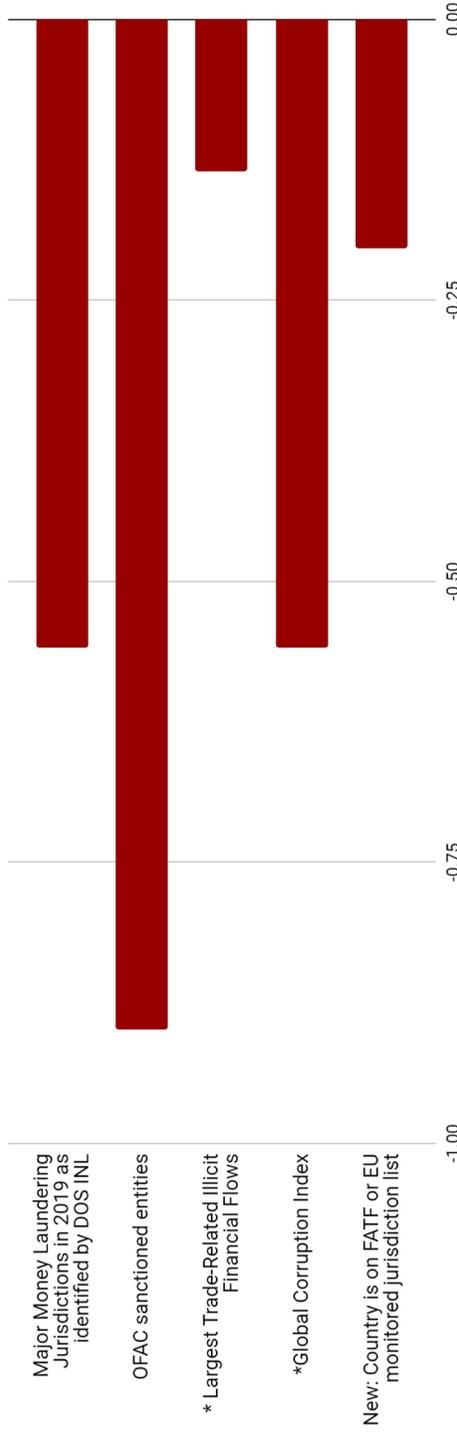
All Tier Two countries need to work more closely with the FATF and its regional bodies to implement the FATF recommendations, especially the six recommendations judged as most relevant to preventing proliferation financing. Countries also need to work on financial transparency by maintaining a public registry of company beneficial ownership, and, if none exists, they should establish a financial intelligence unit which could join the Egmont Group and take on an active role in preventing proliferation financing.

2021 Tier Two: Ability to Prevent Proliferation Financing Performance Fractions



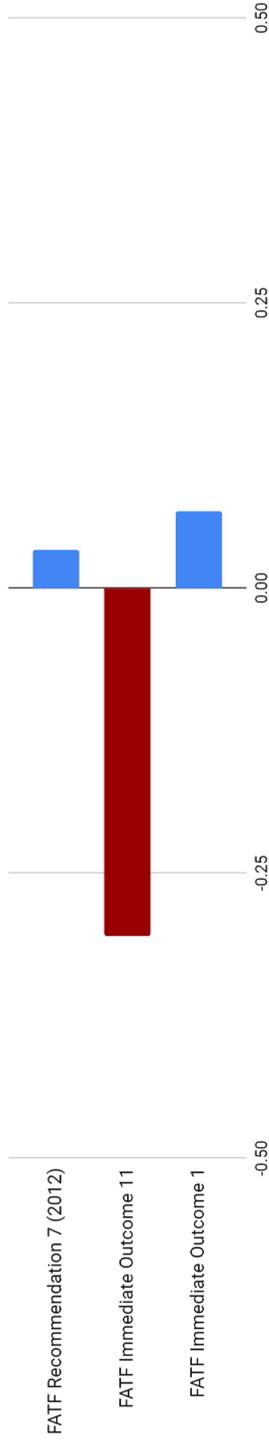
**Figure 10.7.A.** Extent to which positive sub-criteria under *Ability to Prevent Proliferation Financing* super criterion were fulfilled by Tier Two as a group.

**2021 Tier Two: Ability to Prevent Proliferation Financing Performance Fractions - Negative Criteria**



**Figure 10.7B.** Extent to which negative sub-criteria under *Ability to Prevent Proliferation Financing* super criterion affected Tier Two as a group.

### 2021 Tier Two: Ability to Prevent Proliferation Financing Performance Fractions - Extra Credit



**Figure 10.7C.** Extent to which extra credit sub-criteria under *Ability to Prevent Proliferation Financing* super criterion were fulfilled by Tier Two as a group.

## ADEQUACY OF ENFORCEMENT

Seven countries (up from three in 2019) achieved at least two-thirds of the total possible points, while the next fourteen (up from seven in 2019) countries scored above 50 percent but failed to reach the two-thirds mark. The next 22 countries achieved between 25 and 50 percent of the total points. The remaining 16 countries received less than 25 percent of the total points. Of these four countries, Afghanistan, Lebanon, Libya, and Syria, received negative scores. Such frequent, poor performance among transshipment countries, their apparent lack of capacity or willingness to enforce trade controls, and their poor ranking in the Corruption Perceptions Index, need to be seen as collectively hindering their non-proliferation efforts.

The performance fractions show that satisfactory performance of 75 percent across the entire tier was achieved under five sub-criteria: Being a member of Interpol; having a border guard agency; being a member of the harmonized system; having criminal penalties for the transport of nuclear weapons; and having a national regulatory authority for nuclear weapons (see Figure 10.8A). Notably, all but one of these sub-criteria are judged as having low impact, with the remaining one being of medium impact (see Chapter 6 for detailed descriptions of sub-criteria and their impacts.) Five further sub-criteria were fulfilled to 50 percent, including two that are very important for this tier: making use of training and outreach and of international legal assistance mechanisms.

Nevertheless, having means of transit and transshipment enforcement, and allowing customs checks in Free Trade Zones under the Kyoto Convention—arguably the most important mechanisms in terms of sub-criteria for Tier Two countries—are not fulfilled to 50 percent. Figure 10.8B shows that Tier Two is more affected by the negative sub-criteria than Tier One. Twenty-three countries (compared to fifteen in Tier One) had points subtracted for recent or repeated involvement in violations of UN sanctions on North Korea, to varying degrees of severity, resulting in a performance fraction of  $-0.14$ , or  $-14$  percent. Three of the countries were identified as involved in military-related violations in the reporting period covering 2019: Egypt, Syria, and Uganda. Six countries were involved repeatedly in non-military-related violations in the recent years, warranting a lower point subtraction than military-related violations, but a higher subtraction than involvement in 2019 alone. Ten countries were

involved in only a single instance or two in the reporting period covering 2019, resulting in the lowest point subtraction equivalent of a low impact criterion (minus five points). Related to this inability of many countries to prevent sanctions violations on their soil or by their nationals is that only a few countries in this tier submit North Korea sanctions implementation reports on a regular basis.

2021 Tier Two: Enforcement Performance Fractions

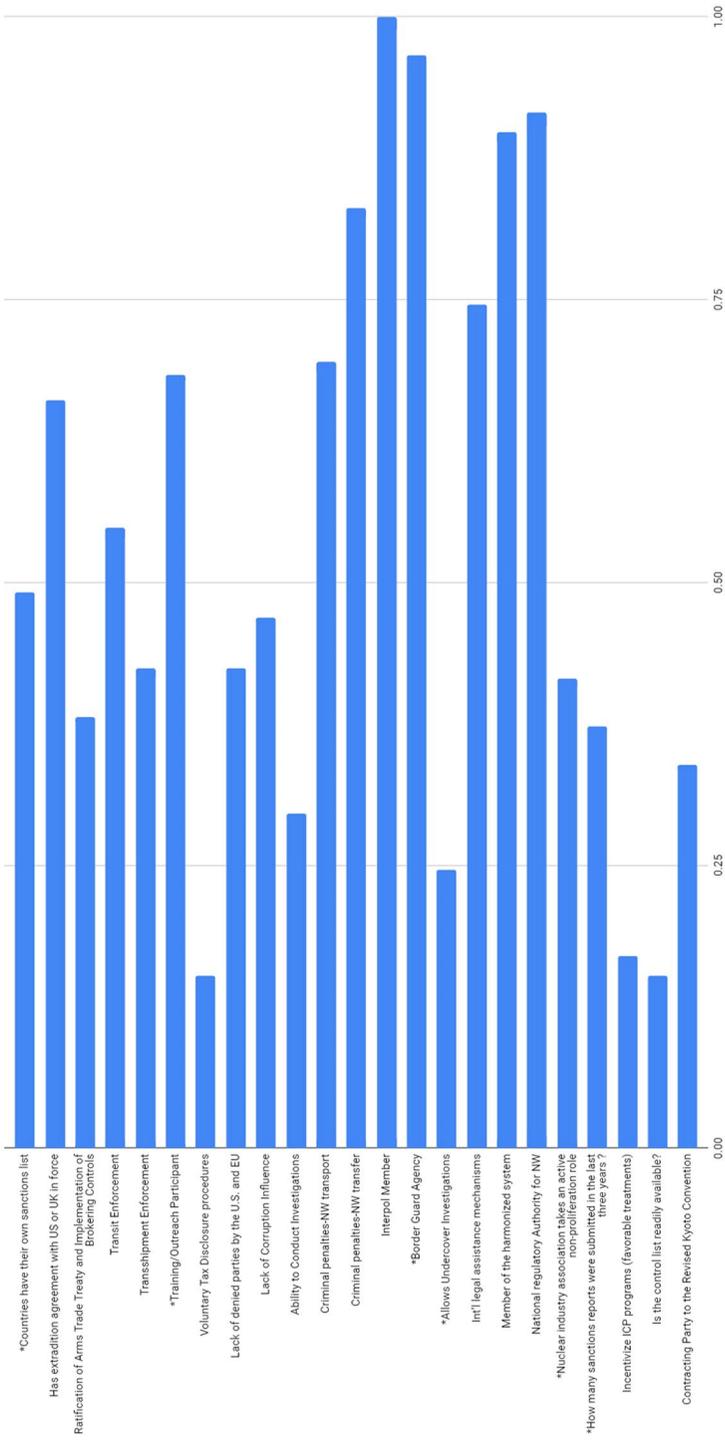


Figure 10.8A. The extent to which positive sub-criteria under the *Enforcement* super criterion were fulfilled by Tier Two as a group.

**2021 Tier Two: Enforcement Performance Fractions - Negative Criteria**



**Figure 10.8B.** Extent to which Tier Two was affected by negative sub-criteria under *Adequacy of Enforcement*.

Tier Rank	Country	Total Points	Tier Rank	Country	Total Points
1	Singapore	963	31	Ethiopia	521
2	Malta	941	32	Namibia	521
3	Cyprus	920	33	Uzbekistan	519
4	Malaysia	849	34	Tunisia	519
5	United Arab Emirates	847	35	Hong Kong	515
6	Moldova (Rep of the)	808	36	Brunei Darussalam	508
7	Armenia	786	37	Tajikistan	507
8	Thailand	760	38	Zambia	494
9	Philippines	755	39	Qatar	482
10	Georgia	726	40	Nigeria	453
11	Peru	690	41	Vanuatu	447
12	Kyrgyzstan	687	42	Morocco	444
13	Ghana	685	43	Paraguay	426
14	Bangladesh	681	44	Niger	419
15	Chile	674	45	Kuwait	407
16	Panama	673	46	Nicaragua	403
17	Mongolia	656	47	Egypt	395
18	Azerbaijan	648	48	Colombia	392
19	Costa Rica	647	49	Ecuador	373
20	Jordan	645	50	Viet Nam	358
21	Sri Lanka	623	51	Oman	316
22	Albania	613	52	Venezuela (Bolivarian Republic of)	309
23	Saudi Arabia	593	53	Lao People's Democratic Republic	305
24	Indonesia	583	54	Iraq	266
25	Algeria	578	55	Uganda	255
26	Dominican Republic	578	56	Lebanon	212
27	Jamaica	572	57	Afghanistan	138
28	Malawi	561	58	Libya	119
29	Bahamas	558	59	Syrian Arab Republic	75
30	Bosnia & Herzegovina	553			

**Table 10.1.** 2021 Rank of Tier Two countries, including total points received.



# CHAPTER 11

## TIER THREE RANKING

Tier Three is composed of the remaining 86 countries that are not in Tiers One and Two:

*Andorra, Angola, Antigua and Barbuda, Bahrain, Barbados, Belize, Benin, Bhutan, Bolivia, Botswana, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Dem Rep of the), Congo (Rep of the), Cook Islands, Côte d'Ivoire, Cuba, Djibouti, Dominica, El Salvador, Equatorial Guinea, Eritrea, Fiji, Gabon, Gambia, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Holy See, Honduras, Kenya, Kiribati, Kosovo, Lesotho, Liberia, Macedonia, Madagascar, Maldives, Mali, Marshall Islands, Mauritania, Mauritius, Micronesia (Federation of), Montenegro, Mozambique, Myanmar, Nauru, Nepal, Niue, Palau, Palestine (State of), Papua New Guinea, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Solomon Islands, Somalia, South Sudan, Sudan, Suriname, Swaziland (Eswatini), Tanzania (United Republic of), Timor-Leste, Togo, Tonga, Trinidad and Tobago, Turkmenistan, Tuvalu, Uruguay, Yemen, and Zimbabwe.*

Compared to Tier One and Two countries, Tier Three countries did not perform as well on fulfillment of sub-criteria and overall. Only one Tier Three country, Andorra, ranked in the top 50 of all 200 countries.

Eleven Tier Three countries ranked between 50 and 100; the remaining 74 countries ranked in the bottom half of all 200 countries.

Many of the countries in Tier Three are not known to have been used as transshipment countries by proliferant states in the process of illegally procuring goods or moving funds, but they do at times factor into sanctions-evading schemes of other countries. Overall, these countries appear to pose a generally lower risk of being caught up in illicit trading schemes. However, this could change as countries develop or as illicit trading networks look to exploit additional states with weak controls.

Table 11.1 (and Figure 11.1) show the rankings of the countries in Tier Three. The average score in 2021 for Tier Three is 368 points. The median is 376. Both are up from 2019, where the average points were 321 and the median was 316.

While the strategic trade control requirements or expectations for non-supplier and non-transshipment countries may not be as high, Tier Three still performed poorly overall. The results suggest that for these countries, which comprise 43 percent of all countries, trade controls are a low priority. In general, Tier Three countries lack a basic commitment to international conventions and legislation from which to establish and enact trade controls.

Moreover, they lack capacity, resources, and possibly the will to combat proliferation and enforce trade controls. Prevalence of corruption in these countries, and the related ease with which illicit funds can be used, support trafficking in strategic commodities. Tier Three countries could potentially be used by unscrupulous “middlemen” or facilitators to finance and procure commodities from supplier countries. As a result, the same cutoff is used for Tier Three as for Tier Two, namely half the total points (650 points). Unfortunately, only a handful of countries in Tier Three achieved these points, an improvement from 2019 nevertheless, where not a single country met the threshold. A score below one-third of the total possible points means that countries need to do considerable work to improve their trade control systems (61 countries). Those in between need to improve their systems somewhat (17 countries). This is visualized in the pie chart in Figure 11.2.

A model strategic trade control system with minimal resource requirements for a Tier Three country is discussed in Chapter 16.

## SCORE AND PERFORMANCE BY SUPER CRITERIA

The average score by Tier Three achieved in each super criterion shows that their low scores stem from insufficient action taken to meet the criteria. Not a single super criterion was fulfilled to even 50 percent. Collectively, Tier Three performed best in the *International Commitment* and the *Legislation* super criteria, which tie at 42 percent. Under *Ability to Monitor and Detect Strategic Trade*, and *Adequacy of Enforcement*, Tier Three collectively reached also less than half, but more than one quarter of the possible points (38 percent and 28 percent, respectively). Tier Three performed worst in its *Ability to Prevent Proliferation Financing*, with only 14 percent of the possible points achieved. Figure 11.3 is a bar diagram visualizing the performance of Tier Three as a group in the five super criteria.

## TIER THREE PERFORMANCE FRACTIONS – HOW COUNTRIES CAN IMPROVE

As discussed earlier, the performance fraction charts the extent to which countries have met the sub-criteria. Please refer back to Chapter 7 for a longer discussion of performance fractions.

### INTERNATIONAL COMMITMENT

No Tier Three country achieved two-thirds of the total possible points under this super criterion; the highest scorer received 63 percent of possible points. Thirty countries, however, did receive at least half of the possible points. Forty-nine countries received between 25 and 50 percent of possible points, while the remaining seven countries received less than 25 percent.

The performance fractions under this super criterion suggest a lack of commitment to adopting international agreements and conventions (see Figure 11.4). While the majority of Tier Three countries are parties to the three major WMD Treaties (NPT, CWC, and BWC), memberships in other important conventions such as the Convention for the Suppression of Acts of Nuclear Terrorism, and the Proliferation Security Initiative, fell short of 50 percent. There is room for improvement regarding IAEA cooperation. In the 2021 PPI update, adherence to the Convention on the

Physical Protection of Nuclear Materials rose to 59 percent, an improvement, but still short of what is desired.

Of all the tiers, Tier Three countries have the highest rate of participation in regional Nuclear Weapon Free Zone treaties, implying an important commitment to preventing the spread of nuclear weapons in their regions. However, this should not be taken as an indication that countries in Tiers One and Two lack commitment to non-proliferation or nuclear disarmament. It more likely reflects the fact that, for many countries in Tiers One and Two, NWFZ treaties have not been established in their regions, for example, in Europe and the Middle East.

2021 Tier Three Rank

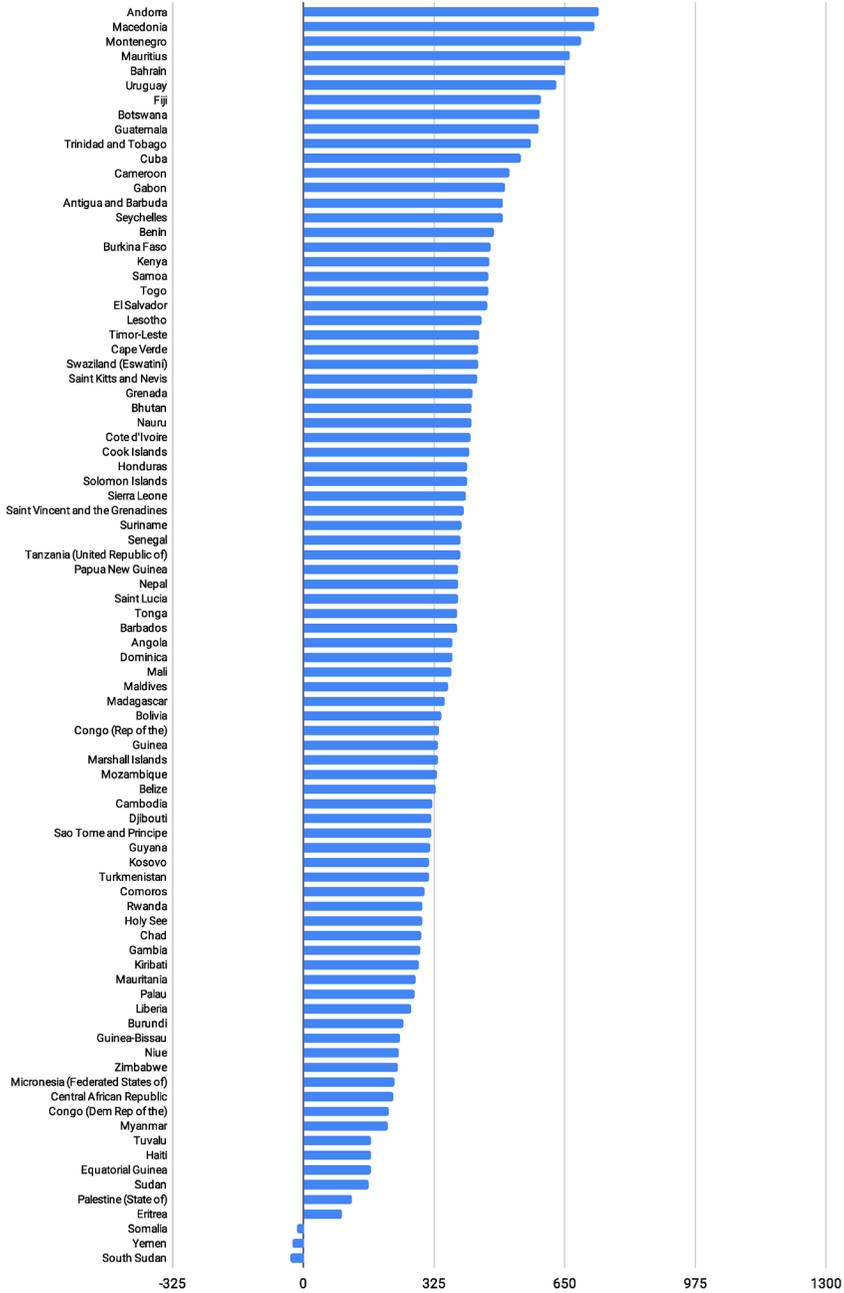
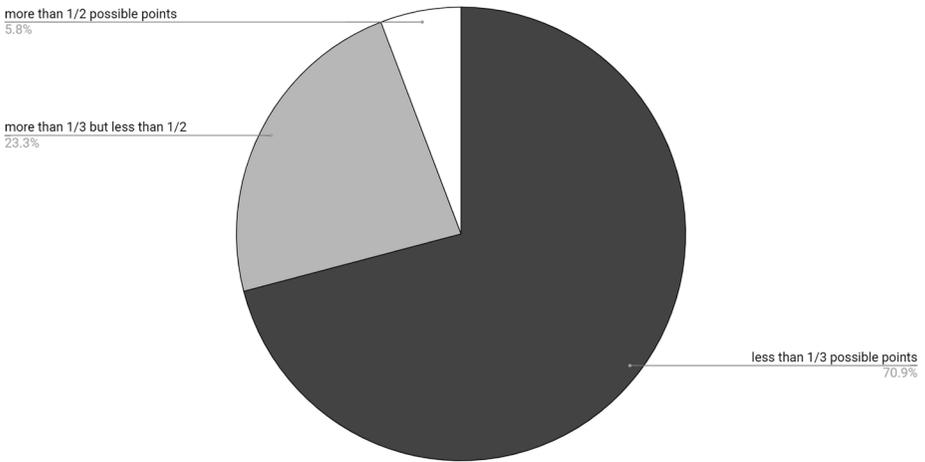
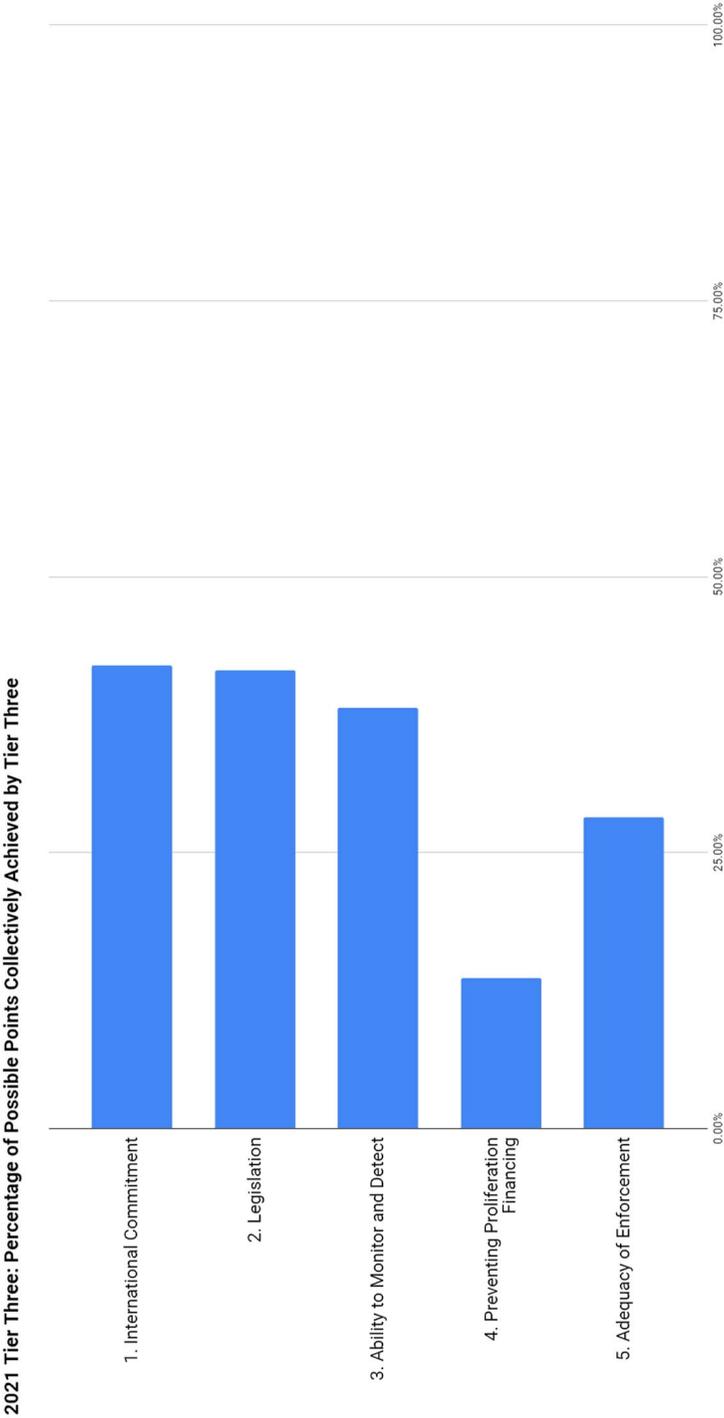


Figure 11.1. Visualization of the total points received by each country in relation to the total possible points (1,300). The scores lead to the rank. The vertical line at 650 represents the 50 percent marker, and the vertical line at 325 is the 25 percent marker.

**2021 Scores of Tier Three Countries**

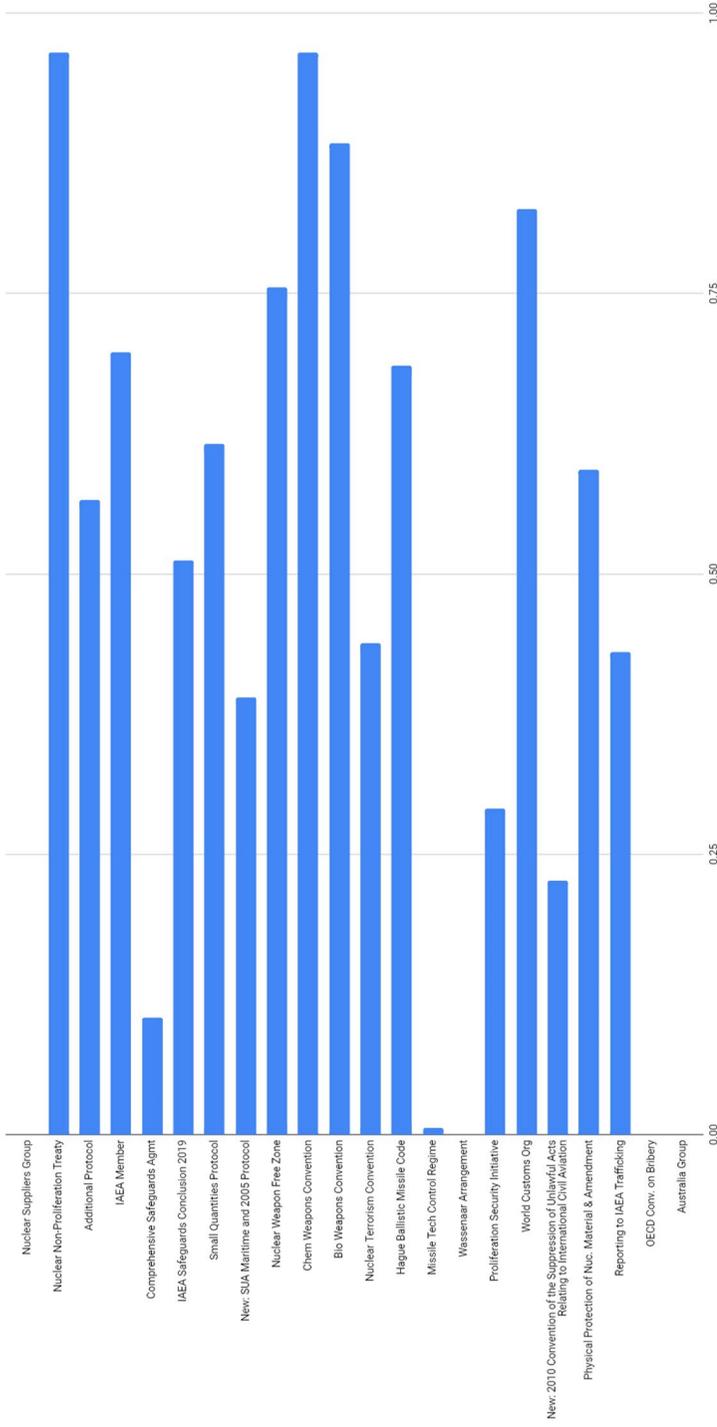


**Figure 11.2.** The pie chart indicates a situation that is dire. Although many countries have improved since the 2019 PPI, the data highlight the need for all countries to continue to work and improve their strategic trade controls. A total of 75 percent of Tier Three countries continue to receive less than one third of the total possible points in the 2021 PPI.



**Figure 11.3.** The extent to which the super criteria were fulfilled by Tier Three as a group.

2021 Tier Three: International Commitment Performance Fractions



**Figure 11.4.** The extent to which sub-criteria making up the *International Commitment* super criterion were fulfilled by Tier Three as a group.

## LEGISLATION

Five countries received more than two-thirds of the possible points under this super criterion, with the highest, Montenegro, achieving 98 percent of possible points. The next 14 countries received at least half, but less than two-thirds, of the points. Fifty-five countries received more than one-quarter but less than one-half of the points, while the remaining twelve received less than one-quarter of the points: Belize, Comoros, Cook Islands, Equatorial Guinea, Eritrea, Guinea-Bissau, Holy See, Niue, Palestine (State of), Somalia, Tuvalu, and Yemen.

Looking at export control legislation specifically reveals that the quality of existing legislation in this tier is poor (see Chapter 3, Table 3.2, for a discussion of how quality of legislation is characterized). Only eight countries were in the Dark or Light Green category of export control legislation, and the overwhelming majority, or 80 percent, have legislation in the Orange or Red categories. As discussed in Chapter 3, Kenya is a newly classified Dark-Green country. Kenya recently adopted new strategic trade control legislation, making the country a new leader in the region and in its Tier, one which other Tier Three nations can learn from.

The following lists countries alphabetically by the quality of their export control legislation:

**Dark Green (5):** *Andorra, Holy See, Kenya, Montenegro, North Macedonia*

**Light Green (3):** *Cambodia, Kosovo, and Myanmar*

**Yellow (9):** *Botswana, Cape Verde, Cuba, Guatemala, Niue, Rwanda, Sierra Leone, Tanzania (United Republic of), and Uruguay*

**Orange (24):** *Barbados, Benin, Bhutan, Bolivia, Burkina Faso, Côte d'Ivoire, El Salvador, Fiji, Gabon, Gambia, Grenada, Lesotho, Mauritania, Nauru, Palau, Saint Kitts and Nevis, Samoa, Senegal, Seychelles, Solomon Islands, Suriname, Timor-Leste, Trinidad and Tobago, Turkmenistan, and Tuvalu*

**Red (45):** *Angola, Antigua and Barbuda, Bahrain, Belize, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo (Dem Rep of the), Congo (Rep of the), Cook Islands, Djibouti, Dominica, Equatorial Guinea, Eritrea, Guinea-Bissau, Guinea, Guyana, Haiti,*

*Honduras, Kiribati, Liberia, Madagascar, Maldives, Mali, Marshall Islands, Mauritius, Micronesia (Federated States of), Mozambique, Nepal, Palestine (State of), Papua New Guinea, Saint Lucia, Saint Vincent and the Grenadines, Sao Tome and Principe, Somalia, South Sudan, Sudan, Swaziland (Eswatini), Togo, Tonga, Yemen, and Zimbabwe*

The performance fractions show that some trade control legislation exists that could support potential future nuclear commodity trade control laws (see Figure 11.5). As of 2021, relevant nuclear direct and dual-use control lists are missing in all but a handful of Tier Three countries. Several sub-criteria, such as having export licensing regulations, an investigative authority, an import control list, and requiring a certain set of documents for imports, are fulfilled to more than 75 percent, but since relevant control lists are missing, these laws and authorities do not apply to many nuclear and other dual-use items. For the other six sub-criteria, countries fall far short of 50 percent, with five of the sub-criteria not reaching 25 percent.

## **ABILITY TO MONITOR AND DETECT STRATEGIC TRADE**

Similar to Tiers One and Two, Tier Three countries do not perform well overall in their *Ability to Monitor and Detect Strategic Trade*. The highest-ranking country received 61 percent of the possible points; fifteen countries (up from just two in 2019) achieved more than 50 percent of the possible points. The next 57 countries, while scoring below half of the total possible points, received at least a quarter of possible points, while the remaining 14 (down from 24 in 2019) countries did not achieve 25 percent.

Performance fractions show that only three sub-criteria were fulfilled to more than 75 percent (see Figure 11.6): using automated customs systems, being a party to the UN Convention on the Law of the Sea or on Transit of Land-locked States, and having a closed ship registry. As such, the shape of the performance fraction profile of Tier Three looks similar to that of Tier Two, with the bars generally shorter in length. Two sub-criteria are fulfilled to 50 percent: the state has a UNSCR 1540 Committee point of contact, and files export declarations electronically.

2021 Tier Three: Legislation Performance Fractions

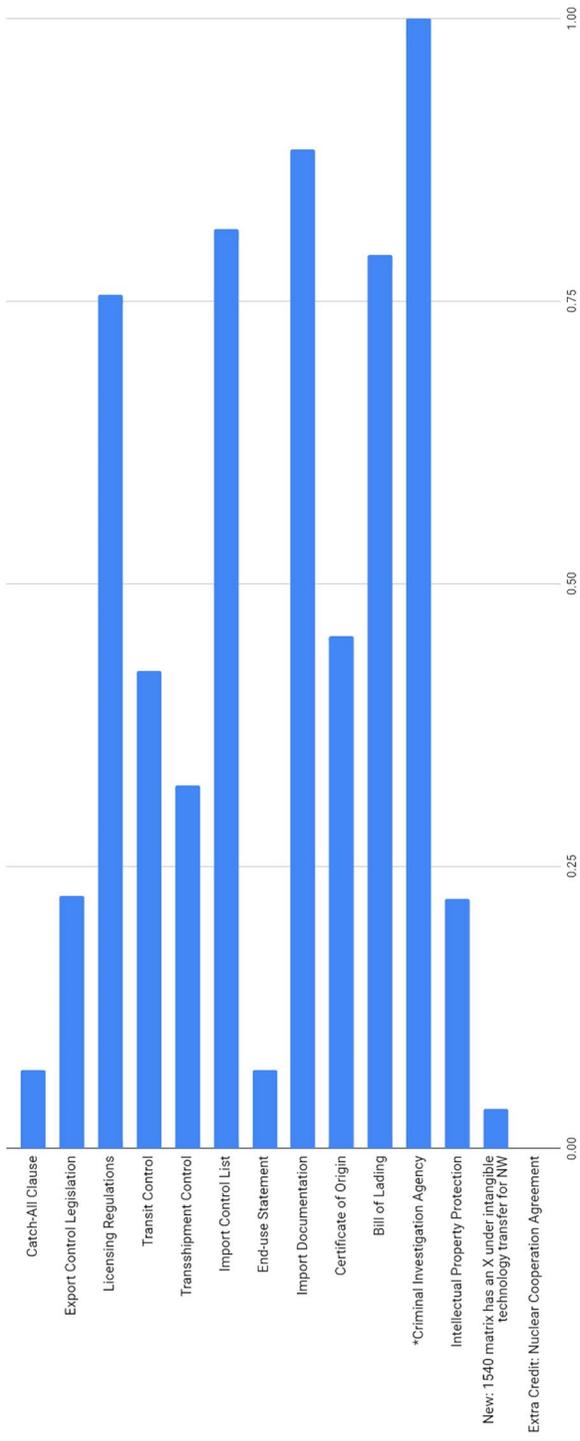


Figure 11.5. The extent to which sub-criteria making up the *Legislation* super criterion were fulfilled by Tier Three as a group. An asterisk next to the sub-criterion indicates that a methodological change occurred in 2021.

2021 Tier Three: Ability to Monitor and Detect Strategic Goods Performance Fractions

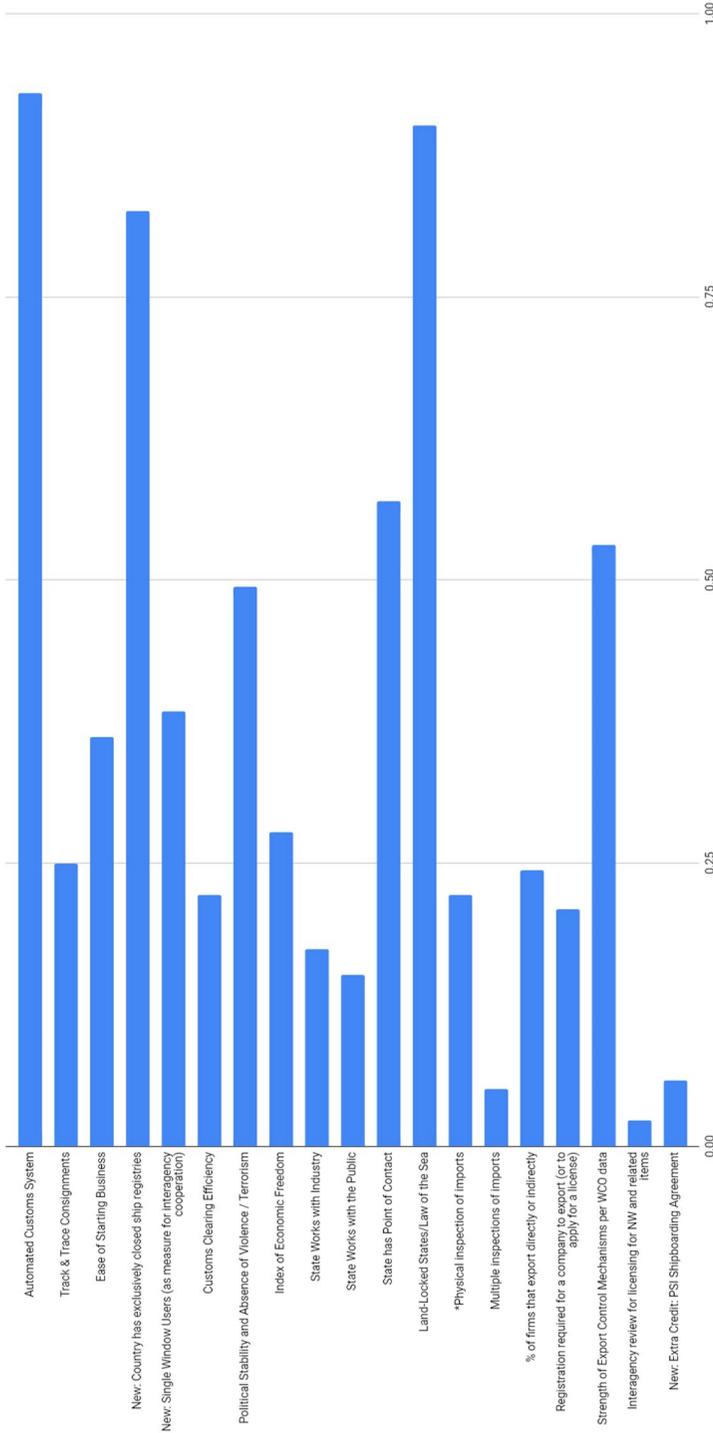


Figure 11.6. The extent to which sub-criteria making up the Ability to Monitor and Detect Strategic Trade super criterion were fulfilled by Tier Three as a group.

## ABILITY TO PREVENT PROLIFERATION FINANCING

Tier Three countries performed the worst in preventing the financing of proliferation, with the highest-ranking country in this super criterion, Andorra, receiving only 65 percent of the possible points. A total of five countries achieved more than half of the total points. The next 16 countries achieved a score between half and 25 percent of the possible points, while the following 44 countries received between zero and 25 percent of the possible points. The remaining 21 countries (down from 26 in 2019) received negative scores and include the following, listed from higher to lower ranking: Palestine (State of), Chad, Micronesia (Federated States of), Tuvalu, Sierra Leone, Rwanda, Kosovo, Cambodia, Mozambique, Equatorial Guinea, Kenya, Burundi, Yemen, Congo (Democratic Republic of), Liberia, Somalia, Eritrea, Myanmar, South Sudan, Mauritania, and Haiti. Fourteen Tier Three countries had a new FATF mutual evaluation report since the 2019 index, and thus were able to receive additional points. Yet, in Tier Three, the compliance levels achieved in the new FATF reports seem to be too low to have a noticeable, positive impact on the tier's performance fractions or overall average score in this super criterion. The performance fractions show that significant improvement must be made in preventing proliferation financing in Tier Three. Only one of the sub-criteria exceeds the 50 percent fulfillment marker (being a member of the Egmont Group; see Figure 11.7A).

Figure 11.7B shows that Tier Three countries are noticeably less of concern for money laundering than Tier Two countries and are less affected by OFAC sanctions than countries in Tier One and Tier Two. This tracks well with the judgment that these countries pose a generally lower risk of being caught up in illicit trading schemes. However, Tier Three countries should not see this as a reason to fall behind in international standards set by FATF (see Figures 11.7A and 11.7C).

It should be noted that for many countries in Tier Three, the sub-criterion's *overall FATF compliance score* was not available from a data source used in the PPI ranking. If data were available, the performance fraction for this specific sub-criterion would likely be higher, but would still fit the trend set by the other sub-criteria. Six of the positive sub-criteria, and nine in total if including extra credit, are based on specific FATF recommendations, and would be part of the overall FATF compliance score. Performance in these sub-criteria is generally low, with the highest

(Recommendation on Law Enforcement Responsibilities, notably also the one where Tier Two performed the best) being 45 percent fulfilled (see Figures 11.7A and 11.7C). Given these low scores, the overall FATF compliance score would be expected to be comparable to these scores, or at least not significantly greater than those sub-criteria scores.

2021 Tier Three: Ability to Prevent Proliferation Financing Performance Fractions

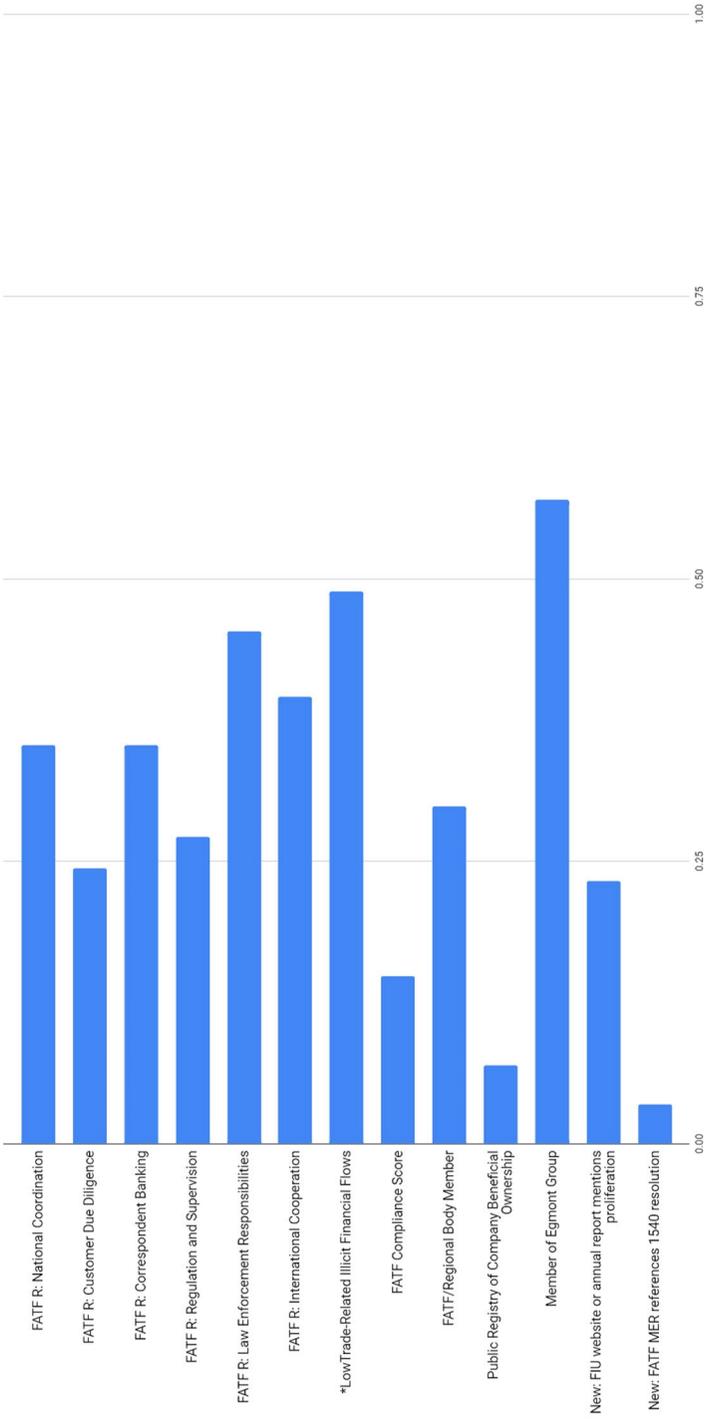
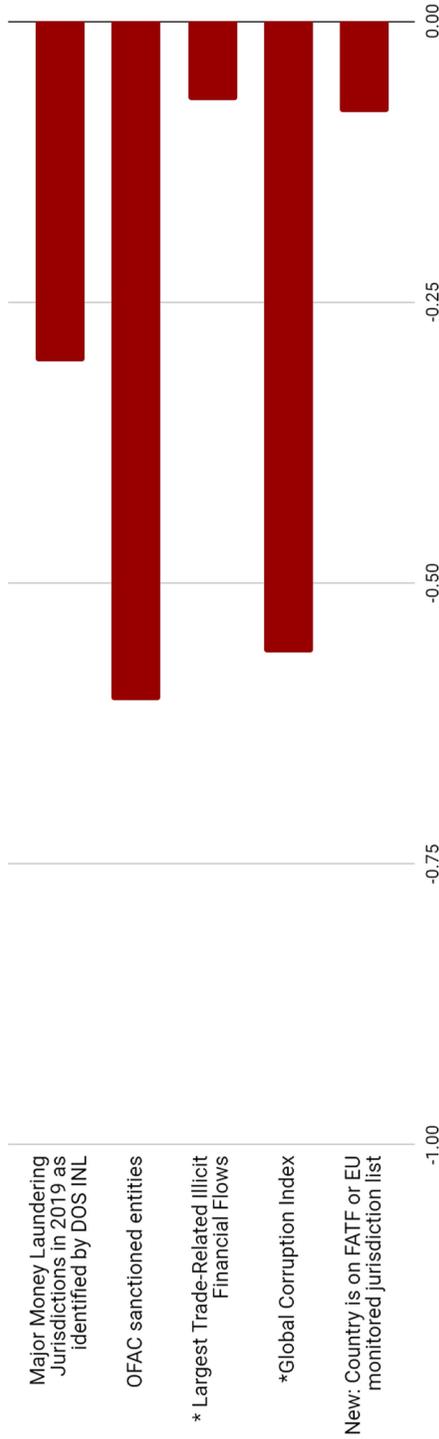


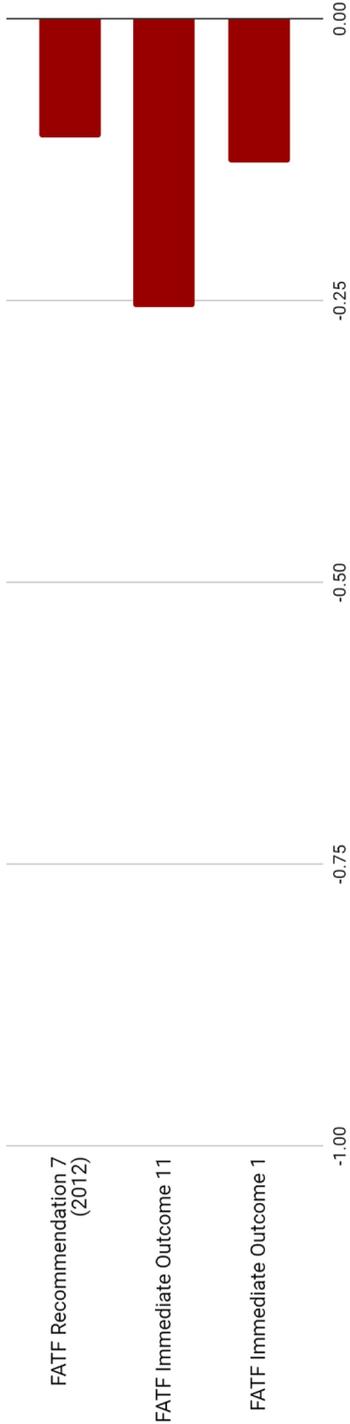
Figure 11.7A. The extent to which positive sub-criteria under the Ability to Prevent Proliferation Financing super criterion were fulfilled by Tier Three as a group.

**2021 Tier Three: Ability to Prevent Proliferation Financing Performance Fractions - Negative Criteria**



**Figure 11.7B.** Extent to which negative sub-criteria under *Ability to Prevent Proliferation Financing* super criterion affected Tier Three as a group.

**2021 Tier Three: Ability to Prevent Proliferation Financing Performance Fractions - Extra Credit**



**Figure 11.7C.** Extent to which extra credit sub-criteria under *Ability to Prevent Proliferation Financing* super criterion were fulfilled by Tier Three as a group.

## ADEQUACY OF ENFORCEMENT

Tier Three countries, in general, lack the capacity to enforce trade controls. Only five countries achieved a score greater than 50 percent of the possible points. The top performing country is Mauritius, which received 59 percent of possible points. The next 55 (up from 41 in 2019) countries received less than 50 percent, but more than 25 percent, of the points, and 22 countries received less than 25 percent, but more than zero points. Five countries or entities received negative scores under this super criterion.

Once again, the *Enforcement* performance fraction profile for Tier Three looks similar in shape, albeit shorter in length, compared to the one for Tier Two. Satisfactory performance (75 percent fulfillment) was achieved in three sub-criteria: not having entities on select U.S. and EU sanctions or screening lists, being a member of Interpol, and having a border guard agency (see Figure 11.8A). Five additional sub-criteria were fulfilled to more than 50 percent: country has an extradition agreement with the U.S. or UK in force, lack of corruption influence (barely exceeded 50 percent), the state has criminal penalties for the transfer, as well as, transport of nuclear weapons enshrined in its laws, and is a member of the harmonized system. Tier Two countries perform significantly better in participating in training and outreach and international legal assistance mechanisms, which Tier Three countries would greatly benefit from as well.

Tier Three countries do perform best under the sub-criterion *Lack of parties on select United States and European Union screening lists*. The great majority, 76 percent of the countries, do not have a single sanctioned entity on several select U.S. or EU sanctions and screening lists. This suggests that these countries have, so far, not been involved with known illicit WMD trading networks. Moreover, it could also reflect that Tier Three countries do not participate as much in global trade, or to the level that Tier One and Two countries do.

Nevertheless, Figure 11.8B shows that Tier Three countries are by no means excluded from UN sanctions violations and evasion. Twenty-three countries were involved in violating UN Security Council sanctions on North Korea and had points subtracted depending on the frequency and gravity of their involvement (see Chapter 6 on how points are subtracted). Of those, five Tier Three countries were involved in military-related sanctions violations in recent years: Congo (Dem Rep of the), Eritrea,

Myanmar, Rwanda, and Yemen. Roughly half of the countries were involved in up to six non-military-related sanctions violations in the reporting period covering 2019. While some countries actively engage in sanctions-evading business, likely because it is a source of much-needed income, or services offered by a sanctioned party come at a cheaper price, others are vulnerable to individuals and entities on their territories engaging in sanctions evasion schemes due to their lack of oversight and regulations.

2021 Tier Three: Enforcement Performance Fractions

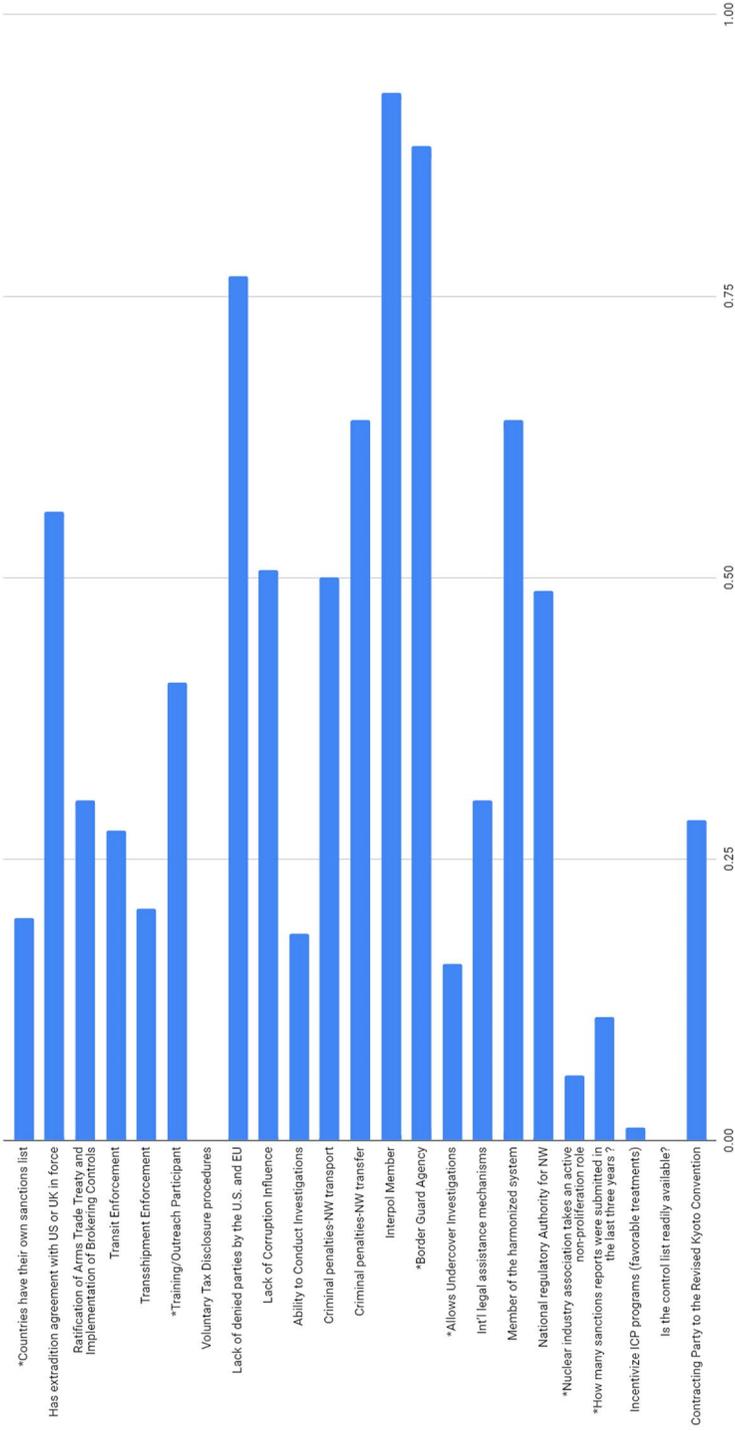
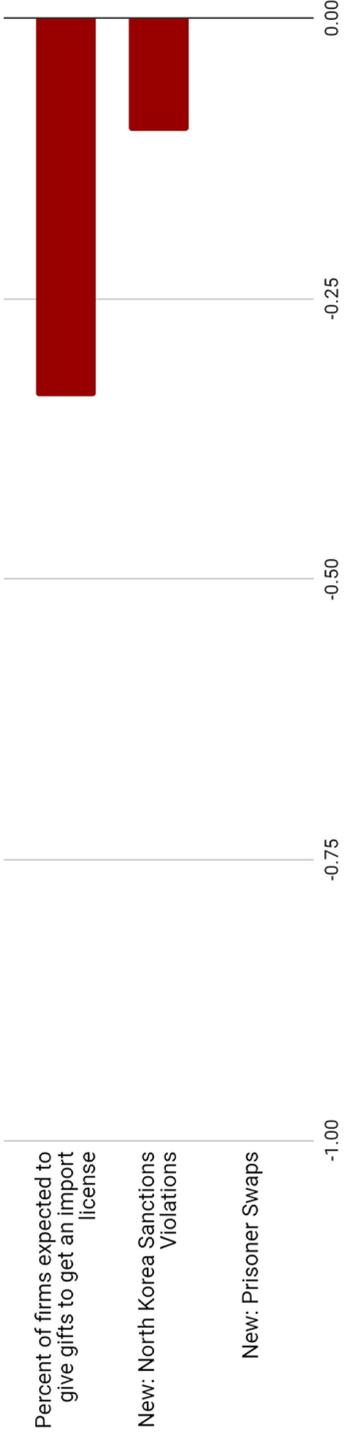


Figure 11.8A. The extent to which positive sub-criteria under *Adequacy of Enforcement* were fulfilled by Tier Three as a group.

### 2021 Tier Three: Enforcement Performance Fractions - Negative Criteria



**Figure 11.8B.** The extent to which negative sub-criteria under *Adequacy of Enforcement* affected Tier Three as a group.

Tier Rank	Country	Total Points
1	Andorra	736
2	Macedonia	723
3	Montenegro	691
4	Mauritius	663
5	Bahrain	652
6	Uruguay	629
7	Fiji	591
8	Botswana	589
9	Guatemala	584
10	Trinidad and Tobago	565
11	Cuba	541
12	Cameroon	512
13	Gabon	500
14	Antigua & Barbuda	497
15	Seychelles	495
16	Benin	473
17	Burkina Faso	466
18	Kenya	461
19	Samoa	461
20	Togo	459
21	El Salvador	456
22	Lesotho	442
23	Timor-Leste	438
24	Cape Verde	436
25	Swaziland (Eswatini)	433
26	Saint Kitts and Nevis	431
27	Grenada	422
28	Bhutan	419
29	Nauru	417
30	Côte d'Ivoire	414
31	Cook Islands	412
32	Honduras	407
33	Solomon Islands	406
34	Sierra Leone	405

Tier Rank	Country	Total Points
35	Saint Vincent & the Grenadines	400
36	Suriname	393
37	Senegal	391
38	Tanzania (United Republic of)	389
39	Papua New Guinea	385
40	Nepal	383
41	Saint Lucia	383
42	Tonga	383
43	Barbados	383
44	Angola	370
45	Dominica	370
46	Mali	369
47	Maldives	361
48	Madagascar	352
49	Bolivia	344
50	Congo (Republic of the)	337
51	Guinea	335
52	Marshall Islands	334
53	Mozambique	332
54	Belize	329
55	Cambodia	320
56	Djibouti	319
57	Sao Tome & Principe	317
58	Guyana	316
59	Kosovo	313
60	Turkmenistan	312
61	Comoros	302
62	Rwanda	296
63	Holy See	294
64	Chad	292
65	Gambia	290

Tier Rank	Country	Total Points	Tier Rank	Country	Total Points
66	Kiribati	287	76	Congo (Democratic Republic of the)	212
67	Mauritania	278			
68	Palau	278	77	Myanmar	209
69	Liberia	267	78	Tuvalu	168
70	Burundi	249	79	Haiti	168
71	Guinea-Bissau	239	80	Equatorial Guinea	168
72	Niue	238	81	Sudan	163
73	Zimbabwe	233	82	Palestine (State of)	122
74	Micronesia (Federated States of)	226	83	Eritrea	95
75	Central African Republic	223	84	Somalia	-16
			85	Yemen	-26
			86	South Sudan	-33

**Table 11.1.** 2021 Rank of Tier Three countries, including total points received.

## NOTES

1. David Albright, Sarah Burkhard, and Spencer Faragasso, “Alleged Sanctions Violations of UNSC Resolutions on North Korea for 2019/2020: The number is increasing,” *Institute for Science and International Security*, July 1, 2020, <https://isis-online.org/isis-reports/detail/alleged-north-korea-sanctions-violations-2020/>.

**SECTION III**  
**FURTHER PPI APPLICATIONS**



# CHAPTER 12

## COUNTRIES WITH THEIR FIRST NUCLEAR POWER REACTOR

The 2021 PPI team evaluated countries that have publicly proposed, planned, or started the construction of their first nuclear power plant. Worldwide civil nuclear development is expected to increase over the next decade as countries work to meet climate policy goals. The following countries were evaluated: Algeria, Bangladesh, Belarus, Bolivia, Ethiopia, Ghana, Kenya, Namibia, Nigeria, Philippines, Rwanda, Saudi Arabia, Turkey, Uganda, United Arab Emirates,<sup>1</sup> Uzbekistan, and Zambia.

Planning, constructing, and operating a nuclear power plant is a laborious process that requires extensive preparation. Countries pursuing civil nuclear power should be compelled to establish a regulatory regime to ensure the safe and secure operation and handling of nuclear facilities, materials, and waste. The procedures for the physical protection of nuclear material and equipment should be enshrined in national laws in order to thwart any attempt at nuclear terrorism. Further, the state needs to update its safeguards protocol early to show its good faith and apply IAEA safeguards to the nuclear facility, material and activities to assure the international community of *exclusively* peaceful purposes.

Often overlooked is the need for robust export controls that can assure that newly gained nuclear know-how, designs, technology, and materials are protected from unauthorized transfers or exports. Export

control regimes are even more important in countries that desire to first import nuclear power reactors and related equipment as a prelude to becoming an international nuclear supplier, or as part of a largely indigenous nuclear fuel cycle, such as Saudi Arabia.<sup>2</sup> Those countries that intend to supply nuclear reactors should fulfill a higher standard in creating robust export controls with catch-all and end-use verification.

Countries with A First Nuclear Power Plant, Proposed, Planned, or Under Construction	
<b>Tier One</b>	
Belarus, Turkey	
<b>Tier Two</b>	
Algeria, Bangladesh, Ethiopia, Ghana, Namibia, Nigeria, Philippines, Saudi Arabia, Uganda, United Arab Emirates, Uzbekistan, Zambia	
<b>Tier Three</b>	
Bolivia, Kenya, Rwanda	

**Table 12.1.** The Tier assignment for all identified countries.

## FINDINGS AND ANALYSIS

The rankings are shown in Figure 12.1. From highest to lowest, the ranks are held by the United Arab Emirates, Philippines, Ghana, Bangladesh, Turkey, Saudi Arabia, Algeria, Belarus, Ethiopia, Namibia, Uzbekistan, Zambia, Kenya, Nigeria, Bolivia, Rwanda, and Uganda.

Overall, the countries planning to acquire nuclear power reactors did not perform better than the average country in the PPI. The average of 541 is very close to the overall average of 546. Out of the seventeen countries, five received more than half of available points, ten received less than 50 but more than 25 percent of all PPI points, and two countries received less than 25 percent (see Figure 12.1). Three of the countries lack any relevant export control legislation, meaning their existing legislation was categorized as Orange, or Red; an additional eight countries have some nuclear safety and security laws but lack comprehensive dual-use export control legislation (categorized as Yellow). The collectively achieved percentage of possible points for this grouping revealed that performance in two super criteria fell below 50 percent: *Ability to Prevent Proliferation Financing*, and *Adequacy of Enforcement* (see Figure 12.2).

Collectively, the countries scored poorly in a number of relevant sub-criteria. For example, the countries scored poorly on transparency

measures, such as: Being a Party to the OECD Convention on Bribery, Having a Public Registry of Company Beneficial Ownership, Placement in the Corruptions Perceptions Index, and Percent of Firms Expected to Give Gifts to Get an Import License. They also scored low in sub-criteria directly applicable to the control of nuclear-related materials and equipment, such as Interagency Review for Licensing for NW and Related Items, Intangible Technology Control, and Brokering Controls. Additionally, ten of the seventeen countries were involved in recent or repeated violations of UNSC sanctions on North Korea. It is further notable that while six countries in this grouping have a dual-use control list, only two countries have the list readily available or easily accessible on a government website. On a positive note, the countries in this grouping received a perfect score in the sub-criterion “National Regulatory Authority for NW.”

Ethiopia is the only country in this group to have not yet signed or ratified the Convention on the Physical Protection of Nuclear Material. Other countries, like Belarus, Uganda, and Zambia, are a party to the originally adopted convention in 1980, however, these countries have yet to adopt the 2005 Amendment. Bolivia and Saudi Arabia are the only countries in this group that have not yet signed or ratified the Additional Protocol. A number of additional countries have signed the Additional Protocol, but the legal document has not entered into force; those countries are Algeria, Belarus, and Zambia. This leaves Bolivia, Saudi Arabia, and Zambia currently with only the “old” Small Quantities Protocol in force. The following states in this group that have signed but not ratified the Convention for the Suppression of Acts of Nuclear Terrorism include Ethiopia, Bolivia, and Uganda. Three countries, Ghana, the Philippines, and Rwanda, have only signed the convention.

## **SUPPLIERS' ROLE**

More often than not, countries pursuing nuclear power have no indigenous capability to construct and operate a nuclear facility, and instead, those countries pursue relationships with international suppliers to secure the necessary components, materials, knowledge, and expertise. The supplier state is in return provided with a unique opportunity to add safety and security requirements and conditional terms to the memorandum of understanding and any following contracts. In the United States, a comprehensive agreement prior to any large transfers of nuclear

material or equipment to ensure the recipients “adhere to a set of strong nonproliferation requirements” is required by law under Section 123 of the U.S. Atomic Energy Act.<sup>3</sup> Unfortunately, this unique opportunity to strengthen the global nonproliferation regime is largely underused by two countries that have emerged as the main suppliers of nuclear reactors and technology.

**Russia.** The Russian Federation’s state atomic energy corporation, ROSATOM, continues to be the largest international supplier of nuclear power and maintains agreements and contracts with many countries around the world.<sup>4</sup> ROSATOM attracts potential customers through lavish financing plans and inexpensive reactor designs and has been particularly active in Africa, entering into negotiations and agreements with many states. ROSATOM has signed nuclear cooperation agreements with the following African nations: Algeria, Angola, the Democratic Republic of the Congo, Egypt, Ethiopia, Ghana, Morocco, Nigeria, Rwanda, Sudan, Tunisia, Uganda, South Africa, and Zambia.

**China.** China is dedicated to expanding its fleet of nuclear power plants and is currently in the process of designing, developing, and constructing at least 14 new commercial reactors.<sup>5</sup> China has ambitious plans for its nuclear industry and aims to establish itself as the premier supplier of nuclear facilities, equipment, and expertise. In order to achieve these goals, China will need to surpass the large market share (60 percent of new nuclear construction sales) enjoyed by ROSATOM.<sup>6</sup> China has exported and sought to export its nuclear technology to countries including Argentina, Egypt, Kenya, Pakistan, Saudi Arabia, Sudan, South Africa and Turkey. Yet, there are concerns over the ability of China to prevent unwarranted actors from obtaining sensitive materials and equipment. A positive development is that in December 2020, China approved its new export control law to enhance and streamline its various export control laws in one system with mechanisms like end-user/ end-use verification, comprehensive dual-use control lists, catch-all controls, and penalties for violating the law.

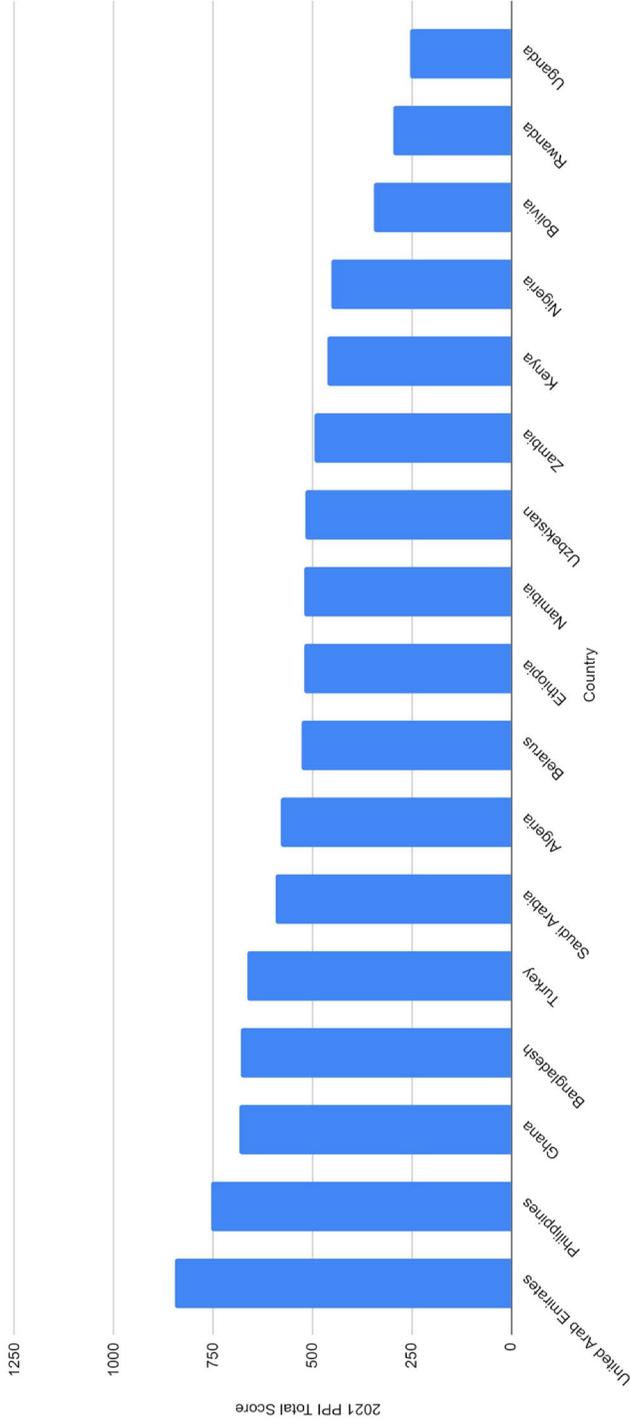
## RECOMMENDATIONS

The states in this grouping should not delay the adoption of comprehensive export control legislation covering dual-use materials and equipment, including criminal penalties for the unauthorized transit and transfer of strategic materials. Countries seeking nuclear power, and especially those exploring a semi-indigenous fuel cycle or exploring to become a supplier of reactor technology should also enact legislation that controls intangible technological exports in order to prevent the spread of sensitive information. All codified controls, including control lists and relevant legislation, should be readily available and accessible on government websites.

The states in this group should all ratify and adopt into national legislation the key conventions listed above, such as those on physical protection – CPPNM, the 2005 Amendment, and the Additional Protocol – prior to receiving major components for their first nuclear power reactors.

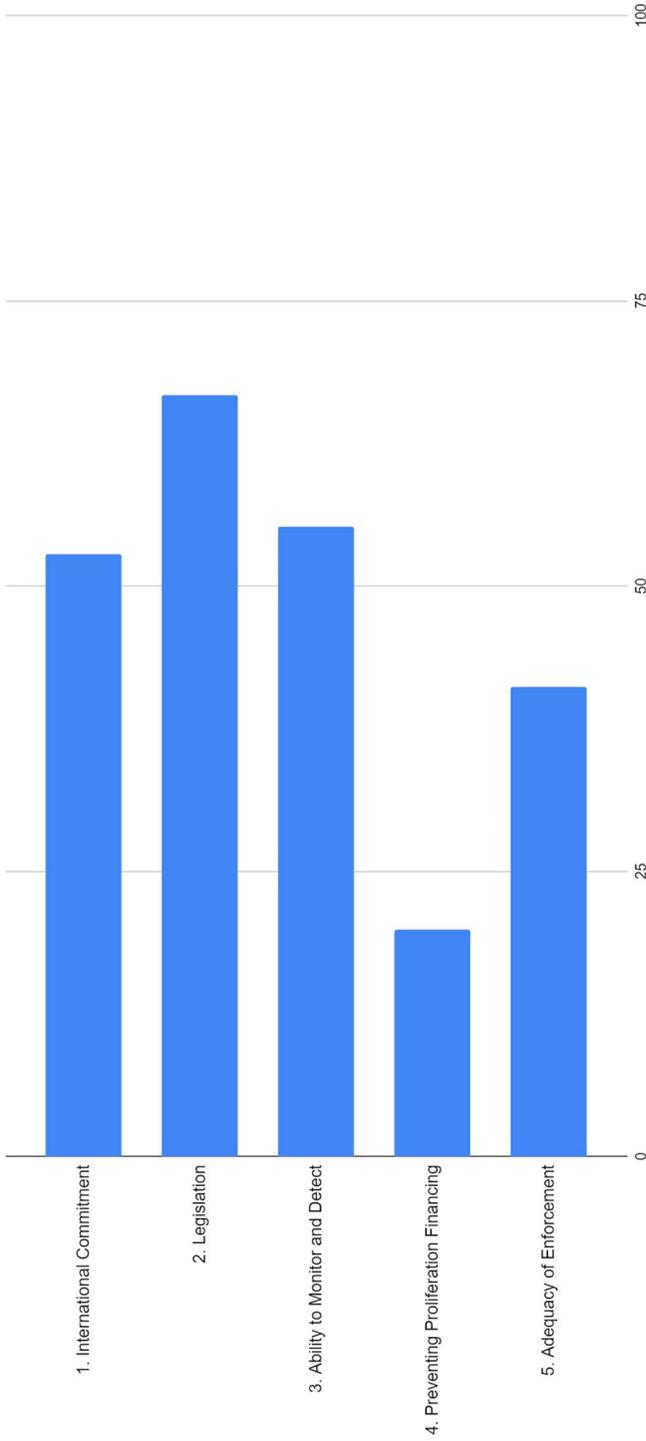
Nuclear suppliers should consider not providing nuclear power reactors, related equipment, and materials to states that received fewer than 25 percent of the available points in the total PPI score without a contractual condition or until such time as they significantly improve their export control and regulatory systems. These countries include Rwanda and Uganda (see Figure 12.1).

**2021 Total PPI Scores of Countries with their First Nuclear Power Reactor Proposed, Planned, or under Construction**



**Figure 12.1.** Total PPI scores of countries with their first nuclear power reactor proposed, planned, or under construction.

**2021 PPI Percentage of Possible Points Collectively Achieved by this Group of Countries with their First Nuclear Power Reactors Proposed, Planned, or Under Construction**



**Figure 12.2.** Extent to which the super criteria were fulfilled by this group of countries with their first nuclear power reactors proposed, planned, or under construction.

## NOTES

1. The UAE has officially become a nuclear power state. After many years of preparation, on February 17, 2020, the Barakah Nuclear Power Plant, which is operated by the Nawah Energy Company, received its operating license from the state Federal Authority for Nuclear Energy. Unit 1 was connected to the grid in August 2020 and is expected to enter commercial operation in 2021. World Nuclear News, “First UAE nuclear reactor reaches full power,” 2020, <https://www.world-nuclear-news.org/Articles/First-UAE-nuclear-reactor-reaches-full-power>.
2. Sarah Burkhard, Erica Wenig, David Albright, and Andrea Stricker, “Saudi Arabia’s Nuclear Ambitions and Proliferation Risks,” *Institute for Science and International Security*, March 30, 2017, [https://isis-online.org/uploads/isis-reports/documents/SaudiArabiaProliferationRisks\\_30Mar2017\\_Final.pdf](https://isis-online.org/uploads/isis-reports/documents/SaudiArabiaProliferationRisks_30Mar2017_Final.pdf).
3. “123 Agreements for Peaceful Cooperation,” *U.S. Department of State, National Nuclear Security Administration*, <https://www.energy.gov/nnsa/123-agreements-peaceful-cooperation>. Accessed April 20, 2021.
4. “About Us,” ROSATOM, 2021, <https://www.rosatom.ru/en/about-us/>.
5. “Nuclear Power in China,” World Nuclear Association, 2021, <https://www.world-nuclear.org/information-library/country-profiles/countries-a-f/china-nuclear-power.aspx>.
6. David Yellen, “The Trade War We Want China To Win: China’s Nuclear Exports Can Challenge Russian Dominance,” Atlantic Council, February 26, 2020, <https://www.atlanticcouncil.org/blogs/energysource/the-trade-war-we-want-china-to-win-chinas-nuclear-exports-can-challenge-russian-dominance/>.

# CHAPTER 13

## INCARCERATION PENALTIES FOR EXPORT CONTROL VIOLATIONS

Criminal penalties for export control violations can serve as an effective deterrent to potential proliferators. A related question is whether the PPI ranking can be related to the length of incarceration of an individual for knowingly violating export controls. A longer potential prison term can provide a greater deterrent against individuals breaking the law, whereas a shorter potential prison term can provide less of a deterrent. The PPI team determined on a country-by-country basis whether individuals convicted of export control violations can be incarcerated and the potential length of incarceration.

This assessment first had to identify which countries have a strategic trade control (STC) system in place, since without such a system of laws, relevant violations or potential prison terms cannot be identified in that country's penal code. In total, prison sentences for STC violations were identified for approximately one fourth of all countries considered in the PPI, based on internet searches of individual countries' penal codes. This chapter considers a subset of those countries where penalties could be found, namely those that are also in Tier One and therefore have the potential to supply strategic goods.

## FINDINGS AND ANALYSIS

The potential length of incarceration varies across this subset of countries. Some countries, such as the United States, can impose sentences of decades, although in practice, many convicted persons receive less than 10 years imprisonment terms, and less than five years is most common. Certain countries with strong export controls—such as those categorized as Dark Green in the PPI assessment on a country’s national export control legislation—nonetheless show a trend of relatively short maximum prison sentences of five years or less for export control violations.

This variation in sentencing remains striking in the European Union, where sentencing terms vary more than expected for a trade zone sharing common export control laws. The multi-year-long review of the European Union’s (EU) STC law on dual-use items (Council Regulation (EC) No 428/2009 of May 5, 2009), resulted in a new regulation accepted by the European Parliament on March 24, 2021, which made strengthening enforcement mechanisms a higher priority for member states. Among the positive outcomes are increased information sharing between EU member states and strengthened cooperation between licensing and customs authorities. However, the penalties for violations are still defined autonomously by each EU member state.

The European Commission has collected and published a list of enforcement measures, i.e., administrative, and criminal penalties, for all EU countries, facilitating the comparison.<sup>1</sup> Violating the law by exporting without a license when one is required, for example, can lead to prison sentences of only five years or less in several countries, including in Denmark<sup>2</sup>, Portugal<sup>3</sup>, Finland<sup>4</sup>, and Cyprus<sup>5</sup>. On the other hand, Estonia<sup>6</sup>, France<sup>7</sup>, Germany<sup>8</sup>, and Latvia<sup>9</sup> have long-term maximum prison sentences of over 10 years for severe cases. Having both shorter maximum sentencing terms for minor cases and longer maximum sentencing terms for severe cases, is common. Austria, for example, has a one-year prison sentence for negligence, three years for intent, and up to 10 years for cases that involve nuclear materials, facilities, and equipment. For some countries, if an export violation entails proven assistance to a nuclear weapon program or another WMD program, sentences can be even longer. Noticeable is that major export economies outside the EU, such as Japan, the United Kingdom, and the United States, in addition to France and Germany in the EU, all have potential periods of incarceration of 10 years or

more. In stark contrast, only administrative penalties could be found in some countries.

The questions that emerge are whether the countries with shorter potential sentencing terms do not sufficiently deter those individuals who would violate export controls, whether their export control systems are strong enough to compensate for the missing deterrent, or whether the shorter sentencing may indicate an overall lower priority given to export controls.

Table 13.1 groups countries with prison sentences of 10 years or more and those with five years or less and lists their individual PPI rank. This correlation of prison sentences and PPI rank shows that in general, countries with shorter prison sentences tend to rank lower in the PPI than countries with longer potential prison sentences. The median rank for countries with a prison sentence maximum of 10 years or more is 24, while the median rank for countries with a prison sentence of five years or less is 37. Figure 13.1 is a scatter plot visualizing this finding. A trendline shows a positive correlation between a better PPI rank and higher prison sentences.

The trend can also be seen when considering countries' scores under Super Criterion *Adequacy of Enforcement* (Figure 13.2). The median *Adequacy of Enforcement* rank for countries with longer prison sentences is 21, while the median for ones with shorter prison sentences is 41.

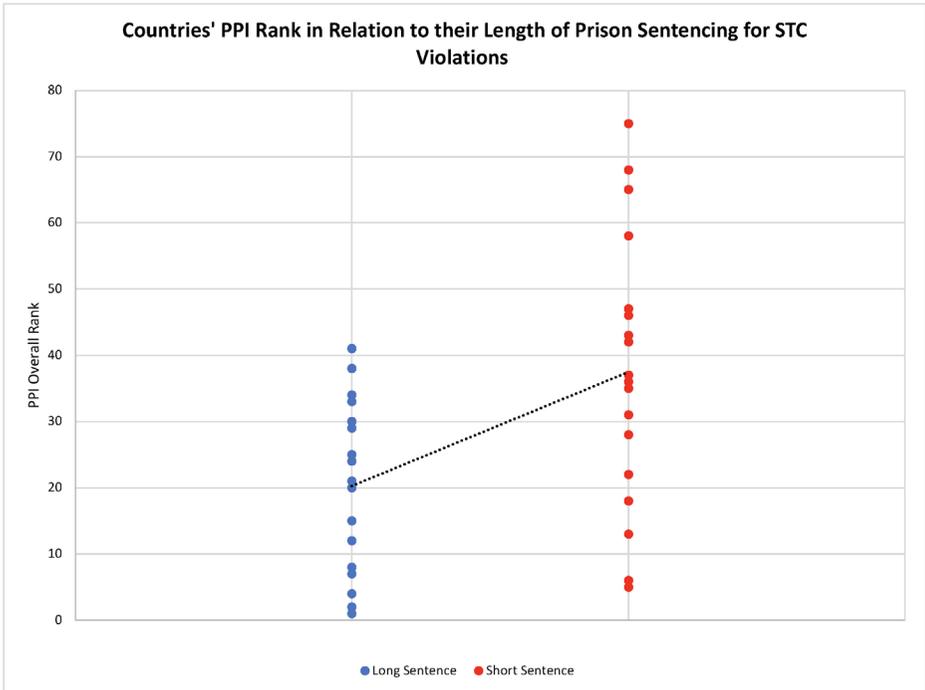
Tier One Countries with Prison Sentences of 10 Years or more	PPI Total Rank	Tier One Countries with Prison Sentences of 5 Years or less	PPI Total Rank
France	20	Ireland	5
United States of America	1	Belgium	6
Estonia	8	Portugal	13
Germany	12	Norway	18
Pakistan	112	Romania	28
China	89	Croatia	31
Latvia	7	Greece	37
United Kingdom of Great Britain & Northern Ireland	2	Taiwan	43
Australia	4	Liechtenstein	68
Austria	15	Finland	22
Canada	21	Iceland	42
Switzerland	24	Brazil	58
Lithuania	25	Israel	35
New Zealand	29	Turkey	65
Japan	30	Slovakia	36
Bulgaria	33	Serbia	47
Luxembourg	34	Ukraine	75
Poland	38	Mexico	46
South Africa	41		

**Table 13.1.** Overall PPI ranks of countries with longer prison sentences for strategic trade control violations compared to the ranks of countries with shorter sentences. All the countries mentioned here are in Tier One. Not included are Tier One countries where no information on penalties could be found, or those that fell between 5 and 10 years. For four countries, Slovakia, Serbia, Ukraine, and Mexico, only administrative penalties could be found. The PPI team grouped them with those countries that have a low prison sentence.

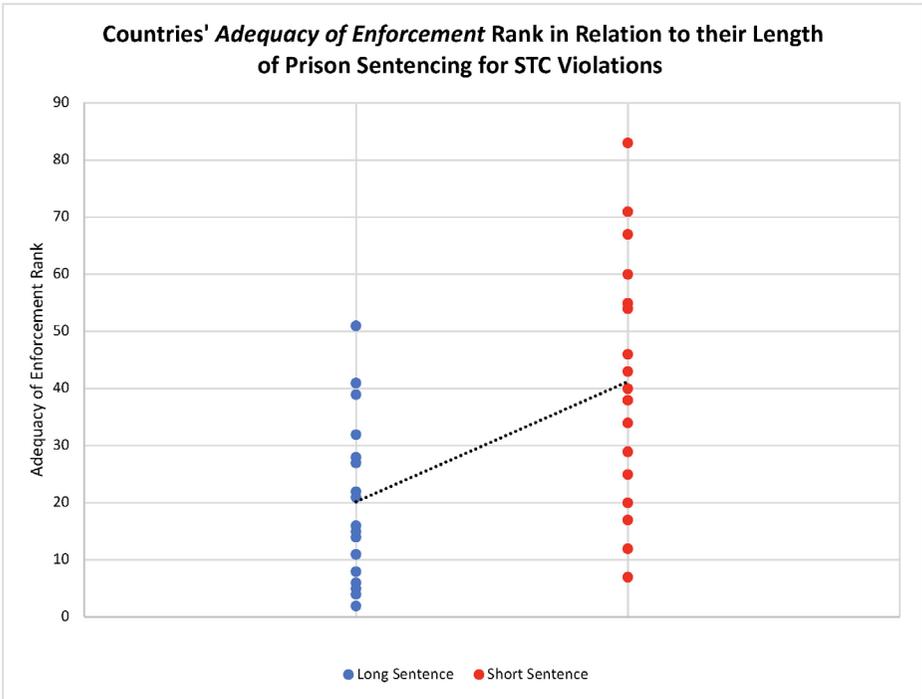
## RECOMMENDATIONS

Those countries that only have administrative penalties should add prison sentencing for individuals that intentionally violate strategic trade control laws, and those countries that have short maximum prison sentences should consider enacting additional, longer penalties that take into

account the severity of the case. For the many countries where penalties, whether civil or criminal, were difficult to find, they should make this information more accessible. In order to serve as a deterrent, penalties must be communicated effectively to the exporting community and to the general public. This can be done in several ways, such as through warnings on relevant authorities' websites (e.g., licensing or customs), general outreach (e.g., pamphlets), law enforcement publications on investigations, or through the judiciary system by releasing press notices about indictments and convictions.



**Figure 13.1.** Countries with longer prison sentencing for strategic trade control violations (left) tend to rank better in the PPI than those with shorter prison sentences (right). Pakistan and China were outliers and omitted from the graph.



**Figure 13.2.** A similar trend as in Figure 13.1 can also be seen in the *Adequacy of Enforcement* of countries. Ukraine was an outlier and was omitted from this figure, but not from the median listed in the text.

## NOTES

1. See: Report by the European Commission, *Report from the Commission to the European Parliament and the Council on the implementation of Regulation (EC) No 428/2009*, Annex, COM(2019) 562, April 11, 2019, <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52019DC0562>.
2. Imprisonment of up to five years.
3. Imprisonment of up to five years.
4. Imprisonment of up to four years.
5. Imprisonment of up to three years.
6. Imprisonment of up to 20 years.
7. Imprisonment of up to 30 years or life sentence.
8. Prison sentence of up to 15 years.
9. Prison sentences of up to twelve years.



# CHAPTER 14

## NATIONAL EXPORT CONTROL LEGISLATION VERSUS CORRUPTION

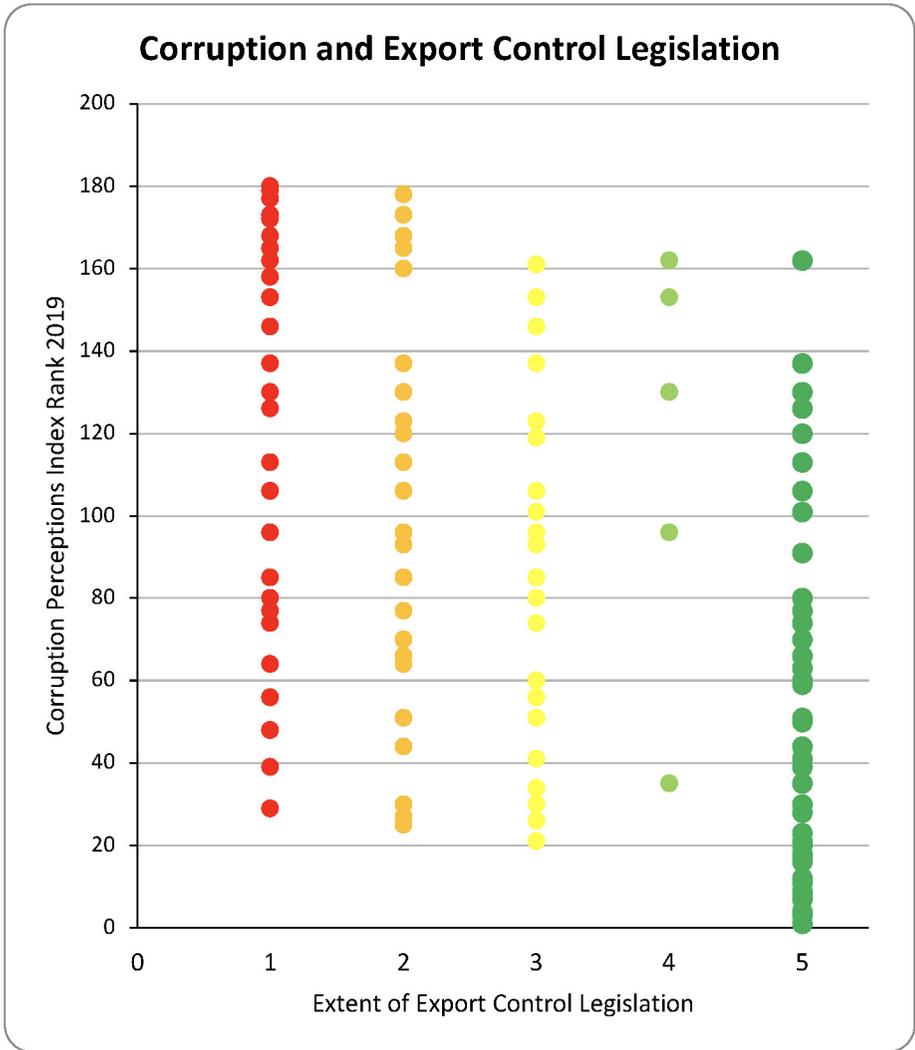
A priority is better understanding the relationship between national export control legislation and corruption. In particular, is there a correlation between corruption and those countries that have minimal or no export controls?

Corruption is measured across 180 countries using the 2019 Corruption Perceptions Index, or CPI, by Transparency International.<sup>1</sup> According to Transparency International, countries that rank low in the CPI tend to be “plagued by untrustworthy and badly functioning public institutions like the police and judiciary. Even where anti-corruption laws are on the books, in practice they’re seldom enforced or ignored. People frequently face situations of bribery and extortion, their basic services are undermined by the misappropriation of funds, and confront official indifference when seeking redress from authorities that are on the take.”<sup>2</sup> Companies engaged in exports may think they can simply ignore legal export requirements, believing that there is little likelihood of being investigated or prosecuted. Overall, corruption can be a major barrier to effective export control implementation and enforcement in a country. In such circumstances, export controls are unlikely to be effectively encoded into laws or implemented in practice.

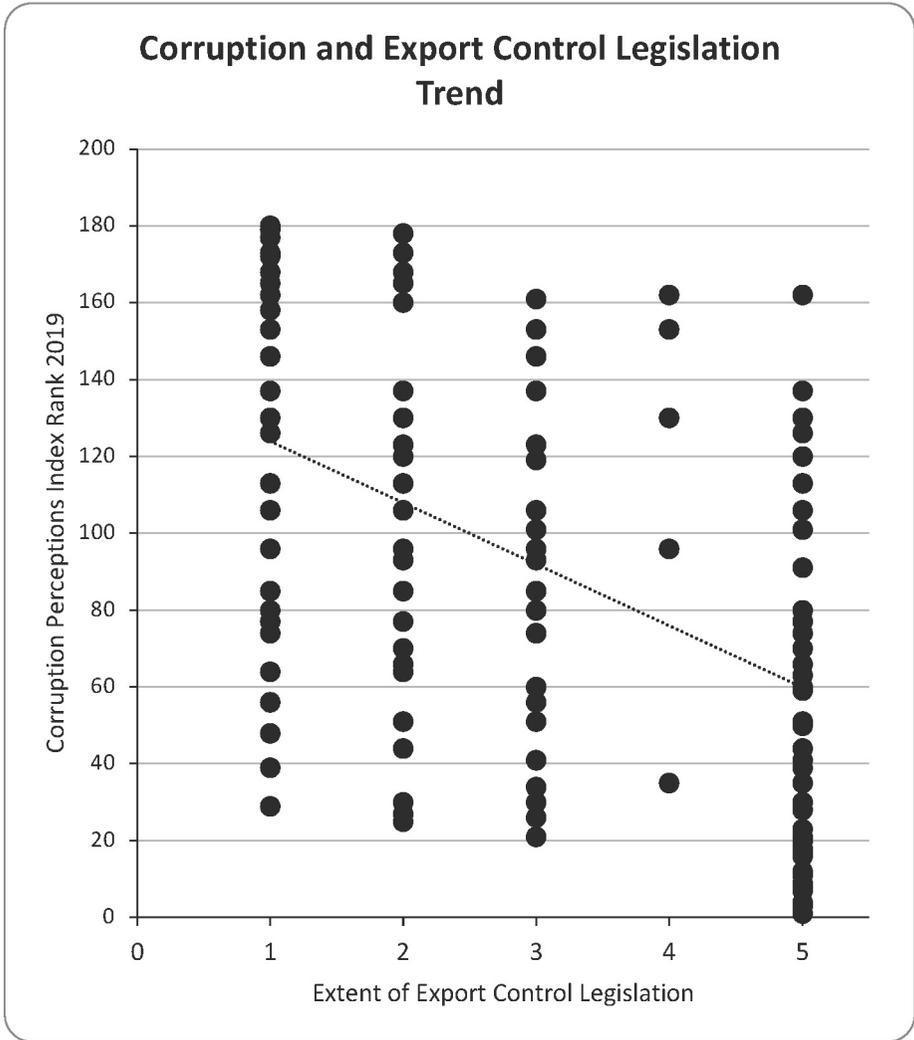
In order to determine the credibility of export control regimes and to identify target countries more likely to pose transshipment, smuggling, proliferation financing, and black-market risks, the PPI team determined which countries ranked in the bottom half of the CPI and correlated their CPI rank with the quality of their legislation, where the legislation has been categorized into five levels of comprehensiveness, as discussed in Chapter 3, and briefly summarized below.

- **Dark Green (legislation is comprehensive):** This category counted 77 countries.
- **Light Green (legislation is somewhat comprehensive):** This category counted 6 countries.
- **Yellow (legislation is deficient):** This category counted 28 countries.
- **Orange (legislation has serious deficiencies):** This category counted 39 countries.
- **Red (legislation is non-existent or severely deficient):** This category has 50 countries.

There appears to be a general correlation between a country's corruption and the extent of its export control legislation with regard to nuclear and other strategic commodities. Countries with more comprehensive legislation tend to be less prone to corruption, or alternatively, there is a positive correlation between inadequate export control legislation and higher levels of corruption (see Figures 14.1 and 14.2).



**Figure 14.1.** The 180 countries ranked by the Corruption Perceptions Index of 2019 are categorized from right to left by the quality of their export control legislation, where the far right is most comprehensive and the far left severely deficient. The legislation color key described qualitatively and in brief from right to left is Dark Green— legislation is comprehensive; Light Green – legislation is somewhat comprehensive; Yellow – legislation is deficient; Orange – legislation has serious deficiencies; and Red – legislation is non-existent or severely deficient.



**Figure 14.2.** The trend line demonstrates the correlation that countries with more extensive legislation (far right) tend to be less corrupt. Export control legislation color codes are removed and presented in grey in order to show correlation.

## COUNTRIES WITH LOW CPI RANKINGS AND INADEQUATE LEGISLATION

This correlation leads to questions about the number of countries that are in the bottom half of the CPI and have less than adequate legislation, in this case, countries with Orange or Red levels of legislation. The following characterizes these countries.

Thirty countries rank in the bottom half of the CPI and have Red category legislation, from better to worse ranking in the CPI:

*Columbia, Egypt, Nepal, Swaziland (Eswatini), Djibouti, Guinea, Maldives, Mali, Liberia, Papua New Guinea, Angola, Honduras, Iran, Central African Republic, Comoros, Madagascar, Zimbabwe, Chad, Burundi, Congo (Republic of the), Congo (Democratic Republic of), Guinea-Bissau, Haiti, Democratic People's Republic of Korea, Afghanistan, Equatorial Guinea, Sudan, Yemen, South Sudan, and Somalia.*

Twenty-one countries rank in the bottom half of the CPI and have Orange category legislation. Listed from better to worse ranking in the CPI, they are:

*Ecuador, Timor-Leste, Ethiopia, Gambia, Côte d'Ivoire, Mongolia, El Salvador, Zambia, Niger, Bolivia, Gabon, Lao People's Democratic Republic, Togo, Dominican Republic, Lebanon, Paraguay, Eritrea, Turkmenistan, Libya, Venezuela (Bolivarian Republic of), and the Syrian Arab Republic.*

In total, there are 51 countries in the Red or Orange legislative categories that also rank in the bottom half of the CPI. They represent 68 percent of all 75 countries within the Red and Orange PPI categories ranked in the CPI, and about a quarter of all countries examined in the PPI.

Fifteen of these 51 countries were recently involved in UNSC sanctions violations on North Korea: Angola, Colombia, Congo (Democratic Republic of), Côte d'Ivoire, Egypt, El Salvador, Eritrea, Honduras, Iran, Lebanon, Libya, Nepal, Togo, Syrian Arab Republic, Yemen.

With the exception of Mauritius, Mongolia, Bahrain, Azerbaijan, Saudi Arabia, Fiji, Dominican Republic, Trinidad and Tobago, Bahamas, Ethiopia, and Tunisia, all of the countries with Red or Orange legislation

rank below 100 in the full PPI ranking. Mauritius and Mongolia are the only two Red and Orange countries that achieved more than 50 percent of the total possible points, and the majority received less than a third of the total possible points (see Figure 14.3).

## **COUNTRIES WITH ADEQUATE LEGISLATION BUT LOW CPI RANKING**

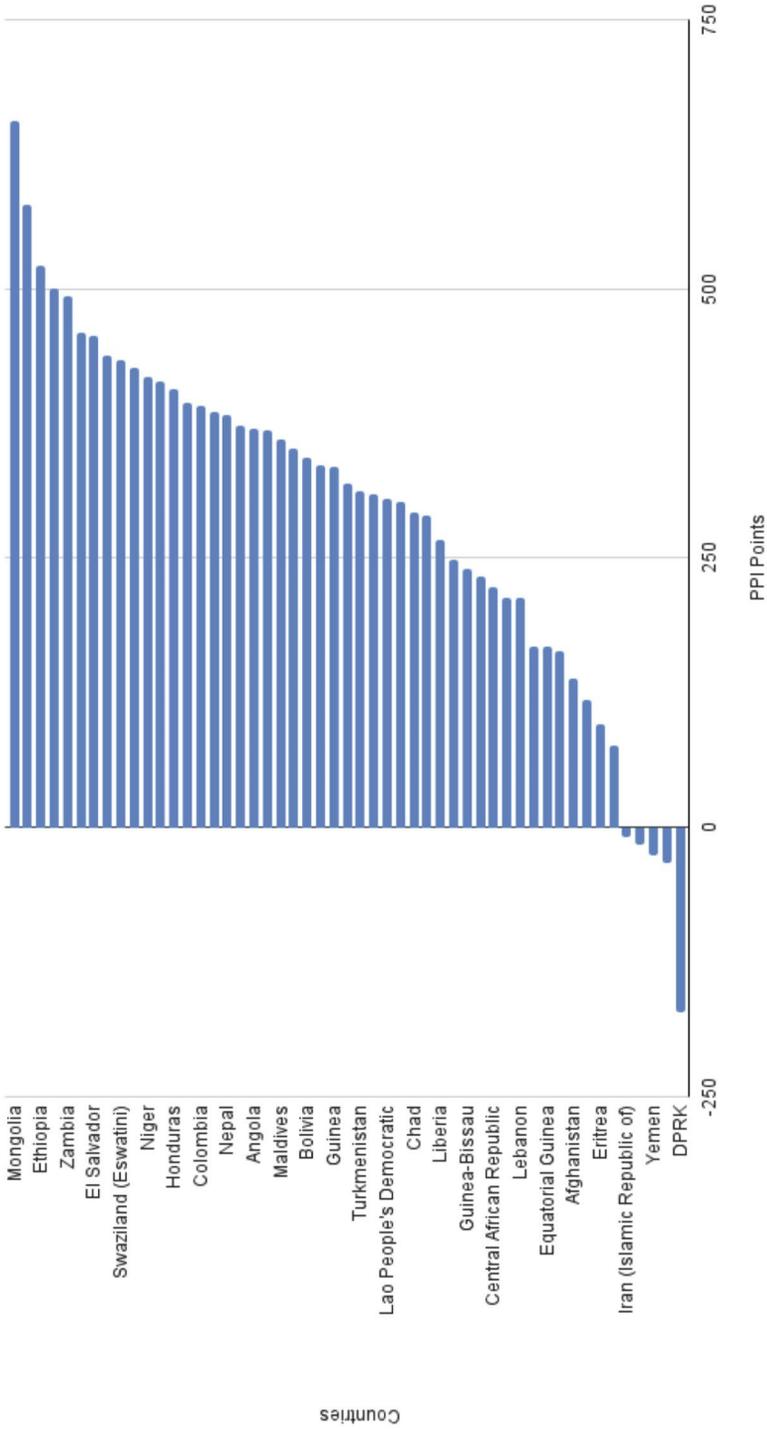
Twenty-five countries rank in the bottom half of the CPI and have Green (Light or Dark Green) legislation, from better to worse ranking in the CPI:

*Serbia, Turkey, Viet Nam, Bosnia and Herzegovina, Kosovo, Panama, Thailand, Albania, Brazil, Macedonia (North), Kazakhstan, Philippines, Moldova (Republic of the), Pakistan, Azerbaijan, Kyrgyzstan, Ukraine, Myanmar, Mexico, Kenya, Russia, Uzbekistan, Tajikistan, Iraq, Cambodia.*

Notably, the Philippines, Russia, Panama, Kenya, and Thailand, all have documented cases of involvement in violations of UNSC sanctions on North Korea.

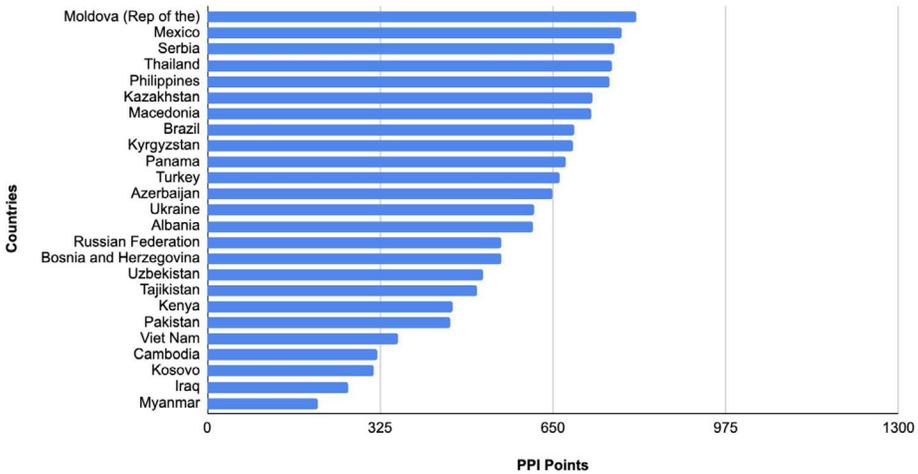
With the exception of Mexico, Moldova, Philippines, Serbia, and Thailand, all of the countries with Green legislation ranked below 50 in the overall PPI with twelve ranking between 50 and 100 and the remaining eight ranking below 100. Eleven of these Green countries achieved 50 percent of the total possible points. The remaining 14 countries received less than 50 percent of the potential points in the PPI (see Figure 14.4).

2021 Final PPI Points of Countries with Red or Orange Color Coding of Export Control Legislation



**Figure 14.3.** 2021 Final PPI points scored by countries with legislation color coding of Red and Orange and in the bottom half of the CPI, out of 1,300 PPI points possible.

### 2021 Final PPI Points of Countries with Green Color Coding of Export Control Legislation



**Figure 14.4.** Final PPI points scored by countries categorized with legislation color coding of Green in the bottom half of CPI, out of 1,300 possible PPI points.

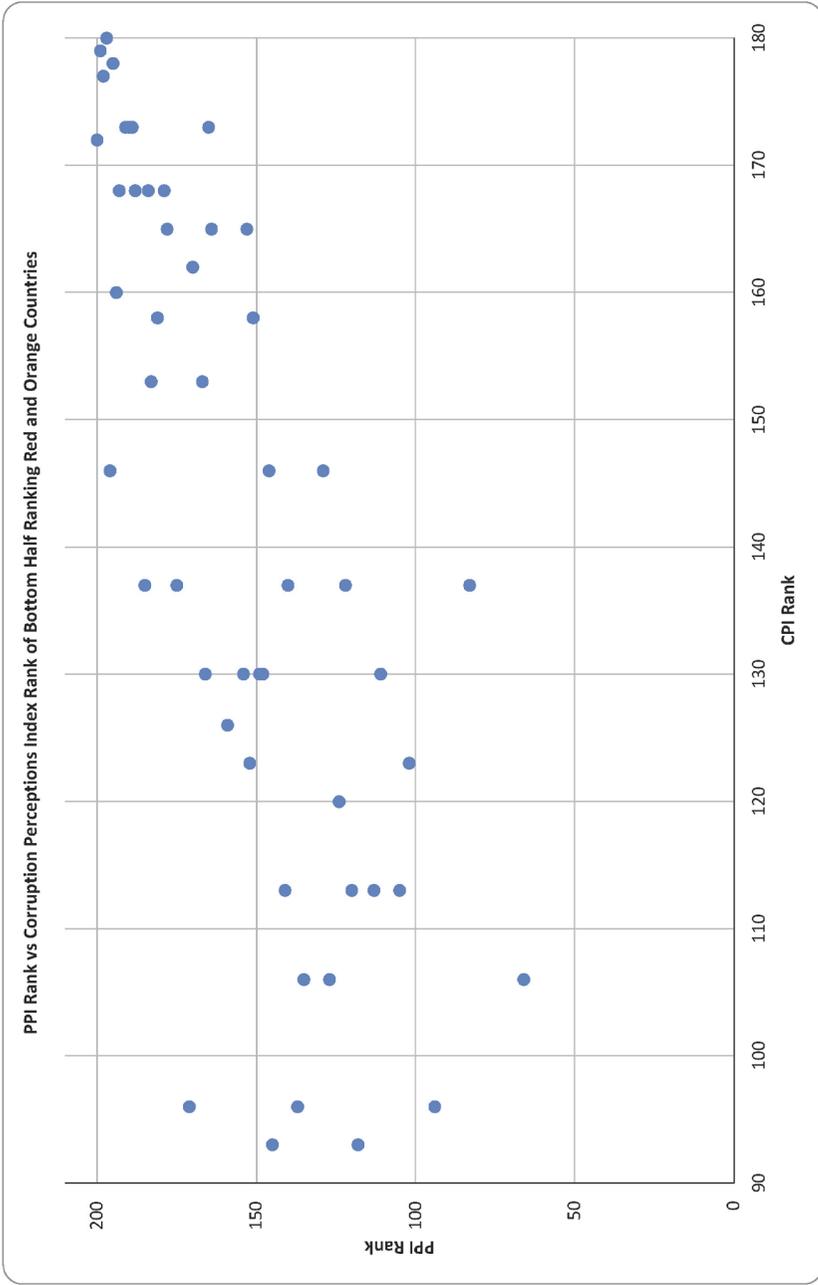
## APPLYING THE PPI SCORE

In general, countries that had low CPI ranks also ranked low in the PPI (see Figure 14.5 and 14.6). Sixty-five of the 76 total countries in this grouping were unable to achieve more than half of the possible points under the *Adequacy of Enforcement* super criterion, and only 27 were able to achieve more than half of the possible points under *Ability to Monitor and Detect Strategic Trade*. Twenty-one of these 76 countries had negative points in the *Ability to Prevent Proliferation Financing* super criterion. Collectively, these results demonstrate an inability to prevent the financing of proliferation, enforce legislation, or aptly monitor and detect illicit inflows and outflows.

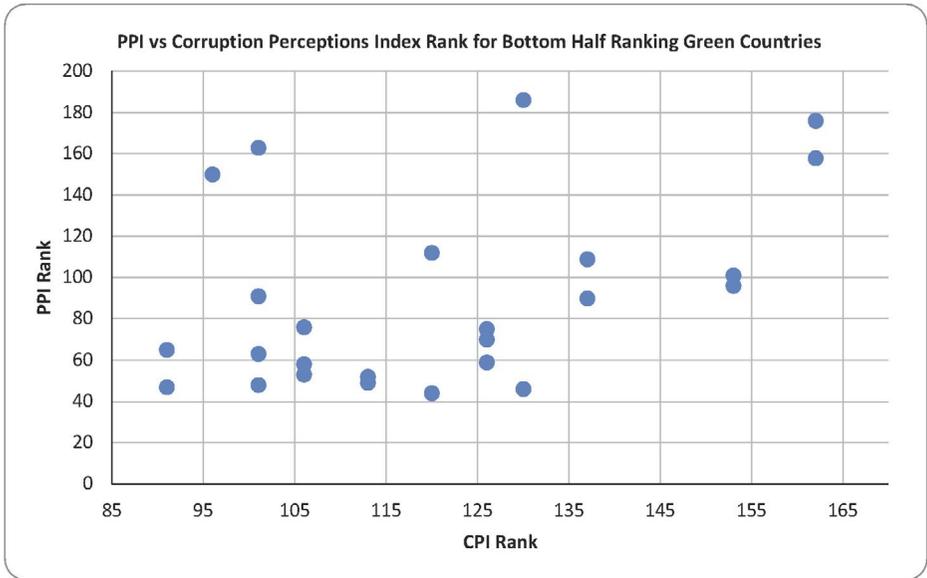
## RECOMMENDATIONS

A priority for the international community should be to assist efforts in the 24 states with Orange and Red category legislation least plagued by corruption (ranking in the top half of the CPI).<sup>3</sup> The assistance should include drafting, implementing, and enforcing export control legislation, or at least the minimal controls discussed in Chapter 16 for Tier Three

countries. At the same time, countries with high levels of corruption should seek international aid and join international efforts to improve their transparency and oversight measures. While such efforts are ongoing, countries should avoid conducting business in controlled or sensitive goods, including conventional military goods, in countries with high levels of corruption and few or no export control laws. Suppliers of sensitive or controlled goods should be wary of any purported end users of such goods in these countries and should take extra due diligence to confirm the end user. Many of the countries included in this grouping are known transshipment points, posing a risk that goods could be transferred across borders, or transshipped to sanctioned states, terrorist groups, or other illegitimate actors.



**Figure 14.5.** Countries categorized with legislation colored as Red or Orange that ranked in the bottom half of the Corruption Perceptions Index. The 51 countries that have high corruption and rank low in the PPI appear in the upper right-hand corner.



**Figure 14.6.** Countries categorized with legislation colored as Dark Green or Light Green that rank in the bottom half of the Corruption Perceptions Index (a total of 25 countries). The countries in the graph that have high corruption and low PPI rank are on the top half of the graph.

## NOTES

1. “Corruption Perceptions Index 2019,” *Transparency International*, January 2020, <https://www.transparency.org/en/cpi/2019/index/nzl>.
2. “Corruption Perceptions Index 2016,” *Transparency International*, 2016, <https://www.transparency.org/en/news/corruption-perceptions-index-2016>.
3. The 24 countries are, listed from better to worse ranking in the CPI, Bhutan, Seychelles, Bahamas, Barbados, Saint Vincent and the Grenadines, Costa Rica, Dominica, Saint Lucia, Grenada, Mauritius, Oman, Vanuatu, Sao Tome and Principe, Senegal, Suriname, Tunisia, Solomon Islands, Bahrain, Benin, Burkina Faso, Kuwait, Lesotho, Guyana, and Trinidad and Tobago.

**SECTION IV**  
**REDUCING THE PERIL**



# CHAPTER 15

## HOW TO IMPROVE PPI SCORES

The PPI provides a way for states to reflect on their own strategic trade control systems and compare their performance to other countries. Intrinsic to the PPI is that all countries need to improve their scores, where the scoring stands as a reminder against complacency by all, including trade control officials, national decision makers, and budgetary authorities.

### A TOOL FOR ASSISTANCE PROVIDERS

The PPI identifies strengths and weaknesses in a country's system, which can be used to determine which countries need assistance and what type of assistance would be most beneficial. Importantly, the PPI not only looks at the existence and enforcement of strategic trade controls, but also at the general environment in which controls are implemented. Therefore, among countries that do not yet have strategic trade control legislation in place, the PPI score, rank, and country-profile offer an evaluation of the foundation upon which strategic trade controls can be built.

The PPI can also serve as a supplement to an assessment by assistance-offering countries of a country. The evolution of a country's score and rank through updates of the PPI can be used by assistance-giving countries or organizations as an objective way to monitor progress and measure success.

The PPI can be integrated into maturity models developed by assistance providers to plan and track progress. The idea of maturity models

to assess a country's strategic trade control level stems from the WCO and has been subsequently adopted by other assistance providers.<sup>1</sup> It facilitates the identification of steps and prerequisites before a country can move on to the next level, and allows for measuring and acknowledging of step-by-step improvements. Maturity models prevent countries from prematurely enacting strategic trade control laws with less ability to implement or enforce. The PPI, through its Tier system, Tier-specific recommendations, and cluster analysis, supports the idea of improving systems within a maturity-level framework.

## HOW TO IMPROVE A PPI SCORE

A natural question is how a country can improve its score. This entails fulfilling many of the sub-criteria or indicators that the project has determined to be of importance. If a country is interested, the PPI team would be happy to provide its points profile and information that led to it, and consult with relevant representatives for a follow-up report. We encourage interested countries to contact us. We also welcome comments and reactions to the rankings.

With 91 positive, point-earning criteria and 1,300 possible points, a single criterion cannot “make or break” a country. Rather, the final PPI scores indicate that creating an effective strategic trade control system relies on many actions, large and small, in several areas. Nonetheless, focusing on improvement or implementation of 24 “high-impact” indicators defined in the previous chapters, some from each super criterion, lays out a strategy for improving a country's strategic trade control performance.

Moreover, despite overall low performance in the super criterion *Ability to Prevent Proliferation Financing*, this area offers great rank improvement opportunities for individual countries as well as a path to improved trade control implementation. Together with *Adequacy of Enforcement*, it is one of two most heavily weighted super criteria in the PPI. A path to better performance is closely tied to working with the Financial Action Task Force (FATF). From 2019 to 2021, 31 countries increased their score under the Proliferation Financing super criterion through improved compliance with FATF standards. There are many other international organizations, such as the World Customs Organization, that countries should cooperate with more closely on trade control

implementation. Implementing the trade control provisions of UNSCR 1540 (2004) and submitting detailed implementation reports would also boost a country's score.

Overall, the PPI balances high standards for strategic trade control systems with reasonable expectations for the implementing country. Some features of control systems that are applicable mostly to supplier states and control regime members are recommendations rather than sub-criteria. Countries that are leading examples of implementing additional features are highlighted throughout the priority recommendations made in Chapter 16. Additionally, through its ranking, the PPI identifies countries that are regional leaders that other countries can turn towards for guidance.

## **DRAWING LESSONS FROM THE TOP TEN COUNTRIES IN 2021**

What sets the top 10 performing countries apart is a well-implemented strategic trade control system bolstered by counterproliferation financing capabilities. They perform well in high-impact sub-criteria across all five super criteria. They earned more than 50 percent of the points available in super criterion *Ability to Prevent Proliferation Financing*, while roughly 83 percent of all other states earned less than 50 percent in this super criterion where the average and median scores lie at 101, out of 400 possible points.

While these countries can be looked at as role models for a well-rounded performance, there are additional countries that score highly in individual super criteria. The table below lists the top 10 performing countries by super criterion (listed alphabetically.)

<b>Super Criterion : International Commitment</b>
Australia, Austria, Czech Republic, Germany, Netherlands, New Zealand, Spain, Sweden, Switzerland, and Turkey.
<b>Super Criterion : Legislation</b>
Australia, Austria, Belgium, Denmark, France, Luxembourg, Netherlands, New Zealand, Taiwan, and UAE.
<b>Super Criterion : Ability to Monitor and Detect Strategic Trade</b>
Belgium, Canada, Estonia, Finland, Ireland, Japan, Republic of Korea, Slovenia, Switzerland, and UAE.
<b>Super Criterion : Ability to Prevent Proliferation Financing</b>
Andorra, Armenia, Australia, Ireland, Israel, Portugal, Singapore, Sweden, United Kingdom, and United States.
<b>Super Criterion : Adequacy of Enforcement</b>
Belgium, Canada, Hungary, Latvia, Lithuania, Netherlands, Slovenia, Spain, United Kingdom and United States.

**Table 15.1.** The top 10 ranked countries within each super criterion, listed alphabetically.

## FOCUSING ON HIGH-IMPACT CRITERIA

Out of the 1,300 total points available in the PPI, roughly one third come from a list of 24 high-impact sub-criteria. The impact of these high-impact sub-criteria is visible by taking a closer look at the top performing countries in 2019 compared to 2021. Although the top three have not changed, some of the others moved dramatically in their scores and ranks.

This movement, visible in the top 10, can be understood by evaluating countries’ performances in high-impact sub-criteria across the five super criteria. It shows that France, Germany, and the Netherlands, for example, countries that appear frequently throughout this book to exemplify measures taken by countries that were outside the realm of quantifiable criteria, and generally considered to have some of the best strategic trade control systems in the world, are falling behind their peers due to a lack of focus on countering proliferation financing.

In the 2021 PPI, Germany ranked 12<sup>th</sup> overall. In a ranking considering high-impact sub-criteria only, Germany dropped to rank 43. Alternatively, South Korea, which ranked 10<sup>th</sup> in the 2021 PPI, remained the same in the high-impact rank. A deeper look shows that Germany only earned 62 percent of 420 possible high-impact points, while the United States, which ranks number one in both ranks, achieved 86 percent of the 420 possible high-impact points. Germany missed many high-impact

points in the super criterion *Ability to Prevent Proliferation Financing*; counting high-impact criteria only, Germany would have received a score of minus 14 points under *Ability to Prevent Proliferation Financing*. This highlights that Germany can quickly recover and maintain its top overall rank by focusing on high-impact sub-criteria, including being more transparent about and publicly reporting its best practices to combat proliferation financing. The PPI team expects that Germany's score in this super criterion will improve with the expected completion of a new FATF Mutual Evaluation (delayed because of the COVID-19 pandemic). Its last Mutual Evaluation was conducted in 2010 and its last follow-up was in 2014.<sup>2</sup> The upcoming one will include much needed information and will undoubtedly improve Germany's score.

There is a whole set of countries that performed worse in the ranking based on high-impact criteria than in the final PPI ranking. These countries are assessed to have some of the greatest potential for significant improvement. For those countries that do not yet have a strategic trade control law in place, for example, their relative robust performance in medium and low- impact criteria could indicate that these countries have a good trade environment to serve as a basis for strategic trade control legislation in the near future. Figure 15.1 graphs the 2021 PPI rank versus the high-impact only rank. The countries of interest appear far below the trendline; they have a ranking closer to 200 on the x-axis (high-impact criteria only rank), but closer to 1 on the y-axis (overall PPI rank). Highlighted here (and listed alphabetically) are 18 countries that rank 30 or more ranks better in the final PPI ranking than in a ranking based on high-impact criteria only: Angola, Armenia, Belize, Bhutan, Cook Islands, Côte d'Ivoire, Germany, Indonesia, Kuwait, Namibia, Niger, Saudi Arabia, Sierra Leone, Sri Lanka, Tanzania (United Republic of), Togo, Tunisia, Uruguay, and Vanuatu.

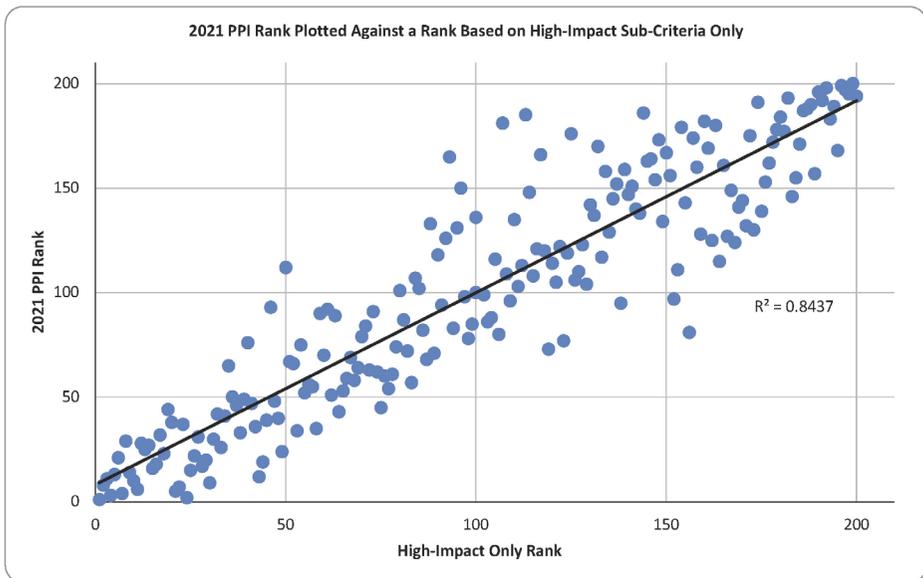
Due to the weighting applied to the Enforcement and Proliferation Financing super criteria, some sub-criteria that are assigned a medium impact attribute more points to a country's final score than a high-impact criterion in super criterion *International Commitment* for example. The final score contribution reflects a proportional relationship between effort and return, as improvements in *Adequacy of Enforcement* and *Ability to Prevent Proliferation Financing* are generally more difficult, but countries are encouraged to work on all high-impact criteria. In *International*

*Commitment* for example, adherence with export control regime guidelines is also rewarded in the PPI, and not only membership.

## EXPORT CONTROL LEGISLATION AND CONTROL LISTS

A strong national legal framework to control the export of weapons of mass destruction and related materials and equipment, including dual-use goods and technology, is fundamental to build a culture of action and commitment to nonproliferation. The top 50 ranks in the PPI are consistently held by countries with comprehensive export control legislation and control lists.

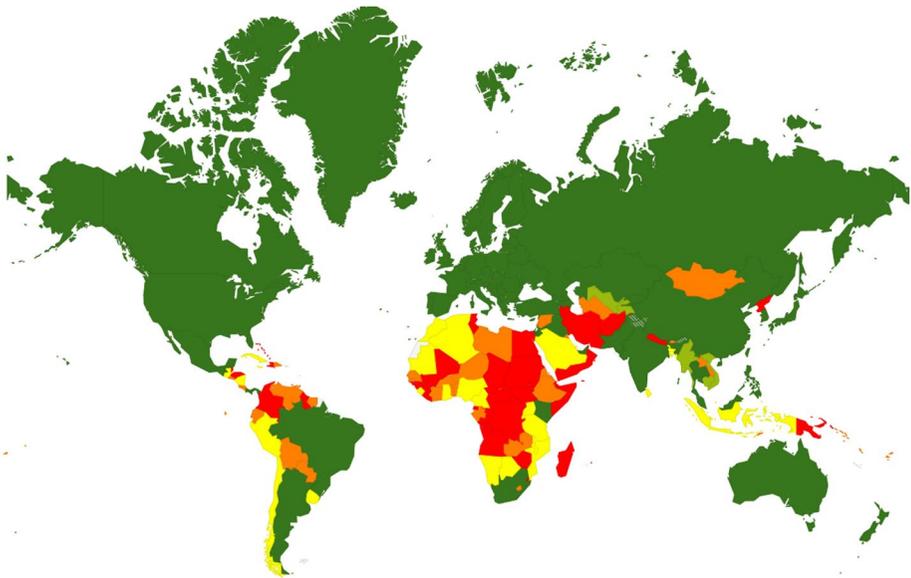
Figure 15.2 is a map that is color-coded by the comprehensiveness of each country's export control legislation, where dark green is the most comprehensive and red is the least comprehensive. The full definition of each category can be found in Chapter 3, Legislation, as well as a table that lists all countries by their assigned color category. The vast majority



**Figure 15.1.** Rank correlation between high-impact sub-criteria only and the 2021 PPI. The  $r^2$  value of 0.84 confirms a strong positive correlation.

of the dark green control legislation is located in the Northern Hemisphere. Notably, the largest economies in the world tend to have dark green legislation. As can be seen, orange and red color categorizations are concentrated in the Southern Hemisphere, and primarily in developing countries.

Visible when comparing the 2021 map to the 2019 map is that countries in Africa, and especially those that are planning to invest in nuclear power infrastructure, are progressing increasingly away from red and orange legislation towards yellow legislation, which encompasses nuclear safety and security legislation with overarching regulations on nuclear-related transfers, transports, and exports (see also Chapter 12, Countries with their first nuclear power reactor publicly, proposed, planned or under construction.) While this is a positive development, countries should see this safety and security legislation as a floor, and not a ceiling. One East African country, Kenya, already took the next step to adopt full strategic trade control legislation that includes a dual-use control list.



**Figure 15.2.** Color coding of the comprehensiveness of export control legislation, where comprehensiveness is measured from most comprehensive to least in dark green, light green, yellow, orange, and red, respectively.

## THE GOOD NEWS: AREAS OF GREATEST IMPROVEMENT

**Countries That Improved the Most.** Many countries in the 2021 PPI improved their score. The country that improved the most was the Philippines: in 2021 it scored 755 points, an increase of 274 points compared to its 2019 score. The next greatest improvement was Thailand, which increased its score by 250 points to a final total of 760. The country that improved its overall rank the most was Vanuatu. (The cluster analysis in Chapter 7, and specifically Figure 7.4, shows why countries with the largest score improvement are not necessarily the countries with the largest rank improvement, as score density varies across the 200 ranks.) In 2019, Vanuatu ranked 181 overall. In the 2021 PPI, Vanuatu ranked 115, an increase of 66 ranks. This change was primarily driven by super criteria *Ability to Prevent Proliferation Financing* and *Adequacy of Enforcement*, where Vanuatu earned a positive 94 points and 162 points over its 2019 score, respectively. In *Ability to Prevent Proliferation Financing*, Vanuatu benefited from implementing and complying with Financial Action Task Force (FATF) recommendations and reporting its progress and updated FATF ratings through a follow-up report.

Globally, the improvement is less impressive, but steady nonetheless. Overall, the average score for the 2021 PPI is 547, an increase of 57 points from the 2019 PPI average of 489 points, representing a 12 percent increase in the average score, or alternatively, the average score is four percent closer to reaching the maximum number of points, 1,300.

With respect to the Tiers, Tier Two improved its average score the most by 75 points, from 467 to 542. Comparatively, Tier One improved by 58 points, and Tier Three by 47 points. With regard to the four clusters, Cluster 2's improvement was the greatest. Its average score rose by 83 points.

For some countries, rank improvement and an increase in overall score can be attributed to the new information submitted to the UNSCR 1540 (2004) Committee and found in the committee-approved matrices. Twelve countries have improved their ranking by 15 or more ranks due to additional information in their 2020 round of committee-approved matrix, and five countries improved their score by 100 or more points. The countries, listed alphabetically, are Bahrain, Benin, Chad, Chile, and Sri Lanka. In total, 86 countries experienced a positive change in their total

points, 101 countries had no change, and only 13 countries suffered a negative point change from the newly available matrices.

**Super and Sub-criteria That Improved Most.** Globally, the most improvement was seen within super criteria *Ability to Monitor and Detect Strategic Trade* and *Ability to Prevent Proliferation Financing*. The two super criteria experienced the largest increase in average scores compared to 2019.

In *Ability to Prevent Proliferation Financing*, all but one of the 13 sub-criteria that were not affected by any change in methodology between the 2021 and 2019 data experienced an increase in globally achieved points.<sup>3</sup> The one sub-criterion that experienced a decrease in globally achieved points was “Having OFAC sanctioned entities.” The Egmont Group saw an increase in its membership since the 2019 PPI, where 10 additional countries have become new members. Further, many countries experienced an increase in their Financial Secrecy Index score, reflecting better implementation of the broad set of FATF criteria, and several others took steps to establish internal or public registries of beneficial ownership. It should be noted that the addition of two new positive sub-criteria did not increase the weighted possible maximum score, but the addition reflects the new availability of relevant, quantifiable data, which by itself is a positive development in the area of proliferation financing.

The increase in overall score in *Ability to Monitor and Detect Strategic Trade* stems from a combination of new and continued sub-criteria. While newly added sub-criteria and changes in source data quantitatively added to the overall score improvement, qualitatively, global improvement is seen across the board of all sub-criteria. For example, raw scores improved globally for all sub-criteria measuring customs systems, such as “Automated Customs Systems,” “Ability to Track and Trace Consignments,” “Customs Clearing Efficiency,” and “Percentage of Electronic Export Declarations.” Sub-criteria related to the implementation of UNSCR 1540 (2004), of which there are four in *Ability to Monitor and Detect Strategic Trade*, saw important global improvements as well. With respect to the new sub-criteria, “Country has exclusively closed ship registries,” and “Country has a single window system for trade facilitation (as a measure for interagency cooperation),” roughly half of the 200 evaluated countries have an operational single window system for trade facilitation

and an overwhelming majority, nearly 83 percent of countries, mandate a closed ship registry.

Of all the sub-criteria related to the implementation of UNSCR 1540 (2004), the largest change occurred in the number of countries that submitted information on “Criminal Penalties for Nuclear Weapon Transport,” and “Criminal Penalties for Nuclear Transfer,” where 24 and 35 additional countries earned points, respectively. Of the three sub-criteria in the PPI related to 1540 outreach, many countries earned additional points, such as for establishing a state point of contact for UNSCR 1540 implementation. Additionally, the 2021 PPI saw the inclusion of a new sub-criterion, “1540 matrix has an X under intangible technology transfer,” under which 38 countries earned points.

## THE BAD NEWS: AREAS FALLING SHORT

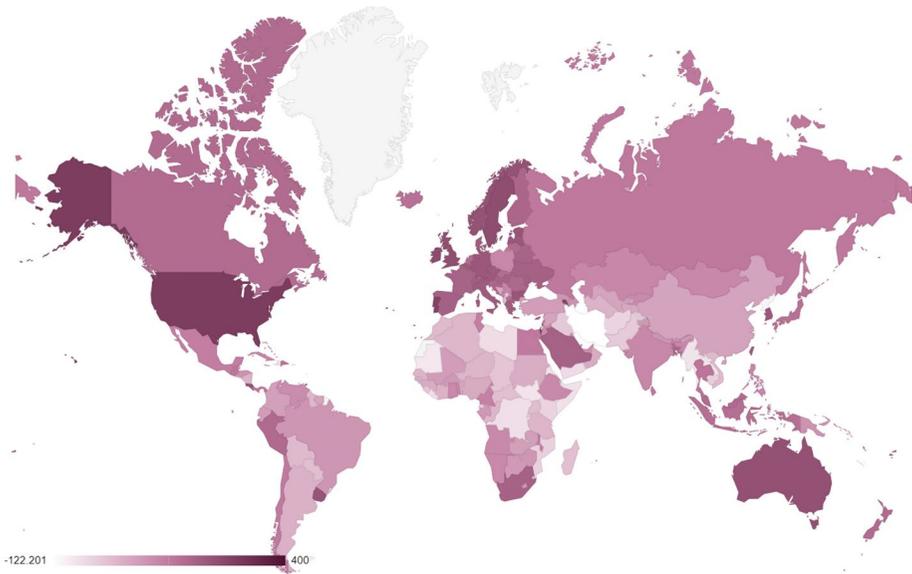
**Countries That Decreased the Most.** While many countries in the 2021 PPI improved their scores, a number of countries’ scores declined. The reasons for the loss of points vary from country to country. A total of 29 countries across all three tiers lost points in this edition of the PPI (see Table 15.2.). The highest-ranking country to lose the most points was Poland, which had a final score of 910 in 2019 and a final score of 864 in 2021, and therefore lost 46 points. Poland lost points in super criteria *Ability to Prevent Proliferation Financing* and *Adequacy of Enforcement*, where it lost about 30 weighted points each, while gaining only about 10 in *Ability to Monitor and Detect Strategic Trade*. The point difference resulted in Poland falling from rank 14 in the 2019 PPI to rank 38 in the 2021 PPI, a decrease of 24 ranks.

The country score that decreased the most overall was Yemen; its score fell from a positive 201 to a *negative* 26 points, a loss of 227 points. Yemen lost points in all super criteria except *Legislation*; overall a significant number of points were lost due to the destabilization caused by the ongoing civil war. The current situation in Yemen makes monitoring trade and enforcing trade control laws an exceptionally difficult task, if not impossible.

Countries with A Score Decrease from 2019 to 2021	
<b>Tier One</b>	
Argentina, India, Iran (Islamic Republic of), Ireland, Poland, Slovakia, and United Kingdom	
<b>Tier Two</b>	
Jamaica, Lebanon, Libya, Oman, Syrian Arab Republic, Uganda, Venezuela (Bolivarian Republic of), and Zambia	
<b>Tier Three</b>	
Bolivia, Congo (Democratic Republic of), Eritrea, Grenada, Haiti, Mali, Mauritania, Niue, Saint Lucia, Sierra Leone, Solomon Islands, Tanzania (United Republic of), Tuvalu, Yemen, and Zimbabwe	

**Table 15.2.** Countries, sorted by tier, that lost points in the 2021 PPI, listed alphabetically.

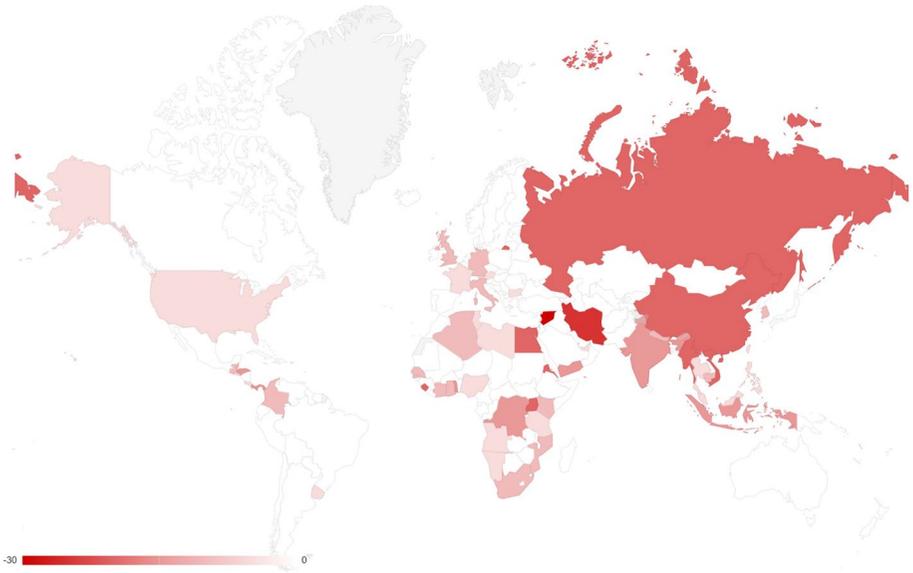
**Ability to Prevent Proliferation Financing.** Despite improvement, this super criterion remains the one where the least points are achieved globally, and where even the high-ranking countries receive scores below 75 percent of the possible points. Figure 15.3 is a world map visualizing how a country performed in this super criterion relative to other countries. Higher scores are in darker color, and lower scores in lighter color, where the range of achieved scores is minus 122 to 293 points, out of 400 possible points. The lighter colors dominate the map, reflecting the low overall average and median in this super criterion, which both lie at 101 points.



**Figure 15.3.** World map of weighted scores received under super criterion *Ability to Prevent Proliferation Financing*.

**Countries Involved in Violating Sanctions on North Korea.** New in 2021, the PPI is using data on sanctions violations made available by the UN Panel of Experts on North Korea in its annual reports. These reports are analyzed by the Institute on a regular basis as soon as they are published by the UN. Chapter 6 explains how points were subtracted from those countries that were involved, and how the subtractions were based on the severity of the activity, such as involvement in military-related sanctions violations or repeated involvement over several years. Figure 15.4 shows the relative severity of the deductions on a world map.

Overall, the number of countries alleged to be involved in violations has increased since the first Institute analysis was conducted in 2017. In that study, the Institute counted 49 countries cited in the Panel of Experts report, but by 2020 the number of countries involved in violations had increased to 62. There may be a number of factors contributing to this effect; newly added sectoral and targeted sanctions that countries had to adjust to; increased reporting by Member States and investigating capabilities by the Panel; and increased global trade overall, but it certainly also shows that some countries have become laxer in their controls. The Institute has



**Figure 15.4.** North Korea sanctions violations subtractions (raw points), where darker red implies a greater subtraction.

continued to monitor and categorize cases to identify patterns and areas that require the most improvement as well as to identify countries that are especially negligent or vulnerable to certain types of sanctions evasion schemes. For example, the Institute’s 2020 report revealed that nine countries were allegedly involved in military-related cooperation with the DPRK, including the training and procurement of military related supplies, and aiding the DPRK in establishing supply chains for ballistic missile development.<sup>4</sup> Unsurprisingly, those nine countries scored in the bottom third of the PPI. Collectively, the countries scored an average of 167 points, barely 13 percent of the total possible points.

A new sub-criterion in the 2021 PPI, “Country has a positive record of submitting sanction implementation reports,” demonstrates the degree to which countries are willing to pay attention and dedicate resources to implementing international sanctions on North Korea. Seventy countries have never submitted a single sanction implementation report, despite a standing requirement since 2006. Of the 105 countries that did submit at least one of five sanctions implementation reports required by UNSCR 2397 (2017) and follow-on resolutions, 13 have not submitted a second

report since then. Only 26 countries (13 percent) had a positive record of submitting all sanctions implementation reports required under the five most recent United Nations Security Council Resolutions.

**Government Unwillingness or Inability to Enforce.** The PPI takes into consideration the economic and political stability in a country when judging a government’s ability to enforce trade control measures. Countries suffering from high levels of corruption, internal destabilizing conflicts, evidence of government interference with trade control investigations, and other deficiencies face significant challenges to effectively implement strategic trade control laws. Of the 50 countries ranked in the bottom quarter of the overall 2021 PPI, 16 countries are affected by point deductions due to this unwillingness or inability to act. For example, Syria suffered point deductions due to its ongoing civil war, its status as a failed state and a state sponsor of terrorism, and bribery and corruption amongst customs officials and law enforcement.

**Corruption.** Corruption amongst government officials remains a pressing issue. In about a quarter of all countries, there is documented evidence of 10 percent or more of all businesses being expected to provide “gifts” in exchange for an import license. Surpassing this 10 percent threshold resulted in a point deduction for that country. See also Chapter 14: National Export Control Legislation versus Corruption, for a correlation of countries’ levels of corruption and PPI performance.

## STATISTICAL ANALYSES

The PPI conducts statistical analyses to improve understanding of the index, but also to give the reader the opportunity to view the data from different angles. The PPI team collaborated with professional statisticians and developed its own in-house capability to conduct principal component analyses (PCA).

Typically, a principal component analysis is used to understand variance, or spread, in a set of data by calculating the “principal components,” variables derived from a complicated combination of initial variables, where the new variables represent the directions where the original data have a larger variance. These components help identify patterns in data, highlighting their similarities and differences. These patterns can be

difficult to determine in a set of data as large as the PPI data, which includes over 100 sub-criteria.

PCA has often been used as a method to reduce the amount of data needed to describe an original data set, where only the first, most important principal components are used to describe the original data set, while preserving much of its information and variance. In the case of the PPI, the immediate goal is to better understand the variance in the data and to add insight into interrelationships among the PPI data. This may allow a better evaluation as to whether any sub-criteria work together within the most important principal components, leading to a determination of a common underlying characteristic.

Although PCA can illuminate patterns in the data, the PCA principal components can also be difficult to interpret. For example, the number of principal components matches the number of sub-criteria, which is 105 in the 2021/2022 version, although as will be discussed below, some principal components are more important than others.

To conduct a PCA, the PPI data are all combined into one set of data, where each data point is the country's weighted score for that particular criterion. For the PPI, the PCA produces over 100 principal components from the sub-criteria. About ten of these principal components describe up to 75 percent of the variance. However, the first few principal components are not sufficient to capture the bulk of the data, showing that there is considerable variance in the country scores overall. The variance is too great to use a small subset of principal components to predict the ranking.

The two sub-criteria with a much larger point range than the remaining criteria were combined in one, so that the PCA would reflect their larger impact on the ranking without dominating the entire PCA results. Thus, the first principal component is dominated by the joint two criteria "Government unwillingness or inability to enforce trade controls" and "Expert judgement," meaning that these two criteria contribute to a relatively large spread in the PPI country scores.

The second principal component is more complicated to interpret. The top ten highest variables or subcomponents of this principal component correlate with the expected elements of a STC system, such as export control legislation, catch-all, and transshipment, and transit controls. Notably, among the top ten are several criteria that measure implementation of financial controls. The largest negatively correlating sub-criteria

include those that measure gaps in financial controls, such as being identified as a country of money laundering concern, or having significant illicit financial flows.

In the third principal component, the sub-criterion with the highest positive value is from Super Criterion *Enforcement*: Participant in international legal assistance mechanism. Most of the top ten positively and negatively correlating criteria are enforcement or financial related, where “Having OFAC sanctioned entities” is the sub-criterion with the highest negative value. In the fourth principal component, nine of the top ten correlating criteria are FATF criteria.

All in all, one could interpret principal component 2 as showing how critical elements of an STC system cause a relatively large spread in country scores, while the principal components that follow indicate how country scores are spread otherwise where enforcement and financial control related criteria play a large role.

**Eliminating Super Criteria Weights.** A second approach is to consider the case where PPI super criteria weights are ignored.

In this case, all sub-criteria are similarly combined into one set of data, but the weightings are eliminated, essentially dissolving the super criteria, although the high, medium, and low impact assignments are maintained. This makes it impossible to relate results from the PCA back to the PPI rank or draw conclusions about the PPI rankings. However, this case can lead to further insights into determining which sub-criteria combinations play a larger role in the main principal components.

Besides using the data in the form of unweighted, raw scores, the statisticians eliminated the two sub-criteria with a much larger point range than the remaining 103 PPI sub-criteria.<sup>5</sup> The first five principal components explain about 50 percent of the variance, and the first sixteen explain almost 75 percent of the variance.

Principal component 1 correlates strongly with expected STC system elements, such as National export control legislation, Catch-all clause, Transshipment and Transit Controls. Notably, the top ten also include sub-criteria from the International Commitment super criterion: Participant in the Wassenaar Arrangement, Member of the Missile Technology Control Regime (MTCR), and Member of Nuclear Suppliers Group. None of the financial control related criteria appears in the top ten. At the other

end of the spectrum of principal component 1 are criteria that correlate negatively, although there are not many, and their absolute correlation value is relatively low. The sub-criterion with the most negative correlation is Party to a Nuclear Weapon Free Zone (NWFZ) Treaty, indicating that for several country scores a higher score in this criterion correlated with a lower score in the positively correlating criteria listed above or vice versa.

In terms of finding patterns in the country scores, the presence or absence of points in these sub-criteria is what many countries have in common, and were all sub-criteria regarded as equal (e.g., the weight of International Commitment were not reduced), several high-scoring countries would likely share these attributes of scoring high in the positively correlating criteria, but lower in the negatively correlating criteria. Given that many of these sub-criteria indicate a mature strategic trade control system, this grouping of criteria appears reasonable. However, the grouping appears to show a bias towards STC capacity rather than implementation.

The absence of financial control-related criteria correlating strongly with principal component 1 may reflect the PPI's general conclusion that most countries do not do well on preventing proliferation financing, including countries that are otherwise widely considered to have some of the best export control systems. It may further reflect that proliferation financing is a topic that in the past has traditionally been largely decoupled from other strategic trade control measures.

The sub-criteria that correlate positively the most to principal component 2 are again more difficult to interpret. The sub-criterion with the highest correlation is: Participant in international legal assistance mechanisms. Others include customs related sub-criteria. One FATF criterion is in the top 10 correlating sub-criteria. Notably, in contrast to principal component 1, none of the sub-criteria stemming from Super Criterion *Legislation* is near the top. The criteria that correlate negatively include enforcement and financial related criteria, such as UNSC North Korea sanctions violations, Major money laundering jurisdictions, and Presence of OFAC sanctioned entities.

FATF-related criteria correlate with principal component 2, where many are in the upper half, but they generally tend to remain near the

center for the first several principal components. Many FATF criteria appear as correlating strongly in principal component 5.

**Correlation Matrix.** A correlation matrix was calculated for the unweighted data. This statistical analysis calculates the correlation between any two sub-criteria. This revealed that while many sub-criteria have positive and negative correlations with other criteria, there are several relatively independent sub-criteria in all five super criteria. A correlation is not necessarily good or bad, but knowing which criteria are correlated may help guide countries' decisions on how to proceed. The following criteria have the least correlation with other criteria and can be seen statistically as the most independent: Import control legislation includes a list of controlled goods, FATF Mutual Evaluation Report references 1540 resolution, State has an identifiable Border Guard Agency, A Bill of Lading (BOL) is required for carriers during transport, Convention of the Suppression of Unlawful Acts Relating to International Civil Aviation (Beijing Convention, 2010), Country has exclusively closed ship registries, UNSC North Korea Sanctions Violations, and Financial Intelligence Unit website or annual report mentions proliferation. Relative independence may mean that the sub-criteria are less relevant than other criteria with respect to the overall purpose of the index, or it could mean that the concept the criterion represents is new to the index and generally under-represented among other criteria. For example, one interpretation could be that the areas of maritime, aviation, and border security are less represented in the PPI than other areas.

## NOTES

1. World Customs Organization, “Strategic Trade Control Enforcement: Implementation Guide,” 2019, [http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/enforcement-and-compliance/tools-and-instruments/stce-implementation-guide/stce-implementation-guide\\_en.pdf?db=web](http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/enforcement-and-compliance/tools-and-instruments/stce-implementation-guide/stce-implementation-guide_en.pdf?db=web); Todd Perry, “Reducing Proliferation Risk Through Export Control Outreach: Assistance Providers’ Use of Maturity Model-Based Approaches,” *Strategic Trade Review*, 2019, Vol 5, Issue 7, pp. 5-24, <https://strategictraderesearch.org/wp-content/uploads/2019/01/Strategic-Trade-Review-Winter-2019.pdf>.
2. “Global Assessment calendar,” Financial Action Task Force, [https://www.fatf-gafi.org/calendar/assessmentcalendar/?hf=10&b=80&s=asc\(document\\_lastmodifieddate\)&table=1](https://www.fatf-gafi.org/calendar/assessmentcalendar/?hf=10&b=80&s=asc(document_lastmodifieddate)&table=1). Accessed April 15, 2021.
3. See the super criteria chapters in Section I for details on which sub-criteria were affected by a methodology change due to a change in available source data.
4. Congo DR, Egypt, Eritrea, Iran, Myanmar, Rwanda, Syria, Uganda, and Ansar Allah/Houthi movement of Yemen.
5. The ranges of “Government Unwillingness or Inability to Enforce,” and “Expert Judgment” made them dominating factors, as shown in the PCA including weights. The relatively large impact of these two criteria on the final PPI ranking is intentional.



# CHAPTER 16

## PRIORITY RECOMMENDATIONS

The central recommendation of the PPI is for countries to improve their scores. However, in the course of developing PPI 2021, the PPI team gained deeper insight into the overall functioning of strategic trade controls around the globe, often confronting roadblocks to effective controls, some from lack of resources, some systematic, and some surprising. This experience led to a discussion of the need for a priority set of recommendations, aimed at government and industry, with the goal of improving the character and implementation of strategic trade control systems both nationally and globally. The following priority recommendations reflect that recent experience, but also build upon the work of others and a set of comprehensive recommendations made in the PPI 2017. They also benefit from other recent Institute experience, including the compilation of illicit trade cases in the Institute's 2020 book, *Illicit Trade Networks—Connecting the Dots*, Volumes 1 and 2.

### NO SAFE HAVENS

Too often, the lack of export control laws has posed a risk to national and international security. The world is replete with cases proving this point: the A.Q. Khan network outfitting Pakistan's nuclear weapons program and then others; the International Atomic Energy Agency's exposure of a range of countries' illicit nuclear commodity procurements, including those by Iraq and Libya; and today Iran and North Korea illicitly

outfitting their nuclear weapons and ballistic missile programs. In all those examples, countries without export controls have played a key role in outfitting these nefarious programs. Although these cases pointed out many weaknesses in export controls, they all demonstrate why it is simply unacceptable for a country to not have any strategic trade control laws. There should not be any safe havens for strategic commodity traffickers.

This finding and recommendation is separate from the question of full implementation of available controls. It must be recognized that not all states have the resources to implement the same level of controls. Nonetheless, all countries and territories should have at least basic strategic trade controls.

With that recognition, the PPI has developed a set of minimal controls for states in Tier Three (see Sidebar: A Minimal STC System). These controls include the full panoply of controls in the national law, including the legal authority necessary to control the export, re-export, transit and transshipment, and associated services, such as brokering and financing, of proliferation-sensitive items or to proliferation-sensitive end users. They involve minimal resources to implement, in terms of funds and personnel. Moreover, if relevant information comes to a government's attention, it should be able to act upon it, stopping, for example, an illicit transit of sensitive goods, or moving to arrest and prosecute or extradite those who carry out, aid, or abet such trafficking. All countries should also have the capability to implement sanctions placed on entities or trading sectors by UN Security Council resolutions.

## **THE 1540 COMMITTEE AND UN MEMBER STATES ON STRENGTHENING RESOLUTION 1540**

UN Security Council Resolutions 1540 (2004) and 2325 (2016) are fundamental to establishing and improving strategic trade controls globally, as is the 1540 Committee and its Group of Experts. The strengthening of Resolution 1540 and its implementation should be a priority for all countries that seek to prevent the spread of WMD and related commodities.

Comprehensive reviews of Resolution 1540 occur every five years; the last one was in 2016, the next one scheduled for late 2021. The 2016 review produced a final report identifying gaps in implementation, that ultimately led to a new resolution, 2325 (2016), highlighting key areas

### **A MINIMAL STC SYSTEM**

A minimal system should include:

- Trade control legislation that includes lists of materials, equipment, and technology covered by multilateral treaties and arrangements, which could be used for the design, development, production, or use of nuclear (including radiological), chemical, and biological weapons, and explosives, and their means of delivery. Examples are the Parts 1 and 2 lists created by the NSG in the nuclear area. In practice, the EU list of dual-use items covers all of these.
- An industry outreach effort to sectors or companies that could be affected by trade control laws. The government should develop a basic knowledge of the country's supply and transshipment potential and which goods and sectors are affected by sanctions.
- The assignment of a few officials (or for very small nations, a single individual) to conduct this industry outreach, issue licenses, and serve as a point of contact for other countries and international organizations. The staff should widely disseminate contact information and work to create a simple website with trade control law information, licensing information, and points of contact for assistance.
- A denied parties list in case a license is requested along with knowledge of sanctioned countries.
- A minimal capability to stop strategic goods in transit, including a point of contact to receive information from other countries. The country should have legal authority to act upon this information, including to expeditiously seize goods, and have a mechanism (such as drawing on foreign expertise, if necessary) for evaluating seized goods.
- Penal codes to include appropriate penalties for trafficking of nuclear and other strategic commodities.
- The ability to enforce trade control laws, including having the ability to prosecute violators or allow for their extradition if they are being sought for prosecution by other countries.
- Work with the 1540 Committee to identify and address gaps and weaknesses in the country's trade control system.
- Anti-corruption measures, for those countries scoring low on the Corruption Perceptions Index.

that needed significant improvements, including enforcement and proliferation financing.

The PPI project identified several recommendations to support the work of the 1540 Committee. The first is that the United States and other countries should provide more resources to the 1540 Committee and its Group of Experts to support the deepening of activities allowed under their current mandate. All countries should fully cooperate with the 1540 Committee, and create and advance their voluntary national implementation action plans if needed.

All states should fully report to the 1540 Committee and update their required information as appropriate. States should pay close attention to their 1540 matrices and submit information to the 1540 Committee accordingly. They should seek out NGO or partner government support in doing so, if needed. Reports should include a reference to the appropriate matrix entry and reference to or copies of relevant legislation and appropriate explanations and be updated as needed.<sup>1</sup> The PPI project found both over- and under-reporting in matrices that is not truly reflective of trade control laws and their implementation. This had the unintended consequence of creating an unnecessary burden for the Group of Experts, tasked with determining whether a condition of the resolution is met or not.

The 1540 Committee and its Group of Experts provide an important service by matching STC-related assistance providers to states requesting assistance. To that end, countries should specifically request support from the Committee's Group of Experts in developing targeted assistance requests to implement best trade control practices related to the provisions in the resolutions.

The 1540 Committee should establish or maintain regular contact with key international organizations such as FATF and regional organizations (see also FATF section) and facilitate more input from them about the availability of assistance in relation to the provisions of Resolutions 1540 (2004) and 2325 (2016). It should establish a method of reporting on its major interactions with international organizations.

The 1540 Group of Experts should revise their matrix template to collect more relevant information on countries' proliferation financing controls. This step would require introducing new language on proliferation financing and likely lengthening the matrix substantially, but it

would more adequately reflect the large global gaps the PPI identifies in proliferation financing controls.

A concrete example is the matrix table for operating paragraph (OP) 3 (c) and (d), where member states' export control legislation to prevent the proliferation of nuclear, chemical, and biological weapons and their means of delivery including related materials is to be collected. As of 2020, there are still cases where states' legislation on the control of radioactive material, such as environmental and radiation safety laws, fill the matrix cell. The Group of Experts should emphasize that control of radioactive material alone is not sufficient, and collect the information in a separate cell, if desired, or indicate clearly that this only fulfills part of the requirement.

**New Resolution Language.** Despite being intended to provide a basic framework for national legislation to build upon, the reality is that most governments view UNSC resolutions as a ceiling, not a floor. With potentially low or vague standards set by the highest body, organizations and governments are often limited in what they can realistically require from their own members or partners.

A specific example of a vague standard is the language on proliferation financing in UNSC 1540. To be more concrete in what is expected from Member States, a supplementary UNSC resolution should include a more encompassing interpretation of WMD-related materials and proliferation financing. This would then pave the way for inter-governmental organizations like FATF to ask more of their members. The Institute suggests the following specific language to be used in a future resolution:

*States shall establish, develop, review, and maintain appropriate effective national proliferation financing controls, in particular over the raising, using, moving, storing, and providing of funds or financial services, or the attempt thereof, for the manufacture, acquisition, possession, development, export, trans-shipment, brokering, transport, transfer, stockpiling or use of nuclear, chemical or biological weapons and their means of delivery and related materials; or the provision of related training and knowledge; and establish and enforce appropriate criminal or civil penalties for the violation of such proliferation finance control laws and regulations.*

## FINANCIAL ACTION TASK FORCE

The FATF has an important and growing role in strengthening efforts to counter-proliferation financing and thereby improve STC implementation and enforcement. As a global standard setter, and with its unique ability to evaluate countries' measures rather than simply reporting them, there are several initiatives FATF can take to motivate and advance global counter-proliferation financing capabilities. Towards that goal, the FATF should accelerate its addition of proliferation financing to a range of relevant FATF recommendations. Applicable FATF recommendations that should contain a proliferation financing component are listed in public reports, such as Jonathan Brewer's *Financing of Nuclear and Other Weapons of Mass Destruction Proliferation*.<sup>2</sup>

Developed countries should encourage and provide resources to the FATF and its regional bodies to increase the speed at which they conduct mutual evaluation reports and follow-up reports. The FATF should continue seeking to standardize between regional bodies in the way that the bodies evaluate countries in their region, diminishing disparities in levels of stringency utilized in the evaluations, thereby improving understanding of where countries stand in the FATF mutual evaluations and compliance categories.

**Need for More Encompassing Interpretations.** The FATF and the international community need to apply interpretations that consider the whole range of proliferation financing activities. Too often, when proliferation financing is defined within a specific context, it is unnecessarily narrowed. A pressing problem concerns FATF's revised Recommendation 1. This revision requires countries to "to identify, assess, understand and mitigate their proliferation financing risks."<sup>3</sup> A current problem is that FATF operationally defines proliferation financing risk as applying only to violation and evasion of United Nations Security Council targeted financial sanctions. This interpretation is too narrow. A broader yet reasonable interpretation for FATF, well within the scope of UNSCRs, should cover financial activities listed as prohibited in country-specific UNSCRs and financial activities related to prohibited trade in sanctioned sectors and commodities.

**FATF Aid to the 1540 Committee.** An earlier section discussed the need of the 1540 Committee to communicate and coordinate with FATF. Likewise, FATF should consider more ways to assist the 1540 Committee. It could aid with the revision of the matrix template to facilitate the collection of relevant information from countries on their proliferation-financing measures. It should periodically update the Committee. It should create a permanent communication channel with fixed points of contact whereby (1) requests to the 1540 Committee from states involving proliferation financing are channeled to FATF for evaluation and input and (2) FATF informs the 1540 Committee of relevant actions or information in relation to the provisions of Resolutions 1540 (2004) and 2325 (2016). Further, FATF should assist the committee's matchmaking process, which means reporting the availability of assistance FATF or its members or regional bodies can offer and matching the assistance provider with a state that is requesting assistance.

## **WORLD CUSTOMS ORGANIZATION**

The WCO is an excellent example of an international organization providing leadership, assistance, and recommendations in improving efforts against illicit commodity trafficking. Its efforts to advance the enforcement part of strategic trade controls deserve continuing support and resources from its member governments.

## **INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)**

The IAEA should be more engaged in assisting Member States to implement UNSCR 1540 (2004). A few concrete steps would include:

- Assisting Member States with respect to the development of the nuclear element of 1540 National Implementation Action Plans, perhaps through adaptation of Integrated Nuclear Security Support Plans (INSSPs); i.e., make 1540 implementation part of Integrated Nuclear Security Support Plans;
- Developing jointly with the 1540 Committee assistance projects to support States' implementation of resolution 1540 (2004) in the nuclear area;

- As requested, assisting States to develop well-focused and technically sound assistance requests;
- Providing advice to Member States about the underlying rationale for nuclear export control guidelines.

States in a position to do so should consider voluntary contributions to the IAEA directed towards enhancing implementation of resolution 1540, including by facilitating responses to assistance requests. In addition, these states should raise this issue at the Board of Governors and explain how their contributions will enhance the implementation of resolution 1540.

Beyond resolution 1540, the IAEA Board of Governors should update the nearly 25-year-old Annex II in the Additional Protocol, upon initiation by Member States. Annex II is the “list of specified equipment and non-nuclear material for the reporting of exports and imports according to Article 2.a.(ix).”<sup>4</sup> The list, which covers facilities and major equipment for nuclear reactors, fuel fabrication, reprocessing plants, and the like, was initially based on the NSG Trigger List. While the latter was updated many times, the former was not.

## **CAPACITY BUILDING**

Improvements in strategic trade controls globally depend on assistance from states with well-developed and tested trade control systems. Efforts by the United States, the European Union, WCO, Japan, South Korea, and others to fund, build, and implement strategic trade control capacities in other countries remain critical to international security and the non-proliferation of WMD and their delivery systems. As such, these efforts deserve sustained budgetary and government wide support.

In the United States, several governmental programs are involved in foreign strategic trade control capacity building and deserve ongoing funding and diplomatic support, such as:

- The Department of State’s Export Control and Related Border Security (EXBS) program
- The Department of Defense International Counter-Proliferation (ICP) Program

- The Department of Energy’s International Nonproliferation Export Control Program (INECP)

Other assistance providers include the European Union Commission’s Peer-to-Peer (“P2P”) Program, and several export control-related agencies and government-affiliated commercial associations in Japan and South Korea.

## FREE TRADE ZONES

Free Trade Zones (FTZs) pose persistent counter-proliferation challenges. A lack of government oversight over goods entering and exiting these zones facilitates the secret transshipment of illicit commodities, turning FTZs into potential diversion points for many goods that often look innocuous to the untrained eye. FTZs should be integrated fully into national strategic trade control systems, including data collection systems, and any exemptions from export controls should be ended. All countries should ensure that government agencies responsible for licensing and enforcing strategic trade controls can access the goods and related data entering and exiting FTZs and seize suspicious cargo if needed. They should collaborate with FTZ authorities to create systems that can provide assurances that goods are not being transshipped to sanctioned countries, such as Iran, North Korea, and Syria, among others.

## RECOMMENDATIONS ORGANIZED BY SUPER CRITERIA OR STRATEGIC TRADE PILLARS

The five PPI super criteria are the pillars of strategic trade controls. Several recommendations emerged on how to strengthen each pillar based on the results of the PPI.

**International Commitment.** As has been mentioned, membership, participation and adherence to international conventions and international organizations are vital steps. The 1540 Committee provides a list of 19 international legal instruments relevant to its work, which states should ratify at their earliest opportunity. Of the 19 instruments, the following are most relevant to the PPI’s purpose of strengthening strategic trade

controls: the International Convention for the Suppression of Acts of Nuclear Terrorism, the Convention for the Suppression of Unlawful Acts Against Civil Aviation, the Convention for the Suppression of Unlawful Acts Against Maritime Navigation and associated protocol, and the Convention on the Physical Protection of Nuclear Materials. States should also consider joining the Proliferation Security Initiative.

**Legislation.** All countries should make available clear information regarding export control laws and regulations on websites, ideally in local languages for domestic companies, and in English or other relevant languages for foreign business partners.

Due to the potential danger of nuclear dual-use and other strategic goods to be misused or proliferated, Non-Aligned Movement (NAM) countries should expand the legal basis of their export controls from which they can then increase their capacity to monitor and enforce controls on strategic trade. Non-NAM countries that have close relations with NAM countries should encourage stronger export control legislation and the broadening of their overall legal basis for monitoring and detecting strategic trade.

### **Border Management Strategy**

A country should have an authority in place to control the borders, identify risks and challenges, and devote resources accordingly. All countries should develop their own border management strategy recognizing the specific characteristics of their border, but one goal should be to identify pathways where strategic goods could cross the border illegally by bypassing official ports of entry, whether by air, sea, or land.

### **Electronic Systems and Data Analysis**

Modern electronic systems make it easier to share data among various government agencies involved in implementing and enforcing STC laws. All countries should establish or increase information sharing activities between licensing authorities, customs, and police or other law enforcement entities. For example, countries should modernize or establish information technology systems that harmonize licensing information with export and import data relating to controlled and sensitive goods.

Here, licensing information should include both granted and denied applications. Data collection and record keeping can create a better way to thwart exports of these goods, for example by identifying potential red flags for associated actors and countries for future shipments. These records can also be used to vet the use of so-called “general,” “global,” or “bulk” licenses to ensure that the terms spelled out under these licenses such as allowed destinations, or the numbers of shipments, are being honored by national suppliers.

### **Post-shipment End-Use Verification for Dual-Use Goods**

The verification of end user declarations can have a significant impact on detecting the unintended diversion of exported goods. A post-shipment end-use verification is a physical check made by a government or company at the site of the good’s stated end destination. It seeks to determine that the stated buyer is in possession of the goods, and is using the goods for the stated end-use. While many exporters require an end-use statement prior to finalizing a sale and making an export, few countries (or their companies) use post-shipment end-use verification as a monitoring tool against the illicit diversion of sensitive goods. Germany and the United States stand out as two of only a few countries that use this tool. Tier One countries should especially use this type of procedure to verify the location and use of nuclear-related goods. A risk-based approach should be used to determine priority goods and destinations for post-shipment end-use verification.

According to the U.S. Department of Commerce, this post-shipment verification is more difficult for technology than for goods, but possible, nonetheless. It is a “high resource investment”, but it also has a “high outcome.”<sup>5</sup>

As few countries have the financial and technical resources needed to carry out such checks, others rely on end-use statements and pre-shipment verifications conducted in the due diligence process. The end-use statement must contain thorough and detailed information to gain sufficient confidence about its veracity. In general, end-use statements should be comprehensive, require detailed descriptions of the end user and the end-use, and contain a non-re-export clause.

## Prevent Undermining of Control Lists

A persistent problem is the tendency of proliferant states to illicitly procure subcomponents of controlled goods to finish the manufacturing of a desired component. Iran has been doing this, for example, in the case of pressure transducers, vacuum valves, and other items, as it attempts to further indigenize its nuclear equipment production over time.<sup>6</sup>

Countries able to supply high quality industrial items should remain vigilant and aim to better prevent this illicit procurement of subcomponents by illicit trade networks and proliferant states. Governments should enlist pertinent federal departments, and national nuclear laboratories and other research entities, to work closely together to identify possible reverse-engineering of key equipment and remaining illicit procurement needs of countries. Critical, identified subcomponents should become subject to licensing and be added to control lists.

The United States can play a key role in working to improve understanding internationally among governments and companies about the seeking of unlisted subcomponents by proliferant states. It should assist partner countries' access to technical expertise or "reachback" when suspect goods are detected or seized and their officials require timely analysis as to the goods' purpose and potential misuse (For more on reachback see the recommendations on *Enforcement*).

## Intangible Technology and Deemed Exports

Countries should be able to control the flow of sensitive or strategic data, software, and knowledge, known as "intangible technology." Intangible products should be addressed in national export control laws, regulating what can be transferred, how, and to whom, and what circumstances trigger a license requirement. To facilitate this, there should be a harmonized set of terms for intangible technologies.

A concrete example of controlling intangible technology transfer is to require a license or authorization for holding technical and potentially sensitive talks and presentations abroad.

Governments can assist universities and research or academic institutions which work with potentially sensitive data, software, and knowledge, by providing best practices, definitions, a guide to establish an export and technology control compliance program, a point of contact, and a point of voluntary self-disclosure of possible violations.

Also related is the outreach to companies and institutions regarding so-called “deemed exports,” typically referring to the transfer of data or knowledge to a foreign national, where it must be assumed that the foreign national may eventually return to their country of origin. Governments should provide guidelines on how to properly share potentially sensitive data among foreign nationals collaborating in professional environments, and what would constitute an illegal transfer, or an illegal “deemed export.”

Another emerging trend is that of foreign investments in companies dealing with potentially sensitive technology. It is especially important for supplier nation governments to have the capability of screening foreign investments to prevent the uncontrolled transfer of technology, focusing not only on potential takeovers of companies involved in the making of military and dual-use goods, but also screening minority share investments with the potential of resulting in uncontrolled transfers of designs, data, software, knowledge and the like. A handful of countries such as France, Italy, and Germany have authorities in place. In the United States, the relevant authority is the Committee on Foreign Investment in the United States (CFIUS).

**Ability to Monitor and Detect Strategic Trade.** Analyzing countries’ abilities to monitor and detect strategic trade revealed a number of shortcomings and recommendations.

### **Increased Customs Involvement**

Customs and border security services are linchpins of strategic trade controls implementation and protection against commodity trafficking. Countries should strengthen their customs services where they can and provide sufficient resources for the many mandates customs agencies typically carry. They should also increase the transparency and efficiency of their customs regulatory processes so that companies are more aware of regulations and how to comply with them. Countries should seek training for customs officials and establish the technical capabilities to detect and seize illicit shipments moving across their borders.

Close cooperation between customs and licensing agencies is key. Licensing entities should routinely provide information on exports to the customs and border security entities. This sharing enables customs and

border officials to be more knowledgeable about that country's exports and industries. In turn, this knowledge can improve these agencies' outreach to relevant industries.

While national control lists should cover as many goods as possible, customs officials need more targeted and risk-based guidance so that they are able to identify the highest-risk goods to detain and seize them. The basis for identifying high-risk goods should be the country's trade profile, e.g., the major imports and exports and the main trading partners.

Successful customs involvement in strategic trade control requires consistency and commitment in customs management and staff. Currently, many countries experience high turnover rates for customs officials, not allowing them to take full advantage of training and experience. If deliberate high turnover rates are meant to address corruption within the agency, alternative anti-corruption techniques may have to be applied. To reduce attrition, customs agencies should create better career paths for their staff within the departments responsible for strategic trade control. The WCO has created a convenient STC enforcement training course for customs to use in annual staff training and during onboarding.

### **Special Role of Harmonized System Codes**

Information analysis and sharing is greatly facilitated by countries using international nomenclature for product classification. The most widely used codes are the Harmonized System (HS) codes, which are customs classification codes developed by the WCO. For non-proliferation purposes, however, they need further development, especially in the strategic commodity categories.

Currently, even key strategic goods rarely have their own HS codes; rather, most fall within broad categories of goods. The faster tracking of HS code changes should be supported.

### **Search Platforms**

To support efforts to better monitor for illicit exports and imports as well as illicit networks, countries should introduce or increase the use of electronic big data import/export monitoring systems, which use import and export information to find anomalies relating to potential illicit procurements and generate investigatory opportunities.

Countries with comprehensive electronic trade databases should consider sharing data among trading partners so that a broader and more reliable picture of the flow of strategic or sensitive goods can be established. The sharing of data among trading partners, while posing challenges, should be encouraged. Assistance-giving countries and organizations may want to focus on establishing at least one modernized and well-trained customs agency in every region who can showcase and promote best practices in data analysis.

### **Private Sector Vigilance and Internal Compliance Programs (ICPs)**

Despite the fact that suppliers and manufacturers build the first line of defense against strategic commodity trafficking, companies may be oblivious to tactics used by illicit trade agents or may be tempted to focus on profit rather than exercising vigilance about potential suspicious activity. To prevent this, there are specific steps a company can implement. A company able to manufacture or supply strategic goods should:

- Know its customer and its customer's customer;
- Have an Internal Compliance Program (ICP) promulgated company-wide (to include overseas subsidiaries);
- Apply the same rigid controls to sales by overseas subsidiaries and distributors as they would for an export;
- Be particularly watchful about trading companies, both domestic and abroad; and
- Study the methods used by traffickers, including knowing red flags

All countries should increase or start government outreach programs to companies (including trading companies, freight forwarders and others involved in the shipment process), research institutes, and academic communities, as well as establish and publicize points of contact relevant to strategic trade control matters. These should be points of contact where companies can go to ask questions and provide information confidentially. Companies should also be encouraged to cooperate with regional associations that seek to improve industry implementation of strategic export and financial controls.

As part of outreach, governments should offer companies, institutes, and academic organizations training in setting up and maintaining ICPs. For those countries with fewer resources, they should make efforts to have their companies participate in international or regional training sessions and workshops organized and sponsored by the 1540 Committee and partnering governments, such as the annual Wiesbaden Conference.

Increasingly, to induce the adoption of ICPs, supplier states are making an ICP a requirement to receive a general export license or to be considered an “Authorized Economic Operator (AEO)” or an entity eligible to trade internationally. By itself, having an ICP in place is rarely enough to receive an export license; they cannot (and should not) replace thorough due diligence by companies and government licensing officials.

Companies vary dramatically, so there is no “one size fits all” guide or manual for all companies. However, an ICP typically has a set of common elements, including to name a few:

- An ICP manual tailored to the company’s products and practices;
- Staff, including personnel with an understanding of identifying suspicious enquiries and an ability to judge the risk of an export;
- Denied entity/persons lists or a screening list to judge requests for quotations or orders;
- A thorough understanding of the sensitivity and classification (for controls) of the companies’ goods and services, including what goods are affected by sanctions (surprisingly, we learned that some companies in Tier One have not done this type of classification of whether their own goods are subject to export controls);
- Regular training of company officials in the procedures and functions outlined in the internal compliance manual.

### **Preventing the Misuse of Shipping**

The shipping sector plays a special role in the movement of goods and as such, it carries a certain degree of responsibility to prevent illicit trade in sensitive goods. In line with this, shipping companies should be held to higher expectations worldwide and take on a more active role in ensuring

the goods they transport and the trade they facilitate do not benefit illegal WMD programs.

To take on this responsibility, there are several steps that shipping companies, freight forwarders and the like can take, starting with the training of staff on WMD programs of concern and related sanctions and sanctions lists. Further, staff should be made aware of illicit procurement methods and red flags in order to conduct increased due diligence and to be able to report suspicious activities to relevant authorities.

Governments can aid the shipping community by communicating legal expectations and potential penalties, as well as reaching out with best practices, current illicit procurement, and emerging sanctions evasion trends.

**Proliferation Financing.** All countries should work to improve the integrity of their national financial controls against proliferation financing and other financial crimes. There are several immediate steps that states can take.

All states should become parties to the International Convention for the Suppression of the Financing of Terrorism.

All countries need to work closely with the Financial Action Task Force (FATF) and its regional bodies, strive to join the FATF as a member, and improve their compliance with proliferation financing-relevant FATF recommendations (see Chapter 5). They should also apply to have the FATF or one of its regional bodies perform a mutual evaluation, following coordination and assistance in bringing their controls into line with FATF-recognized best practices.

## **Preventing the Misuse of Virtual Assets**

An emerging priority is preventing the misuse of virtual assets to aid proliferation and other illegal financial activities. The UN Panel of Experts on North Korea has made a range of recommendations concerning North Korea's violations of UN sanctions involving virtual assets. (See for example S/2019/691, Recommendations 73-76.<sup>7</sup>) These recommendations apply more broadly and should serve as a guide for other countries and situations.

Importantly, countries should adopt legislation and regulations that cover virtual assets, e.g., cryptocurrency, and virtual asset service providers (VASPs), such as cryptocurrency exchanges.

In that effort, countries should follow guidelines in the 2020 FATF Report on Money Laundering/Terrorist Financing (ML/TF) Red Flag Indicators Associated with Virtual Assets. In its draft guidance on proliferation financing risk assessment and mitigation (2021), the FATF also lists VASPs as one sector countries should consider in their identification of vulnerabilities to evasion of proliferation-related financial sanctions.

At the same time, individual governments should bolster and harmonize their cyber security approach by developing interagency collaboration to better protect themselves and their financial institutions from cyberattacks. The UN Panel of Experts lists a group of countries that has fallen victim to North Korean cyberattacks in the past.<sup>8</sup> These countries need to investigate the cases, devote appropriate resources, amend their laws and regulations, and solicit international aid if needed. Countries should also update the Panel on their actions to strengthen their national cybersecurity efforts after the attacks, including national strategies and outreach to financial institutions.

The United States can lead this effort by coordinating closely with its partners on cybersecurity strategies to counter increasingly sophisticated North Korean cyberattacks.

### **Legal Remedies Against Proliferation Financing**

There are multiple paths to enforce laws and regulations prohibiting the financing of proliferation. Countries, especially those new to strategic trade controls, may choose to adopt a specific counter-proliferation financing law criminalizing the act, other countries may have controls embedded in a combination of laws such as Anti-Money Laundering or Counter-Terrorism Financing (AML/CTF) laws, counter-WMD laws, strategic trade controls, and associated penal codes. Model legislation for the former, developed by the Royal United Services Institute and the Asia/Pacific Group on Money Laundering, can be found online.<sup>9</sup> The United States, for example, does not criminalize proliferation financing as such but has many legal tools that enable it to be at the forefront of identifying and countering proliferation financing.<sup>10</sup> The PPI does not favor one approach over another, as long as existing laws and regulations are enforced, and criminal penalties can be applied.

Legislation should also establish laws and regulations regarding the engagement between the supervisors, regulators, authorities, and the

private sector. For example, all countries should have laws and regulations requiring financial regulators to implement immediately new United Nations targeted sanctions, including by sending out notices to banks to block assets.

### **Monitoring**

Countries should better implement financial transaction monitoring systems that help to identify and freeze transactions by sanctioned entities and individuals. For this reason, it is important for countries to either have their own denied parties lists in place or to use those created by other countries with extensive, credible denied parties lists.

### **Outreach**

Advanced countries should expand their outreach programs that provide training and share best practices with countries seeking to improve financial controls, with a focus on counter-proliferation financing. The PPI team was unable to locate many such programs outside of FATF and its regional bodies. Most counter-proliferation financing programs appear to be led by the U.S. State, Justice, and Treasury Departments.

### **Private Sector**

The involvement of the private sector is crucial. Governments should pass laws that regulate and enable the engagement between the private sector and regulators, and other authorities, and among the industry itself.

However, in general, the private sector, and in particular the maritime sector, is behind in understanding proliferation financing risk and ill-equipped to implement sophisticated and technical requirements. This calls for more national or regional guidance, supplementing global guidance by the FATF and other governments, and the developing—and in particular publishing—of risk assessments. This risk assessment can be added to a country's Money ML/TF risk assessment.

All private entities should bolster their ability to impede violators, incorporating financing of proliferation typologies and indicators, such as red flag lists, into due diligence procedures and developing an ability to send timely suspicious transaction reports to relevant authorities. All financial institutions and service providers must have the ability to

freeze assets and block transactions in a timely manner, if requested by the government. To aid the private sector, global institutions and trade associations should develop global reporting standards. The United States should continue to serve as a role model by publishing comprehensive risk assessments, and national strategies to counter them, where the latter would benefit from an expanded section on proliferation financing, listing proliferation financing typologies.

**Adequacy of Enforcement.** A number of countries prioritize the criminal enforcement of strategic trade controls. However, for many others, enforcement lags significantly. Countries should make it a national priority to prosecute crimes of illicit nuclear, missile, and other WMD trafficking and fully enforce relevant UN Security Council sanctions. Toward these goals, countries should establish trained units within investigatory agencies, and work to enhance interagency cooperation. Several countries, including Germany, Sweden, and the United Kingdom, have established federal prosecution units for major strategic trade related cases. Successful prosecutions serve as case studies of deterrence.

The United States should re-evaluate its punitive measures for those entities that violate end user commitments on exports from the United States. According to the U.S. Department of Commerce, 37 percent of all U.S. end-use checks on exported goods in 2019 were not “favorable,” meaning the terms of the end-use could not be established or presented negative results and a possible violation of the Export Administration Regulations (EAR). An immediate investigation must follow an unfavorable post-shipment check. This includes developing a set of consequences for the initial end user who violated the end user agreement, knowingly or unknowingly.

The United States should evaluate its export declaration systems to ensure that declarations include the actual end users of the exported goods, as required, and not freight forwarders or trading companies.

Holding companies and warehouses buying dual-use items also pose potential diversion risks to illegitimate end users, as they may be less familiar with the potential uses of the goods and government requirements than the original suppliers.

Countries should cooperate more on prosecuting strategic commodity traffickers. They should seek cooperation with other countries and set up procedures to exchange sensitive information on illicit trade attempts.

This would increase the chances that officials could stop sensitive goods in transit before they leave the country. They should also cooperate in establishing uniform laws outlawing a wide range of strategic commodity trafficking, in part to better establish a universal norm against commodity trafficking, but also to allow extradition.

### **Persistent National Violators**

Certain countries continue to pursue illicit procurement of or trafficking in nuclear, WMD, missile, and conventional military commodities. Their actions should be recognized as fundamentally inconsistent with international efforts to enact effective strategic trade controls via national legislation and UN Security Council resolutions. The highly negative total scores of Iran, North Korea, and Syria, for example, reflect their failures to respect international nonproliferation norms. Pakistan and perhaps India still reportedly conduct limited illicit nuclear commodity procurements and their actions undermine the credibility of their export control systems. At the very least, all countries and their exporters should view such countries as posing a high risk of violating their export control laws.

In the case of North Korea, countries should severely limit or curtail non-humanitarian-essential trade and fully enforce UN sanctions. Any country caught violating UN Security Council sanctions on North Korea repeatedly deserves closer scrutiny.

All exports of strategic commodities to Iran should be discouraged unless the Islamic Republic allows credible end-use verification, develops and implements an internationally acceptable export control system, which entails ending its illicit nuclear, missile, and military commodity procurements, and meets the conditions of its FATF Action Plan.

### **“Reachback” Capabilities for Customs**

Enforcement of strategic trade controls depends on customs and other enforcement agencies being able to identify controlled or sensitive goods moving illegally through their countries. It is imperative that technical reachback capabilities be made available to customs officials to amplify the effectiveness of onsite reviews and inspections.

Reachback also depends on customs and border officials having the legal authority to hold seized goods long enough to benefit from a reachback system. For example, if the reachback to experts takes a week,

customs and border officials need the legal authority to keep the goods for a week, but in many countries, no such authorities exist. Worse, officers who detain goods may be subject to legal penalties. As a result, the problem should be confronted at multiple points. National authorities must strengthen so-called “indemnity” protections for their officers when shipments are delayed, while adding rapid response capabilities for technical reachback requests.

### **Controlling the Secondary Market**

As with many other commodities, there is a secondary market for used proliferation-sensitive goods. The proliferation risk posed by used goods is often underestimated. As a result, outreach efforts should include specialty resellers so that this segment of the supply chain is neither a victim nor complicit in illicit trade. Additional efforts should be made to communicate legal requirements to legitimate recipients of strategic goods that are considering a resale, and to investigate resales or transfers that occurred unlawfully. This is related to the investigation of unfavorable post-shipment end user verifications discussed above.

### **LAST WORD**

All of these recommendations aim to improve the effectiveness of strategic trade controls and make the world a more peaceful and prosperous place. They flow from the Peddling Peril Index’s comprehensive, multi-year assessments of the creation and implementation of national control systems.

These recommendations represent a practitioner’s experience. Seen from that perspective, the world remains at great risk from the spread of menacing technologies to dangerous regions and actors. Despite their many strengths, the tools to end that risk remain inadequate.

Many nations increasingly recognize the importance of improving controls and joining together to block the illegal flow of sensitive goods. But they have many steps to take, decisions to make, and challenges to overcome. The Institute initiated the Peddling Peril Index project and has provided this updated version to help countries make progress on that path.

## Notes

1. In UN Security Council resolution 2325 (2016), the Security Council encouraged all states that have submitted reports to provide additional information to the 1540 Committee on their implementation of Resolution 1540 (2004), including, voluntarily, on their laws and regulations and on effective practices; to prepare, on a voluntary basis, national implementation action plans mapping out their priorities and plans for implementing the key provisions of Resolution 1540 (2004); and to submit these plans to the Committee.
2. Jonathan Brewer, “The Financing of Nuclear and other Weapons of Mass Destruction Proliferation,” January 24, 2018, Center for New American Security, <https://www.cnas.org/publications/reports/the-financing-of-nuclear-and-other-weapons-of-mass-destruction-proliferation>.
3. (Draft) Guidance on proliferation financing risk assessment and mitigation (2021).
4. IAEA, *Model Protocol Additional To The Agreement(S) Between State(S) And The International Atomic Energy Agency For The Application Of Safeguards*, INFCIRC/540, September 1997, <https://www.iaea.org/sites/default/files/infirc540.pdf>.
5. U.S. Department of Commerce, *BIS 2020 Export Controls Policy and Regulatory Update Virtual Conference*, September 2, 2020.
6. David Albright, Sarah Burkhard, Frank Pabian, and Jack Toole, “Conversion of Fordow: Another Unfulfilled Hope of the Iran Nuclear Deal,” *Institute for Science and International Security*, July 10, 2019, <https://isis-online.org/isis-reports/detail/conversion-of-fordow-another-unfulfilled-hope-of-the-iran-nuclear-deal/8>.
7. UN Security Council, Report of the Panel of Experts established pursuant to resolution 1874 (2009), S/2019/691, August 30, 2019, [https://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/S\\_2019\\_691.pdf](https://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/S_2019_691.pdf).
8. UN Security Council, Report of the Panel of Experts established pursuant to resolution 1874 (2009), S/2019/691, August 30, 2019, [https://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/S\\_2019\\_691.pdf](https://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/S_2019_691.pdf).
9. Anagha Joshi, *Model Provisions to Combat the Financing of the Proliferation of Weapons of Mass Destruction*, Second Edition, RUSI, Centre for Financial Crime and Security Studies, July 2018, [https://rusi.org/sites/default/files/20181002\\_model-law\\_2nd\\_edition\\_final\\_for\\_web.pdf](https://rusi.org/sites/default/files/20181002_model-law_2nd_edition_final_for_web.pdf).

10. The applicable laws and penalties are listed in the U.S. committee-approved 1540 matrix. A list of legal tools available to U.S. authorities is available in Jonathan Brewer, “The Financing of Nuclear and Other Weapons of Mass Destruction Proliferation,” Center for a New American Security, January 2018, <https://s3.us-east-1.amazonaws.com/files.cnas.org/documents/CNASReport-ProliferationFinance-Finalb.pdf?mtime=20180202155127&focal=none>.

**ANNEX I**  
**FULL RANKING AND SUPER CRITERIA**  
**SCORES**

**Table A.1.** Total PPI Rank and Total Points (1300 points possible; negative scores also possible)

PPI Rank	Country	Total Points
1	United States of America	1080
2	United Kingdom of Great Britain & Northern Ireland	1015
3	Sweden	1015
4	Australia	1015
5	Ireland	1009
6	Belgium	1008
7	Latvia	991
8	Estonia	991
9	Czech Republic	991
10	Republic of Korea	987
11	Hungary	983
12	Germany	982
13	Portugal	980
14	Spain	978
15	Austria	973
16	Denmark	972
17	Slovenia	967
18	Norway	966
19	Singapore	963
20	France	962
21	Canada	958
22	Finland	955
23	Netherlands	955
24	Switzerland	951
25	Lithuania	950
26	Italy	946
27	Malta	941
28	Romania	938
29	New Zealand	930
30	Japan	929
31	Croatia	922

PPI Rank	Country	Total Points
32	Cyprus	920
33	Bulgaria	915
34	Luxembourg	894
35	Israel	873
36	Slovakia	868
37	Greece	866
38	Poland	864
39	Malaysia	849
40	United Arab Emirates	847
41	South Africa	836
42	Iceland	821
43	Taiwan*	810
44	Moldova (Rep of the)	808
45	Armenia	786
46	Mexico	779
47	Serbia	766
48	Thailand	760
49	Philippines	755
50	Andorra	736
51	Georgia	726
52	Kazakhstan	724
53	Macedonia	723
54	San Marino*	721
55	India	701
56	Montenegro	691
57	Peru	690
58	Brazil	689
59	Kyrgyzstan	687
60	Ghana	685
61	Bangladesh	681
62	Chile	674
63	Panama	673
64	Mauritius	663
65	Turkey	663

FULL RANKING AND SUPER CRITERIA SCORES

PPI Rank	Country	Total Points
66	Mongolia	656
67	Argentina	655
68	Liechtenstein*	655
69	Bahrain	652
70	Azerbaijan	648
71	Costa Rica	647
72	Jordan	645
73	Uruguay	629
74	Sri Lanka	623
75	Ukraine	615
76	Albania	613
77	Saudi Arabia	593
78	Fiji	591
79	Botswana	589
80	Guatemala	584
81	Indonesia	583
82	Algeria	578
83	Dominican Republic	578
84	Jamaica	572
85	Monaco*	566
86	Trinidad & Tobago	565
87	Malawi	561
88	Bahamas	558
89	China	554
90	Russian Federation	553
91	Bosnia & Herzegovina	553
92	Cuba	541
93	Belarus	526
94	Ethiopia	521
95	Namibia	521
96	Uzbekistan	519
97	Tunisia	519
98	Hong Kong*	515

PPI Rank	Country	Total Points
99	Cameroon	512
100	Brunei Darussalam	508
101	Tajikistan	507
102	Gabon	500
103	Antigua & Barbuda	497
104	Seychelles	495
105	Zambia	494
106	Qatar	482
107	Benin	473
108	Burkina Faso	466
109	Kenya	461
110	Samoa	461
111	Togo	459
112	Pakistan	457
113	El Salvador	456
114	Nigeria	453
115	Vanuatu	447
116	Morocco	444
117	Lesotho	442
118	Timor-Leste	438
119	Cape Verde	436
120	Swaziland (Eswatini)	433
121	Saint Kitts & Nevis	431
122	Paraguay	426
123	Grenada	422
124	Niger	419
125	Bhutan	419
126	Nauru	417
127	Côte d'Ivoire	414
128	Cook Islands	412
129	Honduras	407
130	Kuwait	407
131	Solomon Islands	406

## ANNEX I

PPI Rank	Country	Total Points
132	Sierra Leone	405
133	Nicaragua	403
134	Saint Vincent & the Grenadines	400
135	Egypt	395
136	Suriname	393
137	Colombia	392
138	Senegal	391
139	Tanzania (United Republic of)	389
140	Papua New Guinea	385
141	Nepal	383
142	Saint Lucia	383
143	Tonga	383
144	Barbados	383
145	Ecuador	373
146	Angola	370
147	Dominica	370
148	Mali	369
149	Maldives	361
150	Viet Nam	358
151	Madagascar	352
152	Bolivia	344
153	Congo (Rep of the)	337
154	Guinea	335
155	Marshall Islands	334
156	Mozambique	332
157	Belize	329
158	Cambodia	320
159	Djibouti	319
160	Sao Tome & Principe	317
161	Oman	316
162	Guyana	316

PPI Rank	Country	Total Points
163	Kosovo*	313
164	Turkmenistan	312
165	Venezuela (Bolivarian Republic of)	309
166	Lao People's Democratic Republic	305
167	Comoros	302
168	Rwanda	296
169	Holy See*	294
170	Chad	292
171	Gambia	290
172	Kiribati	287
173	Mauritania	278
174	Palau	278
175	Liberia	267
176	Iraq	266
177	Uganda	255
178	Burundi	249
179	Guinea-Bissau	239
180	Niue	238
181	Zimbabwe	233
182	Micronesia (Federated States of)	226
183	Central African Republic	223
184	Congo (Dem Rep of the)	212
185	Lebanon	212
186	Myanmar	209
187	Tuvalu	168
188	Haiti	168
189	Equatorial Guinea	168
190	Sudan	163
191	Afghanistan	138

FULL RANKING AND SUPER CRITERIA SCORES

PPI Rank	Country	Total Points
192	Palestine (State of)*	122
193	Libya	119
194	Eritrea	95
195	Syrian Arab Republic	75
196	Iran (Islamic Republic of)	-9

PPI Rank	Country	Total Points
197	Somalia	-16
198	Yemen	-26
199	South Sudan	-33
200	Democratic People's Republic of Korea	-172

\*These countries and entities are difficult to rank because of their dependence on other countries or their non-state status.



# TIER ONE RANKS AND SCORES

Table A.2. Tier One Ranks and Scaled, Weighted Super Criteria Scores

Tier One Rank	Country	PPI Rank	Total Points 1300 max	Int'l Commitment 100 max	Legislation 200 max	Ability to Monitor & Detect Strategic Trade 200 max	Ability to Prevent Proliferation Financing 400 max	Adequacy of Enforcement 400 max
1	United States of America	1	1080	85	198	153	293	350
2	United Kingdom of Great Britain & Northern Ireland	2	1015	83	198	144	248	341
3	Sweden	3	1015	92	197	155	252	320
4	Australia	4	1015	92	198	156	241	328
5	Ireland	5	1009	81	198	164	256	309
6	Belgium	6	1008	88	199	163	220	339
7	Latvia	7	991	85	197	148	226	337
8	Estonia	8	991	80	198	162	233	318
9	Czech Republic	9	991	90	197	158	217	330
10	Republic of Korea	10	987	88	197	163	222	318
11	Hungary	11	983	83	196	159	199	345
12	Germany	12	982	90	198	140	224	331
13	Portugal	13	980	88	198	113	275	307
14	Spain	14	978	90	197	159	200	333
15	Austria	15	973	88	199	160	219	307

Tier One Rank	Country	PPI Rank	Total Points 1300 max	Int'l Commitment 100 max	Legislation 200 max	Ability to Monitor & Detect Strategic Trade 200 max	Ability to Prevent Proliferation Financing 400 max	Adequacy of Enforcement 400 max
16	Denmark	16	972	88	198	156	210	320
17	Slovenia	17	967	79	197	160	179	350
18	Norway	18	966	88	198	155	238	288
19	France	20	962	88	198	151	196	330
20	Canada	21	958	85	190	167	176	339
21	Finland	22	955	88	191	167	191	318
22	Netherlands	23	955	92	199	156	172	335
23	Switzerland	24	951	92	194	164	209	291
24	Lithuania	25	950	79	189	160	178	345
25	Italy	26	946	85	197	158	215	291
26	Romania	28	938	83	197	144	185	330
27	New Zealand	29	930	92	198	158	175	307
28	Japan	30	929	85	191	162	162	328
29	Croatia	31	922	75	196	142	186	324
30	Bulgaria	33	915	83	196	143	229	263
31	Luxembourg	34	894	85	199	136	200	274
32	Israel	35	873	45	175	148	278	227
33	Slovakia	36	868	83	197	142	169	278
34	Greece	37	866	83	196	125	213	250
35	Poland	38	864	85	196	150	114	318
36	South Africa	41	836	79	189	135	200	232
37	Iceland	42	821	75	198	122	161	265

Tier One Rank	Country	PPI Rank	Total Points 1300 max	Int'l Commitment 100 max	Legislation 200 max	Ability to Monitor & Detect Strategic Trade 200 max	Ability to Prevent Proliferation Financing 400 max	Adequacy of Enforcement 400 max
38	Taiwan	43	810	28	262**	94	220	206
39	Mexico	46	779	75	196	156	132	221
40	Serbia	47	766	60	196	131	122	257
41	Kazakhstan	52	724	80	150	124	115	255
42	San Marino	54	721	44	192	84	200	202
43	India	55	701	67	189	141	114	190
44	Brazil	58	689	65	188	152	86	198
45	Turkey	65	663	92	188	138	71	175
46	Argentina	67	655	81	173	131	32	238
47	Liechtenstein	68	655	54	185	68	119	229
48	Ukraine	75	615	81	165	133	201	34
49	Monaco	85	566	40	138	47	212	130
50	China	89	554	54	197	137	60	105
51	Russian Federation	90	553	77	188	135	145	8
52	Belarus	93	526	56	177	138	193	-38
53	Pakistan	112	457	35	196	143	-20	103
54	Iran (Islamic Republic of)	196	-9	33	79	89	-122	-88
55	DPRK	200	-172	8	15	11	-102	-105

\*\*The assignment of Extra Credit points allows countries to score above the maximum points.

# TIER TWO RANKS AND SCORES

Table A.3. Tier Two Ranks and Scaled, Weighted Super Criteria Scores

Tier Two Rank	Country	PPI Rank	Total Points 1300 max	Int'l Commitment 100 max	Legislation 200 max	Ability to Monitor & Detect Stra- tegic Trade 200 max	Ability to Prevent Proliferation Financing 400 max	Adequacy of Enforcement 400 max
1	Singapore	19	963	63	168	159	264	309
2	Malta	27	941	79	197	150	203	312
3	Cyprus	32	920	71	197	159	208	284
4	Malaysia	39	849	44	198	127	177	305
5	United Arab Emirates	40	847	54	252**	161	97	284
6	Moldova (Rep of the)	44	808	56	188	128	201	234
7	Armenia	45	786	58	150	160	276	143
8	Thailand	48	760	56	180	141	152	230
9	Philippines	49	755	58	174	129	113	282
10	Georgia	51	726	56	173	116	83	297
11	Peru	57	690	60	130	121	178	200
12	Kyrgyzstan	59	687	54	172	103	108	250
13	Ghana	60	685	58	138	134	109	246
14	Bangladesh	61	681	50	130	102	190	210
15	Chile	62	674	67	93	148	140	227
16	Panama	63	673	67	151	121	140	194
17	Mongolia	66	656	56	101	127	113	257
18	Azerbaijan	70	648	56	159	125	92	215

Tier Two Rank	Country	PPI Rank	Total Points 1300 max	Int'l Commitment 100 max	Legislation 200 max	Ability to Monitor & Detect Stra- tegic Trade 200 max	Ability to Prevent Proliferation Financing 400 max	Adequacy of Enforcement 400 max
19	Costa Rica	71	647	60	103	103	237	143
20	Jordan	72	645	58	136	124	108	219
21	Sri Lanka	74	623	42	131	87	139	225
22	Albania	76	613	54	195	129	18	217
23	Saudi Arabia	77	593	48	86	100	199	160
24	Indonesia	81	583	54	93	124	167	145
25	Algeria	82	578	50	131	149	20	229
26	Dominican Republic	83	578	67	87	109	156	160
27	Jamaica	84	572	56	139	126	44	208
28	Malawi	87	561	54	107	74	138	189
29	Bahamas	88	558	44	69	119	137	189
30	Bosnia & Herzegovina	91	553	56	195	109	48	145
31	Ethiopia	94	521	42	124	82	111	162
32	Namibia	95	521	46	109	94	112	160
33	Uzbekistan	96	519	63	125	104	56	171
34	Tunisia	97	519	56	73	95	129	166
35	Hong Kong	98	515	23	160	113	186	32
36	Brunei Darussalam	100	508	40	114	86	104	164
37	Tajikistan	101	507	58	129	119	46	154

Tier Two Rank	Country	PPI Rank	Total Points 1300 max	Int'l Commitment 100 max	Legislation 200 max	Ability to Monitor & Detect Stra- tegic Trade 200 max	Ability to Prevent Proliferation Financing 400 max	Adequacy of Enforcement 400 max
38	Zambia	105	494	44	86	103	65	196
39	Qatar	106	482	50	94	116	84	137
40	Nigeria	114	453	54	91	101	44	164
41	Vanuatu	115	447	50	67	56	146	126
42	Morocco	116	444	58	86	119	13	168
43	Paraguay	122	426	65	86	97	5	173
44	Niger	124	419	56	67	83	23	189
45	Kuwait	130	407	60	71	83	97	95
46	Nicaragua	133	403	54	122	95	25	107
47	Egypt	135	395	27	119	90	142	17
48	Colombia	137	392	58	57	92	65	118
49	Ecuador	145	373	52	71	97	72	82
50	Viet Nam	150	358	60	105	110	11	70
51	Oman	161	316	40	67	82	41	86
52	Venezuela (Bolivarian Republic of)	165	309	35	99	58	103	13
53	Lao People's Democratic Republic	166	290	38	110	73	-64	149
54	Iraq	176	246	52	92	110	-15	27
55	Uganda	177	222	46	84	95	8	23

Tier Two Rank	Country	PPI Rank	Total Points 1300 max	Int'l Commitment 100 max	Legislation 200 max	Ability to Monitor & Detect Stra- tegic Trade 200 max	Ability to Prevent Proliferation Financing 400 max	Adequacy of Enforcement 400 max
56	Lebanon	185	221	42	101	78	147	-156
57	Afghanistan	191	138	52	77	58	-40	-10
58	Libya	193	109	63	67	46	-52	-6
59	Syrian Arab Republic	195	56	33	60	60	56	-133

\*\* The assignment of Extra Credit points allows countries to score above the maximum points.



# TIER THREE RANKS AND SCORES

Table A.4. Tier Three Ranks and Scaled, Weighted Super Criteria Scores

Tier Three Rank	Country	PPI Rank	Total Points 1300 max	Int'l Commitment 100 max	Legislation 200 max	Ability to Monitor & Detect Strategic Trade 200 max	Ability to Prevent Proliferation Financing 400 max	Adequacy of Enforcement 400 max
1	Andorra	50	736	50	154	90	261	181
2	Macedonia	53	723	62	172	120	166	204
3	Montenegro	56	691	56	196	95	116	227
4	Mauritius	64	663	46	97	97	189	234
5	Bahrain	69	652	58	98	114	161	221
6	Uruguay	73	629	58	78	112	232	149
7	Fiji	78	591	58	67	102	208	156
8	Botswana	79	589	48	131	118	77	215
9	Guatemala	80	584	52	130	121	148	133
10	Trinidad & Tobago	86	565	40	78	105	212	130
11	Cuba	92	541	60	104	102	116	158
12	Cameroon	99	512	48	85	98	124	156
13	Gabon	102	500	56	124	90	78	152
14	Antigua & Barbuda	103	497	60	69	114	96	158
15	Seychelles	104	495	50	87	62	111	185
16	Benin	107	473	54	94	84	55	187
17	Burkina Faso	108	466	56	125	97	77	110

Tier Three Rank	Country	PPI Rank	Total Points 1300 max	Int'l Commitment 100 max	Legislation 200 max	Ability to Monitor & Detect Strategic Trade 200 max	Ability to Prevent Proliferation Financing 400 max	Adequacy of Enforcement 400 max
18	Kenya	109	461	54	173	103	-36	168
19	Samoa	110	461	35	98	84	91	152
20	Togo	111	459	44	75	98	115	128
21	El Salvador	113	456	60	124	69	57	147
22	Lesotho	117	442	54	78	87	79	143
23	Timor-Leste	118	438	25	98	73	102	139
24	Cape Verde	119	436	31	84	85	109	126
25	Swaziland (Eswatini)	120	433	52	99	63	34	185
26	Saint Kitts & Nevis	121	431	35	113	55	52	175
27	Grenada	123	422	29	75	46	130	141
28	Bhutan	125	419	23	90	84	100	122
29	Nauru	126	417	35	83	39	97	162
30	Cote d'Ivoire	127	414	58	79	100	30	147
31	Cook Islands	128	412	21	46	32	226	86
32	Honduras	129	407	52	81	77	90	109
33	Solomon Islands	131	406	27	121	55	59	145
34	Sierra Leone	132	405	38	119	86	-12	175

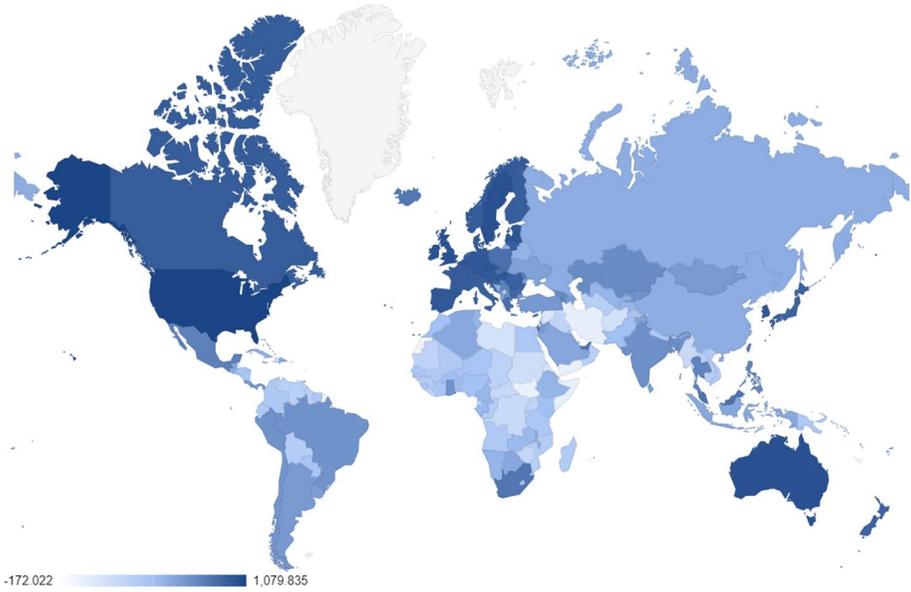
Tier Three Rank	Country	PPI Rank	Total Points 1300 max	Int'l Commitment 100 max	Legislation 200 max	Ability to Monitor & Detect Strategic Trade 200 max	Ability to Prevent Proliferation Financing 400 max	Adequacy of Enforcement 400 max
35	Saint Vincent & the Grenadines	134	400	42	69	92	71	126
36	Suriname	136	393	29	67	110	58	130
37	Senegal	138	391	52	56	102	22	158
38	Tanzania (United Republic of)	139	389	50	85	104	23	128
39	Papua New Guinea	140	385	40	62	74	89	122
40	Nepal	141	383	29	72	93	87	103
41	Saint Lucia	142	383	54	92	51	55	130
42	Tonga	143	383	35	62	71	122	91
43	Barbados	144	383	31	79	48	100	124
44	Angola	146	370	48	56	58	111	97
45	Dominica	147	370	38	69	61	41	162
46	Mali	148	369	60	95	78	71	63
47	Maldives	149	361	27	62	83	31	158
48	Madagascar	151	352	58	72	95	2	124
49	Bolivia	152	344	38	123	58	16	110
50	Congo (Rep of the)	153	337	46	69	81	21	120
51	Guinea	154	335	33	74	86	41	101

Tier Three Rank	Country	PPI Rank	Total Points 1300 max	Int'l Commitment 100 max	Legislation 200 max	Ability to Monitor & Detect Strategic Trade 200 max	Ability to Prevent Proliferation Financing 400 max	Adequacy of Enforcement 400 max
52	Marshall Islands	155	334	44	72	52	71	95
53	Mozambique	156	332	54	106	82	-31	120
54	Belize	157	329	35	46	96	62	90
55	Cambodia	158	320	54	90	99	-30	107
56	Djibouti	159	319	52	85	67	8	107
57	Sao Tome & Principe	160	317	29	62	71	57	97
58	Guyana	162	316	40	62	60	18	137
59	Kosovo	163	313	6	146	62	-15	114
60	Turkmenistan	164	312	63	60	38	27	126
61	Comoros	167	302	48	38	86	42	88
62	Rwanda	168	296	46	78	86	-13	99
63	Holy See	169	294	38	15	22	153	67
64	Chad	170	292	44	95	59	-6	101
65	Gambia	171	290	40	56	64	3	128
66	Kiribati	172	287	29	62	65	17	114
67	Mauritania	173	278	56	108	78	-74	110
68	Palau	174	278	48	52	33	50	95
69	Liberia	175	267	48	69	91	-61	120
70	Burundi	178	249	46	81	75	-43	91

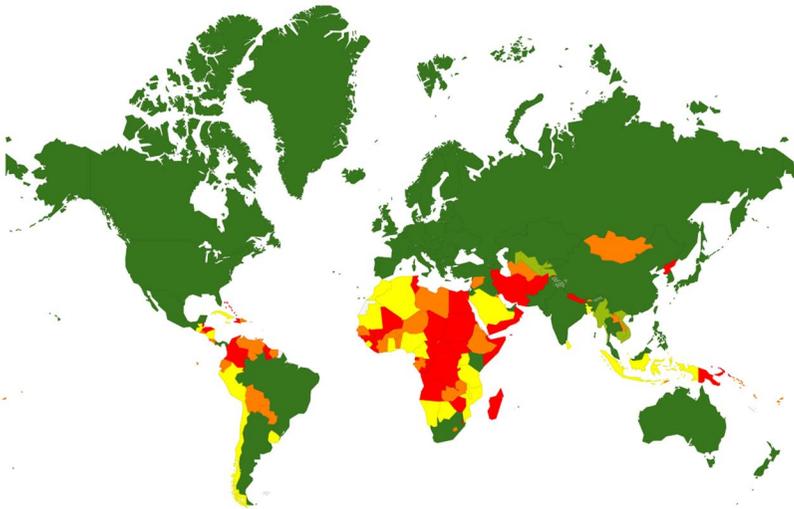
Tier Three Rank	Country	PPI Rank	Total Points 1300 max	Int'l Commitment 100 max	Legislation 200 max	Ability to Monitor & Detect Strategic Trade 200 max	Ability to Prevent Proliferation Financing 400 max	Adequacy of Enforcement 400 max
71	Guinea-Bissau	179	239	38	46	93	27	36
72	Niue	180	238	25	42	32	91	48
73	Zimbabwe	181	233	33	72	85	83	-40
74	Micronesia (Federated States of)	182	226	17	85	32	-12	105
75	Central African Republic	183	223	48	69	65	6	34
76	Congo (Dem Rep of the)	184	212	50	110	101	-59	10
77	Myanmar	186	209	42	110	101	-68	25
78	Tuvalu	187	168	19	37	20	-12	105
79	Haiti	188	168	42	71	83	-77	50
80	Equatorial Guinea	189	168	25	46	46	-31	82
81	Sudan	190	163	35	54	65	41	-32
82	Palestine (State of)	192	122	25	38	63	-5	0
83	Eritrea	194	95	25	44	40	-66	51
84	Somalia	197	-16	21	46	42	-64	-61
85	Yemen	198	-26	44	40	54	-54	-110
86	South Sudan	199	-33	6	54	45	-69	-70

# MAPS SUMMARIZING PPI SCORES AND LEGISLATION CATEGORIES

The following two global maps illustrate the PPI country scores overall and the categories for export control legislation. The first map represents the country scores for all 200 countries, territories, and entities by blue shading, where a darker shade represents a higher score (see table A.1). The second map shows the legislative color categories defined in Chapter 3, where in brief: Dark Green—legislation is comprehensive; Light Green – legislation is somewhat comprehensive; Yellow – legislation is deficient; Orange – legislation has serious deficiencies; and Red – legislation is non-existent or severely deficient.



**Figure A.1.** The strength of trade control systems around the world, according to the 2021 PPI.



**Figure A.2.** World map indicating export control legislation color categories. The legislation color key described qualitatively and in brief is: Dark Green – legislation is comprehensive; Light Green – legislation is somewhat comprehensive; Yellow – legislation is deficient; Orange – legislation has serious deficiencies; and Red – legislation is non-existent or severely deficient. See Chapter 3 for more on these legislative categories.

**ANNEX II**

**RANKING BY CLUSTER ANALYSIS**

## CLUSTER ONE

Rank	Country	Points
1	United States of America	1080
2	United Kingdom of Great Britain & Northern Ireland	1015
3	Sweden	1015
4	Australia	1015
5	Ireland	1009
6	Belgium	1008
7	Latvia	991
8	Estonia	991
9	Czech Republic	991
10	Republic of Korea	987
11	Hungary	983
12	Germany	982
13	Portugal	980
14	Spain	978
15	Austria	973
16	Denmark	972
17	Slovenia	967
18	Norway	966
19	Singapore	963
20	France	962
21	Canada	958

Rank	Country	Points
22	Finland	955
23	Netherlands	955
24	Switzerland	951
25	Lithuania	950
26	Italy	946
27	Malta	941
28	Romania	938
29	New Zealand	930
30	Japan	929
31	Croatia	922
32	Cyprus	920
33	Bulgaria	915
34	Luxembourg	894
35	Israel	873
36	Slovakia	868
37	Greece	866
38	Poland	864
39	Malaysia	849
40	United Arab Emirates	847
41	South Africa	836
42	Iceland	821
43	Taiwan	810
44	Moldova (Rep of the)	808
45	Armenia	786
46	Mexico	779

## CLUSTER TWO

Rank	Country	Points
47	Serbia	766
48	Thailand	760
49	Philippines	755
50	Andorra	736
51	Georgia	726
52	Kazakhstan	724
53	Macedonia	723
54	San Marino	721
55	India	701
56	Montenegro	691
57	Peru	690
58	Brazil	689
59	Kyrgyzstan	687
60	Ghana	685
61	Bangladesh	681
62	Chile	674
63	Panama	673
64	Mauritius	663
65	Turkey	663
66	Mongolia	656
67	Argentina	655
68	Liechtenstein	655
69	Bahrain	652
70	Azerbaijan	648
71	Costa Rica	647
72	Jordan	645
73	Uruguay	629
74	Sri Lanka	623
75	Ukraine	615
76	Albania	613

Rank	Country	Points
77	Saudi Arabia	593
78	Fiji	591
79	Botswana	589
80	Guatemala	584
81	Indonesia	583
82	Algeria	578
83	Dominican Republic	578
84	Jamaica	572
85	Monaco	566
86	Trinidad and Tobago	565
87	Malawi	561
88	Bahamas	558
89	China	554
90	Russian Federation	553
91	Bosnia & Herzegovina	553
92	Cuba	541
93	Belarus	526
94	Ethiopia	521
95	Namibia	521
96	Uzbekistan	519
97	Tunisia	519
98	Hong Kong	515
99	Cameroon	512
100	Brunei Darussalam	508
101	Tajikistan	507
102	Gabon	500

## CLUSTER THREE

Rank	Country	Points
103	Antigua & Barbuda	497
104	Seychelles	495
105	Zambia	494
106	Qatar	482
107	Benin	473
108	Burkina Faso	466
109	Kenya	461
110	Samoa	461
111	Togo	459
112	Pakistan	457
113	El Salvador	456
114	Nigeria	453
115	Vanuatu	447
116	Morocco	444
117	Lesotho	442
118	Timor-Leste	438
119	Cape Verde	436
120	Swaziland (Eswatini)	433
121	Saint Kitts and Nevis	431
122	Paraguay	426
123	Grenada	422
124	Niger	419
125	Bhutan	419
126	Nauru	417
127	Cote d'Ivoire	414
128	Cook Islands	412
129	Honduras	407
130	Kuwait	407
131	Solomon Islands	406
132	Sierra Leone	405
133	Nicaragua	403

Rank	Country	Points
134	Saint Vincent & the Grenadines	400
135	Egypt	395
136	Suriname	393
137	Colombia	392
138	Senegal	391
139	Tanzania (United Republic of)	389
140	Papua New Guinea	385
141	Nepal	383
142	Saint Lucia	383
143	Tonga	383
144	Barbados	383
145	Ecuador	373
146	Angola	370
147	Dominica	370
148	Mali	369
149	Maldives	361
150	Viet Nam	358
151	Madagascar	352
152	Bolivia	344
153	Congo (Rep of the)	337
154	Guinea	335
155	Marshall Islands	334
156	Mozambique	332
157	Belize	329
158	Cambodia	320
159	Djibouti	319
160	Sao Tome & Principe	317
161	Oman	316
162	Guyana	316

FULL RANKING AND SUPER CRITERIA SCORES

Rank	Country	Points
163	Kosovo	313
164	Turkmenistan	312
165	Venezuela (Bolivarian Republic of)	309
166	Lao People's Democratic Republic	305
167	Comoros	302
168	Rwanda	296

Rank	Country	Points
169	Holy See	294
170	Chad	292
171	Gambia	290
172	Kiribati	287
173	Mauritania	278
174	Palau	278
175	Liberia	267
176	Iraq	266
177	Uganda	255

## CLUSTER FOUR

Rank	Country	Points
178	Burundi	249
179	Guinea-Bissau	239
180	Niue	238
181	Zimbabwe	233
182	Micronesia (Federated States of)	226
183	Central African Republic	223
184	Congo (Dem Rep of the)	212
185	Lebanon	212
186	Myanmar	209
187	Tuvalu	168
188	Haiti	168

Rank	Country	Points
189	Equatorial Guinea	168
190	Sudan	163
191	Afghanistan	138
192	Palestine (State of)	122
193	Libya	119
194	Eritrea	95
195	Syrian Arab Republic	75
196	Iran (Islamic Republic of)	-9
197	Somalia	-16
198	Yemen	-26
199	South Sudan	-33
200	DPRK	-172