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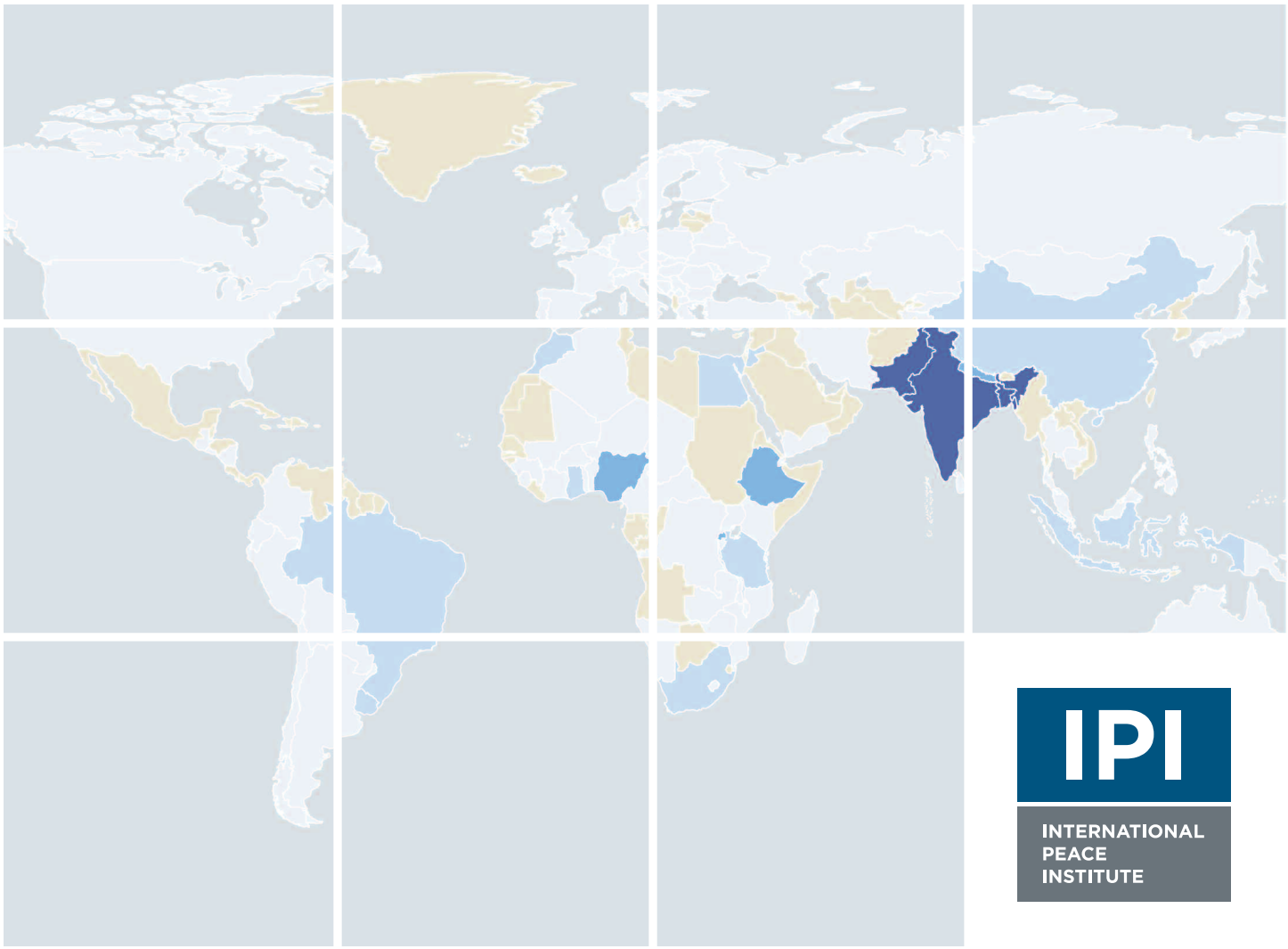
Trends in Uniformed Contributions to UN Peacekeeping: A New Dataset, 1991–2012

PROVIDING FOR PEACEKEEPING NO. 3

CHRIS PERRY and ADAM C. SMITH



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Cover Image: Chloropleth map ("heat map") of uniformed contributions to UN peacekeeping missions in December 2012. IPI Peacekeeping Database/Chris Perry.

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Providing for Peacekeeping is an independent research project established to broaden the understanding of the factors and motivations that encourage or discourage states from contributing to UN peacekeeping operations. Its aim is to generate and disseminate current information and analysis to support efforts to "broaden the base" of troop- and police-contributing countries, improve the quality of troop and police contributions, and fill key capability gaps.

The project is undertaken in partnership with Griffith University and the Elliott School of International Affairs at George Washington University. IPI owes a debt of gratitude to its partners and to its generous donors whose contributions make projects like this possible.

CONTENTS

Introduction

Since the creation of the United Nations Truce Supervision Organization (UNTSO) in 1948, United Nations peace operations have been an integral component of the quest for international peace and security. Sixty-seven operations have been conducted (fifteen ongoing as of June 2013) in forty-two countries over the course of six and a half decades.[1] In that time, UN member states have invested a tremendous amount of resources in terms of blood and treasure. In all, 3,108 UN peacekeeping personnel have died in the line of duty,[2] and more than $90 billion has been spent on the entire enterprise.[3]

With such expense and sacrifice has come significant achievement. Despite the difficulty inherent in isolating the effects of UN peacekeeping, scholars have provided convincing evidence of peacekeepers' effectiveness in reducing the risk of a return to armed conflict.[4] Many countries that have hosted UN peacekeeping operations, such as Cambodia, El Salvador, Liberia, Mozambique, Namibia, and Sierra Leone, continue to stand out as success stories.

Yet despite the tremendous and continuing efforts associated with UN peacekeeping operations, it remains difficult to build a sound evidence base with which to research basic questions associated with their composition and overall impact. Specifically, the full range of available data on uniformed contributions to UN peacekeeping has not been readily available to researchers, limiting the use of quantitative methods on questions related to UN peacekeeping.

There is currently no publicly available and searchable database offering all available statistics on uniformed contributions (troops, military observers and experts, and police) to UN peacekeeping since 1990.[5] Over the last few years, DPKO has improved access to historical information on uniformed contributions.[6] At present, DPKO documentation of monthly contribution levels is available from November 1990 and is regularly updated. This data is disaggregated by mission and by troop- and police-contributing country (TCC/PCC). However, it is not available as a single dataset. Rather it comes in the form of monthly electronic PDF files in a variety of formats. Further, while some of these documents present contributions in a tabular format necessary for electronic extraction into a spreadsheet application, earlier ones are either non-tabular or are grainy images of photocopied documents.[7] This has made analysis of the full span of data extremely difficult.

The IPI Peacekeeping Database, developed by the International Peace Institute, fills this gap. The database was constructed as part of the Providing for Peacekeeping Project (PPP), an ongoing research initiative hosted by IPI and managed in partnership with George Washington University's Elliott School of International Affairs and Griffith University. A central focus of the project is to analyze the factors that encourage or discourage states from contributing to UN peacekeeping operations.[8] The project's aim is to generate and disseminate current information and analysis to support efforts to "broaden the base" of troop- and police-contributing countries, improve the quality of troop and police contributions, and fill key capability gaps. The IPI Peacekeeping Database, along with thematic and country-specific analysis, can be accessed at PPP's website www.providingforpeacekeeping.org.

This report describes the new database and focuses on a number of key findings from the data regarding overall trends in uniformed contribu-

1 See UN Department of Peacekeeping Operations (DPKO), "Past Peacekeeping Operations," available at www.un.org/en/peacekeeping/operations/past.shtml .

2 See DPKO, "Fatalities by Year," (as of May 10, 2013) available at www.un.org/en/peacekeeping/fatalities/documents/stats_1.pdf .

3 This figure includes only the UN's assessed peacekeeping budget over that period and does not include the significant additional costs incurred by some troop- and police-contributing countries beyond what they receive in troop and equipment reimbursements.

4 See Virginia Page Fortna, *Does Peacekeeping Work? Shaping Belligerents' Choices After Civil War* (Princeton, NJ: Princeton University Press, 2008), and Michael Doyle and Nicholas Sambanis, *Making War and Building Peace: United Nations Peace Operations* (Princeton, NJ: Princeton University Press, 2006).

5 The Stockholm International Peace Research Institute's "Multilateral Peace Operations Database" includes yearly data on the composition of UN and non-UN peacekeeping operations; however, the data represent only year-end figures, rather than the more specific month-by-month data. In addition, the database lacks the TCC/PCC-specific contribution levels necessary for analyzing underlying political and organizational dynamics of mission composition. The Center on International Cooperation's *Annual Review of Global Peace Operations* also lacks month-by-month data and is not available to researchers electronically.

6 See DPKO, "Troop and Police Contributors," available at www.un.org/en/peacekeeping/resources/statistics/contributors.shtml .

7 For more information, see the Annex.

8 For more on this subject, see Alex J. Bellamy and Paul D. Williams, eds., *Providing Peacekeepers: The Politics, Challenges and Future of UN Peacekeeping Contributions* (Oxford: Oxford University Press, 2013).

tions to UN peacekeeping. We first highlight the variations in contribution numbers among regions and within subregions over the period from 1991 to 2012. Second, we show a dramatic increase in the number of countries contributing personnel to UN peacekeeping during this period. We also demonstrate that, counterintuitively, contributions of uniformed personnel to UN peacekeeping became much less equally distributed during the same period. There was a strong shift toward relatively fewer countries providing a relatively higher share of the total number of UN peacekeepers. Third, we look at some contribution patterns among individual states and groups of states. We use a variance coefficient to show which countries, in terms of their monthly contribution levels, are more or less predictable providers of peacekeepers. As one test of how a country's troop-contribution levels could be affected by its aspiration for a permanent seat on the UN Security Council, we then divide contributors into four groups—permanent members of the Security Council, self-declared candidates for permanent membership, primary contenders from Africa, and all other TCC/PCCs. The final section outlines our plans for future enhancements to the IPI Peacekeeping Database and offers avenues for new research utilizing this resource. The Annex provides details about how the database was compiled.

The IPI Peacekeeping Database

The IPI Peacekeeping Database tells us which countries have sent their UN peacekeepers where in the post–Cold War period and what kind of uniformed personnel they chose to deploy. Drawing from UN archival records, the IPI Peacekeeping Database presents the first publicly available database of total uniformed personnel contributions of each contributing country (TCC/PCCs) by month, by type (troop, police, or expert/observer), and by mission, from November 1990 to the present. Beginning with November 2009 (the first month this data was made available by the UN), the database includes further disaggregation by sex and by type of police contribution (formed police units or individual police officers). Specifically, the IPI database details the contributions of 147 TCC/PCCs to seventy-three peace operations and related missions each month over the last twenty-three years.[9] The database will be updated on a monthly basis as the UN makes its own data available. This report uses data up to December 2012.

The level of detail of the data included in the database allows for methods of analysis not previously available in the study of UN peacekeeping. It is perhaps most obviously useful for analyzing and testing some of the factors that may influence member states to take an active role in UN peacekeeping efforts and the trends over time of those contributions. The database also has a geospatial component: the geographic location of TCC/PCC capitals and the coordinates for the headquarters of each UN mission are included. Such data makes it possible to assess if a country has been more likely to contribute to missions that are closer to home, for instance.

Trends in Contributions to UN Peacekeeping

REGIONAL TRENDS

The increase in the overall number of UN peacekeepers deployed in the post–Cold War period is well documented. The origin of these peacekeepers and the exact composition of their contributions (troops, observers, and police) are less well known.

As figure 1 exhibits, from 1991 to 2012 there were two separate spikes in troop contributions to UN peacekeeping and, by extension, in peacekeeping deployments. However, figure 2 shows that each significant increase was led by a different set of contributors. The first, short-lived spike began in 1992 and was led primarily by European contributions deployed to the Balkans. Following a period of

9 The list of seventy-three includes a number of "missions" that are not explicitly UN peacekeeping operations. These can be classified as three categories. First are those that play a support role to another UN mission. This includes some specific contributions to the UN logistics base in Brindisi over a two-month period and support to the political and peacebuilding missions of BINUB, BNUB, BONUCA, MICAH, UNAMI, UNIOSIL, UNMA, UNMIN, UNOA, and UNOTIL. Second are those that can be called "gap missions," essentially a DPKO categorization for the transition period between two related missions. This includes both UNFOR and UNPF in the former Yugoslavia. Finally, two "missions" seem to be slight variations of UN peacekeeping operations, specifically ONUCI (the French acronym for UNOCI) and UNAMET (a variation of UNTAET).

Figure 1: Contributions of troops, military observers, and police to UN peacekeeping (1991–2012).

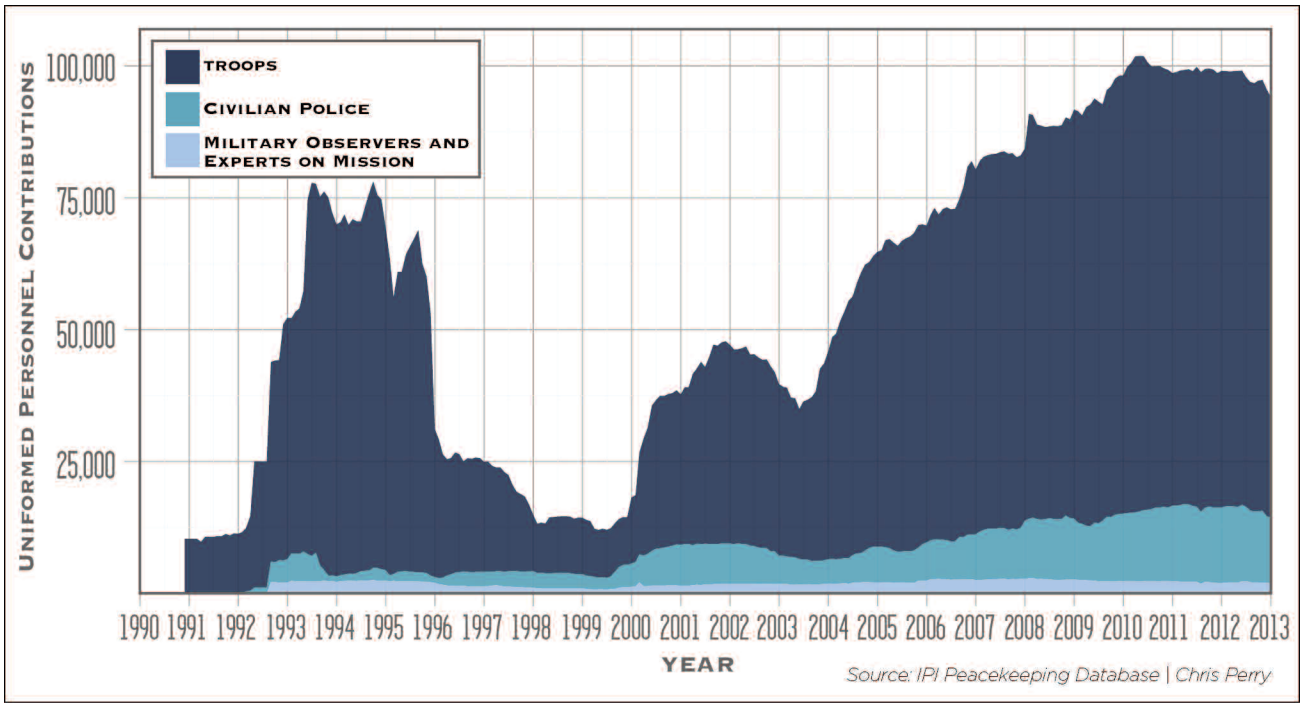
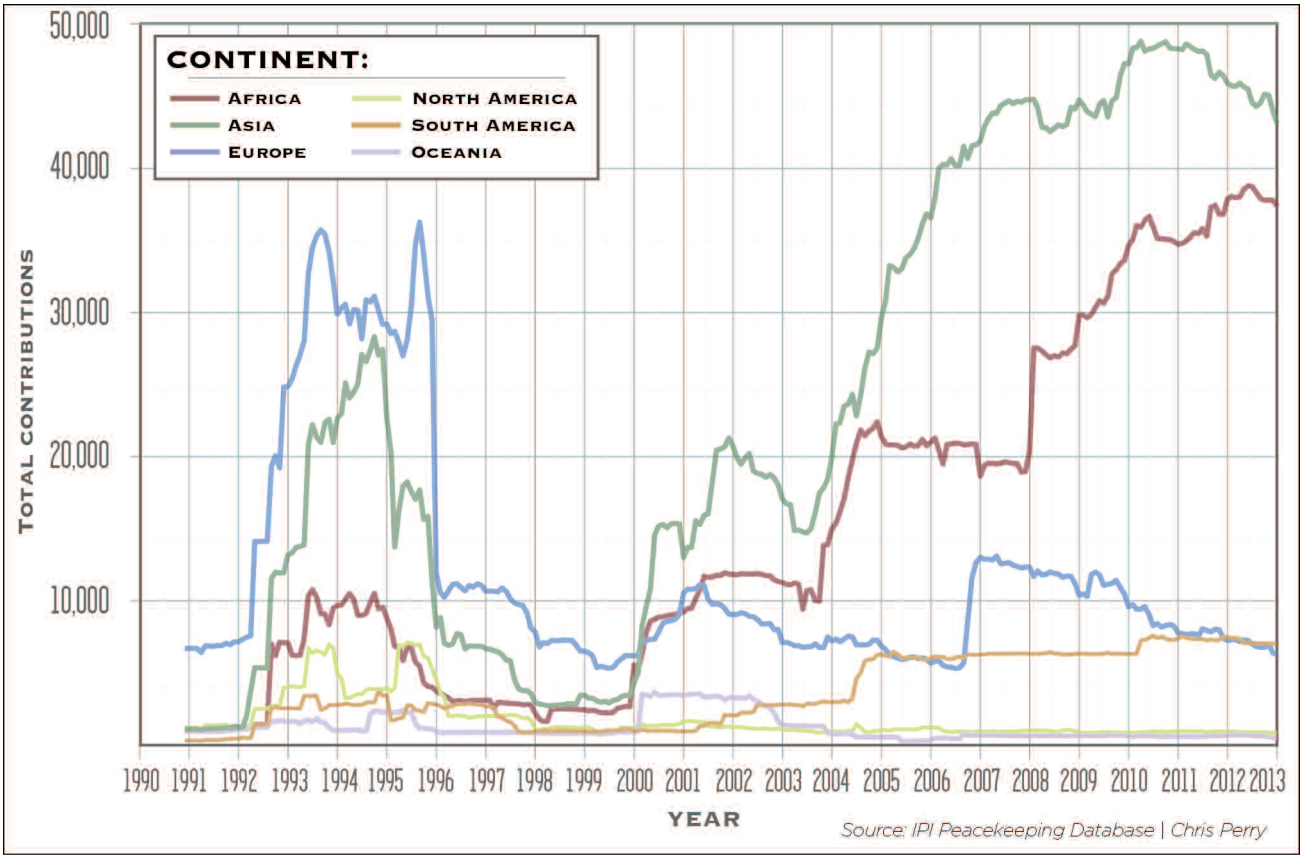


Figure 2: Contributions of uniformed personnel to UN peacekeeping by continent (1991–2012).



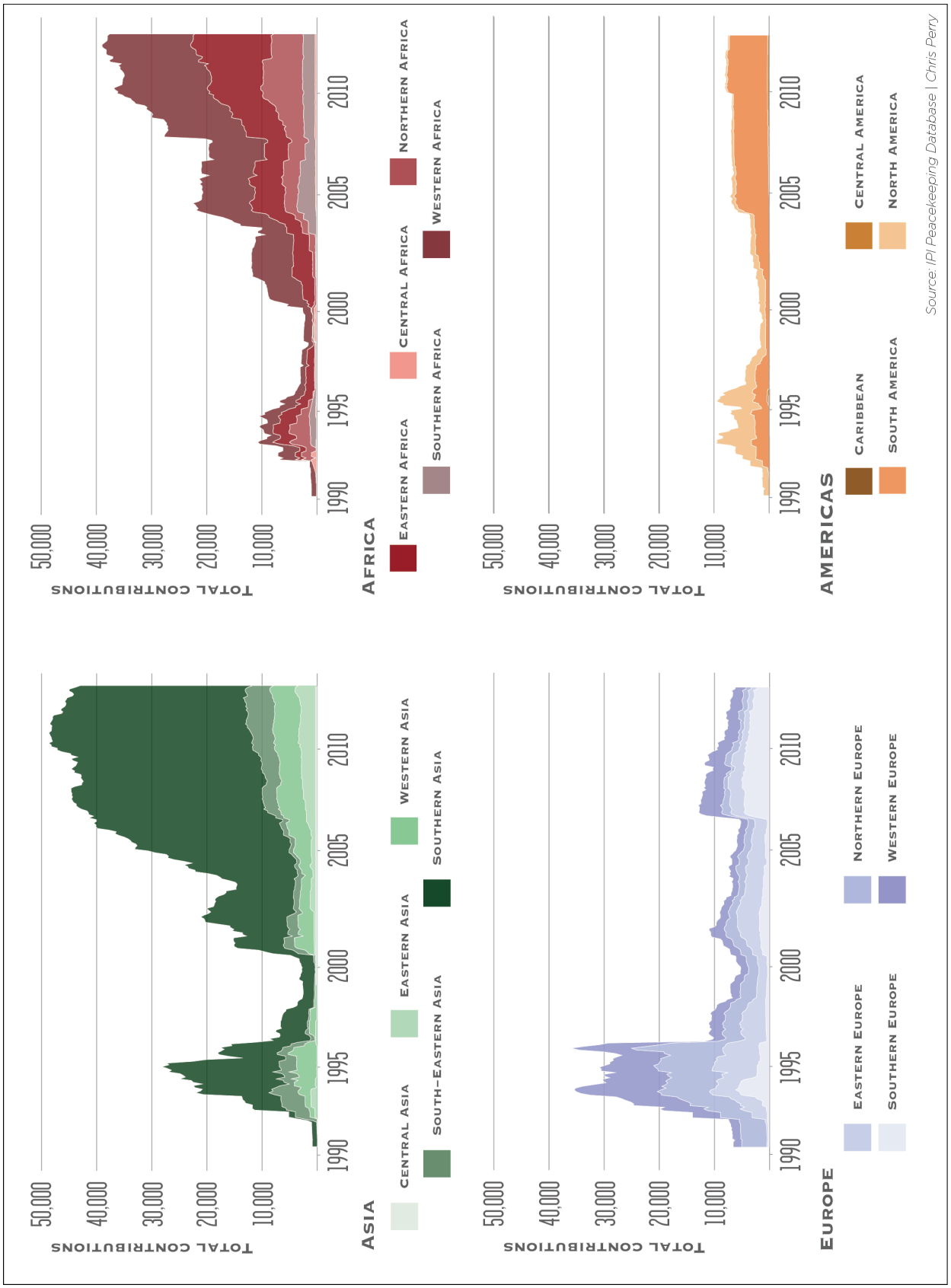


Figure 3: Contributions of uniformed personnel to UN peacekeeping by subregion (1991–2012).

retrenchment from 1996 to 2000, a second wave of UN peacekeeping began that continues to this day. During this most recent period, European contributions have remained low relative to the total. The majority of the increase in uniformed personnel contributions has come instead from countries in Asia and Africa.[10] At the end of 2012, more than 85 percent of UN peacekeepers were Asian or African in origin.

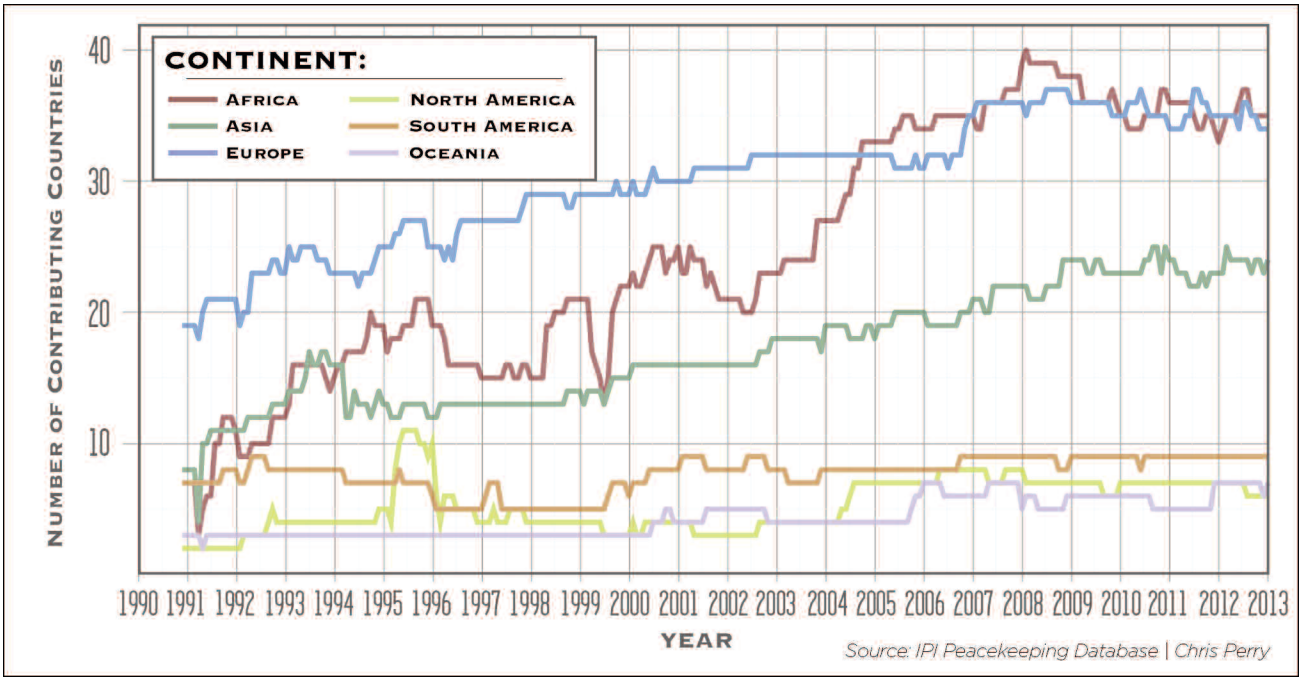
Following a steady decline in European contributions from 2007 to 2012, South America and Europe now provide roughly the same overall number of UN peacekeepers. However, South America's contributions are primarily military, whereas Europe provides more police to UN peacekeeping.

Further geographic disaggregation shows a significant variation in contributions at the regional level (figure 3).[11] In Asia, much of both surges is explained by the significant, continual contributions of a few South Asian countries (Bangladesh, India, Pakistan, and, to a lesser extent, Nepal). In Africa, on the other hand, the subregional spread of contributions is more diffuse. A large portion of Africa's contributions is driven by substantial West African contributions from Ghana and Nigeria. In recent years though, eastern Africa has increased its share, as Rwanda and Ethiopia have contributed more. In Europe, the increase in contributions in 2007 was largely driven by the Spanish, Italian, and Irish contributions to the UN mission in Lebanon (UNIFIL). Finally, South America's contributions also grew quickly in 2004, as Brazil and others took the lead in the UN's mission in Haiti.

BROADENING THE BASE

While the recent increase in African and Asian peacekeepers has been largely driven by significant contributions from relatively few countries (e.g., Nigeria, Rwanda, and Ethiopia; Bangladesh, India, and Pakistan), it has also been affected by an increase in the number of countries contributing UN peacekeepers from these regions. In a fairly short period of time, from 2002 to 2008, the number of African countries contributing to peacekeeping doubled, surpassing the number of European contributors (see figure 4). Asia experienced similar growth in new contributors, although

Figure 4: Number of countries contributing troops and/or police to UN peacekeeping by continent (1991–2012).



10 All continental designations are based on geographic location. Hence, Egypt and Morocco are part of continental Africa, and Russia and Turkey are part of continental Asia.

11 We base subregional categorization on the United Nations Statistical Division's "geographical sub-region" determinations from "Composition of Macro Geographical (Continental) Regions, Geographical Sub-regions, and Selected Economic and Other Groupings," available at http://unstats.un.org/unsd/methods/m49/m49regin.htm .

this increase took a much longer time (from 1998 to 2011, approximately).

Indeed, today many more countries are participating in UN peacekeeping than during the first surge in 1993 (115 countries participated in 2012, compared to the peak of 73 in 1993).[12] In the past five years, however, the number of TCC/PCCs has decreased slightly, down from 119 in 2007. This decrease has occurred despite efforts by DPKO and the UN Department of Field Support to broaden the base of TCC/PCCs. Yet, judging the "breadth" of the base involves more than just counting the number of contributing countries. An analysis of the changing size of each country's contribution over the last five years can show whether the burden of personnel contributions is being shared more equally or less equally.

Although the median level of uniformed contributions did not change significantly over this period (hovering around 100 personnel per country per month), we can use an alternate measure of distribution, the Gini coefficient,[13] to show the relative spread of troop contributions over time (figure 5). A value of 1 would represent a situation in which all troops were provided by a single TCC, and a value of 0 would mean that every TCC contributed the same number of troops. Using this measure, a shift toward a more "narrow" contribution base is evident since 1993—from 0.42 to a peak of 0.79 in 2006. Since 2006, a reverse trend is evident, with contributions becoming slightly more evenly distributed. However, this rate of change toward more equal distribution has been incremental and limited, moving only from 0.79 to 0.74 over six years.

The lower graph in figure 5 shows that this reverse trend has been driven in part by those contributors in the fourth quintile, whose share of total contributions increased slightly over the last six years. This suggests a recent increase in contributions from countries just below the "top-level" TCCs. Another striking feature of the lower graph is the near convergence of the top three quintiles of contributors between 1996 and 1998, which was immediately followed by eight years of continual increase in the top quintile's relative share of contributions. Such a period of convergence could signify the "pivot point" in the shifting composition of UN peacekeeping contributors.

TCC/PCC CONTRIBUTION RATIONALES

One of the primary aims of the IPI Peacekeeping Database is to help researchers better understand the factors that influence countries to contribute to UN peacekeeping. In this respect, the database can be used to illustrate patterns and trends of contributions among individual countries or groups of countries. For instance, we observe that certain countries over this period have held their contribution levels stable (relative to the total authorized number of UN peacekeepers at a given time). In such countries, this continuity may be one indicator that the decision to contribute is not necessarily linked to specific domestic political or foreign-policy developments. Rather, the rationale to contribute may be based more on normative, economic, or institutional factors, which tend to stay more constant. On the other hand, some countries' contributions vary greatly over this period. These swings may indicate that political or security considerations play a greater role in their decision-making calculations.[14]

To determine which countries vary the most relative to their mean contribution levels, we used a relative standard deviation to normalize the data (see figure 6).[15] Ranking the largest fifty TCCs according to this ratio, we find that the United Kingdom and Morocco are the most consistent in terms of their troop contributions and Namibia and Malawi are the least consistent.

In figure 7, the graphs showing the contributions of the United Kingdom and Morocco display a fairly consistent pattern since 2005.[16] In the absence

12 This increase in contributing countries is at least partially attributable to the growth in the overall number of UN member states during that period (e.g., former Soviet republics, Eritrea, and the states of the former Yugoslavia).

13 The Gini coefficient is a measure of the equity of distribution that is typically used to show wealth distribution. A Gini score of 1 represents perfect inequality, where all instances are attributed to a single entity (i.e., contributions of troops). A score of 0 represents perfect equality (i.e., each TCC contributes the same number of troops).

14 Contribution data on their own cannot explain a TCC/PCCs' rationale to contribute; however, such data can be indicative and used to illustrate or test hypotheses about decisions to contribute.

15 The relative standard deviation is the absolute value of the coefficient of variation, which in turn is defined as the ratio of the sample standard deviation to the sample mean.

16 Since the total number of UN peacekeepers fluctuates, the graphs show the ratio of that country's contributions relative to the total number of UN peacekeepers.

Figure 5: Distribution of troop contributions to UN peacekeeping (1991–2012).

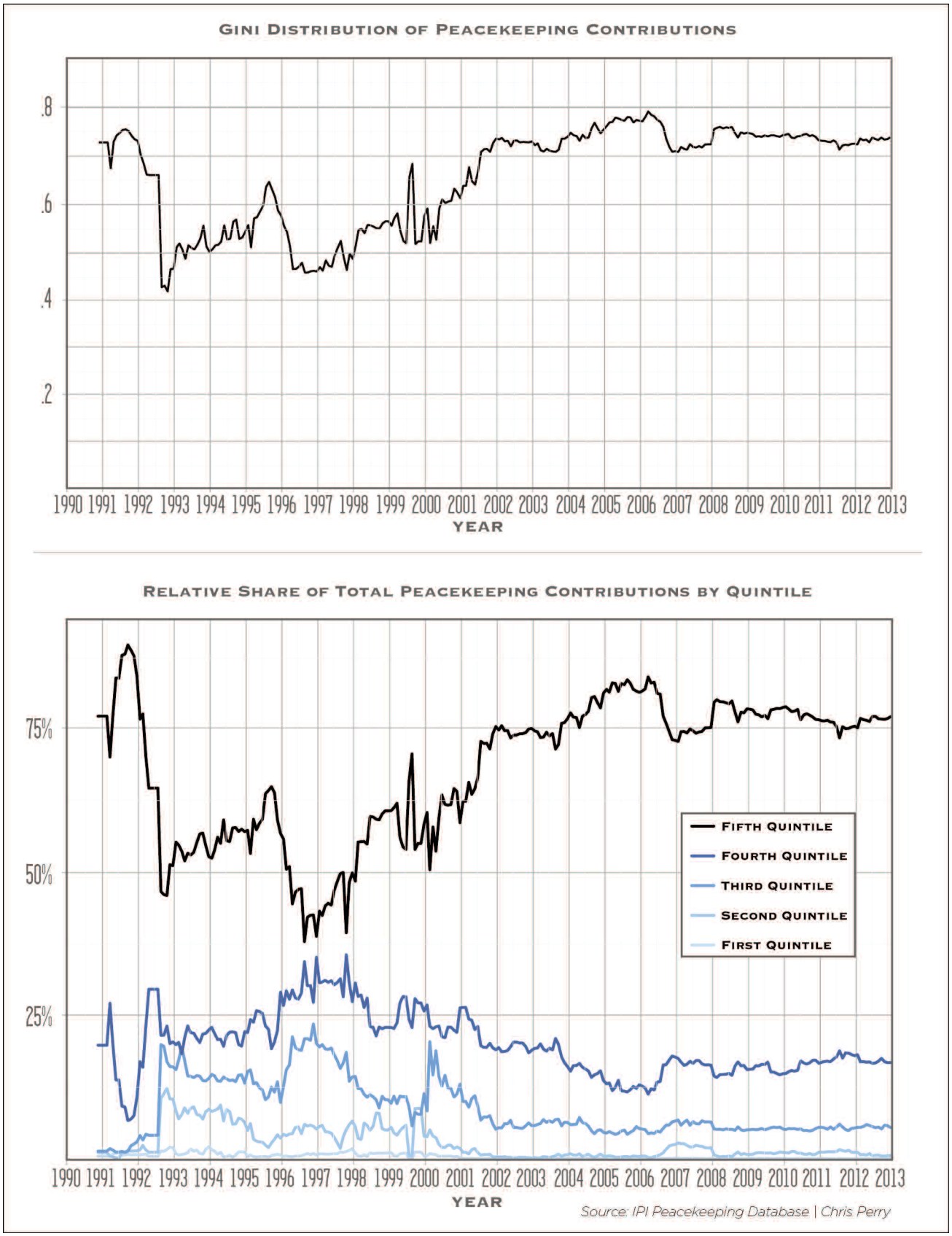


Figure 6: Consistency of troop contributors to UN peacekeeping, measured by variance coefficient (2005–2012).

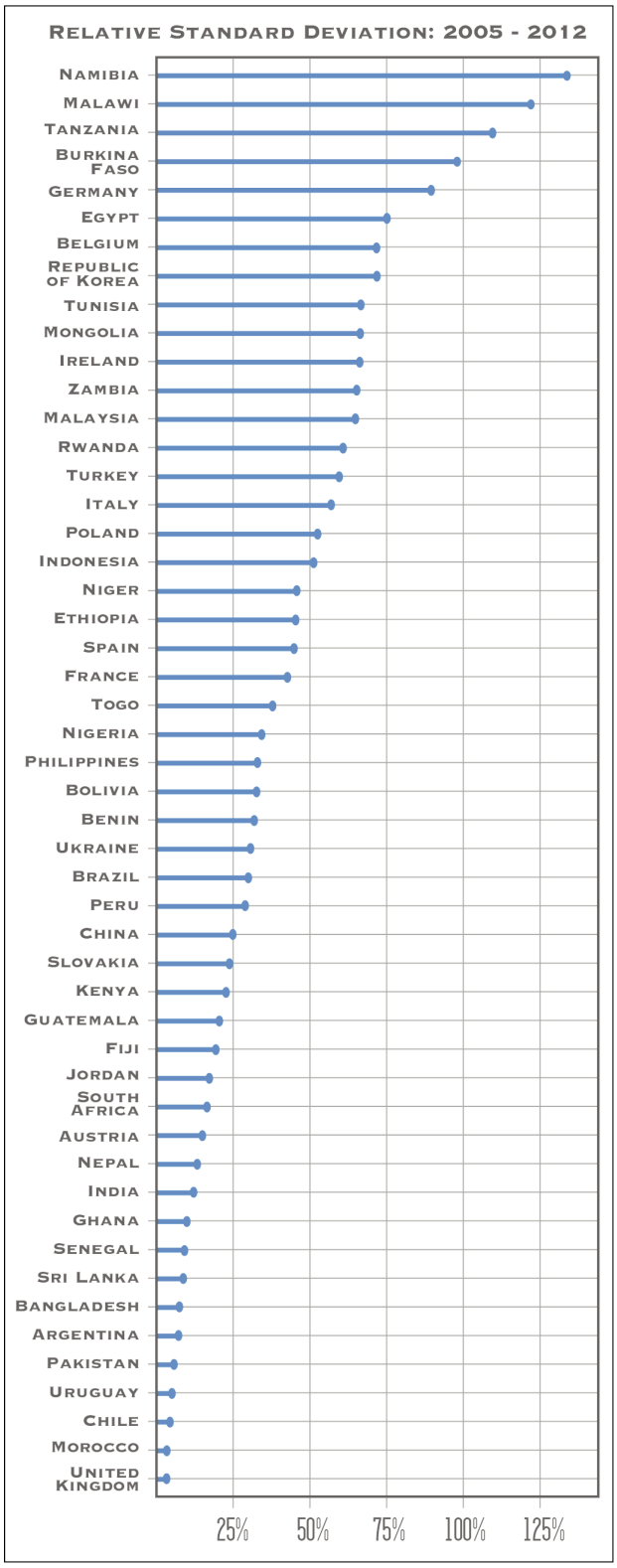
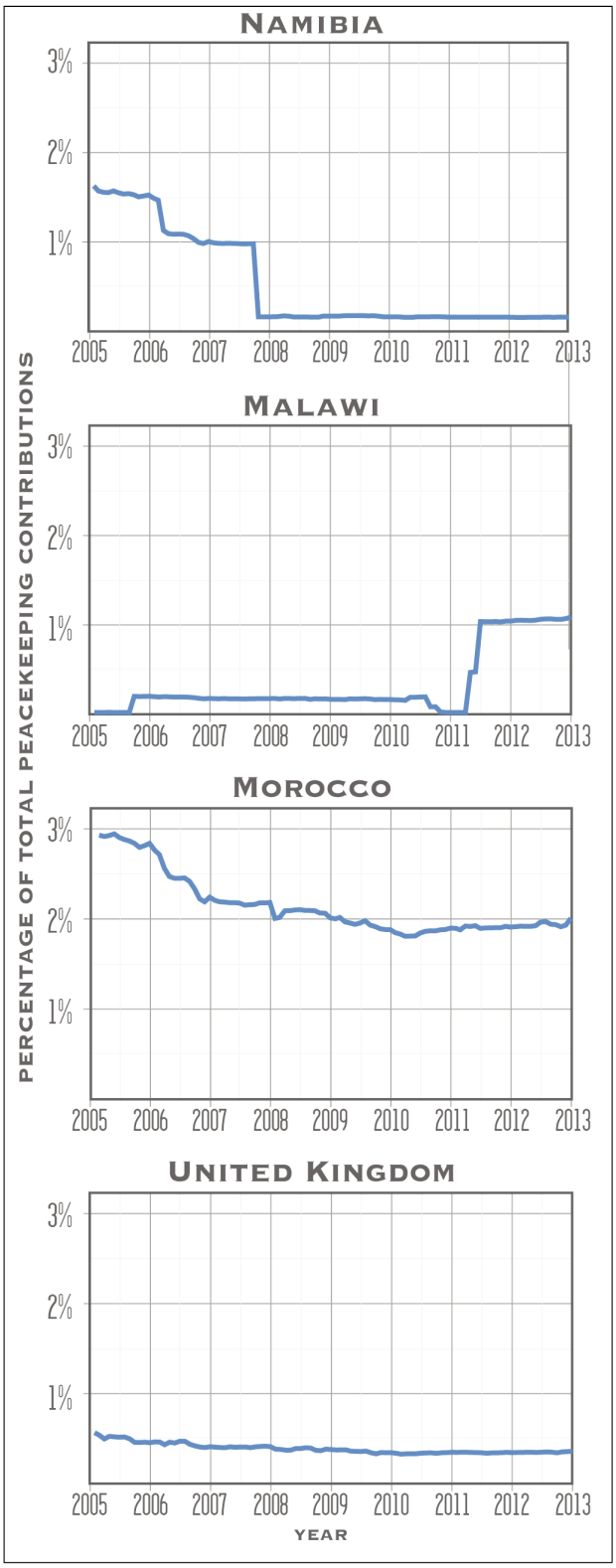


Figure 7: Least and most consistent troop contributors (2005–2012).

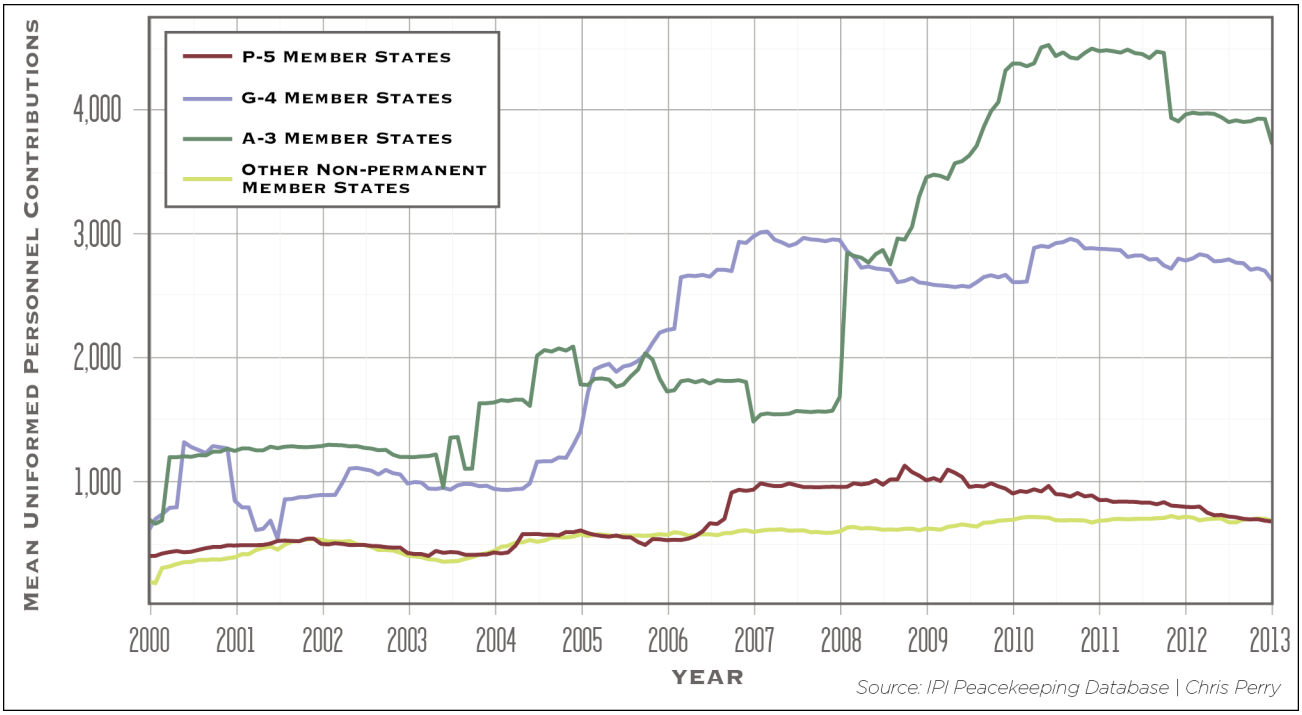


Source: IPI Peacekeeping Database | Chris Perry

of other data or qualitative research, this might suggest that such countries have more "institutional" rationales for contributing (or not contributing) troops that are unlikely to change suddenly.[17] On the other hand, the graphs of the two least consistent countries, Namibia and Malawi, exhibit the opposite effect, perhaps indicating that their contribution decisions are more affected by variable political or security dynamics.[18]

The IPI database could also be used to isolate and compare the historical contribution patterns of similar groups of states. For instance, does aspiration for a permanent UN Security Council seat potentially affect contributions to peacekeeping? As an initial test for this hypothesis, we looked at the contribution patterns of four groups of countries: permanent members of the Security Council (P5), declared aspirants to permanent membership (G4), the three primary contenders from Africa (A3), and all other TCC/PCCs.[19] Figure 8 below shows the mean contribution levels of each group over time. The data shows that the G4 aspirants more than tripled their average contributions between 2004 and 2007. Likewise, the A3 had a similar threefold increase in their contributions between late 2007 and 2010, though this has since plateaued. On the other hand, the P5 and the other TCC/PCCs kept their contribution levels relatively steady throughout. An initial reading of these observations would support the idea that aspiration to a permanent seat might manifest outwardly as an increase in contributions to UN peacekeeping. The differences in the trends of the G4 and the A3 are likewise interesting since the framework for Security Council reform is slightly different for each group, as are the dynamics for and against their inclusion on the council. However, this is cursory analysis that needs further examination through more in-depth research.

Figure 8: Mean uniformed contributions to UN peacekeeping by P5, G4, A3, and all others (2000–2012).



17 The Providing for Peacekeeping Researchers Network produces succinct country profiles with the complementary qualitative analysis to explain a TCC/PCC's contribution levels over time, available at www.providingforpeacekeeping.org/profiles .

18 Contribution levels can change for reasons completely exogenous to a TCC/PCC's own decision making, such as when a peacekeeping mission ends. However, countries with strong institutional or financial rationales to contribute might then find another mission in which to participate.

19 The G4 includes Brazil, Germany, India, and Japan. The A3 includes Egypt, Nigeria, and South Africa.

Using the Dataset for Further Research

For the broader research community, IPI has made the dataset publicly available on the Providing for Peacekeeping Project (PPP) website www.providingforpeacekeeping.org. By releasing this dataset, IPI hopes to create new opportunities for research for both PPP and the broader community of analysts and practitioners interested in peace operations. For PPP, the data will feed into both macro- and country-level analyses already being undertaken by the PPP network of independent researchers. These researchers will utilize the data as they develop analytical profiles of each UN TCC. Finally, the data will also be used for quantitative analysis to guide future thematic studies on peacekeeping issues such as policing, gender in peacekeeping, and the political economy of peacekeeping contributions.[20] Other issues, such as the effects of Security Council elections on contribution levels or a cluster analysis of contributor characteristics, will be explored by utilizing the dataset.

IPI will update the contribution data on a monthly basis. We will also expand the data to other variables, such as the annual assessed financial contributions paid by member states to the UN peacekeeping budget. In addition to the raw dataset, the data is navigable through an interactive online data visualization that utilizes geospatial attributes.

We suggest that there are a number of possible uses for researchers and policymakers beyond those discussed above. First, the contribution data can be combined with and analyzed in relation to population or economic datasets or to particular indices (democracy, corruption, etc.). Second, the database's geospatial component can be combined with other GIS datasets such as the Armed Conflict Location Event Dataset (a georeferenced African conflict dataset from the Peace Research Institute in Oslo), the Georeferenced Event Dataset (from Uppsala University), the georeferenced Ethnic Power Relations dataset (from ETH Zurich and UCLA), Afripop, and Asiapop. Finally, for policymakers and practitioners, we hope that the data could be put to use in predictive modeling for force-generation targeting.

20 All content from the Providing for Peacekeeping Project, including the IPI Peacekeeping Database, the TCC/PCC profiles, and thematic studies, is available at www.providingforpeacekeeping.org .

Annex

Creating the Database

The data was generated using publicly available documents provided by the UN Department of Peacekeeping Operations (DPKO). DPKO supplies monthly contribution-level updates as PDF archives, which go back to November 1990. These documents come in four distinct types. The first type, from November 1990 until the end of 1998, consists of scanned raster images of photocopies of DPKO's internal records. These documents were too damaged to use optical character recognition (OCR) software to convert the relevant data to a usable format. All data for this period was entered by hand and then checked for anomalies. The second type of DPKO documents covered contribution data from 1999 until April 2001. For these, Adobe's OCR functionality was used to convert raster images to text. Text extraction software was then used to extract that text into a tabular format. Again, data was checked afterwards for anomalies and, in some cases, entered by hand where the OCR proved unable to deal with formatting issues. The third type came from May 2001 to July 2002. By this point, DPKO files contained actual text elements presented in tabular format, allowing us to extract data using Adobe's "copy as table" functionality. Finally, beginning in August 2002, DPKO provided archives as database queries in a variety of structures (e.g., by mission, by TCC, or by post). Again, these PDFs contain gridded text elements, allowing us to use text extraction software to extract data into a comma-separated-value (CSV) file.

Once the data was in a CSV format, we used R, an open-source statistics program, to write a processing script to restructure and clean the data. This made use of a variety of R packages, including the "regex" regular expression function in the base package and the "plyr" data manipulation package. As a final quality control, we used Tableau for a visual check of anomalies once all the data was written to a common format. Our final data is stored in a relational MySQL database to aid future data manipulation.

After completion of the initial aggregation of the data we discovered the Python PDF to XML library, which allows us to directly extract the underlying PDF data as XML and process the resulting dataset based on text positioning in the document. We decided to leave the process partially automated in order to watch for changes in document formatting, but through a relatively small number of steps we can extract the data, update our SQL database, load the new data into R, and update selected analysis. In addition to the main dataset, we hope to make a number of graphs and data subsets available on a monthly basis.

MISSING DATA

As is often the case with archival data, there were some cases of missing data. Records for the months of December 1990, January–February 1991, May–July 1992, December 1998, November 1999, and February 2001 were not included in DPKO's web archives. Given the choice between dropping those months and using some sort of interpolation methodology, we chose a variation of nearest-neighbor interpolation, essentially carrying all contributions from the previous month to the missing month. While this is not a perfect solution, we feel that a comprehensive coverage of contributions during the post–Cold War period outweighs the chance of a relatively small measurement error.

In addition to missing months, there were a small number of files in which the record was partially missing, specifically:

- April and May 1998 were missing records for the Jordan–Romania group;
- July 1998 was missing records for Albania–El Salvador, Jordan–Romania, and Venezuela–Zimbabwe;
- July–August 1998 were missing Russia–USA; and
- October 1998 was missing Jordan–Romania.

As in the case of missing months, we felt that interpolation was an appropriate treatment for missing variables. However, due to the partial incompleteness of these records, we assumed that linear interpolation was superior to the nearest neighbor approach.

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