The Dutch Foreign Relations Index: Version 2

Methodological Note

Hugo van Manen, Koen van Wijk, Elisabeth Dick, Tim Sweijs

Table of Contents

1 Introduction

The Dutch Foreign Relations Index (DFRI) measures the depth of Dutch relations with other countries for the period 1996-2018 along two dimensions: relevance (how important is a country for the Netherlands?) and compatibility (to what extent does it share similar values?). The DFRI thus offers, from the Netherlands' perspective, an overview of the strategic relevance and compatibility of states worldwide. It aims to infuse Dutch foreign policy debates with more conceptual and empirical clarity by providing Dutch policymakers with a tool to more effectively prioritize policy efforts to maximize national interests and promote values. This document introduces the index conceptually and provides an overview of the methodology employed to produce it. HCSS would like to emphasize that this is a first step of a foundational effort to put discussions relating to the maintenance (and forging) of Dutch partnerships on firmer empirical footing. We plan to continue iterating on the included indicators in the future and welcome any feedback that would help in improving the index and its underlying domains and dimensions.

2 The Index

The joint interest and values-based approach of the DFRI derives from a long tradition of Dutch foreign policies being rooted in a mix of 'peace, profits and principles',[1] which endures to this very day. The goals outlined in key national security and strategy documents published by the Dutch Ministry of Foreign Affairs, Defense and Security and Justice clearly express this commitment to a mixture of values and interests.[2] The DFRI systematically maps the extent to which countries are important for the Netherlands both in terms of interests and in terms of shared values within the political, military, economic, and judicial domains. Both dimensions are relevant for the Netherlands being able to achieve its objectives. The DFRI conceptualizes these dimensions respectively as strategic relevance and compatibility. These incorporate an assortment of economic, political, military, and judicial indicators. Strategic relevance is based on the degree of influence a country wields in the international system and the size and nature of its relationship with the Netherlands. Compatibility considers the degree to which these countries' worldviews align with the Netherlands. These two dimensions and their underlying elements are discussed in further detail below.

The *National Security Strategy* (NSS) 2019 identifies five vital Dutch interests; namely: the maintenance of territorial integrity; physical safety; economic security, socio-political stability; environmental security. The *Geïntegreerde Buitenland -en Veiligheidsstrategie* (GBVS) singles out three additionally, and to some extent overlapping, objectives. These include the protection of Dutch territorial security, the protection and promotion of economic security and the protection of international law.[3] The DFRI operationalizes the Netherlands' relationship with other states by incorporating indices which relate to these countries (potential) ability to contribute to the Netherlands' pursuit of the maintenance of a.) territorial integrity, b.) physical safety, c.) environmental stability, d.) socio-political stability, e.) international rule of law, and f.) economic security. This index conceptualizes the previously outlined interests as follows. Maintenance of territorial integrity refers simply to the sovereignty of the Netherlands' borders. Physical safety is a concept which deals with disease

---

[1] The joint interest and values-based approach of the DFRI derives from a long tradition of Dutch foreign policies that combines the pursuit of Dutch interests with a strong emphasis on values. See: Duco Hellema, *Nederland in de Wereld* (Amsterdam: Spectrum, 2014); Joris J. C. Voorhoeve, *Peace, Profits and Principles: A Study of Dutch Foreign Policy* (The Hague: M. Nijhoff, 1979); Rob de Wijk et al., "Een Kompas Voor Een Wereld in Beweging" (The Hague: The Hague Centre For Strategic Studies, February 27, 2017), https://hcss.nl/report/een-kompas-voor-een-wereld-beweging The goals outlined in the Coalition Agreement as well as in key national security and strategy documents published by the Dutch Ministry of Foreign Affairs, Defence and Security and Justice clearly express this commitment to a mixture of values and interests.

[2] Stef Blok, "Wereldwijd Voor Een Veilig Nederland - Geïntegreerde Buitenland- En Veiligheidsstrategie 2018-2022" (The Netherlands Ministry of Foreign Affairs, March 19, 2018), https://www.rijksoverheid.nl/documenten/rapporten/2018/03/19/notitie-geintegreerde-buitenland--en-veiligheidsstrategie-gbvs.

[3] See "Wereldwijd Voor Een Veilig Nederland: Geïntegreerde Buitenland- En Veiligheidsstrategie 2018-2022" (The Hague: Ministerie van Buitenlandse Zaken, 2018), https://www.rijksoverheid.nl/documenten/rapporten/2018/03/19/notitie-geintegreerde-buitenland--en-veiligheidsstrategie-gbvs. See also "Nationale Veiligheid Strategie 2019" (The Hague: Nationaal Coördinator Terrorismebestrijding en Veiligheid, 2019), https://www.nctv.nl/documenten/publicaties/2019/6/07/nationale-veiligheid-strategie-2019.

prevention and the safeguarding and maintenance of critical national infrastructure. The concept of environmental safety relates to the negative externalities brought on by climate change and environmental degradation. Socio-political stability relates to trends surrounding the maintenance of human rights while international rule of law relates to governance style. Finally, the concept of economic security concerns itself with market access and international openness to free trade.

The DFRI's gauging of relevance and compatibility within the political, military, economic, and judicial domains allows for a great deal of flexibility when it comes to operationalizing countries' likely ability to contribute to the aforementioned security interests. As an example, the combination of political relevance and compatibility with military relevance and compatibility speaks not only to overlap in military and political interests between the Netherlands and other countries, but also to other countries' military and political clout within the international system. As a result, the combination of these metrics allows us to identify which countries are best positioned to contribute to the Netherlands' territorial integrity and physical safety. Political relevance and compatibility are also of relevance when it comes to gauging other countries' ability to contribute to the Netherlands' socio-political stability and, when combined with judicial compatibility, to the international rule of law. Other countries' ability to contribute to Dutch environmental safety and economic stability are measured mainly through economic relevance and compatibility, though elements of the political domain – and political compatibility in particular – are also of relevance.

Because metrics incorporated within the DFRI allow for the systematic identification of countries which combine a high degree of relevance with a low degree of compatibility, the index can also be used to pinpoint potential challengers and/or adversaries. As an example, a country such as China emerges from this index as being extremely relevant to the Netherlands within the political, military, and economic domains, but registers low on compatibility across the board. In the most general sense and owing to the nature of the indicators which feed into relevance, China's high degree of relevance speaks to its ability to shape world events in its image. Because China's compatibility with the Netherlands registers as exceptionally low, its high degree of relevance can be reasonably interpreted as a potential threat to the Netherlands' ability to maintain its territorial integrity, ensure its physical safety, safeguard its socio-political stability, protect international rule of law, enjoy continued economic security. As with every Index, the results obtained through the DFRI are based on proxy indicators and are therefore approximations. 'Economic relevance', for instance, is an abstract concept that cannot be captured directly. This notwithstanding *can* however capture and track discernible developments in a number of concrete and measurable manifestations of this abstract concept, though such measurements always remain far from perfect because they are simplified representations of a much more complex reality. In the economic domain of the DFRI, for instance, we do not account for global

value chains and the different values added along each node of the chain, nor do we include foreign direct investments, even though we realize that these are important elements. Finally, indices are often not comprehensive in terms of the domains that are considered. The current iteration of the DFRI does not include such domains as education or innovation, which may limit explanatory power at micro as well as macro levels and is unfit to predict the future position of a country.

This method note starts with a generalized description of data normalization procedures within the relevance and compatibility dimensions (Chapter 4). It subsequently provides a domain-by-domain overview of the indicators and data processing methods applied within the relevance and compatibility dimensions (Chapter 5), as well as a discussion of caveats and changes made to the DFRI since its previous iteration released in 2017 (Chapter 6).

3 Data normalization

3.1 Relevance

The maximum score that a country can obtain within any domain of relevance is 33.$\overline{3}$. In order to ensure that data is comparable between different dimensions and domains, data must be normalized to fall within a predetermined range. For the purpose of relevance, normalization occurs over the entire time period (1996-2018). This normalization method differs from the method applied in compatibility in that it effectively benchmarks all points relative to a single country-year based highpoint across the dataset rather than relative to one an annual high point. This methodology allows for the analysis of trends over time and is applied because the metrics used within relevance universally capture the volume of real-time transactions. These are frequently subject to variations which derive from their interactions with global shocks which - under a year-based normalization scheme - would not be captured within the index. As an example, a year-based normalization of economic relevance would likely fail to capture drops in absolute relevance during (and in the wake of) the 2008-2009 recession because an annual normalization would still evaluate the largest trading partner of that year as a maximum score, even if the absolute volume of trade would have been halved. A year-based normalization method would, in other words, capture an annual 'percent of the pie' score on a per-country basis. While such an approach has merit, we argue that - because state *needs* (population, magnitude of security threats, etc.) are not necessarily reduced (and, indeed may even *proliferate* as a result of international shocks) - such a metric is inadequate for measuring relevance as it has been conceptualized within this index because it would fail to capture trends such as (for example) the United States' decline in military power relative to China post-2004. This method of normalization is applied to all four domains, each of which contains country-year scores with values ranging from 0 to 1. Because normalization occurs over the entire time period, 0 and 1 scores are attained by only one country-year combination per domain. As judicial relevance is only used for in-domain comparison and is the same as political relevance, it is not included in the total relevance calculation. The returned value is therefore multiplied by 33.$\overline{3}$ to yield a domain score and is summed together with other domain scores within relevance to return a value which may range from 0-100. On this range, 100 is indicative of maximum relative relevance within all indicators and 0 is indicative of minimum relative relevance within all indicators.

3.2 Compatibility

The compatibility dimension is geared towards capturing the distance (or, stated otherwise, the degree of similarity) between the Netherlands and Country X rather than relative relevance. Because of this, the calculations applied to the underlying data within this dimension differ from those used within the relevance dimension in several

ways. These are outlined below. As compatibility utilizes a unique indicator for all four domains, countries can attain a maximum yearly score of 25 within each domain.

Individual country-year scores on indicators included within the compatibility dimension are calculated by asserting (on a country-year basis) what the absolute difference between the Netherlands' and Country X's performance is. This means (as previously outlined) that compatibility scores do not capture whether a Country X performs better or worse than the Netherlands. Take a scenario in which the Netherlands scores a 5 on UN voting behavior, the United States Scores a 10, and the Russian Federation scores a 0. In this scenario, the Russian Federation and the United States would both receive a score of 5 because their preferences (albeit in different ways and for different reasons) differ strongly from the preferences expressed by The Hague. Where relevance is normalized across the entire time series, one country receives a score of 1 in one year and one country receives a score of 0 in one year - compatibility is normalized on a yearly basis. This means that, within compatibility, the process of normalization results in one country scoring 0 and one country scoring a 1 every year between 1996 and 2018. Countries are, in other words, benchmarked against one-another yearly rather than against the top performing (country-year) point within the entire time series. This methodology allows for more dynamic tracking of changing affinity with the Netherlands over time because it controls for the occurrence of systemic shocks, and a country's compatibility with the Netherlands reflects its position vis-a-vis current events rather than its position vis-a-vis future (or past) occurrences. Because countries with a larger difference would score closer to 1 (that is to say: higher) than countries with low distance scores (high compatibility), the range is inverted prior to normalization. This ensures that - as intended - countries which score *high* in absolute difference, score *low* on compatibility. In all calculations, the countries are benchmarked against the Netherlands. The country with the biggest difference to the Netherlands is assigned a score of 0, while the country that is closest to the Netherlands receives a score of 1 after normalization.

Once the previously outlined process of normalization is completed, the resulting data points are summed together on a domain-by-domain basis to form the total compatibility score. All domains are weighted equally, meaning that, as there are four domains, each score is multiplied by 25, so that the theoretical maximum amounts to 100. In the case of domain which are made up of data contributions derived from more than one indicator, all indicators are given equal weight and are normalized.

4 Relevance

4.1 Concept and Underlying Domains

Relevance is a measure of countries' strategic importance to the Netherlands over time. Relevance is measured on a country-by-country basis, and is applied to the political, military, economic, and judicial domains. Relevance can be understood as an expression of individual countries' positions within the international system. It covers variables such as international power and influence, access to resources, and the size and depth of existing dyadic relationships with the Netherlands. For an overview of the domain makeup of relevance, refer to Table 1.

Table 1 - Domain taxonomy relevance

Relevance			
Domain	Description	Proxy	Source
Political	Measurement of a state's influence within the global system	Global Influence	Pardee Center for International Futures: The Global Influence Index
Military	Measurement of a state's military coercive capabilities	Share of global power	Pardee Center for International Futures: Global Power Index
Economic	Measurement of a state's importance to the Dutch economy	Bilateral import and export volume	UN Comtrade
Judicial	Measurement of a state's ability to affect norm-making in the global system	Global Influence (the same as political)[4]	Pardee Center for International Futures: The Global Influence Index

4.2 Domains

4.2.1 Political

Political relevance operationalizes a country's potential ability to leverage its influence within the international system to either support or hinder the Netherlands in the pursuit of its national objectives. The data used to construct this variable is derived from the Pardee Center of International Futures' Global Influence Index (GII), which

---

[4] Judicial relevance is conceptualized as being the same as political relevance. Because of this, it is not included in calculations for total relevance, but included in the dataset only for in-domain analysis and comparisons.

conceptualizes influence as a state's *potential* ability to modify the behavior of its peers. The GII is unique in its ability to gauge *bidirectional* state influence at the dyadic level; its contribution to the DFRI is sizeable. The GII incorporates a multi-domain (economic, military, and political) taxonomy which measures 'bandwidth' (what is the size of a relationship?) as well as 'dependence' (who is more reliant on whom?) at the dyadic (i.e. country A – country B) level. In total, 119 different indicators are included, spanning the period 1963-2016. The GII's inclusion of directional (i.e. country A -> country B) elements such as aid provision and trade as a percent of GDP distinguish it not only conceptually - power is almost exclusively an expression of coercive potential - but also methodologically from the Global Power Index which is used to operationalize military relevance. Because it is almost impossible to attribute changes in state behavior to the influence of external actors (if only because attribution to any *one* actor is problematic within the context of an international system), the GII derives its conclusions vis-a-vis influence from an approximation of a state's *potential* ability to modify the behavior of its peers on the basis of a multi-domain approach to influence.[5] Our political relevance indicator is geared towards quantifying to what degree a country's international relationships have the potential to be leveraged to the Netherlands' aid or hindrance. The DFRI incorporates GII data pertaining to each state's potential influence within the global system. Because the GII provides direction-specific influence measurements for all world dyads, values for this variable are calculated by summing together the state influence of countries on an annual, state-to-state basis for the period 1996-2016. These values were subsequently (as outlined under the normalization method) normalized between 0 and 1 for any given country and time period. The resulting measurement provides an overview of each country's relative share of influence within the global system over time, and - given that influence *can* be deliberately leveraged to induce change in behavior - serves as a potentially useful proxy of political relevance.

As the GII has not been updated since 2017, the dataset does not extend beyond 2016. To increase the immediacy of the Dutch Foreign Relations Index, missing values were imputed by means of a moving average calculation. 2017 and 2018 values were therefore inferred on the basis of data pertaining to previous (available) years. This is deemed to be an accurate and appropriate tool to extrapolate the missing data points as global influence is a slow-moving indicator. Furthermore, one can assume that the trend of the past two years by-and-large holds true for the immediately following time period. A maximum of two missing values were forecasted by the simple moving average approach, to limit the uncertainty in the Dutch Foreign Relations Index and to ensure the dataset's overall reliability and robustness.

---

[5] Jonathan D. Moyer et al., "Power and Influence in a Globalized World" (Washington, DC: Atlantic Council, Frederick S. Pardee Center for International Futures and HCSS, January 2018), https://www.atlanticcouncil.org/images/Power_and_Influence_.pdf.

4.2.2 Military

Whereas political relevance is a product of other countries' potential influence capacity, military relevance refers to their potential ability to assert themselves through coercive means. A country's ability to wage war and protect one's allies is an integral aspect of international politics and engagement. Simultaneously, military power does not exist in a vacuum and is - in many ways - greater than the sum of its parts. Indicators such as defense spending or standing army size capture single (materialistic) elements of military power but provide little insight into a wider set of attributes of national power. HCSS therefore makes use of the Pardee Center for International Futures' Global Power Index (GPI).[6] The GPI corrects for the aforementioned shortcoming by supplementing data on material resources with several structural indicators - including (to name a few) economic and diplomatic strength, investment into R&D, FDI flows, access to Internet/Communication technology, access to nuclear weapons, and access to human capital - to express a country's share of global power (% of world total) on an annual basis. Because of this, it effectively operationalizes power as a zero-sum game. Increases in the absolute values of underlying indicators only increase one country's share of global power if the increases are *relatively larger* than the increases recorded in other countries. This measurement is considered effective because military capacity *as a measurement of relevance* is intended to capture not destructive or operational capacity, but *potential ability* to contribute to (or impede) the Netherlands' interests.

The DFRI utilizes the GPI to express countries' military relevance to the Netherlands as a percentage of world power on an annual basis, with the data being normalized over the entire time series (1996-2018). It should be noted that several of the indicators (namely measurements relating to trade) used in the GPI recur in the DFRI's other domains. Because these variables are often operationalized in *different* ways than they are in the DFRI (for example, the GPI measures total trade while the DFRI measures *only* trade with the Netherlands) and because these values are often used to modify (read: amplify through multiplication) the value of materialistic military indicators, this redundancy adds to the saliency of the GPI as a whole and is considered acceptable.

As this dataset has not been updated since 2016, the same extrapolation technique used in political relevance was applied. An identical conclusion about the volatility of the indicator can be drawn. As the analysis of the existing data points show, global power is a slow-moving indicator, meaning that the forecasting of missing data points is justifiable and can be used in further analysis.

4.2.3 Economic

---

[6] The GPI was developed in collaboration with the U.S. National Intelligence Council. For more information, see Moyer et al.

Given the fact that Netherlands is one of the world's premier trading hubs, global trade is of critical importance to the Dutch economy. The underlying argumentation applied throughout our 'economic relevance' indicator is that trade is an effective proxy for the degree to which the Netherlands' economy *interacts* with other countries' economies. This interaction can take the form of both incoming and outgoing goods and services - both of which have value to the Netherlands. The variable is accordingly conceptualized as taking the form of international trade, and is - using annual (1996-2018) dyadic data obtained through UN Comtrade[7] - expressed as the sum of monetary value of imports and exports between the Netherlands and Country X. We deliberately decided not to account for the size of the economy of the trading partner for two reasons. The first is that trade as percentage of GDP is already used as an indicator within the Global Influence Index and would thus compound the severity of outliers which occur in economies which are disproportionately dependent on global trade. The second is that relevance is a function of usefulness as viewed *from* the Netherlands' perspective. As such, the metric of interest is not so much the share, and by extension the size, of the target economy, but the value of the trade relation in and of itself.

From 1996 until 1999, the UN Comtrade dataset combines the import and export data for Belgium and Luxembourg into one, simply referred to as Belgium-Luxembourg. 'Belgium-Luxembourg' data is used to create Belgium's score in those years, while Luxembourg is assigned a null score. This is considered justified due to Belgium's importance as a trade partner for the Netherlands, as well as the fact that trade with Luxembourg is minute in comparison, with Belgium's score being more than 40 times higher in 2000.

The total economic relevance of a country reflects the normalized sum of imports and exports. Data is normalized over the entire time series (1996-2018). This means that a country's economic relevance score can vary from 0 to 1, with 1 representing a country-year combination in which the relevant country's trade volume (imports + exports) with the Netherlands was higher than it was with any other country in any other year.[8]

---

[7] United Nations, "Download Trade Data," UN Comtrade Database, 2019, https://comtrade.un.org/data/.

[8] For a more elaborate mathematical description see the Methodology subsection.

5 Compatibility

The second dimension of the DFRI captures the concept of compatibility. Within the context of the DFRI, compatibility measures the distance between the Netherlands and other countries in terms of values in similar domains as the relevance dimension. This allows us to gauge the degree to which these countries' worldviews align with the Netherlands. Building upon the notion that the best predictor of future action is past action, the DFRI posits that the way that countries are likely to view (and, as a result, respond to) future developments within the international arena closely reflects the way they perceive (and react to) the world today. As these views transpose into the real world through government policy, the distance between two countries' held preferences can be established through the compilation of indicators which capture either the direct structural impacts of their policies, or both governments' expressed values in real time. As is also the case within the relevance dimension, compatibility features political, military, and economic, and judicial domains. The domain indicators used to measure compatibility are universally geared towards gauging the likelihood that a country would be willing to mobilize its corresponding power resources towards achieving outcomes which align with Dutch interests. For an overview of the domain makeup of compatibility, see Table 2.

Table 2 - Domain taxonomy compatibility

Compatibility			
Domain	Description	Proxy	Source
Political	Measurement of the level of diplomatic interaction between the Netherlands and Country X and the extent to which they express similar foreign policy preferences	Diplomatic Bandwidth (shared IGO membership and dyadic diplomatic representation) United Nations General Assembly Voting Behavior	Pardee Center of International Futures: Political Bandwidth[9] United Nations General Assembly Voting Data[10]
Military	Measurement of the depth and intensity of military alignment and cooperation	Shared alliances, shared Centers of Excellence within NATO or other	NATO[11]/EU[12] & COE websites[13]

---

[9] Moyer et al., "Power and Influence in a Globalized World."

[10] Michael A. Bailey, Anton Strezhnev, and Erik Voeten, "Estimating Dynamic State Preferences from United Nations Voting Data," *Journal of Conflict Resolution* 61, no. 2 (2017): 430–56, https://doi.org/10/f9pzwz.

[11] NATO, "Member Countries," NATO, May 14, 2019, http://www.nato.int/cps/en/natohq/topics_52044.htm.

[12] European Commission, "From 6 to 28 Members," Text, European Neighbourhood Policy And Enlargement Negotiations, December 6, 2016, https://ec.europa.eu/neighbourhood-enlargement/policy/from-6-to-28-members_en.

[13] NATO, "Centres of Excellence," NATO, January 24, 2019, http://www.nato.int/cps/en/natohq/topics_68372.htm.

		(non-EU) multilateral military cooperation platform (e.g. MNFP), as well as instances of training or procurement outside of NATO or EU frameworks.	Notes to parliament from the Dutch minister of Defense (2012-2019)[14]
Economic	Measurement of the degree to which the Netherlands and Country X value the principles of free trade	Regulatory regimes concerning domestic business, labor, and monetary regulation, as well as trade, investment, and finance regulations	Economic Freedom Index[15]
Judicial	Measurement of distance between the degree to which the Netherlands and Country X subscribe to liberal democratic principles.	Level of electoral democracy and effective checks and balances on executive power	V-DEM Liberal democracy index (v2x_libdem)[16]

5.1 Domains

5.1.1 Political

Political compatibility operationalizes the distance between the Netherlands' and Country X's values as expressed through diplomatic venues. This is done by combining data relating to the two countries' annual voting records in the United Nations' General Assembly (UNGA) and data relating instances of shared membership of international organizations (IGOs) and dyadic diplomatic representation. These respectively tend towards operationalizing foreign policy preferences and ideational values, but - as these are (in almost all cases) closely connected - largely get at the same phenomenon. UNGA voting behavior accounts for 1/3 of a country's political compatibility score, while political bandwidth accounts for the remaining 2/3, as it incorporates two indicators (IGO membership and diplomatic representation).

To operationalize UNGA voting behavior, we use Bailey et al.'s data on ideal voting points.[17] This dataset aggregates voting trends within the UNGA on an annual basis and

---

[14] Tweede Kamer der Staten-Generaal, "Kamerstukken in Dossier 33279," Overheid.nl, October 1, 2019, https://zoek.officielebekendmakingen.nl/dossier/33279.

[15] Terry Miller et al., "2019 Index of Economic Freedom" (The Heritage Foundation, 2019), https://www.heritage.org/index/download.

[16] Michael Coppedge et al., "V-Dem Country-Year Dataset V9" (Varieties of Democracy (V-Dem) Project, 2019), https://www.v-dem.net/en/data/data-version-9/.

[17] Bailey, Strezhnev, and Voeten, "Estimating Dynamic State Preferences from United Nations Voting Data."

gauges general compatibility between countries worldwide. This measurement thus proxies for similarities or differences in foreign policy preferences because it normalizes against a non-moving target, ensuring that yearly variations can be attributed to a shift in either the Netherlands' or Country X's preferences. Political compatibility as captured through UNGA voting behavior was calculated at the country level and on a year-by-year basis and spans the years 1996-2018. The difference between the Netherlands' and Country X's "ideal point" voting average for any given year was normalized against all other countries' scores in the same year, and assigned a score ranging between 0 and 1. The country with the biggest distance within any given year received a value of 0, while the country with the lowest distance of the year receives a value of 1. Finally, the normalized values were multiplied by 1/3 to account for the partial representation of UNGA voting behavior in political compatibility.

The second indicator to approximate political compatibility is the Diplomatic Bandwidth of the Netherlands and Country X. Diplomatic bandwidth looks at shared membership of IGOs and the level of diplomatic representation. Due to the Netherlands' documented interest in maintaining a high degree of international cooperation, this addition improves the index's capacity to capture state position vis-a-vis foreign policy preferences. The index operationalizes the size of the relationship between the two countries in one value.[18] As is also the case with UNGA voting data, data pertaining to share IGO membership was normalized at the country level on a year-by-year basis, spanning the years 1996-2018. As political bandwidth is already expressed in relation to the Netherlands, the distance between the Netherlands and Country X does not need to be calculated. For that reason, the original values were normalized between 0 and 1 on a year-by-year basis, with the result being that the country with the lowest score in political bandwidth in a year receives a value of 0. The country with the highest score in political bandwidth in a year receives a value of 1. The normalized values were subsequently multiplied by 2/3.

The final step is to add the two indicators together to calculate a country's political compatibility with the Netherlands on a year-by-year basis.

5.1.2 Military
Our military compatibility indicator operationalizes the degree to which the Netherlands and Country X cooperate militarily. The variable is operationalized through three distinct metrics; namely: a.) NATO and/or EU membership, b.) the depth of formalized cooperation, and c.) instances of shared training and/or procurement. These account for 1/2, 1/3, and 1/6 of a country's total military compatibility within a given year respectively. All data within military compatibility was hand-coded on the basis of the sources outlined in Table 3 below. Values within military compatibility are

---

[18] Jonathan Moyer D., Tim Sweijs, and Hugo van Manen, "Appendix to Interdependence and Power in a Globalized World," Working paper (Frederick S. Pardee Center for International Futures, December 2017), 17–20, https://pardee.du.edu/appendix-interdependence-and-power-globalized-world.

not normalized based on a difference in distance calculation because we assume that a higher degree of cooperation is automatically indicative of a higher degree of compatibility.

Table 3 - List of source material used for military compatibility

Type of Cooperation	Description	Source
NATO and/or EU membership	Membership of NATO *or* EU after 2009.	EU[19] and NATO[20] websites
Depth of formalized cooperation	Count of number of NATO centers of excellence in which the Netherlands and Country X share membership.	NATO Center of Excellence websites[21]
	Count of number of other (non-EU or NATO) multilateral military platforms (e.g. MNFP) in which the Netherlands and Country X share membership	Notes to parliament from the Dutch minister of Defense (2012-2019)[22]
Instances of shared training and/or procurement	Count of instances of procurement cooperation (e.g. buying marine vessels together with Belgium)	
	Counts of instances of cooperation vis-a-vis training exercises, training ranges, etc.	

Starting with NATO and/or EU membership, this was coded on a year-by-year basis and accounts for 1/2 of a country's military compatibility score in any given year. Countries were awarded a score of 1 for all years in which they were registered members of NATO, or for all years post-2009 in which they were registered member of the EU. Countries which met neither of these criteria in any given year were awarded a 0. The 2009 EU cutoff year was applied because the Lisbon Treaty's mutual defense clause did not go into effect until that year,[23] meaning that the EU did not facilitate formal defense cooperation prior to 2009.[24] Post-2009, both institutions institutionalize military cooperation by committing countries to come to one-another's aid in the event of

---

[19] European Commission, "From 6 to 28 Members."
[20] NATO, "Member Countries."
[21] NATO, "Centres of Excellence."
[22] Tweede Kamer der Staten-Generaal, "Kamerstukken in Dossier 33279."
[23] Publications Office of the EU, "Collective Defence," EUR-Lex, accessed December 17, 2019, https://eur-lex.europa.eu/summary/glossary/collective_defence.html.
[24] Publications Office of the EU.

external aggression.[25] Shared membership of both organizations does not result in a higher score because their function vis-a-vis this sub variable's function ('Is a form of formalized cooperation present?') are considered redundant. Annual country scores were assigned a weight of 1/2.

The depth of formalized cooperation was operationalized on the basis of intelligence sharing, coordination through NATO Centers of Excellence (COEs), or coordination through other military cooperation platforms on the one hand, and instances of shared training and/or procurement on the other. These components respectively account for 1/3 and 1/6 of a country's total military compatibility score in any given year (1/2 total). Depth of formalized cooperation as operationalized through instances of intelligence sharing, coordination through NATO Centers of Excellence (COEs), or coordination through other military cooperation platforms is an expression of shared organization membership. The subcomponent of military compatibility was calculated by counting the number of organizations and/or NATO COEs in which the Netherlands and Country X boast shared membership in any given year. All organizations and/or NATO COEs were awarded the same weight; every instance of shared membership awarded a country a 1 starting in the year that it or the Netherlands joined the relevant COE. Annual country tallies were normalized by dividing all scores in any given year by the highest score attained in that year, with the result being a data series in which the maximum possible score is 1. Annual country scores were subsequently multiplied by 1/3.

Instances of shared training and/or procurement were normalized in the same manner and accorded a weight of 1/6 of total military compatibility. Notes to Dutch Parliament between 2012 and 2019 were hand coded, with each instance of shared procurement or a training exercise awarding involved countries a 1. No distinction was made between types of training exercises and/or type (and size, complexity, etc.) of shared procurement. Annual country scores were subsequently tallied and normalized using the same principle outlined in the previous subcomponent, meaning that all values were divided by the highest attained value in any given year.

Adding these scores together then gives a country's score per year. The sum of all sub variables makes up the total score of each country in military compatibility.

5.1.3 Economic

Economic compatibility operationalizes the distance between the Netherlands' policies vis-à-vis free trade and those of Country X. This was done by compiling country-year scores for several of the indices used within the Economic Freedom Index which - due to the index's decidedly libertarian leanings - penalize countries on the basis of number

---

[25] For NATO, see: NATO, "Collective Defence - Article 5," NATO Topics, November 25, 2019, https://www.nato.int/cps/en/natohq/topics_110496.htm; For the EU, see: Publications Office of the EU, "Collective Defence."

of restrictive policies enacted by policy area. The DFRI therefore incorporates only the Economic Freedom Index's data relating to domestic business, labor, and monetary regulation, as well as trade, investment, and finance regulations while excluding those relating to government size (government spending, fiscal health and tax burden) and rule of law (property rights, judicial effectiveness, government integrity).[26] This selection tends away from the decisively libertarian undertone present in the Economic Freedom Index and includes only those aspects that can be considered to align with Dutch values. These sub-indicators are assigned equal weight. The distance of each country's score from the Netherlands in the total sum of all sub-indicators is normalized between 0 and 1 on a year-by-year basis. This results in the country with the lowest economic similarity to the Netherlands in a given year receiving a value of 0, and the country with the highest economic similarity receiving a value of 1.

5.1.4 Judicial

Compatibility in the judicial domain is geared towards operationalizing the distance between the degree to which the Netherlands and Country X subscribe to the principle of liberal democracy. The data leveraged to construct this variable was derived from the liberal democracy index (v2x_libdem) of the Varieties of Democracy (V-DEM) project published by the University of Gothenburg,[27] which incorporates data relating to the effective rule of law, judicial independence and other checks and balances which serve to protect civil liberties and limit executive power. Additionally, the level of electoral democracy is incorporated. V-DEM compiles this data from a wide range of sources.[28]

The values were transformed by calculating the difference between the Netherlands' score and that of Country X of V-DEM's v2x_libdem index. The resulting annual country scores were subsequently normalized between 0 and 1 on a year-by-year basis. A value of 0 indicates that the country is furthest away from the Dutch score, while a value of 1 implies that the country is closest to the Netherlands in the liberal democracy index and therefore, indicates that it shares and strives for the same values as the Netherlands.

---

[26] Terry Miller et al., "2019 Index of Economic Freedom: Methodology" (The Heritage Foundation, 2019), https://www.heritage.org/index/download.
[27] Coppedge et al., "V-Dem Country-Year Dataset V9."
[28] Michael Coppedge et al., "V-Dem Codebook V9" (Varieties of Democracy (V-Dem) Project, 2019), https://www.v-dem.net/media/filer_public/e6/d2/e6d27595-9d69-4312-b09f-63d2a0a65df2/v-dem_codebook_v9.pdf.

6 Caveats and Changes Since Previous Iteration

6.1 General Caveats

Several limitations apply to this methodology in terms of data completeness. For numerous countries in the world, it is not possible to collect complete data for each individual metrics over the entire time frame. Three such scenarios occurred and were handled: in the first case, a data series was missing at the beginning or end of the time series. In such an event, the last known value was taken. In concrete terms, this means that a simple moving average method was applied to extrapolate missing datapoints occurring within the DFRI's extremities. In the second case, data in the middle of a series could be missing. In these cases, a linear approximation was applied to extrapolate the missing data point, although never for more than three subsequent years. Finally, there are cases in which the data series as a whole is missing. In such a case, the compatibility or relevance for that particular domain is simply not calculated. In these cases, countries are omitted from the macro-level analysis. This occurs more frequently in compatibility, largely because it uses a larger number of different metrics and because some compatibility metrics measure normative elements (such as liberal democracy) rather than empirical quantities.

Countries were also removed from the dataset as a result of data sparsity, as a result of not being recognized by the United Nations, or as a result of presiding over populations of less than 500,000 in 2010. Somalia was also manually filtered out due to inaccurate data points. All in all, this results in a total of 125 countries for which complete compatibility data is available and 159 for which data is available in at least one year. For relevance, 149 countries had complete data availability and 162 with at least one year. The total number of countries for which data was available in both metrics amounted to 115 for all years and 157 for at least one year. For a comprehensive list of countries and their division into regions see Annex A.

Specific conceptual caveats apply to specific indicators. Importantly, UNGA voting behavior (used in political compatibility) can only indicate political preferences to a limited extent. The GA is not the most authoritative venue for intergovernmental political decision making, a role which is fulfilled by the Security Council. Furthermore, strategic voting may impact the representativeness of final results. However, while the UNGA's resolutions rarely produce real policies on important issues, it does function as a key venue through which states can express their opinions on global issues. UNGA voting cohesion is also frequently used in academic studies for this purpose.[29]

---

[29] Bailey, Strezhnev, and Voeten, "Estimating Dynamic State Preferences from United Nations Voting Data"; Michael A. Bailey and Erik Voeten, "A Two-Dimensional Analysis of Seventy Years of United Nations Voting," *Public Choice* 176 (2018): 3355, https://doi.org/10/gdw7kx; Madeleine O. Hosli et al., "Voting Cohesion in the United Nations General Assembly: The Case of the European Union" (ECPR Fifth Pan-European Conference, Porto, Portugal, 2010); Muhittin Kaplan, Abdullah Yuvacı, and Amanov Shatlyk, "One Nation, Many Voices? External Cohesion of the Turkic Council States in the United Nations General Assembly, 1993-2011," *Bilig - Turk DunyasI Sosyal Bilimler Dergisi* 74 (May 2015): 125–49; Kaplan, Yuvacı, and Shatlyk; Ulf Jakobsson, "An International Actor Under Pressure: The Impact of the War on

Another caveat applies to military compatibility. While conceptually important, we were unable to provide an effective overview of operational cooperation in the field and therefore decided to exclude it from this indicator. Simply including all nations which have been on the same side as the Netherlands in international conflicts would reduce the saliency of this indicator as it would include many nations with minor contributions to large missions, without directly cooperating with Dutch forces. We hope to be able to include this factor in a future iteration of the DFRI.

Lastly, the bilateral trade data included in economic relevance is susceptible to external intervening variables which were not corrected for. Two major factors are oil prices and currency exchange rates. Fossil fuels have a significant impact on overall trade volume when expressed in currency. Particularly large exporters of these fuels are affected by this (notably Russia). During a fall in oil prices, the amount of goods traded with Russia might remain the same, as well as its importance to Dutch energy needs, but its economic relevance would still decline due to reduced prices.

Currency exchange rates have a similar effect on trade volume. If the euro's exchange rate to the dollar is reduced due to market fluctuations, the Netherlands' trade volume with the United States rises proportionately, as the same products become more expensive from the Netherlands' perspective. We aim to correct for these fluctuations in future iterations of the DFRI.

6.2 Changes Since Previous Iteration (2017)

Since the original installment of the DFRI was published in 2017, HCSS has worked to update and improve it. The new version published here is the result of that effort. There are a few key differences in how the Index is constructed and how the data was treated. Specifically, several changes were made to the categories, the data selection, and the way the data was manipulated. These changes are explicitly outlined below.

Firstly, the initial installment of the DFRI's division into domains was overhauled because of issues with the operationalization of the 'Energy & Environment' domain. While this domain is clearly important and is mentioned explicitly in the Dutch foreign policy papers pointed out in the introduction, adequate proxies could not be found. The operationalization of this domain in the previous iteration was found problematic. HCSS will continue to improve on this Index and hopes to be able to include an improved version of this domain in a future iteration. Additionally, the 'Democracy & Human Rights' domain has been reimagined, using a different proxy and data source. To better reflect its purpose, it was renamed to 'Judicial'.

Terror and the Fifth Enlargement on EU Voting Cohesion at the UN General Assembly 2000-05," *Journal of Common Market Studies* 47, no. 3 (2009): 532–54, https://doi.org/10/dhzbqs.

Secondly, a number of domains' proxies and data sources were changed to more suitable alternatives. As mentioned above, this was the case for the re-branded judicial domain. Additionally, military compatibility was reconstructed with more indicators, derived from a larger body of sources (Dutch government, diplomatic and NATO documents) to improve the data granularity over time and to provide a more complex reflection of Dutch military cooperation.

Lastly, three of the source datasets were collected differently due to the limited availability of their original sources. Economic relevance (measured through bilateral trade volume) now includes all bilateral trade (as the disappearance of the energy & environment domain made the exclusion of energy-related trade illogical) and is collected directly from UN Comtrade rather than from the Observatory of Economic Complexity, as the latter's dataset does not extend beyond 2016. Political and military relevance use the Frederick S. Pardee Center for International Futures' Global Influence and Global Power Indexes, respectively. Both do not extend beyond 2016. To make up for this lacking data, these were extrapolated up to 2018 in accordance with methods outlined in the previous chapters.

7 Works Cited

Bailey, Michael A., Anton Strezhnev, and Erik Voeten. "Estimating Dynamic State Preferences from United Nations Voting Data." *Journal of Conflict Resolution* 61, no. 2 (2017): 430–56. https://doi.org/10/f9pzwz.

Bailey, Michael A., and Erik Voeten. "A Two-Dimensional Analysis of Seventy Years of United Nations Voting." *Public Choice* 176 (2018): 3355. https://doi.org/10/gdw7kx.

Blok, Stef. "Wereldwijd Voor Een Veilig Nederland - Geïntegreerde Buitenland- En Veiligheidsstrategie 2018-2022." The Netherlands Ministry of Foreign Affairs, March 19, 2018. https://www.rijksoverheid.nl/documenten/rapporten/2018/03/19/notitie-geintegreerde-buitenland--en-veiligheidsstrategie-gbvs.

Coppedge, Michael, John Gerring, Carl Henrik Knutsen, Staffan I. Lindberg, Jan Teorell, David Altman, Michael Bernhard, et al. "V-Dem Codebook V9." Varieties of Democracy (V-Dem) Project, 2019. https://www.v-dem.net/media/filer_public/e6/d2/e6d27595-9d69-4312-b09f-63d2a0a65df2/v-dem_codebook_v9.pdf.

———. "V-Dem Country-Year Dataset V9." Varieties of Democracy (V-Dem) Project, 2019. https://www.v-dem.net/en/data/data-version-9/.

European Commission. "From 6 to 28 Members." Text. European Neighbourhood Policy And Enlargement Negotiations, December 6, 2016. https://ec.europa.eu/neighbourhood-enlargement/policy/from-6-to-28-members_en.

Hellema, Duco. *Nederland in de Wereld.* Amsterdam: Spectrum, 2014.

Hosli, Madeleine O., Evelyn van Kampen, Frits Meijerink, and Katherine Tennis. "Voting Cohesion in the United Nations General Assembly: The Case of the European Union." Porto, Portugal, 2010.

Jakobsson, Ulf. "An International Actor Under Pressure: The Impact of the War on Terror and the Fifth Enlargement on EU Voting Cohesion at the UN General Assembly 2000-05." *Journal of Common Market Studies* 47, no. 3 (2009): 532–54. https://doi.org/10/dhzbqs.

Kaplan, Muhittin, Abdullah Yuvacı, and Amanov Shatlyk. "One Nation, Many Voices? External Cohesion of the Turkic Council States in the United Nations General Assembly, 1993-2011." *Bilig - Turk DunyasI Sosyal Bilimler Dergisi* 74 (May 2015): 125–49.

Miller, Terry, Anthony B. Kim, James M. Roberts, and Patrick Tyrell. "2019 Index of Economic Freedom." The Heritage Foundation, 2019. https://www.heritage.org/index/download.

———. "2019 Index of Economic Freedom: Methodology." The Heritage Foundation, 2019. https://www.heritage.org/index/download.

Moyer, Jonathan D., Tim Sweijs, Mathew J. Burrows, and Hugo van Manen. "Power and Influence in a Globalized World." Washington, DC: Atlantic Council, Frederick S. Pardee Center for International Futures and HCSS, January 2018. https://www.atlanticcouncil.org/images/Power_and_Influence_.pdf.

Moyer, Jonathan, D., Tim Sweijs, and Hugo van Manen. "Appendix to Interdependence and Power in a Globalized World." Working paper. Frederick S. Pardee Center for International Futures, December 2017. https://pardee.du.edu/appendix-interdependence-and-power-globalized-world.

NATO. "Centres of Excellence." NATO, January 24, 2019. http://www.nato.int/cps/en/natohq/topics_68372.htm.

———. "Collective Defence - Article 5." NATO Topics, November 25, 2019. https://www.nato.int/cps/en/natohq/topics_110496.htm.

———. "Member Countries." NATO, May 14, 2019. http://www.nato.int/cps/en/natohq/topics_52044.htm.

Publications Office of the EU. "Collective Defence." EUR-Lex. Accessed December 17, 2019. https://eur-lex.europa.eu/summary/glossary/collective_defence.html.

Tweede Kamer der Staten-Generaal. "Kamerstukken in Dossier 33279." Overheid.nl, October 1, 2019. https://zoek.officielebekendmakingen.nl/dossier/33279.

United Nations. "Download Trade Data." UN Comtrade Database, 2019. https://comtrade.un.org/data/.

Voorhoeve, Joris J. C. *Peace, Profits and Principles: A Study of Dutch Foreign Policy.* The Hague: M. Nijhoff, 1979.

"Wereldwijd Voor Een Veilig Nederland: Geïntegreerde Buitenland- En Veiligheidsstrategie 2018-2022." The Hague: Ministerie van Buitenlandse Zaken, 2018. https://www.rijksoverheid.nl/documenten/rapporten/2018/03/19/notitie-geintegreerde-buitenland--en-veiligheidsstrategie-gbvs.

Wijk, Rob de, Paul Sinning, Willem Oosterveld, and Tim Sweijs. "Een Kompas Voor Een Wereld in Beweging." The Hague: The Hague Centre For Strategic Studies, February 27, 2017. https://hcss.nl/report/een-kompas-voor-een-wereld-beweging.

Annex 1

Table 4 - All included countries, division into regions and number of years for which data is available (1996-2018; total of 23 years)

Country	Regions	Total Relevance	Total Compatibility	Total Aggregate
Armenia	CIS+	23	23	23
Azerbaijan	CIS+	23	23	23
Belarus	CIS+	23	23	23
Georgia	CIS+	23	23	23
Kazakhstan	CIS+	23	21	21
Kyrgyz Republic	CIS+	23	21	21
Moldova	CIS+	23	23	23
Russian Federation	CIS+	23	23	23
Tajikistan	CIS+	23	21	21
Turkmenistan	CIS+	23	21	21
Ukraine	CIS+	23	23	23
Uzbekistan	CIS+	23	21	21
Australia	East Asia & Pacific	23	23	23
Cambodia	East Asia & Pacific	23	22	22
China	East Asia & Pacific	23	23	23
Fiji	East Asia & Pacific	23	23	23
Hong Kong SAR, China	East Asia & Pacific	4	0	0
Indonesia	East Asia & Pacific	23	23	23
Japan	East Asia & Pacific	23	23	23
Korea, Rep.	East Asia & Pacific	23	23	23
Laos	East Asia & Pacific	4	23	4
Malaysia	East Asia & Pacific	23	23	23
Mongolia	East Asia & Pacific	23	23	23
Myanmar	East Asia & Pacific	23	23	23
New Zealand	East Asia & Pacific	23	23	23
North Korea	East Asia & Pacific	23	23	23
Papua New Guinea	East Asia & Pacific	23	18	18
Philippines	East Asia & Pacific	23	23	23
Singapore	East Asia & Pacific	23	23	23
Solomon Islands	East Asia & Pacific	23	10	10
Thailand	East Asia & Pacific	23	23	23
Timor-Leste	East Asia & Pacific	17	10	10
Vietnam	East Asia & Pacific	23	23	23
Albania	Europe	23	23	23
Austria	Europe	23	23	23
Belgium	Europe	23	23	23
Bosnia and Herzegovina	Europe	23	21	21
Bulgaria	Europe	23	23	23
Croatia	Europe	23	23	23
Cyprus	Europe	23	23	23
Czechia	Europe	23	23	23
Denmark	Europe	23	23	23
Estonia	Europe	23	23	23
Finland	Europe	23	23	23
France	Europe	23	23	23
Germany	Europe	23	23	23
Greece	Europe	23	23	23
Hungary	Europe	23	23	23
Ireland	Europe	23	23	23
Italy	Europe	23	23	23
Latvia	Europe	23	23	23
Lithuania	Europe	23	23	23
Luxembourg	Europe	19	23	19
Montenegro	Europe	13	10	10

North Macedonia	Europe	23	17	17
Norway	Europe	23	23	23
Poland	Europe	23	23	23
Portugal	Europe	23	23	23
Romania	Europe	23	23	23
Serbia	Europe	13	0	0
Slovak Republic	Europe	23	23	23
Slovenia	Europe	23	23	23
Spain	Europe	23	23	23
Sweden	Europe	23	23	23
Switzerland	Europe	23	17	17
Turkey	Europe	23	23	23
United Kingdom	Europe	23	23	23
Argentina	Latin America & Caribbean	23	23	23
Bolivia	Latin America & Caribbean	23	23	23
Brazil	Latin America & Caribbean	23	23	23
Chile	Latin America & Caribbean	23	23	23
Colombia	Latin America & Caribbean	23	23	23
Costa Rica	Latin America & Caribbean	23	23	23
Cuba	Latin America & Caribbean	23	23	23
Dominican Republic	Latin America & Caribbean	23	23	23
Ecuador	Latin America & Caribbean	23	23	23
El Salvador	Latin America & Caribbean	23	23	23
Guatemala	Latin America & Caribbean	23	23	23
Guyana	Latin America & Caribbean	23	23	23
Haiti	Latin America & Caribbean	23	23	23
Honduras	Latin America & Caribbean	23	23	23
Jamaica	Latin America & Caribbean	23	23	23
Mexico	Latin America & Caribbean	23	23	23
Nicaragua	Latin America & Caribbean	23	23	23
Panama	Latin America & Caribbean	23	23	23
Paraguay	Latin America & Caribbean	23	23	23
Peru	Latin America & Caribbean	23	23	23
Suriname	Latin America & Caribbean	23	23	23
Trinidad and Tobago	Latin America & Caribbean	23	23	23
Uruguay	Latin America & Caribbean	23	23	23
Venezuela	Latin America & Caribbean	23	23	23
Algeria	MENA	23	23	23

Bahrain	MENA	23	17	17
Djibouti	MENA	23	22	22
Egypt, Arab Rep.	MENA	23	23	23
Iran	MENA	23	23	23
Iraq	MENA	23	2	2
Israel	MENA	23	23	23
Jordan	MENA	23	23	23
Kuwait	MENA	23	23	23
Lebanon	MENA	13	23	13
Libya	MENA	23	19	19
Morocco	MENA	23	23	23
Oman	MENA	23	23	23
Qatar	MENA	23	20	20
Saudi Arabia	MENA	23	23	23
Syria	MENA	23	19	19
Tunisia	MENA	23	23	23
UAE	MENA	23	23	23
Yemen	MENA	23	0	0
Canada	North America	23	23	23
United States	North America	23	23	23
Afghanistan	South Asia	23	2	2
Bangladesh	South Asia	23	23	23
Bhutan	South Asia	23	10	10
India	South Asia	23	23	23
Nepal	South Asia	23	23	23
Pakistan	South Asia	23	23	23
Sri Lanka	South Asia	23	23	23
Angola	Sub-Saharan Africa	23	20	20
Benin	Sub-Saharan Africa	23	23	23
Botswana	Sub-Saharan Africa	19	23	19
Burkina Faso	Sub-Saharan Africa	23	23	23
Burundi	Sub-Saharan Africa	23	19	19
Cameroon	Sub-Saharan Africa	23	23	23
CAR	Sub-Saharan Africa	23	16	16
Chad	Sub-Saharan Africa	23	22	22
Comoros	Sub-Saharan Africa	23	10	10
Congo, Dem. Rep.	Sub-Saharan Africa	23	17	17
Congo, Rep.	Sub-Saharan Africa	23	23	23
Côte d'Ivoire	Sub-Saharan Africa	23	23	23
Equatorial Guinea	Sub-Saharan Africa	23	20	20
Eritrea	Sub-Saharan Africa	23	10	10
Eswatini	Sub-Saharan Africa	19	23	19
Ethiopia	Sub-Saharan Africa	23	23	23
Gabon	Sub-Saharan Africa	23	23	23
Gambia, The	Sub-Saharan Africa	23	22	22
Ghana	Sub-Saharan Africa	23	23	23
Guinea	Sub-Saharan Africa	22	22	22
Guinea-Bissau	Sub-Saharan Africa	0	20	0
Kenya	Sub-Saharan Africa	23	23	23
Lesotho	Sub-Saharan Africa	19	23	19
Liberia	Sub-Saharan Africa	23	10	10
Madagascar	Sub-Saharan Africa	23	23	23
Malawi	Sub-Saharan Africa	23	23	23
Mali	Sub-Saharan Africa	23	23	23
Mauritania	Sub-Saharan Africa	23	23	23
Mauritius	Sub-Saharan Africa	23	20	20
Mozambique	Sub-Saharan Africa	23	23	23
Namibia	Sub-Saharan Africa	19	22	19
Niger	Sub-Saharan Africa	23	23	23
Nigeria	Sub-Saharan Africa	23	23	23
Rwanda	Sub-Saharan Africa	23	22	22
Senegal	Sub-Saharan Africa	23	23	23

Sierra Leone	Sub-Saharan Africa	23	23	23
South Africa	Sub-Saharan Africa	23	23	23
South Sudan	Sub-Saharan Africa	6	0	0
Sudan	Sub-Saharan Africa	23	9	9
Tanzania	Sub-Saharan Africa	23	23	23
Togo	Sub-Saharan Africa	23	20	20
Uganda	Sub-Saharan Africa	23	23	23
Zambia	Sub-Saharan Africa	23	23	23
Zimbabwe	Sub-Saharan Africa	23	23	23