

The Causes and Consequences of Refugee Flows: A Contemporary Re-Analysis[‡]

Andrew Shaver[‡], Benjamin Krick[§], Judy Blancaflor[¶], Xavier Liu[‡], Ghassan Samara[‡], Sarah Yein Ku[‡], Shengkuo Hu[‡], Joshua Angelo[‡], Martha Carreon[‡], Trishia Lim[‡], Rachel Raps[‡], Alyssa Velasquez[‡], Sofia de Melo[‡], Zhanyi Zuo[‡]

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Abstract

The world faces a forcible displacement crisis. Tens of millions of individuals have been forced across international boundaries worldwide. Therefore, the causes and consequences of refugee flows are the subjects of significant social science inquiry. Unfortunately, the historical lack of reliable data on actual refugee flows, country-specific data reporting timelines, and more general pre-2000 data quality issues have significantly limited empirical inferences on these topics. We replicate twenty-eight articles on these topics using data newly released after a multi-year collaboration with the United Nations on annual dyadic flows. We observe major inconsistencies between the newly released flow numbers and the stock-based flow estimates upon which decades of research are based; we also find widespread inappropriate treatment of missing historical values. When we replicate the existing literature using the newly introduced flow data, correcting the treatment of missing historical values, and temporally extending/restricting the study periods, we produce significantly different results.

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[‡]Assistant Professor, University of California, Merced; Corresponding Author: ashaver@ucmerced.edu

[§]Doctoral Student, Duke University

[¶]Research Intern, Political Violence Lab

[‡]Doctoral Candidate, University of California, Merced

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Introduction

The world faces a forcible displacement crisis: > 100 million individuals have either fled their countries or been displaced within them.¹ International displacement has risen dramatically in recent decades due to conflict and political instability in countries from Afghanistan to Venezuela, with Ukraine producing the single largest outflow of refugees in a single year in recorded history.² Forcible displacement has tremendous human costs, and its causes and consequences are the focus of significant social science research. However, empirical studies of refugee flows have been limited by a lack of reliable data.

Existing results are often derived from refugee population stock measures – total end-of-year population counts of refugees within host countries – rather than actual flow estimates. Stock-based results are subject to fundamental questions about internal validity. Much prior research is based on data collected before 2000, when the United Nations Refugee Agency (UNHCR) began systematically tracking refugee and asylum seeker (REF/ASY)³ numbers globally. The quality of pre-2000 data is limited, with many missing values that much existing research does not properly account for. Analyses focused on origin countries are often missing data because asylum countries were not then reporting arrivals to the UNHCR; separately, asylum countries that were reporting arrival data often did not collect national origin.

In this study, we seek to address these issues. Following a multi-year collaboration with the UNHCR, culminating in the release of new international displacement flow data (1962-2022)⁴, we reevaluate 28 studies published over decades on the causes and consequences of refugee flows.⁵ Using country-specific reporting timelines, we update these articles’ results to

¹See <https://www.unhcr.org/global-trends>.

²We later discuss the uncertainty surrounding the magnitude of these increases due to the constraints of available data.

³In some cases refugees and asylum seekers are distinct populations. In others, asylum applications are simply the mechanism by which individuals are subsequently registered as refugees. See appendix for additional discussion.

⁴For details, see: politicalviolencelab.com/refugeeflows

⁵Specifically, we reassess the causes of REF/ASY outflows from origin countries and the impacts of REF/ASY inflows into asylum countries. “Flows” may refer to the number of departures from an origin country (“outflows”); arrivals to an asylum country (“inflows”); or individuals fleeing one country for another (“directed dyadic flows”). When referring to these movements generally, we adopt the term “flow(s)”, specifying specific types as relevant

account for possible measurement error introduced when missing values were treated as 0s. We also temporally extend these studies so that results are based on contemporary observations less affected by historical data-quality issues. Our goal is to understand how existing results change when we address these issues — an important question for a body of work with significant influence on academic and policy discourses.

In brief, we observe large inconsistencies between the newly released flow numbers and the stock-based estimates upon which decades of research is based, and we find that the inappropriate treatment of missing historical values is widespread. We produce significantly different results when we replicate the existing literature following three different approaches: first, replacing the old stock-based data with the newly introduced flow data; second, correcting the treatment of missing historical values; and third, temporally extending the studies.

Specifically, we find that in 19 articles on flow causes, $\approx 75\%$ of findings replicate; in 9 articles focused on flow consequences, only $\approx 55\%$ replicate. These percentages are conservative: we assess only whether previously reported results maintain statistical significance and/or whether the sign of estimated coefficients reverses. A stricter standard would also assess substantial changes in magnitude (toward 0), likely driving these percentages lower still.

A subset of our replications are “theory-based” — these consist of reanalyses of studies that focuses on refugee flows but adopts some other measure of REF/ASY (e.g. stocks).⁶ These studies contribute substantially to the ongoing debate about the effects of refugees on political violence in host countries — as Savun and Gineste (2019) note, “security consequences associated with refugee flows are among the most widely studied aspects of forced migration.” Thus, we view these replications as complements to the original work, offering new empirical insights, and we clearly distinguish in the results which replications are theory-based. In our replications, effects of refugees on security conditions are attenuated, suggesting that the literature’s identification of refugees as sources of violent instability is likely overstated. The contrast between our findings and those based on stocks points to potentially important differences in the effects of refugee inflows versus sustained presence.

to specific research questions, data constructions, etc.

⁶E.g. authors avoiding using stock-based flow estimates because of data quality concerns or using stock figures after theorizing about the effects of both flows and stocks.

The new data also reveal that forced displacement is much more common than reported: Rubin and Moore (2007, p. 91) note that “[f]orced migration is a relatively rare event... around 82% [of country-year cases] experienced no forced migration...”. When we extend this study to 2000–2021, we calculate that number to be 22%.⁷

On the Internal Validity of Previous Results

Refugee Measurement

The UNHCR has tracked REF/ASY flows since 1962. Flow records were used primarily for operational purposes and were not centralized until recently. In 2019, the UNHCR released a draft flow dataset. We engaged in extensive discussions with UNHCR staff about the data, including possible additions/modifications to capture new international movements and apparent inconsistencies across data versions.⁸ We also compared statistical results using redacted and unredacted data versions to help validate the UNHCR’s decision to release only redacted data to protect individual asylum seekers’ identities in cases of very small dyadic flows.

The UNHCR ultimately released the final “Forced Displacement Flow Dataset” in 2022. The new flow data is depicted in A.1 Figure 1, with additional details in A.2.1.

[FIGURE 1 ABOUT HERE]

Flows and Stock-Based Estimates Compared

Actual flows diverge from stock-based estimates for several reasons.⁹ First, researchers estimate flows from stocks as follows, where i denotes either the directed dyad (i.e., sending-receiving country pair) or the asylum/origin country, depending on the unit of interest, and t refers to the year:

⁷For asylum country-years without (in)flows, that percentage is 28%.

⁸These discussions also involved Fearon and Shaver (2020)

⁹For a more detailed discussion see A.2.2

$$\hat{f}_{i,t} = \Delta s_{i,t} = \begin{cases} s_{i,t} - s_{i,t-1} & \text{when } s_{i,t} \geq s_{i,t-1} \\ 0 & \text{when } s_{i,t} < s_{i,t-1} \end{cases}$$

Stock-based estimates calculated this way do not account for naturalizations, returns, or resettlements (hereafter “stock departures”); births and deaths; or any other variable affecting host-country stock levels. We find that a substantial number of (directed-dyad) cases involve simultaneous (same-year) stock departures and directed flows. In $\approx 45.40\%$ of asylum country-year observations, inflows and stock departures co-occur; in $\approx 20.81\%$ of cases, stock departures are greater than or equal to inflows (See A.1 Figure 2). By capturing new arrivals, the new flow data avoid this issue.

[FIGURE 2 ABOUT HERE]

Second, under the stock-based estimation approach, years of “negative” flow are set to 0. We calculate that nearly one third ($\approx 29.68\%$) of all first-differenced observations result in negative values that are converted to 0s. In just under half of these directed-dyad-year cases ($\approx 48.56\%$), the new data report positive values instead.

Third, stock-based flow estimates suffer from major left-censoring. The UNHCR begins tracking REF/ASY arrivals for different countries in different years. Under the first-differences approach, stocks treated as 0 in years before a country’s first reporting year likely capture pre-existing populations (not inflows). To quantify this potential issue, we compare the sum of refugee stocks for all directed-dyad-year observations corresponding to the first year of UNHCR reporting to the sum of the new data’s flows for those same years. Results suggest that many stock-based flow estimates capture pre-existing refugee populations rather than new flows — a source of significant potential error in statistical estimates. (See A.1 Figure 2.) Pre-existing population values do not enter into the new flow data.

Fourth, until 2007, stock data include population values for 3rd country resettlements, erroneously depicting “flows” into countries where REF/ASY eventually resettled, sometimes years after displacement. The new data prioritize asylum seeker applications to reflect increases in the year of their actual arrival.

Fifth, the stock data include “non-flow increases”: adjustments to stock values due to

methodological revision, legislative change, or other host-country changes to how REF/ASY are defined or calculated. These positive re-estimations produce apparent flow increases that do not reflect actual new arrivals. In the new flow data, these changes have been removed.¹⁰

Sixth, stock-based flows lag actual flows in countries that use their asylum systems to grant refugee status; asylum seekers enter into stock data only after their asylum applications have been processed and approved — sometimes years after arrival.¹¹ The new flow data prioritize asylum seeker *applications* to capture movements during the years in which they occurred.

Overall, how do the new flows compare with stock-based estimates? $s_{i,t}$ is a function of stock departures. When stock departures occur simultaneously (within the same year) with inflows, measures of flows are attenuated: $\hat{f}_{i,t} \leq f_{i,t}$ (i.e. the number of stock departures in a given year reduces the calculable inflows by that number). This is consistent with patterns in the data: In $\approx 81\%$ of directed-dyad-year cases, flow values are strictly larger than stock-based estimates (and larger than or equal in $\approx 84\%$ of cases). Overall, we calculate that the new flow data capture 14,227,372 more flows than the stock-based data from 1962–2022¹²: for every ≈ 5 flows reported under the stock-based approach, the new data report 1 additional flow.

We directly compare flow values with their stock-based estimates, estimating bias as $\frac{inflow_{i,t}}{(stock_{i,t} - stock_{i,t-1})}$. A.1 Figure 2 displays the distribution of resulting percentages for a) all asylum-country year observations and b) all origin-country year observations. Overall, these percentages fall above 100%.¹³¹⁴ In A.2.3, we supplement this analysis by reporting for each asylum country the correlation between inflows to that country and stock-based estimates. Results indicate that stock-based estimates tend to significantly underestimate flows; in $> 10\%$ of cases, the two variables are either not correlated or are negatively correlated.

¹⁰There is one important caveat; see A.2.5 for details.

¹¹See A.2.1 for an important discussion on non-approved asylum applications.

¹²This figure excludes stateless and Palestinian refugees from both the new flow and stock datasets; see A.2.1.

¹³Outlying values are produced when flows significantly exceed the stock-based estimates, with resulting means exceeding 1000%; we therefore use median values (134.92% and 212.84% for the asylum and origin countries, respectively).

¹⁴This approach drops observations in cases where $\Delta stock < 0$ and values are set to 0. At the asylum- and origin-country levels, these percentages are 15.13% and 24.83%, respectively.

Pre-2000 Data Missingness and Quality Issues

Three major issues are associated with UNHCR data generation and reporting patterns before the year 2000, when the UNHCR standardized approaches to data collection and when many asylum states adopted information and communication technologies that significantly improved reporting. The empirical problems discussed below persist beyond the year 2000, but are significantly reduced; we use the pre-/post-2000 framing for analytical parsimony.¹⁵

The first empirical issue is the inappropriate treatment of missing data. Until recently, centralized data on when the UNHCR began tracking REF/ASY in each country was unavailable. In the absence of positive displacement values, many panel datasets set country-/dyad-year observations to 0.¹⁶¹⁷ While some missing positive refugee values for yearly country/dyadic observation may reflect true 0s, in others they reflect positive values that the UNHCR did not collect. Nearly every study we replicated follows the practice of setting such observations to 0 when they precede country-specific data collection timelines. For an asylum-country-year panel dataset 1962–1999, this practice results in $\approx 49.82\%$ of observations being set to 0.¹⁸

We supplement our analysis with UNHCR-supplied data on centralized collection efforts by country from 1970 on.¹⁹ Patterns in data collection are depicted in A.1 Figure 3. Many countries' data does not appear in centralized records until long after statistics began to be collected. Before 2000, UNHCR collected asylum seeker data only from several dozen industrialized countries; in 2000, when they centralized data collection, that number jumped to 137 countries, with more countries being added every year.

[FIGURE 3 ABOUT HERE]

Using the new flow data, we produce panel datasets with observations set to NA (rather

¹⁵See A.2.4 for a more detailed treatment.

¹⁶Typically, authors constructed balanced panels, setting country-/dyad-year observations to the same starting year and assigning 0s to observations without refugee values.

¹⁷This practice is widespread. Of the 28 articles we analyze, 24 impute 0s; 4 avoided this issue by limiting their analyses to modern periods.

¹⁸For a directed-dyad panel, the percentage is $\approx 50.75\%$.

¹⁹The exception is the set of 37 countries that supplied data to the UNHCR on asylum seeker flows 1970–1999. For these countries, initial reporting years are unknown; we know only that these 37 countries reported asylum figures for some or all years during this period. We discuss this in more detail later.

than 0) for years before data collection began.²⁰ As we show in A.4.1 and the full set of results posted in Harvard Dataverse, this replacement produces additional changes in several results.

The second empirical issue emerges because UNHCR records are mostly constructed from asylum state records: studies using origin-country panel datasets are missing some unknown (potentially very substantial) number of REF/ASY outflows. These missing values were not captured by corresponding inflow data from asylum countries that were not yet reporting data to the UNHCR (See A.1 Figure 3). $\approx 68\%$ of the “causes” studies we replicate (and $\approx 40\%$ of all of the studies we replicate) use origin-country panel datasets.

The third empirical issue is that until 2000, a significant amount of UNHCR data for tracked REF/ASY is missing national origin information.²¹ For research designs in which REF/ASY origin is relevant, missingness on this variable introduces noise (and potentially bias) to results. We display this pattern in A.1 Figure 3.

We cannot directly correct for these final two issues. However, by 2000, these problems are substantially eliminated. For this reason, our analyses include contemporary replications: we extend studies through the most recent date possible and analyze them from the period beginning in 2000. These are our preferred specifications, as all four issues that we raise are either resolved or substantially mitigated.²²

Replications

We used Google Scholar to search general and social science academic journals for articles engaging in quantitative research on global refugee flows. Our search query limited cases to those that i) reference refugee flows, ii) include the terms “UNHCR” and “data”,²³ and iii) were

²⁰As discussed below, data on flows were secured at the level of the asylum country (not the origin country). We can identify only a subset of observations with missing data in our origin country-year panel dataset. We therefore construct origin-country panel datasets using a more complicated procedure, described in A.3.4.

²¹See Marbach (2018) for additional discussion of this issue and a proposed solution.

²²Data issues aside, there are other reasons why contemporary study results might differ from previous results, ranging from overall displacement numbers to the evolution of the international response to flows.

²³Because data on refugee stocks (whether used to estimate flows or used directly) are supplied by the UNHCR, this term helps restrict results to quantitative studies.

published by a major publisher,²⁴ returning 1,556 responsive articles. We manually inspected each, eliminating studies that i) did not deal with causes or consequences of refugee flows, ii) were entirely qualitative, iii) incorporated data on refugees only as a control or in secondary (tertiary, etc.) analyses, or iv) were single country studies. This produced 35 qualifying studies. We were unable to obtain replication materials for 7 of these. We replicated the remaining 28 by i) correcting incorrectly imputed zeros and ii) replacing the old stock-based measures with the new flow data. We assess whether previously reported results maintain statistical significance and/or whether the sign of estimated coefficients reverses.²⁵ A detailed description of these articles appears in A.3.2; more information on replication procedures is included in A.3.4.

By assessing how existing results change when we address the empirical issues described above, this effort falls into the class of “broad” (Dafoe, 2014), “statistical” (Hamermesh, 2007), or “wide” (Pesaran, 2003) replications involving re-estimating test results with the use of new data or related modifications (e.g. adopting alternatively constructed variables). The studies we replicate form the backbone of research on the causes and consequences of refugee flows and have influenced research agendas, curricula, and policy discourses.²⁶ Replication results inform causal inferences in cases in which the original authors’ testing strategies were well-identified – save for the empirical corrections we apply – but more generally, they update our understanding of the “published record... recognized [as] state of the art” (King, 2006, p. 119), providing direction for additional scholarly inquiry and the reexamination of their policy implications.²⁷

²⁴See A.3.1 for the list of publishers and formal search query.

²⁵A stricter standard would also assess changes in magnitude. Accordingly, our replication standard is conservative.

²⁶This research totals 4,257 citations at the time of writing.

²⁷Our research follows other replication efforts of this nature (e.g., Carroll and Kenkel (2019); Fisher et al. (2013); Nyrup and Bramwell (2020)), though we note that there is no clearly established, single definition of or approach to replication in the social sciences (Clemens, 2017; Duvendack et al., 2017; Freese and Peterson, 2017). Consistent with the practical research realities inherent to global, quantitative refugee research in which observational studies are prevalent, our goal is not to produce a causally-interpretable meta-analysis more typical of academic disciplines wherein causally identified research designs (e.g. randomized controlled trials) are more practical and common. Instead, our focus on fundamental data issues seeks to facilitate continued causal inferential progress within the forcible displacement research space.

Results & Discussion

Results are succinctly presented in A.4.1 (Tables 1 and 2). Complete replication regression results (alongside original estimates) appear in a supplemental appendix posted to Harvard Dataverse. Of the 64 total tests from causes articles, $\approx 75\%$ replicate. More significantly, of twenty total tests from consequences articles, only $\approx 55\%$ replicate²⁸. We classify 14 of the 28 (50%) articles we replicate as “plausibly causally identified”²⁹. Of these, $\approx 71\%$ of results on causes replicate and $\approx 18\%$ focused on consequences replicate. This is quantitatively and substantively consistent with the results in our full sample. We present and discuss a select set of results below.

Causes

With respect to the causes of flows, updated study results rarely overturned original findings; however, they frequently supported hypotheses discarded by the original authors as statistically unsupported.

Our findings confirm the central roles played by the “push factors” of political violence and state repression in driving international displacement. We corroborate results that link civil war/insurgency to outflows, estimating larger effects of these factors than did Echevarria and Gardeazabal (2021); Davenport et al. (2003), and Moore and Shellman (2004); we also uncover a larger effect of state repression on outflows than Rubin and Moore (2007). Steele (2017) has observed that “current understanding tends to equate wars or violence with an increase in displacement, but we can and need to be more precise.” Our replications amplify her call. Future work might incorporate the new flow data into global analyses of potential heterogeneous effects across factors such as the timing of violence, its spatial distribution and intensity, and the technologies used to perpetrate it.

We also replicated papers focused on “pull factors” that incentivize international over

²⁸This is partially driven by “theory based extensions” (see A.3.3), and these results thus illuminate the difference between the effect of refugee flows versus refugees’ continued presence

²⁹This classification is based on the use of instrumental variable, difference-in-difference, regression discontinuity, synthetic control, natural experiment, or fixed effects study designs. (See Tables 1 and 2.) We adopt this criterion following referee comments.

internal displacement and influence the choice of international destination. In replications of Moore and Shellman (2004, 2007) and Turkoglu and Chadeaux (2019), we find limited support for the idea that refugees are motivated by economic opportunity or democratic institutions in destination countries. This finding contrasts with Neumayer (2005)’s framing of “bogus” refugees as seeking opportunities rather than protection — a framing that is echoed in prominent political discourse. Our results also illuminate the role of alliance dynamics: consistent with Moorthy and Brathwaite (2019) but not Moore and Shellman (2007), we find that the presence of formal alliances positively influences dyadic flows.

A more subtle theme of our replications is the under-explored role of factors discouraging or restricting individuals from seeking refuge abroad. In our replication of Echevarria and Gardeazabal (2021), we estimate larger effects of country size, proximity to potential asylum states, and island status. We estimate a larger plausible effect of physical border barriers on outflows than Schon and Leblang (2021). We confirm Moore and Shellman (2007)’s negative relocation costs estimates and untangle their “unexpected negative finding with respect to the impact of a common language”, confirming that common language is positively related to dyadic flows, potentially reducing transaction costs. These findings encourage further inquiry into factors that potentially restrict international displacement – from border securitization (Simmons and Kenwick, 2022) to severe weather and natural disasters along border regions under climate change.

Consequences

With respect to the consequences of inflows, we observe significant changes from previous results. In our replications of this seminal literature, the relationship between the arrival of refugees and the onset of war and political violence is attenuated: we find that refugees are only infrequently conduits of violence, and the conditions under which forced displacement poses a risk to host countries appear to be specific.

With respect to refugees’ connection to terrorism, our replications find partial support for Choi and Salehyan (2013)’s analysis linking these variables, but the relationship is significant only for transnational attacks. This is consistent with Milton et al. (2013)’s results and our corresponding replication (though we estimate smaller effect sizes). We corroborate Polo and

Wucherpfennig (2021)’s causal finding that refugee influx is positively associated with terrorism, but only in the specific case of refugees from communities with ties to transnational terrorist organizations; the association for refugees originating from countries without ties is *negative*. Findings highlight the potential heterogeneous treatment effects of inflows on terrorism, with potential implications for more tailored policy responses and programming.

When we reexamine work on refugees and governments’ respect for human rights, we fail to confirm either of Wright and Moorthy (2018)’s findings: our results indicate neither that an influx of refugees positively influences repression nor that this relationship is moderated by development. In fact, in countries with high GDP, the influx of refugees is associated with *decreased* repression. We do not recover Chu (2020)’s significant relationship between refugees from rival and non-rival origin states and hosts’ respect for human rights.

Finally, when we replicate work linking refugees to inter- and intra-state conflict, our findings do not substantiate Salehyan and Gleditsch (2006)’s seminal research associating refugees to civil war diffusion.³⁰ We also fail to confirm Bohmelt et al. (2019)’s link between refugee flows and non-state actor violence. Our results partially support Salehyan (2008)’s findings that flows between states can provoke militarized disputes: flows between a given dyad increase the probability that the receiving state initiates a conflict with the sender, but we do not find that it increases the probability of sender-state initiation.

Collectively, these findings speak against the new politics of fear, challenging political narratives that frame refugees as security threats and the restrictive state policies they underpin. Our findings do not indicate that there are *no* effects of refugee inflows on violent instability, but it seems that refugees play a role in producing or facilitating political violence, wittingly or not, only under particular circumstances. The differences between our findings and those based on refugee stocks highlight potentially important differences between the effects of refugee inflows into a country and the effects of sustained refugee presence. These differences warrant further exploration — particularly because of the “growing difficulty [of] uprooted people... in finding lasting solutions to their plight” (Crisp, 2021, p. 3).

³⁰See additional details on this complicated case in the supplemental appendix with results posted to Harvard Dataverse; the relationship originally reported may have been driven by post-World War II migration dynamics and/or limited data from this period. We invite additional investigation.

We conclude by noting a publication bias against null results (Gerber et al., 2008; Esarey and Wu, 2016). Our replications sometimes supported hypotheses that were discarded when tested with lower-quality data because they lacked statistical support. Other meaningful relationships relating to refugee flows may have therefore gone undiscovered, which scholars might now retest with these new data.

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A Appendix

Contents

A.1	Primary Figures	1
A.2	“Forced Displacement Flow Dataset” Description and Comparisons	4
A.2.1	Data Description	4
A.2.2	Comparisons with Stock-Based Flow Estimates	8
A.2.3	Additional Empirical Comparisons with Stock-Based Estimates	11
A.2.4	Broader Concerns about Pre-2000 UNHCR Data	11
A.2.5	Imputation of Missing Flow Values in Major Cases	14
A.2.6	Additional Reflections on the Observation that Refugee/Asylum Seeker Outflows Are At an All-Time High	17
A.3	Replication Details	17
A.3.1	List of Academic Publishers and Formal Search Query	17
A.3.2	Detailed List of Included Studies	17
A.3.3	Replication Categories	21
A.3.4	Detailed Replication Procedures	23
A.4	Results	31
A.4.1	Summary of Replication Scores	31

A.1 Primary Figures

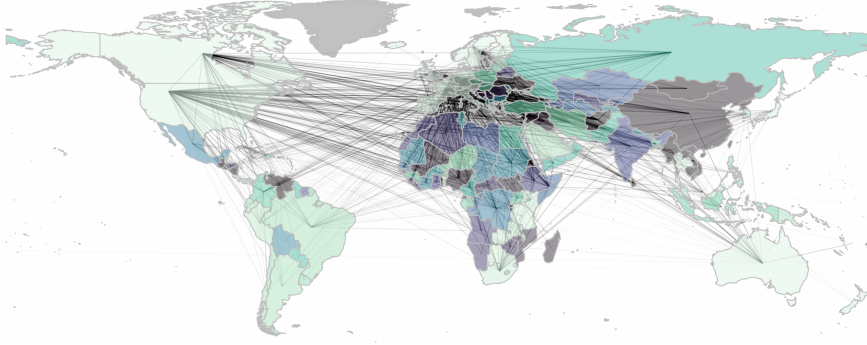


Figure 1: Dyad-year refugee and asylum seeker outflows (between country centroids for all outflows greater than or equal to 500 persons for the period 2000 through 2021) using the new UNHCR data. Country color coding reflects percentage of flows into and out of each country's borders that are outflows.

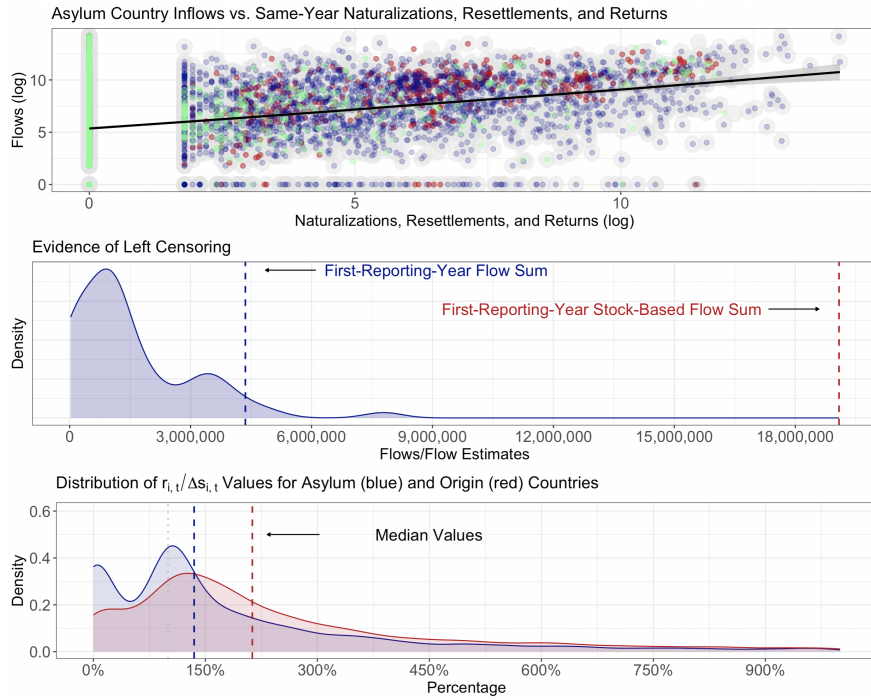


Figure 2: From top to bottom: **Plot 1:** This figure plots asylum country-year refugee naturalizations (green), resettlements (red), and returns (blue) and against inflows. Broader gray dots represent the sum of naturalizations, resettlements, and returns for each asylum country-year. The figure shows that significant numbers of refugees/asylum seekers are often naturalized, resettled, and/or returned in the same years that refugees continue to arrive. In such years, stock-based inflow estimates will be skewed downward. Data on naturalizations, resettlements, returns, and inflows provided by the UNCHR (UNHCR, 2021b,c). **Plot 2:** This figure provides strong evidence of a left-censoring effect in stock-based flow estimates. Specifically, inflows estimated using stocks show significant spikes on the first year of UNHCR country reporting that likely reflect pre-existing refugee populations, not actual new inflows. **Plot 3:** This figure displays estimated “bias” in stock-based estimates of inflows given by $\frac{inflow_{i,t}}{(stock_{i,t} - stock_{i,t-1})}$. The figure displays the distribution of resulting percentages for a) all asylum-country year observations and b) all origin-country year observations. Overall, these percentages fall well above 100%, indicating that stock-based estimates generally significantly underestimate actual inflows.

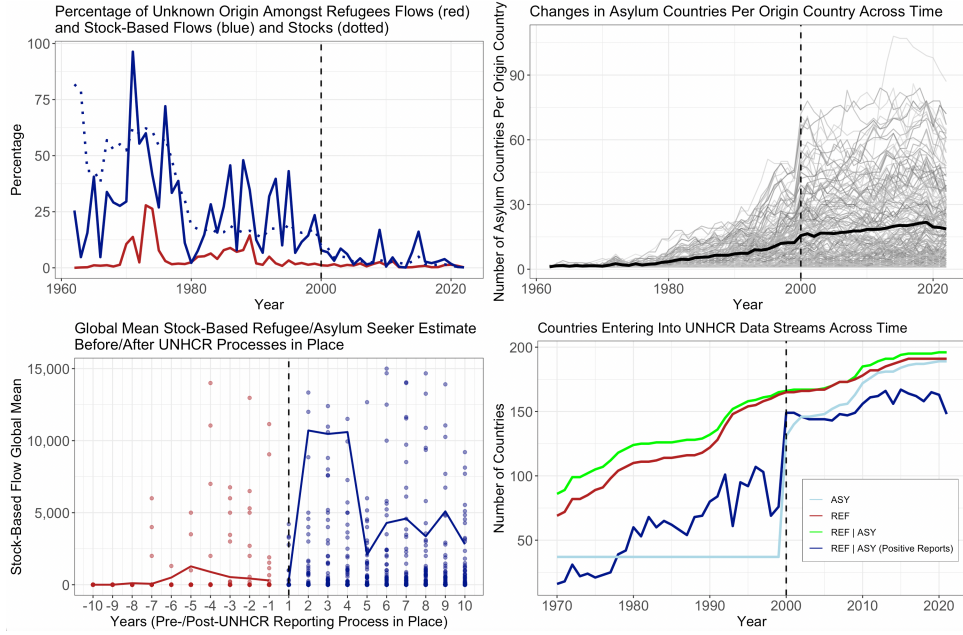


Figure 3: Clockwise from top left: **Plot 1:** This figure displays the percentage of directed-dyad-year observations in which the origin of the refugee/asylum seeker population is unknown in the new flow data (red), the stock-based estimates (blue) and stocks (dotted). In many instances, the national origin of refugees/asylum seekers was not tracked; the number of these instances fall drastically by 2000. **Plot 2:** This figure displays the annual number of asylum countries reporting outflows for each origin country, which significantly increases by 2000. Pre-2000 origin-country data are very likely missing many outflows from those countries, for many of the countries to which they fled did not report them. **Plot 3:** This figure plots (in green) the number of countries reporting refugee or asylum seeker inflow data to the UNHCR. Lines in red and light blue disaggregate yearly country totals between refugees and asylum seekers, respectively. The darker blue depicts the total number of countries per year for which actual refugee or asylum seeker numbers were reported. Differences in the green and blue lines may reflect cases in which potential asylum states had data sharing agreements in place with the UNHCR but did not have any numbers to actually report. **Plot 4:** This figure displays stock-based inflow estimates for each asylum country for the decade preceding and following the year in which a UNHCR reporting process was put in place in that country. Mean stock-based inflow estimates for all asylum countries are plotted for each year. Points depict individual asylum-country values. If post-reporting process trends generally reflect actual pre-reporting process trends, then pre-reporting values adopted by scholars (virtually all 0s) are likely systematically skewed toward 0.

A.2 “Forced Displacement Flow Dataset” Description and Comparisons

A.2.1 Data Description

For much of its history, the United Nations Refugee Agency (UNHCR) has tracked both refugee stocks in and refugee inflows to a subset of countries around the world. The number of countries from which the UNHCR collects information has grown substantially over time, with a particularly large increase in country coverage occurring in 2000. Pursuant to the 1951 Refugee Convention Article 35.2, states have since 1951 supplied the UNHCR with end-of-year population totals (stocks) for refugee communities residing within their territories, which the UNHCR subsequently published. These refugee stock data have formed the basis of much published quantitative research on refugee issues.³¹

Beginning in 1962, the UNHCR began also capturing flow data (and would go on to track additional types of movement). However, these records were not centralized and were used primarily for UNHCR’s internal operational purposes. Although the UNHCR has maintained this historical flow data, they did not release them in a comprehensive format until 2019.

In 2019, the UNHCR first released a draft flow dataset to Fearon and Shaver (2020). Fearon and Shaver (2020) and members of this research team subsequently engaged in extensive discussions with UNHCR staff about the nature of the data; possible additions/modifications intended to capture first-time movements (including in cases where individuals were not formally designated as refugees but for all intents and purposes met the definition – e.g. individuals fleeing the Nagorno-Karabakh conflict); and apparent inconsistencies across cases as different versions of the data were developed/shared.

The UNHCR team ultimately released a version of the dataset (the “Forced Displacement Flow Dataset”) intended specifically to track new international displacements (directed dyadic flows) between countries during a given year. That release took place on World Refugee Day of 2022.³² Details below are based on the most recent version of the data, which the UNHCR

³¹This data is presently available through the UNHCR Population Statistics Dataset UNHCR Refugee Data Finder and is the source for all papers (except one) reevaluated in our study, which range from the seminal work of Davenport et al. (2003) and Moore and Shellman (2004) to recently published scholarship from Polo and Wucherpfennig (2021) and Schon and Leblang (2021).

³²For additional details, see: <https://www.politicalviolencelab.com/refugeeflows>

will continue to periodically update and adjust.

To protect the identities of individual asylum seekers in cases in which very small numbers of individuals (e.g. < 5) fled to a given country, the UNHCR released a redacted version of the flow dataset that introduces noise to these cases to obscure the true values. As part of our collaboration with the UNHCR, we generated results using both redacted and unredacted versions to demonstrate that the redactions have effectively no bearing on their use, justifying the UNHCR’s choice to release only the redacted data. Scholars with more focused research/empirical questions (e.g. on specific country cases) where the redactions might meaningfully affect results are encouraged to contact the UNHCR directly.

The resulting dataset consists of three distinct populations:

1. Newly arrived refugees, including individuals granted *prima facie* (group) recognition, who received temporary protection or who were considered “refugee-like”.
2. New asylum applicants (excludes individuals with repeat or appeal applications).³³
3. Other people in need of international protection.³⁴

Newly Arrived Refugees: Individuals included in this category include those who received *prima facie* (group) recognition; were afforded temporary protection; or were considered “refugee-like. Under *prima facie* recognition, individuals fleeing “readily apparent, objective circumstances in the country of origin...” are granted refugee status and directly registered as such. This type of recognition “is commonly associated with situations of large-scale influx, although it may also be applied to other examples of group departure... for example, where the refugee character of a similarly situated group of persons is apparent” (UNHCR, 2014).³⁵

³³To avoid duplication, individuals afforded individual refugee protection status through Refugee Status Determination (RSD) processing are excluded from the set of individuals tracked in [1], as they are counted in this category.

³⁴Although the data include new movements of both stateless individuals and Palestinian refugees, data on these two communities is limited. With respect to stateless individuals, in some instances, former habitual countries of residence are unknown, complicating assessments of international displacements. With respect to Palestinian refugees, cases of flows under The United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) are also not tracked by the UNHCR. Scholars specifically interested in either of these communities should exercise caution if using the new flow data.

³⁵In contrast, individual refugee protection status involves individuals first registering as asylum seekers before later being registered as refugees. For this reason, and because of potentially significant processing timelines associated with this process, cases of individual recognition are not counted in this first category as they are captured in the new asylum applications described below.

Temporary protection, as Schwartz (2022) explains, “allows designated migrants to remain in the host country for a pre-determined period due to unsafe conditions in their country of origin, including conditions that would qualify migrants for refugee status as well as other humanitarian or political emergencies that would not. This was the European Union’s approach, for example, at the outset of the Ukrainian displacement crisis.” Together, individuals in the first two categories of this group — those with *prima facie* recognition or temporary protection — constitute 51,967,086 new displacements between 1962 through 2022.

The third set of individuals in this category includes those identified as being in “refugee-like” situations. These are individuals for “whom refugee status has, for practical or other reasons, not been ascertained” (UNHCR, 2021a). This is a particularly noteworthy category, as it captures the new movements of individuals across international borders who have not yet been formally designated as refugees (owing, for instance, to political sensitivities associated with the designation and the countries involved) but who for all intents and purposes are refugees. For academic purposes, these are people who clearly fit the broad definitions of international forcibly displaced persons in the academic literature. To establish this category, the UNHCR did a case-by-case evaluation to separate the new arrivals who were not officially defined as refugees from other non-flow increases.

To give examples, this set of internationally displaced persons includes many tens of thousands who have fled the Nagorno-Karabakh conflict. It includes more than one million Ukrainians who have been displaced to Russia following Moscow’s full-scale invasion of Ukraine. And it includes the recent outflows of Afghans to Iran and Pakistan that have followed the Taliban’s 2021 seizure of power. Overall, these observations capture 2,560,730 new displacements in the dataset.

New Asylum Applicants: The data capture first-time asylum applications that are registered by asylum seekers in a given host country in a given year. In addition to applicants, these numbers include individuals for whom *individual* refugee protection status (not group *prima facie* status, as in the category above) has been granted. The overwhelming majority of countries in the Global North process refugees using the individual refugee status determination process. A significant advantage to classifying individuals via new applications rather than final asylum

approvals is that the data capture the movements of these individuals on the year on which they occur: individuals first apply for asylum when they arrive, but processing times are often long, and they may not be officially registered as refugees until long after they have applied for asylum. When asylum approval date is used, their entry as refugees in the stock data lags their actual arrival. The UNHCR have adopted the application-tracking method as the most direct way of capturing true year-to-year flows.

To refine these counts, the UNHCR has removed individuals with repeat or appeal applications. Furthermore, in some regions of the world (e.g. Europe), asylum systems cover multiple countries. Where possible, the UNHCR staff has removed instances of new applications where applications have also been filed in other countries. However, the flow data does capture some number of arrivals that governments ultimately did not or will not approve. This is not necessarily a limitation of the data; for various reasons, governments will sometimes deny the asylum applications of individuals who are in fact clearly fleeing violence/persecution. (For instance, rates of asylum application approvals have varied significantly between the current and former U.S. presidential administrations (TRAC, 2021).) In these cases, the flow data pick up legitimate cases of forcible displacement. In cases of truly spurious asylum applications, however, the data does overcount inflows. First-time asylum applicants constitute 33,172,903 new displacements between 1970 and 2022.

Other People in Need of International Protection: Finally, the flow data includes the movement of individuals designated as “Other people in need of international protection” (OIP). Currently, this category is devoted entirely to Venezuelans who have fled social unrest, economic collapse, etc. in the country. This category captures 5,365,510 new displacements throughout this crisis across twenty-four destination countries.

Data Collection Timelines

The quality and scope of the directed dyadic flow data continues to increase over time. (See A.1 Figure 3) *Prima facie* (group) recognition data began to be collected in 1962, and in 1970, asylum seeker data became available. However, this data was initially limited to several dozen high-income countries. The data quality improves sharply in 2000, when UNHCR adopted

standardized approaches to refugee and asylum seeker data collection. Around the same time, many asylum states adopted information and communication technologies that significantly improved their reporting and collection processes. As a result, by 2000, the number of countries from which the UNHCR collected asylum seeker data had risen to 137, and it continues to grow over time. In 2007, the UNHCR also began to track refugee-like situations, and in 2018, they began to track “Other people in need of international protection” displacements.

A.2.2 Comparisons with Stock-Based Flow Estimates

The new flow data diverge from stock-based estimates for a variety of important reasons. As described in the paper, stock-based estimates of flows have historically been calculated directly from stocks using a first-differences method where the difference between yearly values of a given origin country population in a given asylum country is used to estimate flows. In cases of a positive increase, that value is used as the flow estimate. In cases of negative changes (i.e. where the population decreases over time), a value of 0 is instead adopted. Below, we describe key differences in the new flow and stock-based estimates.

First, the yearly stock values from which flow estimates have historically been generated vary for reasons other than flows into the receiving country. For instance, naturalizations, resettlements, returns, births, and deaths within refugee communities can cause changes in stock levels, and thus in flow-based measures derived from them. Of particular significance are simultaneous inflows and naturalizations, resettlements, and returns (which we group together as “stock departures”). Stock-based estimates undercount inflows because they do not account for these stock departures (or any other variable affecting the stock in the host-country). Pairing stock departure data (supplied by the UNHCR) with the new flow data, we find that there are a substantial number of cases involving simultaneous (same-year) flows between pairs of countries that are offset by stock departures. (See A.1 Figure 2, in which we plot inflows against the sum of stock departures.) The results reveal significant simultaneous increases and decrease to refugee stocks. In $\approx 45.40\%$ of asylum country-year observations, inflows and stock departures co-occur, and in $\approx 20.81\%$ of cases, stock departures are greater than or equal to inflows.

Second, under this approach, years of “negative” flows are set to 0; we calculate that just shy of one third of all first-differenced stock observations ($\approx 29.68\%$) result in negative

values that are converted to 0s by authors adopting this strategy.³⁶ In just under half of these (directed-dyad-year) cases in which stock-based flows are set to 0 ($\approx 48.56\%$), the new flow data report positive values. This is a significant difference, and in some cases, these differences are very large. In 1999, while the stock-based estimates show no movement from Serbia to Albania, the new flow data report 435,000 flows. Similarly, in 1983, the stock-based data reports 0 flows from Rwanda to Burundi, while the new flow data show just under 200,000.

Third, stock-based flow estimates suffer from a major left-censoring issue. Under the first-differences approach, treating the stock on the year prior to reporting for that specific country as a 0 estimates a flow on the first year of reporting that may not capture new inflows but rather pre-existing populations. For instance, in the year 1994, the first year in which Bosnian refugees are reported in Germany, the population (stock) total is 350,000. In contrast, the flow data estimate new arrivals that year of 7,298. Thus, in this case, the stock-based estimation procedure generates a spurious inflow of 342,702 individuals for that year.

To put in perspective how large this potential issue is, we calculate the sum of the refugee stock for all directed-dyad-year observations corresponding to the first year of UNHCR reporting. We then compare this to a) the sum of flows in that dyad for those same years and b) the sum of global flows per year using the new flow data. (By construction, the summed stock value would also be the sum of stock-based flows across the first year of reporting.) As displayed in A.1 Figure 2, the stock-based flow sum for all first years of reporting greatly exceeds the sum of flows for any/all years. This is a clear indication that much of the stock-based flow estimate for all first years of reporting captures pre-existing refugee populations rather than new flows — a source of significant potential error in statistical estimates. In contrast, because the new data are based only on new flows, no such pre-existing population values erroneously enter into the new data.

Fourth, until the year 2007, the stock data include population values corresponding to 3rd country resettlements (that is, values corresponding to the refugee population size in countries within which refugees were eventually resettled after fleeing from their country). Thus, stock-based flows will show “inflows” into countries that refugees/asylum seekers did not actually flee

³⁶To calculate this percentage, we simply take the full set of directed-dyad-year cases between 1961 and 2022; calculate year-to-year changes; then divide the total number of cases by those with negative values.

to but eventually resettled in, potentially years after initially fleeing their home countries.

One example where this practice results in significant disagreement between the new data and the stock-based estimates is the case of Bosnians in the United States. Stock-based flow estimates from 1962 through 2022 show a total of 201,298 Bosnians “fleeing” to the United States. The flow data shows a value that is less than 1% of this figure: 1,942. The UNHCR confirm for us that the difference comes from resettlements to the United States. Such excess values should not be counted as flows, but in the stock-based flow approach they are. The UNHCR has removed such movements from the new data so that only actual first-time flows are captured.

Fifth, the stock data include a number of what the UNHCR calls “non-flow increases”. These are cases where adjustments to a stock value in various years are made not because the stock actually increased from the year before but because some methodological revision, legislative change, or other host-country change to defining/calculating refugees/asylum seekers resulted in a re-counting or re-estimate of the number of these individuals in the country. (For instance, stateless refugee populations may vary in size following acquisition or loss of citizenship, but this change does not indicate new flows/international movements.) In these cases, when the re-count/re-estimation is positive, the stock-based inflows estimates will show increases in the number of individuals arriving to the country that do not actually reflect new arrivals. In the new data, such changes have been removed to ensure that such non-flow increases are not reflected.³⁷

Sixth and finally, as described above, the new data prioritize asylum seeker applications in an effort to capture movements during the years in which they occurred. For countries that use their asylum systems to grant refugee status, the new data reflect asylum seeker increases on their year of their actual arrival to the country. In contrast, these individuals enter into the stock data only after their asylum applications have been processed and approved. Given

³⁷There is one caveat of note here: In some cases, (e.g. refugee counts from censuses), stock values represent cumulative flows over multiple previous years during which they were not recorded. In such cases, both the new flow and stock-based data are incorrect. The flows do not appear in the new flow data, and they are wrongly displayed in the stock data years after they occurred. Through continued communication with the UNHCR, we have sought to identify and correct significant cases in which this occurs, ensuring that these missing flows appear in the new flow data. In A.2.5 “Imputation of Missing Flow Values in Major Cases”, we describe the specifics of this effort in more depth.

lengthy application processing times, many refugee counts in the stock data appear potentially years later once cases are finally approved. Stock-based inflows thus lag actual inflows.³⁸

A.2.3 Additional Empirical Comparisons with Stock-Based Estimates

For each asylum country, we use ordinary least squares regression to generate vectors of slope coefficients ($\hat{\beta}$) and coefficients of determination r^2 from the basic linear models: \forall directed-dyad $d \in D$ for a given asylum country c for each year t , $f_{t,d}^c = \zeta f_{t,d}^{\hat{c}} + \epsilon_{t,d}^c$. Density plots for both variables are displayed in A.1 Figure 4. These results allow us to assess the correlation between inflows to each asylum country and stock-based estimates of inflows to that country. If the latter are a close approximation of the former, we should expect resulting coefficient values to cluster around a value of 1, which would indicate that each stock-based inflow is associated with roughly the same number of actual inflows. Furthermore, if the latter are a close approximation of the former, we should also expect stock-based estimates to explain most of the variance in inflows. (The more precise the estimates, the closer the resulting vector of r^2 values should be to 1.)

However, results diverge significantly. The mean of $\hat{\beta}$ (≈ 0.58) is significantly below 1, indicating that stock-based estimates of inflows tend to significantly underestimate inflows. In fact, $> 10\%$ of $\hat{\beta} \in \hat{\beta} \leq 0$, indicating that for some countries, the two variables are either not correlated or, worse still, are actually negatively correlated. The mean of r^2 (≈ 0.50) indicates that a great deal of the yearly variance in actual inflows is unexplained by the stock-based estimates.

A.2.4 Broader Concerns about Pre-2000 UNHCR Data

As summarized in the paper, we identify three major empirical issues associated with the data generation and reporting patterns of the UNHCR's stock and flow data before the year 2000.³⁹

³⁸Again, as noted above, an important caveat is that the flow data capture some number of arrivals that governments ultimately did not approve as asylum seekers/refugees. While this approach is imperfect, the UNHCR have adopted it as the most direct way of capturing true year-to-year flows.

³⁹While these issues are not technically limited to the period before the year 2000, that year is a clear turning point for the quality of data. This is because in 2000, the UNHCR adopted a standardized approach to

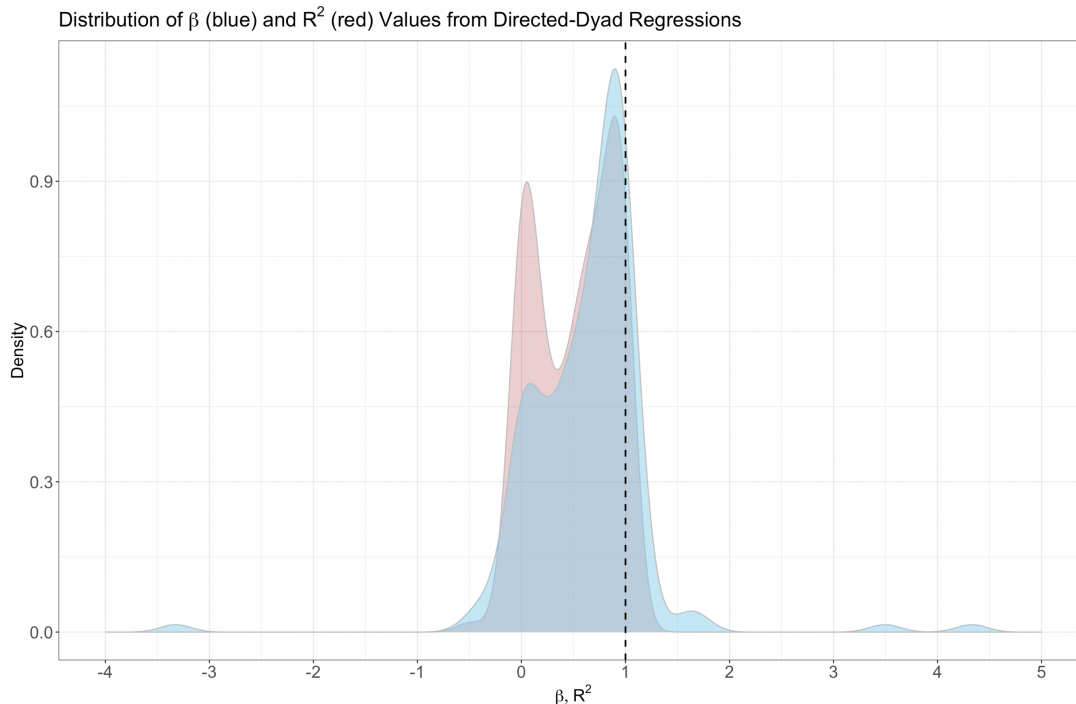


Figure 4: This figure plots the distributions of $\hat{\beta}$ and r^2 values derived from comparison of refugee inflow data (UNHCR, 2021c) and refugee stock-based estimates of inflows (UNHCR, 2021d).

Imputed 0s

The first empirical issue that poses a threat to the replicated articles' internal validity involves the inappropriate treatment of missing data. Until recently, there was no available centralized data on the year on which the UNHCR began tracking refugees and asylum seekers by country. Many scholars constructed panel datasets and set country- or dyad-year observations to 0 in the absence of positive displacement values.⁴⁰ While missing positive refugee values for some observations may be true 0s, some were positive values that were not collected by/shared with the UNHCR. The practice of setting country/dyad-year observations that precede country-specific data collection timelines to 0 affects nearly every study we replicate.

We supplement our analysis with UNHCR-supplied data on centralized collection efforts

refugee and asylum seeker data collection, and around the same time, asylum countries adopted information and communication technologies that improved data collection and reporting processes. The issues that we describe below persist beyond the year 2000 but at significantly reduced levels/rates. We adopt the pre-/post-2000 framing as a constructive heuristic that parsimoniously captures the phenomena we describe below.

⁴⁰Typically, authors have constructed balanced panels, setting country/dyad-year observations to the same starting year and assigning 0s to observations without refugee values.

by country from 1970 on.⁴¹ Patterns in data collection are depicted in A.1 Figure 3. The UNHCR did not began to centrally collect data on asylum seekers globally until the year 2000, producing a substantial increase in data from several dozen industrialized countries to 137 countries, with additional countries entering every year thereafter. However, many countries do not enter into centralized records until many years after statistics began to be collected.

How widespread is the issue of coding NAs as 0s? In asylum-country-year panel datasets, for the period 1962–1999, $\approx 49.82\%$ of observations (3730 of 7486) preceding country reporting timelines would be set to 0. When we look at the period 2000–2022, that number drops to $\approx 11.54\%$ (500 of 4334). For directed-dyad-year panel datasets, these numbers are $\approx 50.75\%$ (738,436 of 1,455,183) and $\approx 13.03\%$ (102,334 of 785,483), respectively.⁴²

Unknown Missingness Within Origin-Country Datasets

A related but separate issue of missingness emerges from the temporally staggered asylum-country reporting patterns. This issue concerns the construction of origin-country and origin-country-year datasets. UNHCR records come mostly from asylum state records, significantly complicating efforts to calculate origin-country or origin-country-year observations. This is because so many asylum countries were not reporting; it is unknown whether some number of refugees left a given origin country for non-reporting hosts during the pre-2000 period.

This issue is especially relevant for our replications, because 11/19 ($\approx 68\%$) of the “causes” studies we replicate ($\approx 40\%$ of all of the studies we replicate) use origin-country panel datasets in their analyses. These studies are therefore missing some unknown (and potentially very substantial) number of refugees and asylum seekers fleeing from those countries, because the asylum countries to which they fled were not then reporting data to the UNHCR.

In A.1 Figure 3, we display the annual number of asylum countries that reported inflows from each origin country, with each inflow corresponding to outflows for that origin country. As indicated by UNHCR country-specific reporting timelines, there is a significant increase in the

⁴¹The exception is 37 countries that supplied data to the UNHCR on asylum flows between 1970 and 1999. For these countries, initial reporting years are unknown – only that these 37 countries reported asylum figures during some or all years during this period. We discuss this in more detail later.

⁴²At the much reduced post-2000 levels of missingness, scholars might implement imputation procedures to estimate values for these missing values.

number of asylum countries reporting data in 2000. Between 1962 and 1999, the rate of change in the number of reporting asylum countries per origin country is $\approx 1019.91\%$ ⁴³; between 2000 and 2022, that number is $\approx 19.75\%$. This indicates that origin-country focused studies using pre-2000 data are very likely missing many outflows from those countries, because many of the countries to which the refugees fled did not report them. For research designs in which the national origin of refugee and asylum seeking populations is relevant, missingness on this variable is certain to introduce some degree of noise to results, potentially also introducing bias. We display this pattern in A.1 Figure 3.

Refugees/Asylum Seekers of Unknown Origin

Another change in data reporting patterns that took place around 2000 is a rise in the number of asylum countries reporting national origin data on refugees, thereby reducing missingness in outflows from sending countries. Before 2000, a significant number of countries that were reporting data did not track the origin of refugees/asylum seekers. (In these cases, the *number* of refugees/asylum seekers was tracked but their origins were unknown – a different issue to the one we raise above, where the the number of refugees/asylum seekers is not known in the first place.) For research designs in which the national origin of refugee and asylum seeking populations is relevant, missingness on this variable introduces some degree of noise to results, potentially also introducing bias. We display this pattern in A.1 Figure 3.

A.2.5 Imputation of Missing Flow Values in Major Cases

As described in the paper, one improvement of the new flow data over the stock data for the purposes of studying flows concerns the treatment of “non-flow increases”. The stock data include a number of cases where adjustments to a stock value in various years were made not because the stock actually increased from the year prior but because some methodological revision, legislative change, or other host-country change to defining/calculating refugees/asylum seekers resulted in a re-counting or re-estimate of the number of refugees/asylum seekers in the country. In these cases, when the re-count/re-estimation is positive, the stock-based inflow

⁴³Readers may wonder if this extreme percentage is driven by particularly low numbers of reporting countries in 1962. Even if we recalculate this percentage from 1970 through 1999, it is $\approx 777.26\%$.

estimates show increases in the number of individuals arriving to the country that do not actually reflect new arrivals. In the new data, such changes have been removed to ensure that such non-flow increases are not reflected.

There is one important caveat: In some cases, (e.g. refugee counts from censuses), stock values represent cumulative inflows over multiple previous years during which they were not recorded. In such cases, both the new flow and stock-based data are incorrect. Such inflows do not appear in the new data, and they are wrongly displayed in the stock data years after they occurred. Through continued communication with the UNHCR, we have sought to identify and correct significant cases in which this occurs, ensuring that these missing inflows appear in the new data. Below, we detail the specific set of cases in which we have applied corrections and our method for doing so.

We refer readers who are interested in the precise calculations to the R code accompanying this project.

Flow of Afghans to Pakistan: In 2007, the UNHCR registered an increase in the population of Afghan refugees in Pakistan of nearly one million individuals. Before 2007, Pakistan had included in its count of refugees only those living in camps. Through the census, Pakistan identified refugees residing in urban areas. The UNCHR has not included these additional recognized refugees in the flow data as they were unable to ascertain when these individuals had left Afghanistan. We approximate their arrival by distributing the 2007 stock increase of refugees (minus flows that were actually captured) across the preceding war years at a rate reflecting inflows that were captured by the UNHCR during this period.

Flow of Iraqi to Jordan and Syria: In 2006 and 2007, the UNHCR registered increases in the population of Iraqi refugees in Jordan and Syria, with Jordan showing an increase of approximately half a million in 2006 and Syria showing an increase of approximately 1.5 million between 2006 and 2007. These populations were updated as Iraqis were registered and verified by the UNHCR, but as with the case above, the UNHCR has not entered them into flow data, because they lack data on these refugees' actual departure years from Iraq. We approximate their arrival to Jordan and Syria by distributing the three stock increases (minus inflows that

were captured) across the preceding war years (starting in 2003 with the United States invasion of Iraq) at a rate reflecting inflows that were captured by the UNHCR during this period.

Flow of Burundi to Rwanda and Tanzania: In 1993, following the murder of its president, Burundi experienced significant refugee outflows (Stearns, 1994). Nevertheless, in the new data, for Burundi to Rwanda and to Tanzania in 1993, outflows are reported. According to the UNHCR, this is because of verification issues associated with arrival years. Since there is evidence that these outflows occurred in 1993, we assign the stock-based estimate to that year's inflow values for both receiving countries.

Flow of Sahrawi to Algeria: Starting near the end of 1975, Fiddan-Qasmiyeh (2011) describe the “mass exodus of Sahrawi firstly being displaced to other parts of the territory... and later... to the nascent Algerian-based refugee camps near the territory's border with that country.” The new data show no international displacement during this period. We rely on historical references to displacement beginning at the end of 1975 and then increasing thereafter. The stock data show staggered increases in the Sahrawi stock in Algeria between the years of 1975 and 1977, then no other change until 1981, when the population increases by 165,000. We estimate flows based off these year-to-year changes, linearly interpolating the estimated flows from 1977 through 1981.

Flow of Colombians to Venezuela and Ecuador: In 2005, the UNHCR registered increases in the population of Colombian refugees (“others of concern”) in Ecuador and Venezuela of approximately 250,000 and 175,000, respectively. In these case, despite requiring international protection, many such individuals did not apply for asylum for reasons that included security concerns. As before, verifications and re-assessments by the UNHCR allowed for adjustments to the stock figures but not to the flows, because of uncertainty over arrival years. Attributing these “others of concern” to specific years is especially difficult because of the long-running nature of the conflict in Colombia. However, we again use the flow data to guide us in estimating the temporal distribution of the refugees who were missed. The first recorded year of flows in the new flow data is 1991 for Colombians arriving to Ecuador; for Venezuela, the first recorded year is 1996. Thus, we use the pre-existing flow rates over the periods 1991 through 2005 for

Ecuador and 1996 through 2005 for Venezuela, distributing the extra flows across those years.

A.2.6 Additional Reflections on the Observation that Refugee/Asylum Seeker Outflows Are At an All-Time High

We observe that forcible displacement has reached historical highs over the past decade. This observation is based on available UNHCR data, and a few caveats are required. First, because the UNHCR data does not extend beyond the end of the second world war, the observation is limited to this contemporary history. Second, as detailed throughout this letter, the UNHCR’s data collection process has improved over time, and part of the rise in numbers reflects more thorough documentation/record keeping; current reported increases should be interpreted with caution, as previous spikes in displacement may be under-counted. Finally, while levels have recently reached all-time highs, this does not take into account increases in the global population. The consequences of refugee flows, for instance, may be influenced less by overall refugee and asylum seeker numbers than they are the size of those populations relative to the populations receiving them. When we standardize global yearly outflows by global yearly population patterns change somewhat substantially. While the recent spike in outflows is undoubtedly substantial relative to overall population levels, it is less substantial than outflows that occurred in 1980 and again in the early 1990s as the Soviet Union collapsed.

A.3 Replication Details

A.3.1 List of Academic Publishers and Formal Search Query

Academic Publishers: American Association for the Advancement of Science; Cambridge University Press & Assessment; Elsevier; National Academy of Sciences; Nature Portfolio; Oxford University Press; PLOS; Royal Society Publishing; Sage Publishing; Springer; Taylor & Francis Online; University of Chicago Press Journals; and Wiley.

Formal Search Query: “refugee flows” | “refugee inflows” | “refugee outflows” & “UNHCR” & “data” & site:pnas.org | site:science.org | site:nature.org | site:plos.org | site:royalsocietypublishing.org | site:tandfonline.com | site:cambridge.org | site:oup.com | site:sagepub.com | site:wiley.com | site:journals.uchicago.edu | site:elsevier.com | site:springer.com | site:jstor.org

A.3.2 Detailed List of Included Studies

Article Details (Causes of Refugee Flows)

Causes								
No.	Article Name	Journal (Year)	Authors	Citation Count	Study Period	Outcome Variable	Explanatory Variable	Identification
1	Sometimes You Just Have to Leave: Domestic Threats and Forced Migration, 1964 – 1989	<i>International Interactions</i> (2003)	Christina, Will Moore, Steven Poe	492	1964–1989	Net Migration	Violent Threat (Repression, Dissent violence, and Civil War)	regression w/ fixed effects [†]
2	The Effects of Foreign Aid on Refugee Flows	<i>European Economic Review</i> (2019)	Axel Dreher, Andreas Fuchs, Sarah Langlotz	83	1976–2013	Refugee Flow by Stock	Foreign Aid	instrumental variable [†]
3	Refugee Gravitation	<i>Public Choice</i> (2016)	Jon Echevarria-Coco, Javier Gardeazabal	25	1990–2013	Refugees Stocks*	Conflict, Civil Liberties, Language, etc.	regression w/ fixed effects [†]
4	A Spatial Model of Internal Displacement and Forced Migration	<i>Journal of Conflict Resolution</i> (2021)	Jon Echevarria-Coco, Javier Gardeazabal	6	1990–2016	Refugees & IDPs Stocks*	Spatial & Geographical Factors	regression w/ fixed effects [†]
5	Judicial independence and refugee flights	<i>Conflict Management and Peace Science</i> (2022)	Saadet Ulasoglu Imamoglu	0	1976–2015	Stock-Based Refugee Flow	Judicial Independence	regression w/ fixed effects [†]
6	The Refugee of My Enemy Is My Friend: Rivalry Type and Refugee Admission	<i>Political Research Quarterly</i> (2019)	Joshua L. Jackson, Douglas B. Atkinson	10	1960–2006	Stock-Based Refugee Flow	Interstate rivalry	regression w/ controls
7	The Threat of Violence and Forced Migration: Geographical Scope Trumps Intensity of Fighting	<i>Civil Wars</i> (2007)	Erik Melander, Magnus Oberg	126	1981–1999	Stock-Based Refugee Flow + New IDP's	Geographical Scope and Intensity of Fighting	regression w/ controls
8	Fear of Persecution: Forced Migration, 1952–1995	<i>Journal of Conflict Resolution</i> (2004)	Will H. Moore, Stephen M. Shellman	461	1952–1995	Refugee Flow by Stock	Dissent, Genocide, Civil War, Polity	regression w/ fixed effects [†]
9	Refugee or Internally Displaced Person? To Where Should One Flee?	<i>Comparative Political Studies</i> (2006)	Will H. Moore, Stephen M. Shellman	231	1990–2011	Stock-Based Refugee Flow / New IDP's	Push of Genocide Civil war; Pull of Democracy GDP	regression w/ controls

*Theory-based extension

[†]Plausibly Causally Identified

Article Details (Causes of Refugee Flows)

Causes								
No.	Article Name	Journal (Year)	Authors	Citation Count	Study Period	Outcome Variable	Explanatory Variable	Identification
10	Whither Will They Go? A Global Study of Refugees' Destinations, 1965-1995	<i>International Studies Quarterly</i> (2007)	Will H. Moore, Stephen M. Shellman	292	1965-1995	Stock-Based Refugee Flow	Various (Violence, Economics, Etc)	regression w/ controls
11	Risk Factors for Forced Migrant Flight	<i>Conflict Management and Peace Science</i> (2007)	Will H. Moore, Jacqueline H. Rubin	49	1965-1994	Binary Indicator of Flow	Migration Risks (genocide, civil war, etc.)	regression w/ fixed effects [†]
12	Refugees and Rivals: The International Dynamics of Refugee Flows	<i>Conflict Management and Peace Science</i> (2019)	Shweta Moorthy, Robert Brathwaite	29	1952-2011	Stock-Based Refugee Flow	International Rivalry	regression w/ controls
13	The Asylum Hump: Why Country Income Level Predicts New Asylum Seekers, But Not New Refugees	<i>Journal of Refugee Studies</i> (2021)	Constantin Ruhe, Charles Martin-Shields, Lisa M. Grob	5	2000-2014	Stock-Based Refugee Flow, New Asylum Applications	GDP	regression w/ fixed effects [†]
14	How Inter-State Amity and Animosity Complement Migration Networks to Drive Refugee Flows: A Multi-Layer Network Analysis, 1991-2016	<i>PLOS ONE</i> (2021)	Justin Schon, Jeffrey C. Johnson	6	1991-2016	Refugee Flow by Stock	Networks of interstate amity and animosity	network model
15	Why Physical Barriers Backfire: How Immigration Enforcement Deters Return and Increases Asylum Applications	<i>Comparative Political Studies</i> (2021)	Justin Schon, David Leblang	10	1990-2016	Stock-Based Refugee Flow	Borders	instrumental variable [†]
16	Supporting Rebels and Hosting Refugees: Explaining the Variation in Refugee Flows in Civil Conflicts	<i>Journal of Peace Research</i> (2021)	Oguzhan Turkoglu	4	1968-2011	Stock-Based Refugee Flow	State Support of Rebel Groups	regression w/ controls; matching [†]
17	Nowhere to go? Why do Some Civil Wars Generate More Refugees Than Others?	<i>International Interactions</i> (2019)	Oguzhan Turkoglu, Thomas Chadeaux	17	1951-2008	Stocks*	Neighborhood Polity GDP	regression w/ fixed effects [†]
18	Unpacking the Effects of Genocide and Politicide on Forced Migration	<i>Conflict Management and Peace Science</i> (2014)	Gary Uzonyi	34	1975-2010	Stock-Based Refugee Flow + IDP	Politicide Geonocide	regression w/ controls
19	The Effects of Water Scarcity and Natural Resources on Refugee Migration	<i>Society and Natural Resources</i> (2013)	Travis Warziniack	20	2008	Refugee Stocks*	Water Scarcity	regression w/ controls

*Theory-based extension

[†]Plausibly Causally Identified

Article Details (Consequences of Refugee Flows)

Consequences								
No.	Article Name	Journal (Year)	Authors	Citation Count	Study Period	Outcome Variable	Explanatory Variable	Identification
20	Blame the Victims? Refugees, State Capacity, and Non-State Actor Violence	<i>Journal of Peace Research</i> (2019)	Tobias Bohmelt, Vincenzo Bove, Kristian Gleditsch	60	1989 – 2015	Non-state Actor Violence	Refugee Stock*	regression w/ controls
21	No Good Deed Goes Unpunished: Refugees, Humanitarian Aid, and Terrorism	<i>Conflict Management and Peace Science</i> (2013)	Seung-Whan Choi, Idean Salehyan	196	1970–2007	Domestic International Terrorist Attacks	USCRI Refugee Flow	regression w/ controls
22	Hosting Your Enemy: Accepting Refugees from a Rival State and Respect for Human Rights	<i>Journal of Global Security Studies</i> (2020)	Tiffany Chu	10	1990-2010	Human Rights Score	Refugee Stock* from Rival Countries	regression w/ controls
23	Radicalism of the Hopeless: Refugee Flows and Transnational Terrorism	<i>International Interactions</i> (2013)	Daniel Milton, Megan Spencer, Michael Findley	135	1969–2001	ITERATE Transnational Terrorism	Stock-Based Refugee Flow	regression w/ controls
24	Trojan Horse, Copycat, or Scapegoat? Unpacking the Refugees-Terrorism Nexus	<i>Journal of Politics</i> (2021)	Sara M.T. Polo, Julian Wucherpfennig	11	1970–2016	Terrorism (GTD)	Refugee Stock*	fixed effects; instrumental variable [†]
25	Refugees and the Spread of Civil War	<i>International Organization</i> (2006)	Idean Salehyan, Kristian S. Gleditsch	1346	1951–2001	Spread of Intrastate Conflict	Refugee Stock*	regression w/ controls
26	The Externalities of Civil Strife: Refugees as a Source of International Conflict	<i>American Journal of Political Science</i> (2008)	Idean Salehyan	360	1955–2000	Militarized Interstate Disputes	Refugee Stock*	regression w/ controls
27	Refugee Flows and State Contributions to Post-Cold War UN Peacekeeping Missions	<i>Journal of Peace Research</i> (2015)	Gary Uzonyi	63	1990–2011	Peacekeeping Mission	Stock-Based Refugee Flow	regression w/ fixed effects [†]
28	Refugees, Economic Capacity, and Host State Repression	<i>International Interactions</i> (2018)	Thorin M. Wright, Shweta Moorthy	23	1952–2011	Repression	Refugee stock*	regression w/ fixed effects [†]

*Theory-based extension

[†]Plausibly Causally Identified

A.3.3 Replication Categories

In this subsection, we provide additional details relating to the replications. Below we describe the three types of replications we engage in.

Replications

Most of our replications are direct reproductions of statistical tests carried out by authors who use flow estimates to directly study the causes or consequences of refugee flows. We first identify articles in which authors derive empirical results using estimates of refugee flows. We then replicate their approaches, substituting the new UNHCR flow measures in place of their previous estimates and maintaining the original values of all other variables. In these cases, our replicated results using flows should be seen as substitutes for results originally reported by authors.

Theory-Based Extension

In another set of articles, authors use some non-flow measure of refugees and/or asylum seekers (e.g. stocks), but we assess the work to be related theoretically to flows. To identify these cases, we first look for direct language by authors indicating a specific focus on refugee flows. When there are no direct references, we turn to the logic guiding the research for indications of an implicit theoretical focus on flows. In such cases, our replicated results using flows should *not* necessarily be viewed as substitutes for results originally reported by authors but as supplements to existing research. Several examples below highlight differences across articles and further explicate this process.

In some cases, authors chose not to use flows simply because flow data were previously unavailable. As Devictor et al. (2021) write:

“[W]e cannot reliably calculate refugee flows. Thus, the main variable used in the analysis is the refugee stocks... To better approximate flows, we restrict the sample to large refugee events.”

Similarly, even as Salehyan (2008, p. 795) includes flow estimates in their analysis as a robustness check, they note that flow estimates are “not a true flow measure and [...] refugee repatriation and third-country resettlement can affect totals.” Because this author did choose to use flows, the decision to replicate their work with the new flow data is straightforward.

In addition, their arguments confirm our choice to replicate the study, with many relating directly to considerations of short-term inflows (as opposed to the potentially protracted presence captured by stock measures). For instance, they argue that:

“In countries where ethnic cleavages are deeply entrenched, **large, unexpected migrant inflows** may tilt the delicate ethnic balance in the host society and spark intergroup conflict... As Brown (1996) [(1996)]writes, ‘The **sudden influx of refugees** can aggravate ethnic problems and further complicate the picture by changing the domestic balance of power’ (1996, 576).”⁴⁴

Clearly, this type of dynamic is much better captured by flow than stock numbers. Yet the stock measures that Salehyan (2008) uses align nicely with other arguments they make, including potential strain on public services and the spread of disease, which might persist or even increase in intensity as refugees remain stranded within a given host country.

In this case, stock and flow measures capture separate, complementary dynamics. While our results speak to the effects of refugee inflows on the risk of militarized disputes between states, Salehyan (2008)’s stock-based results capture the effect of a given number of refugees hosted (however long those refugees remain in the country) on that risk. Because many refugees live in protracted displacement,⁴⁵ it is also critical to understand the effects of longer-term residence in asylum countries.

Other examples come from Salehyan and Gleditsch (2006), who focus explicitly on refugee flows (e.g. “the role of **refugee flows**”, the “experience [of] an **influx of refugees**”⁴⁶) throughout their research, and Polo and Wucherpfennig (2021). In these articles, some mechanisms relate clearly to the refugee stock measures they use in their studies. Yet, others (e.g. “transnational or domestic terrorist outcomes [based on] host countries’ presumed inability to screen, vet, or integrate large numbers of refugees due to administrative overload” (Polo and Wucherpfennig, 2021, p. 16)) occur with the *arrival* of refugees (flows), not their persistent presence (stocks). Again, in reviewing the logic undergirding both studies, we conclude that the authors’ use of stocks and our use of flows produce distinct, complementary inferences.

⁴⁴Bolded text applied by the authors.

⁴⁵According to (UNHCR, 2020, p. 24), “...the vast majority (77%) of the world’s refugees are living in protracted displacement... cases in which ‘25,000 or more refugees from the same nationality have been in exile for at least five consecutive years’.”

⁴⁶Bolded text applied by the authors.

Contemporary Replications

We also engage in a separate set of empirical exercises in which we use the new data to extend existing research beyond their original study periods, setting the base year to 2000, to determine whether and how results change. Many of the most influential studies on the causes or consequences of refugee flows are based on data that correspond largely to the Cold War period. For example, Salehyan and Gleditsch (2006)’s highly cited work on refugees and the spread of civil war and Moore and Shellman (2004, 2006, 2007)’s pioneering work on the determinants of displacement cover the periods 1951-2001, 1952-1995, 1976-1995, and 1965–1995, respectively.

Because reporting by countries of refugees and asylum seekers increases significantly in the year 2000, in these contemporary replications we restrict our re-analysis to the period beginning in the the year 2000 and ending in the most recent year for which we are able to obtain data for all variables included in the original studies.⁴⁷ Because many datasets used in studies (e.g. to generate controls) are not updated frequently, we arbitrarily restrict our set of contemporary replications to those for which the the original study periods include no data after 2013.

The results generated through these contemporary replications represent our best estimates of the actual relationships relating to the causes and consequences of refugees examined in this project. The results from these extensions are both contemporary and based on the highest quality, most (geographically) comprehensive data available.

A.3.4 Detailed Replication Procedures

Although we provide below many (and the most important) details associated with the replications and contemporary analyses, for succinctness, we do not include all details of coding decisions; these are included in the notes contained in our replication materials, within the relevant R scripts.

⁴⁷For these contemporary replications, data included in the original studies (whether as independent variables, primary explanatory variables, or as controls) are sometimes no longer available from their original source. In such cases, we identify alternative sources to construct the variables used in the studies. In other cases where a specific variable is widely used across studies (e.g. country GDP), for sake of efficiency, we use data from a single source rather than constructing GDP measures from all possible sources. In some cases, as we describe in the Appendix, our reconstructions of variables also represent improvements on data previously used for that variable.

UNHCR Political Boundaries: Contemporary vs. Historical

The UNHCR data is based on contemporary country boundaries. This has two implications. First, some now-defunct states were subsumed under a single, geographically larger state (e.g. East Germany was dissolved into contemporary Germany when it unified with West Germany). In these cases, it is impossible to match flows to the historical state.⁴⁸ However, this should not affect our replications, as the UNHCR stock data undergirding most existing work also uses contemporary boundaries. Thus, such cases *should* have already been removed from the analyses we replicate.⁴⁹ Thus, while the lack of historical boundaries does not affect our ability to replicate studies, it does mean that certain cases are unavoidably excluded from analysis; this has only modest implications for the generalizability of our work (and previous work), for these cases are relatively rare⁵⁰.

Some now-defunct states have fractured into smaller contemporary states (e.g. Sudan). These cases are much easier to deal with, as we are able to recover the values for the historical state by aggregating refugee values for the current states to the previous state for all relevant years that the previous state existed. In the case of Sudan, for all years prior to 2011, values for modern-day Sudan would equal the summation of values for South Sudan and contemporary Sudan.

UNHCR Political Boundaries: Partially Recognized States

A second issue concerns cases in which state independence is only partially recognized internationally (e.g. Kosovo, Northern Cyprus, Palestine, the Sahrawi Arab Democratic Republic, and Taiwan). UNHCR flow data reflects only countries the United Nations recognizes. This issue is, of course, not specific to the UNHCR data, and all country-year datasets must adopt some set of boundaries that include or exclude such cases.

We note this here only because the set of states in the UNHCR data does not always

⁴⁸We discuss this further in the conclusion of the paper and highlight the value such data might have should the UNHCR ever attempt to construct such a dataset.

⁴⁹We say *should* here because we did encounter at least one case in which scholars included values (all 0s) for such states in their analysis; this is incorrect and is likely a data preparation oversight. For such case(s), we first re-run their analysis without these countries (to confirm that their previous results hold) before running our replication(s) without these countries.

⁵⁰Other cases include North and South Vietnam, North and South Yemen, and West Germany.

match the set included in the other datasets that we replicate with the flow data. This mismatch results in particular coding decisions. For instance, the UNHCR does not include Kosovo, which instead falls under the broader single designation of “Serbia and Kosovo: S/RES/1244 (1999)”, referencing United Nations Security Council resolution 1244. For datasets that treat Kosovo and Serbia as separate states, we modify these data (rather than the UNCHR data, which we are unable to disaggregate), merging Serbia and Kosovo into a single entity. For instance, for population values, we would sum population values for both territories for both years.⁵¹⁵²⁵³

Overseas Territories

In some cases the UNHCR tracks flows in and out of territories (e.g. the British overseas territories of Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Gibraltar, and Montserrat). Because such territories are formally part of other countries, and because many datasets used in the replications and extensions exclude these territories, we aggregate their numbers to the appropriate subsuming state.

Micro-states

A number of micro-states are deleted from the panels used in the replications and extensions because data is generally unavailable for these countries.⁵⁴ The UNHCR tracks refugee flows to and from these states, but their numbers are small: total inflows and outflows to these states between 1991 and 2020 are 4672 (0.007726093% of total inflows) and 17,660 (0.02920437% of total outflows), respectively.

⁵¹None of our coding decisions should be interpreted as normative political judgments about any of these disputed cases. For practical reasons associated with data construction, we follow United Nations coding decisions. As scholars, we remain neutral on this point, even if we personally hold particular views.

⁵²We note East Timor independently, given its transition to independence. Although the UN Transitional Administration in East Timor (UNTAET) was established in 1999, the state was not formally independent until 2002 (BBC News, 2018), so data from many sources for East Timor is often unavailable before 2002. The violence that led to outflows from the East Timor region pre-independence were perpetrated by and/or with the support of the Indonesian state. Therefore, we match refugee outflows between 1999 and 2001, associated with East Timor by the UNHCR, to Indonesia.

⁵³A second example includes the modern-day countries Slovakia and Czechia, formally united and known as Czechoslovakia pre-1993. Thus, for 1991 and 1992 we aggregate the UNHCR values to create Czechoslovakia.

⁵⁴These include Andorra, Antigua & Barbuda, Dominica, Grenada, Kiribati, Liechtenstein, Marshall Islands, Micronesia (Federated States of), Monaco, Nauru, Niue, Palau, Samoa, San Marino, São Tomé & Príncipe, Seychelles, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenadines, Tonga, Tuvalu, Vanuatu, Vatican City.

Stateless and Unidentified Refugees and Receiving States

The UNHCR data includes flows of refugees officially designated as stateless as well as flows in which sending or receiving states are simply unknown. States of origin may be unknown for refugees whose arrival in asylum countries is recorded, and asylum destinations may be unknown for individuals whose flight from particular countries is recorded. Where possible, we include these populations in our analyses. For instance, in studies conducted using the (asylum) country-year level of analysis, details on origin are often not used, and individuals in UNHCR’s “Stateless” and “Unknown/Various” categories can therefore be included in our replications. However, for all replications and extensions in which statistical testing is performed using (country) dyadic or directed dyadic panel datasets, these groups of individuals are necessarily excluded; no other variables can be associated with them. For context, total inflows and outflows of unknown origin from 1991-2020 are 8,366 (0.01383487% of all inflows) and 737,637 (1.219831% of all outflows), respectively. Total outflows of stateless origin 1991-2020 are 149,599 (0.2473921% of all outflows).

Data on Internally Displaced Persons

Some articles that we replicate and/or extend combine two sets of data — estimates of refugee flows and data on internally displaced persons — to create more general measures of forcible displacement. For these, we complete replications and extensions with available IDP data. However, we have general concerns about the nature of existing IDP data: as the former Internal Displacement Monitoring Centre (IDMC) director notes, “for most countries affected by internal displacement only rough estimates are available. These often only cover parts of a country, or specific groups of IDP” (Rasmusson, 2006).⁵⁵ Although various efforts are underway to develop better data on IDPs (see, for instance, Taia et al. (2021)), we use the existing IDP data with the caveat that results derived from them should be interpreted with caution.⁵⁶ Nevertheless, the studies we replicate/extend were published using such data, and we accordingly follow their

⁵⁵See also World Bank Group (2019). These problems of data collection extend not only to those IDPs who are directly displaced by violence but also to refugee returnees who end up as part of the existing IDP population (Fagen, 2009)

⁵⁶For instance, of the three existing datasets on IDP stocks or flows with which we are familiar, the first, USCRI (2008), is missing observations for 12.32 % of observations (375 of 3,045) in our country-year panel dataset; the second (UNHCR, 2021) and third (IDMC, 2020a) are missing 51.92 % and 59.47 %, respectively.

approach. Our approach to using IDP data is as follows: for replications, we follow previous scholars in using data from USCRI (2008). For extensions, USCRI (2008) cannot be used as it ends in 2008. Instead, we combine data from two separate sources (IDMC, 2020b; UNHCR, 2021) to construct IDP flow estimates from 2008 through 2020.⁵⁷

The Issue of Constructing Origin-Country Panel Datasets

For the pre-2000 period, substantial numbers of countries did not consistently report data to the UNHCR. That UNHCR records are mostly constructed from asylum state records significantly complicates efforts to calculate origin-country/origin-country-year observations, for in the pre-2000 period, it is unknown whether some number of refugees left a given origin for a non-reporting host. The most conservative approach would assume potential missingness for ALL refugee-sending countries in the pre-2000 period as there is some non-zero probability that they sent refugees to one or more of the non-reporting countries during the period. However, that would effectively require assuming missingness for all countries before 2000.

As an alternative, since refugees often do not travel beyond contiguous neighbor states, we use reporting or lack thereof by refugee-sending countries' contiguous neighbors to determine whether or not to treat a given historical values of 0 as potentially false 0s. Indeed, for refugee/asylum seeker-producing countries, for the 2000-2021 period, we calculate that refugees traveled to *all* contiguous neighbors of the sending state in approximately 20 to 50% of cases. For refugee/asylum seeker-producing countries for this same period, refugees travel to at least one contiguous state in between roughly 50 to 90% of cases.

Specifically, for each year between 1962 and 1999, we determine whether at least one country contiguous to each potential sending country was not reporting in that year. If they were not, then we treat 0s for that sending country as suspect and set them to NA. If a potential sending country's contiguous neighbors were all reporting, we treat those 0s are true 0s.

This admittedly imperfect approach strikes a balance between taking the lack of reporting seriously and imposing strict criteria that would effectively eliminate all pre-2000 variables.

⁵⁷Specifically, for all years of overlap (2008 through 2017), we calculate the average of the two time series for each country.

Replications Matching Caveats

In some replications and extensions, issues with data and/or statistical models prevent us from carrying out direct comparisons; we denote these original models/data in the results with a “corrected” label. These data and/or model problems fall into three general groups.

The first issue affects replications only. In a number of cases, the study periods began before 1962, the first year for which the United Nations’ flow data is available.⁵⁸ In these cases, we drop the years of non-overlapping coverage and reestimate results using the *original* data to determine whether or not the original findings are robust to dropping these early post-World War II years. We report these robustness test results in our results section, along with the replication results. In most cases, results using the abridged version of the original data are (effectively) unchanged. However, as we note above, this is not always the case. Most notably, Salehyan and Gleditsch (2006)’s results are not robust to dropping observations from the 1950s. We refer to these cases as temporally-restricted replications.

Second is an issue related to the issues with state boundaries and micro-states described above. Some authors who used the UNHCR stock data (which, like the flow data, is based on contemporary country boundaries only) did not, in their original work, always correct their variables to account for changes in countries and/boundaries. In such cases, we adjust the original dataset to correctly account for such changes. We then retest the authors’ models, confirming that they are consistent with the original results, before moving on to the replication. We refer to these cases as geographically-corrected replications.

Third, some (typically generalized linear) models no longer produce estimates (e.g. they fail to converge) when either the new flows data is used (replications) or when the newly extended datasets are introduced. Given variation across studies, our approaches to this issue vary. However, broadly speaking, our process follows these steps: First, in some cases, the change in the nature of the data indicates that an alternative model should be used. The most notable instance of this arises in cases in which authors had originally used zero-inflated negative binomial models because of the preponderance of observations with values of 0 (usually country-year

⁵⁸Specifically these include: Moorthy and Brathwaite (2019) (1952-2011); Jackson and Atkinson (2019) (1960–2006); [3] Moore and Shellman (2004) (1952-1995); Turkoglu and Chadeaux (2019)(1951-2008); Salehyan and Gleditsch (2006) (1951-2001); Salehyan (2008) (1955-2000); and Wright and Moorthy (2018) (1952-2011).

or dyad-year observations). For various reasons (e.g. any cases in which returns, resettlements, births/deaths, or any combination of these variables) equalled or exceeded outflows in a given year), the distribution of first-differenced flow estimates are skewed toward 0. In the actual flow data, however, observations of 0 are much rarer, and the choice of a zero-inflated model is no longer appropriate (nor practical to implement). Where such models produce estimation issues, we simply replace them with an alternative count model (e.g. negative binomial). In other cases, where co-linearity between variables produces convergence issues, we eliminate the minimum number of controls required to achieve estimation. For instance, some authors include squared and cubic terms of variables that are highly correlated. In such cases, if we can achieve convergence by dropping only the cubic term, we do that. Most importantly, in all such cases we first confirm that results using the *original* data produce results consistent with those originally reported by the author(s) to confirm that the omitted variables do not influence them. Only then do we proceed to replicate using the truncated set of variables.

Contemporary Replications Specifics

This final sub-section provides details specific to the contemporary replications. We carry out contemporary replications of all studies. However, we extend only those with few if any observations corresponding to years in the 2000s. Specifically, we select for extensions all articles with study periods that do not extend past 2012.⁵⁹ The set of articles that we extend comprises Davenport et al. (2003); Jackson and Atkinson (2019); Melander and Oberg (2007); Moore and Shellman (2004, 2006, 2007); Moorthy and Brathwaite (2019); Turkoglu and Chadeaux (2019); Uzonyi (2014); Choi and Salehyan (2013); Chu (2020); Milton et al. (2013); Salehyan (2008); Salehyan and Gleditsch (2006).

For each contemporary replication, we begin the new study period at 2000, when the UNHCR’s near complete global coverage began; end dates vary according to data availability. Some covariates are widely used across the set of cases we replicate. For instance, measures of GDP or GNP are often included in regression analyses. For purposes of efficiency, and in some cases for the sake of data improvement, we adopt standard measures of such variables,

⁵⁹This cutoff is somewhat arbitrary, but we selected it based on the fact that a number of covariates required for the extensions come from datasets that themselves do not cover much of the past decade. The feasibility of consistently carrying out extensions that extend beyond this period is limited.

applying them to all extensions, even where the original authors adopted a different data source. GDP is a good example. Historically, obtaining quality data on GDP has been challenging for countries experiencing civil conflict (Gleditsch, 2002) — precisely the set of countries of interest in many of the papers we replicate/extend. Recent work by Fariss et al. (2022) introduces improved GDP data for use by conflict (and other) scholars. Thus, we adopt their updated GDP (and population) measures in our extensions. In other cases, data used by authors has not been updated for many years (e.g. some of the Correlates of War data). For these, we necessarily identify alternative measures for the extensions. These coding decisions and other details relating to each case are provided below.

As a second example, authors using the Polity dataset dealt with missing data using various strategies. Polity has since taken steps to deal more carefully with these special transition codes. Thus, in the extensions, we may drop additional variables that the authors included solely based on missingness and simply use the updated Polity measures.

Ethical and Data Access Considerations

All data used in the study are publicly available, with the exception of the restricted ITERATE terrorism dataset used by Milton et al. (2013). We acquired the data for our extension of their results thanks to the support of University of California, Merced’s University Library Collection Services.

A.4 Results

A.4.1 Summary of Replication Scores

Table 1: Result Scores (Causes of Refugee Flows)

Causes					
No.	Article	False 0's Removed	New Flow Measure	Both Modifications	Contemporary
1	Davenport et al. (2003)	7/7	7/7	6/7	6/7
2	Dreher et al. (2019) [†]	NA*	0/3	0/3	0/3
3	Echevarria and Gardeazabal (2016) ^{††}	NA*	4/4	4/4	4/4
4	Echevarria and Gardeazabal (2021) [†]	4/4	3/4	3/4	3/4
5	Ulasoglu Imamoglu (2022) [†]	NA	1/1	1/1	1/1
6	Jackson and Atkinson (2019)	2/2	2/2	2/2	2/2
7	Melander and Oberg (2007)	3/3	2/3	2/3	3/3
8	Moore and Shellman (2004) [†]	4/4	3/4	4/4	4/4
9	Moore and Shellman (2006)	4/4	2/4	2/4	3/4
10	Moore and Shellman (2007) [†]	16/17	10/17	10/17	11/17
11	Rubin and Moore (2007)	3/3	3/3	2/3	3/3
12	Moorthy and Brathwaite (2019)	2/2	1/2	1/2	2/2
13	Ruhe et al. (2021) [†]	NA*	1/1	1/1	NA×
14	Schon and Johnson (2021)	NA*	2/2	2/2	2/2
15	Schon and Leblang (2021) [†]	NA*	3/3	3/3	3/3
16	Turkoglu and Chadeaux (2019) ^{††}	2/2	2/2	2/2	0/2
17	Turkoglu (2021) [†]	1/1	1/1	1/1	1/1
18	Uzonyi (2014)	2/2	2/2	2/2	1/2
19	Warziniack (2013) [‡]	NA*	2/2	2/2	NA×
19	Total	50/51 ≈ 98 (99)%	52/67 ≈ 75 (81)%	50/67 ≈ 75 (82)%	48/64 ≈ 75 (79)%
8	Excluding Non-Plausibly Identified	27/28 ≈ 97 (99)%	28/40 ≈ 70 (81)%	29/40 ≈ 73 (83)%	27/39 ≈ 69 (71)%
15	Excluding Theory-Based	48/49 ≈ 98 (100)%	43/59 ≈ 73 (80)%	42/59 ≈ 71 (78)%	43/58 ≈ 74 (81)%

[†]Theory-based Extension

*Author correctly handled missing values

^{††}Plausibly Causally Identified

× Author's original study period included only post-2000 observations

Weighted Averages followed by Averages in Parentheses

Table 2: Result Scores (Consequences of Refugee Flows)

Consequences					
No.	Article	False 0's Removed	New Flow Measure	Both Modifications	Contemporary
20	Bohmelt et al. (2019) [‡]	1/2	1/2	1/2	1/2
21	Choi and Salehyan (2013) [†]	NA*	0/2	0/2	1/2
22	Chu (2020) [‡]	2/2	0/2	0/2	0/2
23	Milton et al. (2013)	1/1	1/1	1/1	1/1
24	Polo and Wucherpfennig (2021) ^{††}	6/6	6/6	6/6	5/6
25	Salehyan and Gleditsch (2006) [‡]	0/1	0/1	0/1	0/1
26	Salehyan (2008) [‡]	2/2	2/2	2/2	1/2
27	Uzonyi (2015) [†]	0/2	0/2	0/2	0/2
28	Wright and Moorthy (2018) ^{††}	2/2	2/2	0/2	0/2
9	Total	14/18 ≈ 78 (69)%	14/20 ≈ 70 (61)%	12/20 ≈ 60 (50)%	11/20 ≈ 55 (48)%
3	Excluding Non-Plausibly Identified	8/10 ≈ 80 (59)%	8/10 ≈ 80 (57)%	6/10 ≈ 60 (20)%	5/10 ≈ 50 (18)%
3	Excluding Theory-Based	1/3 ≈ 33 (50)%	1/5 ≈ 20 (33)%	1/5 ≈ 20 (33)%	2/5 ≈ 40 (50)%

[‡]Theory-based Extension

*Author correctly handled missing values

^{††}Plausibly Causally Identified

Weighted Averages followed by Averages in Parentheses

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