Feeding the Tigers:
Remittances and Conflict in Sri Lanka*

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Abstract

This paper estimates and quantifies the impact of the diaspora remittance flows on the conflict intensity and outcomes in the Sri Lankan Civil War during the period 1996-2009. We develop an approach to infer which remittance inflows were likely to benefit the Tamil Tiger rebels relative to the central government based on Facebook connections data at the subnational level. Using shocks to source country remittance outflows, we show that exogenous increases in remittances accessible to the Tamil Tigers significantly increased their fighting strength. We then set up a quantitative model of two-sided armed conflict over many contested geographic locations, augmented with remittance flows that affect the fighting strengths of the two sides. We structurally estimate the key parameters using remittance and conflict data, and calibrate the model to the Sri Lankan subdistricts over the period of the conflict. Our main quantitative finding is that remittances had a significant impact on the timing of the central government victory, and were a substantially more important component of the military strength of the Tamil Tigers than of the government. Remittances that favored the Tamil Tiger rebels may have prolonged the war by as much as 14 years.

Keywords: Conflict, Remittances, Diaspora, Tamil Tigers, Sri Lankan Civil War
JEL Codes: F24, D74, O53

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1. Introduction

According to the World Migration Report 2022, there were 281 million international migrants in the world in 2020. Emigrants remain connected to their origin countries both economically and politically. The total annual remittances sent home by the diaspora amount to over US$700 billion, far larger than the US$200 billion in global official development assistance (ODA). In many cases remittances constitute a vital lifeline that keeps fragile economies afloat (Yang, 2011). At the same time, numerous case studies highlight the significant political influence exerted by diasporas, particularly in revolutions and wars (Horowitz, 2000; Shain, 2002; Smith and Stares, 2007). Remittances have been argued to shape domestic politics and armed conflict in countries across the globe, ranging from Sri Lanka to Turkey, Northern Ireland, Lebanon, and Eritrea, to just name a few (Picard, 2000; Schmitz-Pranghe, 2010).[1]

However, currently there is limited quantitative evidence on the political influence of diasporas in the origin countries. In particular, we still lack reliable estimates of the importance of remittances for the outcomes of civil conflict, such as parties' chances of winning or conflict intensity and duration. This paper provides econometric evidence and a quantitative assessment of the role of remittances in the Sri Lankan Civil War over 1996-2009, a two-sided conflict that pitted the central government against the separatist Tamil Tigers (Liberation Tigers of Tamil Eelam, henceforth LTTE). This is an "ideal" setting for investigating the role of remittances, as there is abundant anecdotal evidence of the Sri Lankan diaspora allegedly funding (voluntarily or under threat) the fighting activities of the LTTE (Becker, 2006; Chalk, 2008; France24, 2011).

Our empirical contribution is to estimate the influence of side-specific remittances on conflict outcomes. The main challenge we must overcome is that there are no remittance data at the subnational level, and without additional information it is impossible to tell which remittances go to which side of the war. We use data on Facebook social connections at the bilateral source country-Sri Lankan subdistrict level. We build a measure of an exogenous remittance shock at the subdistrict level by combining these connections with the data on outgoing remittances at the source country level. This local remittance shock is a shift-share: if a particular Sri Lankan subdistrict has Facebook links with countries that had a large increase in aggregate outgoing remittances, we will code this district as experiencing a higher remittance inflow, relative to subdistricts with social connections to countries where outgoing remittances did not rise. We combine this measure with subdistrict-level information on armed conflict, LTTE territorial control, and ethnic composition. The result is a panel dataset of 322 Sri Lankan subdistricts over the period 1996-2009.

The conflict had a strong ethnic component, with Tamil areas generally supporting the LTTE and Sinhalese areas the government. Taking this into account, we proceed to aggregate the local remittance shocks across subdistricts with varying Tamil ethnic shares to build measures of the total remittance shocks to each side of the conflict in each year. We view these as shocks to the fiscal capacities, and therefore the fighting strengths, of the two sides. Over the period of the analysis,

[1] The data sources for this paragraph are International Organization for Migration (2021), US Census (2024), and World Bank (2024). Political leaders in exile who have pulled the strings of revolution or resistance at home famously include Vladimir Lenin, Charles de Gaulle, Benito Mussolini and Ayatollah Ruhollah Musavi Khomeini, among many others.

the central government forces were on the offensive. Our main reduced-form empirical result is that remittance funding for the LTTE deters the government's offensive actions in LTTE-controlled areas contested by the government, reducing fighting there. At the same time, greater funding for the government makes it more likely to undertake military operations in the LTTE-controlled areas, increasing fighting. These findings are *prima facie* evidence that remittances matter for conflict.

The reduced-form econometric estimates cannot be used to quantify the impact of remittances on the conflict as a whole, or to perform counterfactuals. We thus develop a quantitative model of the Sri Lankan Civil War. In the model there are two sides to the conflict, and a large number of geographic locations that these two sides contest. The outcome of fighting in a location is control of that location. The probability of winning a contest for a location is a function of the endogenous fighting efforts, weighted by each side's fighting efficiency. In turn, a side's fighting efficiency increases with the total amount of remittances it is able to appropriate across the territories under its control.

The model is structurally estimated and calibrated to the Sri Lankan subdistricts and the actual history of the war from 1996 to its end in 2009. We use equilibrium relationships implied by theory and a transparent identification strategy to econometrically estimate the key parameters, using data on remittance shocks and control of territory at the subdistrict level over time. The most important structural parameters are the elasticities of fighting efficiency with respect to remittances available to the two sides to the conflict. We find that the elasticity of the LTTE's fighting efficiency with respect to remittances is about double that of the government.[2] Given the parameter estimates, we recover the exogenous disturbances to the fighting strength of both sides to match the evolution of the war over the period 1996-2009.

Our framework can make sense of the relatively abrupt collapse of the LTTE at the end of the conflict, as the remittance channel generates a powerful feedback loop. A shock that decreases LTTE territorial control gets amplified by the fact that it also curtails its ability to capture remittances, which further weakens the LTTE. When we turn off this feedback loop, the final government offensive of 2008-2009 is not successful at ending the war, and LTTE remains in control of substantial territory as of 2009. Our main counterfactual scenarios investigate how the war would have evolved if the sides were not supported by remittances. In the first exercise, we simply halve all remittances coming into Sri Lanka across the board. Though this shock is aggregate to Sri Lanka and uniform across locations, in this counterfactual the LTTE loses half of the territory it held in each year. This is due to the higher estimated elasticity with which the LTTE transforms remittances into fighting strength compared to the central government.

Next, we explore the fact that remittances from some countries go primarily to Tamil areas, while those from other countries go mostly to non-Tamil areas. We remove remittances from four countries that are most heavily tilted towards the LTTE. When this remittance support to the LTTE is withdrawn, its fighting strength collapses, and the central government instantaneously secures virtually complete victory in 1996. In the data, the complete victory does not come until 2009, meaning that remittances from these 4 countries may have prolonged the war by about 14 years. Thus, while the winning odds

[2]This is consistent with the notion that the state has a "headstart" advantage due to the standing army, making it less dependent on remittances (for settings where one actor has such a "headstart", see e.g. Konrad, 2009).

were from the beginning stacked against the LTTE, the large foreign remittances delayed the inevitable defeat. On the flip side, removing remittances from countries that are the key sources for the central government has barely any impact on the evolution of the war. The clear conclusion emerging from both counterfactual experiments is that access to remittances was much more important for the LTTE's prospects in the war than for the government's.

Our work draws from, and contributes to, several strands of the literature. First and foremost is the literature on migrants' remittances (Rapoport and Docquier, 2006; Yang, 2011; Rapoport, 2019), which has among other things studied the major determinants of remittance flows (Carling, 2008), as well as the economic consequences of remittances (Maimbo and Ratha, 2005; Yang, 2008; Giuliano and Ruiz-Arranz, 2009; Clemens and McKenzie, 2018). A few contributions link diasporas and remittances to political outcomes. Mariani, Mercier, and Verdier (2018) build a theory of how transfers from diasporas affect fighting. Escribà-Folch, Meseguer, and Wright (2018) conclude that remittances lead to more protests in non-democratic recipient countries, while García and Maydom (2021) find that receiving remittances is associated with stronger support for vigilantism and repressive policing. As far as armed civil conflict is concerned, drawing on cross-country evidence, Regan and Frank (2014), Hassan and Faria (2015), Okafor and Piesse (2018) and Batu (2019) conclude that remittances are on average negatively associated with conflict and terrorism, while Elu and Price (2012), Mascarenhas and Sandler (2014) and Mahmood (2024) find a positive impact of remittances on domestic terrorism financing and activity.[3]

The second is the literature on the economics of conflict (for recent surveys, see Anderton and Brauer, 2021; Rohner and Thoenig, 2021; Rohner, 2024; Thoenig, 2024), and in particular the international dimension of civil conflicts (e.g. Martin, Mayer, and Thoenig, 2008a; Martinez, 2017; Durante and Zhuravskaya, 2018; World Bank, 2020; Anderson et al., 2022; Malik, Ali Mirza, and Rehman, 2025). This literature stresses that funding is key for the feasibility of any armed rebellion or insurgency (Collier, Hoeffler, and Rohner, 2009), and that the availability of reliable funding sources for the competing factions leads to longer-lasting wars (Fearon, 2004).[4] While existing work has focused on the financing of armed conflict through resource rents (Berman et al., 2017), or military aid (Dube and Naidu, 2015; Berman and Lake, 2019; Dimant, Krieger, and Meierrieks, 2024), it has all but ignored the role of remittances, which is of arguably paramount importance.[5] Our work is also related to the small set of papers building and estimating quantitative models of conflict that take network links and spatial factors into account (Martin, Mayer, and Thoenig, 2008b; König et al., 2017; Mueller, Rohner, and Schönholzer, 2022; Couttenier et al., 2024), and that investigate the spread of violence over time

[3] A related body of work studies the general impact of emigration on conflict, beyond remittances (for qualitative surveys of major arguments and mechanisms, see Brinkerhoff, 2011; Van Hear and Cohen, 2017). It has been argued, among others, that diasporas can act as mediators, that emigration can result in value-transmission and also act as an "escape valve" for local tensions (Bosetti, Cattaneo, and Peri, 2021). In contrast, Brockmeyer et al. (2023) emphasize that migrant networks can be a source of recruits into fighting and terrorist activities. While some studies have found that emigration is associated with less conflict in the origin country (Preotu, 2016; Peters and Miller, 2022), others conclude that the overall effect is ambiguous due to countervailing forces (Miller and Ritter, 2014; Mariani and Mercier, 2019).

[4] Beyond rebel funding, another important factor affecting the feasibility of rebellion is state capacity, which has been studied, among others, by Besley and Persson (2011) and Acemoglu, García-Jimeno, and Robinson (2015).

[5] Beyond specifically military aid, other papers examine the nexus between general humanitarian/foreign aid and conflict (see, among others, Berman et al., 2013; Nunn and Qian, 2014; Ahmed and Werker, 2015).

(Novta, 2016).

Finally, our paper contributes to the empirical analysis of how income shocks affect violence. Much of the debate in this literature has focused on contrasting the *opportunity cost* and *rapacity* channels (Dube and Vargas, 2013; McGuirk and Burke, 2020). In this context, financial remittances may, on the one hand, improve living standards (Yang, 2011), thereby raising the opportunity cost of engaging in violence or shaping incentives to influence conflict through the outside option offered by migration (e.g., Karadja and Prawitz, 2019). On the other hand, remittances may provide critical resources to actors seeking to advance political or military agendas (Mariani, Mercier, and Verdier, 2018), consistent with the logic of rapacity effects. Our reduced-form estimation and model quantification control for both the opportunity cost and rapacity effects, but focus on a distinct mechanism: the impact of remittances on fighting strength. This mechanism features a positive feedback loop between territorial control and fighting efficiency. Although a similar loop may arise with extractive rents or control over natural resources, to the best of our knowledge our paper is the first to quantify the strength of this feedback mechanism.

Beyond the distinct economic mechanism, it is crucial to analyze remittances separately from other sources of income in conflicts. First, remittances are primarily driven by income shocks abroad. Consequently, the ability of warring groups to appropriate these transfers depends not only on territorial control but also on the geographic distribution of their respective diasporas across host countries—an effect highlighted in one of our counterfactual scenarios. Second, remittances raise a different set of policy implications. Whereas transparency initiatives and corporate social responsibility are central in managing natural resource revenues (Berman et al., 2017), and border security plays a pivotal role in regulating aid disbursement in conflict zones (Premand and Rohner, 2024), remittances call for entirely different instruments. These include the monitoring of international money transfers, enforcement of fundraising regulations, and ultimately forms of financial surveillance that necessarily extend beyond the borders and sovereignty of the conflict-affected country—thus requiring international coordination and cooperation.

In sum, this paper is the first to investigate how exogenous shocks to remittance inflows affect the relative victory prospects of all factions engaged in a given civil conflict. Empirically, we develop a novel methodology to estimate bilateral remittance flows to specific subnational regions. Theoretically, we build a structural model that quantifies the role of remittances in shaping the evolution of the Sri Lankan Civil War, allowing us to conduct counterfactual simulations. Crucially, our framework captures multiple channels through which remittances affect conflict dynamics—not only through their impact on financing and military capacity, but also via their compounded and dynamic feedback effects on territorial control and strategic behavior.

The remainder of the paper is organized as follows: Section 2 describes the historical background and data used in the paper, and presents reduced-form econometric evidence that remittances affected the fighting intensity in the Sri Lankan Civil War. Section 3 lays out the theoretical model and quantifies it. Section 4 concludes. The Appendix collects additional details on data, empirics, theory, and quantification.

2. Context, data, and reduced-form estimates

2.1 Context

Sri Lanka is an island of some 65 thousand square kilometers, located next to the southern tip of India.[6] It gained independence from the United Kingdom in 1948. Home to about 23 million people, its largest population groups are the Sinhalese with about 75 percent, the Sri Lankan Tamils with 11 percent, the Sri Lankan Moors with 9 percent, and the Indian Tamils with 4 percent. The political tensions between the Sinhalese majority and the Tamil separatists mounted at the beginning of the 1980s and by 1983 escalated into a full-blown war. The pro-independence Tamils coalesced around the Liberation Tigers of Tamil Eelam, whose end goal was the creation of an independent state in the northern and eastern regions of Sri Lanka. Rebel military bases were erected throughout the jungle areas in the northern and eastern parts of the island (as well as in the neighboring Indian state of Tamil Nadu). By the mid 1990s, the LTTE were in control of a significant part of their claimed "Tamil Eelam" territory and were acting as a "robust quasi-state" (Cronin-Furman and Arulthas, 2021) with their own police, military, border checkpoints, a taxation and court system, as well as health and education facilities (Chalk, 2008). There was a brief glimmer of hope in 2002 when Norway brokered a ceasefire, but fighting resumed, with renewed escalation after 2006. The conflict ended in 2009 when the government defeated the LTTE militarily.

The LTTE was explicit about setting up taxes to fund its activities, both domestically and in the diaspora. The civil war led to a large exodus from Sri Lanka. Anecdotal evidence conveys the image of taxation or extortion of members of the diaspora (La, 2004; Becker, 2006; Chalk, 2008). While some financial contributions were voluntary, or partly siphoned away from donations to charitable NGOs (Chalk, 2008), others were forced. The LTTE seems to have maintained a systematic database of Tamils abroad, registering and taxing them when they visited Sri Lanka but also taxing them in their country of residence, usually under threat to their family living in Sri Lanka (Gunaratna, 2003).[7] As documented by Chalk (2008), the LTTE also derived funding from investments in overseas Tamil businesses and commercial holdings. These were sometimes "owned by proxy," where the LTTE provided start-up capital and then got a share of subsequent profits. The potential for the aforementioned diverse channels of cash flows for the LTTE were typically larger when Tamil communities abroad were more sizeable and economically flourishing, as we shall exploit below in our causal identification strategy.

The Sri Lankan economy was also reliant on remittances, which financed around 75% of the

[6] The main sources for this paragraph include CIA World Factbook (2024), Encyclopedia Britannica (2024), Richards (2014), Layton (2015) and Wickremesekera (2016).

[7] For example, a 2006 report from Human Rights Watch reads "LTTE has begun to systematically identify visiting expatriates and pressure them to contribute to the 'cause.' [...] If visitors cannot verify a history of regular contributions, they then may be told an amount of money that they 'owe' to the LTTE. The amount varies but is often calculated on the basis of $1, £1, or 1 euro per day, for each day that they have lived in the West." (Becker, 2006) (p.35). Gunaratna (2003) writes "The solicitation appeals of the LTTE collectors were credible and effective, because they were accompanied by a thinly veiled threat of punishment for noncompliance. As each fund collector made certain to demonstrate his/her knowledge of the identity, politics, and family affiliations of the target, potential supporters would be aware that the LTTE knew the details of his or her extended family in the LTTE-controlled or dominated northeast." (p.212).

country's trade deficit in 2005. Hence, the government of Sri Lanka also partially depended on the diaspora for funds. For example, a 2006 speech by the Deputy Governor of the Central Bank of Sri Lanka highlighted the role of remittances in financing sovereign borrowing: "The country uses remittances for payment of imports, goods and services while the banks invest remittances in foreign currency bonds issued by the government. That helps the government's foreign borrowing programme" (Jayamaha, 2006). Overall, this background is suggestive that remittances and funding from the diaspora were important for both the LTTE and the central government.

2.2 Data and basic patterns

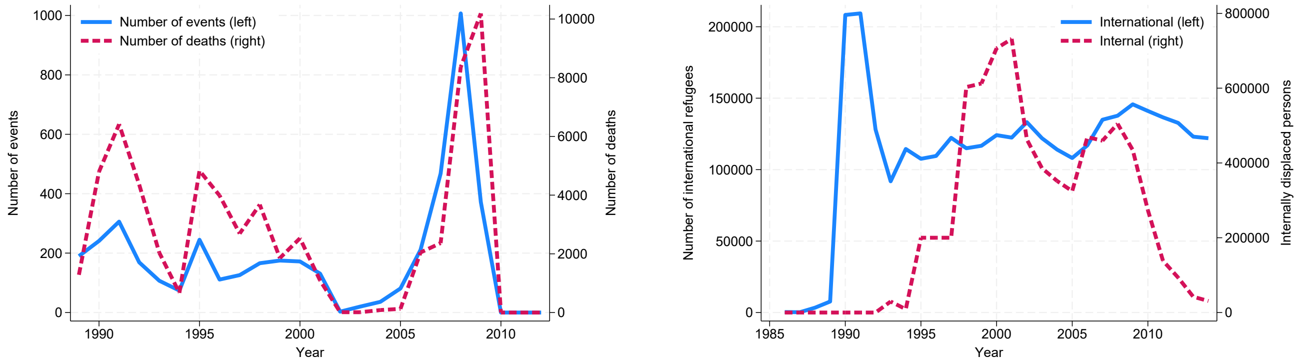
Our empirical analysis combines data on conflict events, time-varying LTTE territorial control, ethnic shares at the Sri-Lankan subdistrict level, remittances at the source country level, and Facebook social connections at the subdistrict-foreign country pair level. Appendix A.1 provides additional details on the data.

The conflict data come from the Uppsala Conflict Data Program (UCDP) Georeferenced Event Dataset (GED) (Sundberg and Melander, 2013; Davies, Pettersson, and Öberg, 2023). This dataset contains fine-grained data covering individual events of organized violence, including state-based, non-state based, and one-sided incidents. The primary sources consist of global newswire reporting, local media, NGO/IGO reports, and books, among others. In particular for Sri Lanka, the key underlying sources include Agence France Presse, Associated Press, BBC Monitoring South Asia, Asian News International, Reuters, Xinhua, Amnesty International, Crisis Watch, Human Rights Watch, International Crisis Group, and SATP timeline for Sri Lanka. A variety of quality checks, drawing on the help of specialists, are put in place to minimize the risk of reporting bias. The data contain information on the date of each event and its geo-coordinates, allowing us to build a panel dataset of conflict at the Sri Lankan subdistrict ("divisional secretariat") level. The left panel of Figure 1 displays the number of conflict events and deaths in Sri Lanka from the UCDP. The right panel displays the total number of internally displaced people and the total number of refugees abroad from Sri Lanka, sourced from the United Nations High Commissioner for Refugees (UNHCR, 2023). The number of international refugees peaked in the early 1990s but remained high into our sample period. The total number of registered refugees is available at the yearly frequency, but of course substantially understates the total number of Sri Lankans abroad. Total migrant data are available at the decadal frequency, and show that there were 893 thousand Sri Lankans abroad in 2000, equivalent to 6.1% of the total Sri Lankan labor force. This number rose to 1.37 million, or 8.3% of the Sri Lankan labor force in 2010 (World Bank, 2023). The number of internally displaced people also spiked in the second half of the 1990s, during the 3rd Eelam War that started in 1995 after a ceasefire.

The extent of LTTE territorial control at various points in time is sourced from the Sri Lankan Ministry of Defence.[8] Figure 2 displays the evolution of LTTE territorial control between 1996 and 2009. Ethnic composition and population data are sourced from the 2012 Sri Lankan Census of

[8] The ministry provided an animation of the extent of territory at various time intervals over the course of the civil war. An archived version of this animation is available here. We converted it to GIS shapefiles and computed the share of each subdistrict under LTTE control for each year between 1989 and 2009.

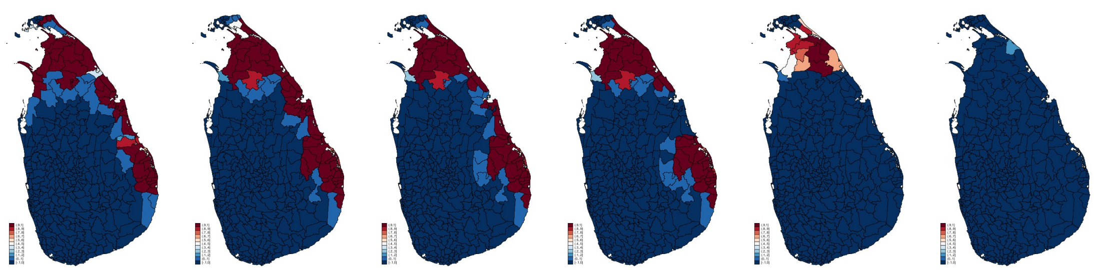
Figure 1: The evolution of the Sri Lankan Civil War



Conflict evolution | Movements of people

Notes: The left panel plots the number of conflict events and deaths from UCDP. The right panel plots the number of internally displaced persons and the number of refugees abroad from UNHCR (2023).

Figure 2: Sri Lankan Civil War: LTTE territorial control



1996 | 2000 | 2006 | 2007 | 2008 | 2009

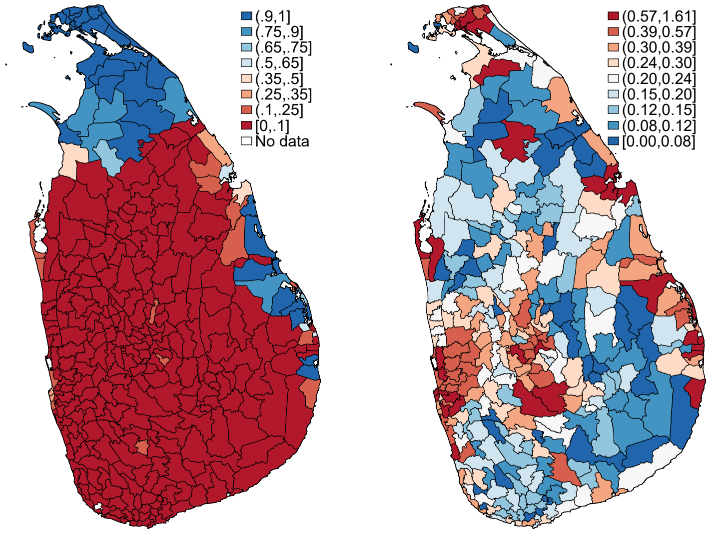
Notes: The figure depicts LTTE-controlled areas at different times during the war (source: Sri Lankan Ministry of Defence). The colors denote the fraction of the subdistrict under LTTE control.

Population and Housing (Department of Census and Statistics - Sri Lanka, 2012). The 2012 Census was the first full census since 1982. It reports population by ethnicity and subdistrict, which we use to compute ethnic shares at the subdistrict level. The left panel of Figure 3 displays the Tamil ethnic share by subdistrict. For comparison, Appendix Figure A1 shows the extent of the Tamil "ethnic homeland" as construed by the LTTE. The top panel of Table 1 reports the summary statistics on the distribution of ethnic shares. While the unweighted average Tamil share is 16%, across subdistricts there is full variation, with both Tamil and Sinhalese shares varying from 0 to 1.[9] Remittance data come from the World Bank's World Development Indicators dataset (World Bank, 2024).

Our final sample includes 322 Sri Lankan subdistricts, 107 remittance source countries, and the period 1996-2009.

[9]Note that the average Tamil subdistrict-level share in Table 1 is unweighted, while the overall (population weighted) share in the country as a whole is 11%, as reported in Section 2.1.

Figure 3: Tamil ethnic share and local remittances



Tamil ethnic share

Local remittances $LR_{n,2000}/GDP_{2000}$ in b.p.

Notes: The left panel depicts the share of Tamils in the subdistrict. The right panel depicts the local remittances measure in 2000, normalized by the 2000 Sri Lankan GDP, in basis points.

2.3 Measuring region-specific remittances

Our main hypothesis is that remittances received by a particular side to the conflict have an impact on fighting outcomes. The challenge we face is that there are no available data on remittances received at the subnational level.[10]

Our first step is to build a proxy for the local remittances LR_{nt} received by each Sri Lankan subdistrict n at time t. This proxy is a shift-share:

$$LR_{nt} = \sum_{o} \pi_{on} \times \texttt{OUTREM}_{ot}, \tag{2.1}$$

where $\texttt{OUTREM}_{ot}$ is the total outward remittance flow from origin country o at time t, and π_{on} is the imputed share of those remittances going to Sri Lankan subdistrict n. The raw data for outremittances are in current US dollars, and we convert it to real values using the Sri Lankan CPI.[11] Since migration data are not available at the bilateral subdistrict level, we turn to the Social Connectedness Index

[10] Information on total (country-level) incoming and outgoing remittances is available from standard sources such as the IMF Balance of Payments Statistics or the World Bank's World Development Indicators. Ratha and Shaw (2007) use country-pair migration shares to impute bilateral country-pair remittances. To our knowledge migration data are not available at the bilateral subnational level.

[11] We first convert current USD to current Sri Lankan rupees, and then divide by the Sri Lankan CPI. We take CPI data from the World Development Indicators (World Bank, 2024) and exchange rate data from the Penn World Tables (Feenstra, Inklaar, and Timmer, 2015).

Table 1: Summary statistics

	N	Average	S.D.	Median	Min	Max
Ethnic share						
Sri Lankan Tamil share	322	0.158	0.316	0.020	0.000	0.996
Sinhalese share	322	0.708	0.362	0.882	0.001	1.000
SCI weights (in b.p.)						
Subdistrict weight (π_{on})	34,454	0.043	0.256	0.003	0	16.694
Total LKA weight ($\sum_{n \in LKA} \pi_{on}$)	107	14.086	53.888	1.527	0.25	477.533
Remittance shock and GDP (2010 Sri Lankan rupees $1,000LKR \approx 8.8USD$)						
LR_{nt} (000s)	4,508	1,239	1,105	900	71	11,158
$\Delta \ln LR_{nt}$	4,186	0.068	0.145	0.054	-0.170	0.779
$\Delta \ln ER_{Lt}$	13	0.048	0.105	0.061	-0.097	0.320
$\Delta \ln ER_{Gt}$	13	0.069	0.147	0.060	-0.098	0.514
$\sum_n LR_{nt}$ (million)	14	399	133	368	267	653
GDP (million)	14	38,394	7,671	36,124	28,048	51,359
LTTE control and violence						
$LTTE_{nt}$	4,508	0.135	0.332	0	0	1
$\mathbb{I}(\texttt{violence}_{nt} > 0)$	4,508	0.087	0.282	0	0	1
$\mathbb{I}(\texttt{violence}_{nt} > 0) \mid LTTE_{n,t-1} = 0$	3,394	0.034	0.181	0	0	1
$\mathbb{I}(\texttt{violence}_{nt} > 0) \mid LTTE_{n,t-1} > 0$	1,114	0.250	0.433	0	0	1

Notes: This table displays the summary statistics. Ethnic shares come from the Department of Census and Statistics - Sri Lanka (2012). SCI weights are computed from the SCI as described in equation (2.2). The remittance shock is defined in equation (2.1), and the GDP comes from the World Development Indicators (World Bank, 2024). $LTTE_{nt}$ is the share of subdistrict n under LTTE control.

(SCI), which is based on Facebook friendship links (Bailey et al., 2018). It is defined as:

$$\texttt{SCI}_{on} \equiv \frac{\texttt{FBfriends}_{on}}{\texttt{FBusers}_o \texttt{FBusers}_n},$$

where $\texttt{FBfriends}_{on}$ is the number of friendship links between location n and location o and $\texttt{FBusers}_n$ is the number of users in location n. Importantly, Facebook reports $\texttt{SCI}_{on}$ at the subnational level. In Sri Lanka, we will use information on $\texttt{SCI}_{on}$ at the subdistrict level. In the main analysis, the index o will be at the country level, and thus $\texttt{SCI}_{on}$ will reflect the Facebook connections between country o and Sri Lankan subdistrict n. In a validation exercise we will also use $\texttt{SCI}$ information at the US state-Sri Lankan subdistrict level. Appendix A.1 presents additional details on the SCI. Our proxy for the share of subdistrict n in total outward remittances from country o is:

$$\begin{aligned}\pi_{on} &= \frac{\texttt{SCI}_{on}\texttt{pop}_n}{\sum_d \texttt{SCI}_{od}\texttt{pop}_d} \qquad (2.2)\\ &\overset{A_1}{=} \frac{\texttt{family}_{on}}{\sum_d \texttt{family}_{od}} \overset{A_2}{=} \frac{\texttt{FBfriends}_{on}}{\sum_d \texttt{FBfriends}_{od}} = \frac{\frac{\texttt{FBfriends}_{on}}{\texttt{FBusers}_o\texttt{FBusers}_n} \times \texttt{FBusers}_n}{\sum_d \frac{\texttt{FBfriends}_{od}}{\texttt{FBusers}_o\texttt{FBusers}_d} \times \texttt{FBusers}_d} \overset{A_3}{=} \frac{\texttt{SCI}_{on}\texttt{pop}_n}{\sum_d \texttt{SCI}_{od}\texttt{pop}_d}.\end{aligned}$$

The first line states that we proxy the remittance share by the share of subdistrict n in the population-weighted SCI of origin country o. The second line describes the logic behind this proxy and spells out explicitly the required assumptions.

The first assumption (A_1) is that the remittances are sent in proportion to the family ties between n and o, relative to o's overall family ties. It amounts to assuming the same propensity to remit per family tie for each immigrant group in o. Since we do not have migrant stocks at the bilateral subnational levels, $\texttt{family}_{on}$ is unavailable. The second assumption (A_2) is that the family ties are well-proxied by the number of Facebook friendships. Facebook friendships have been shown to adequately reflect the true social network (Bailey et al., 2018, 2021, 2024; Chetty et al., 2022). The raw $\texttt{FBfriends}_{on}$ numbers are not made public by Facebook. But by multiplying both the numerator and the denominator by the number of Facebook users in each location, they can be converted to an expression that involves the SCI. Finally, because the data on the total Facebook users by location are inaccessible to us, A_3 substitutes population for the number of Facebook users.

The second panel of Table 1 reports the summary statistics for the values of π_{on}. For an individual Sri Lankan subdistrict, the mean is tiny, 0.043 *basis points*, reflecting the fact that a typical Sri Lankan subdistrict represents a tiny share of all the social connections in a typical country in the world. The variation across subdistrict-country pairs is massive relative to the mean, however, with a standard deviation of 0.256 basis points. Adding up across Sri Lankan subdistricts yields the total connectedness of country o to Sri Lanka. At the mean across countries, Sri Lanka is 0.14% of all of country o's social connections, which is in line with Sri Lanka's small size relative to the world population. Once again, the variation across countries is quite large, with the standard deviation of 0.54% and the maximum value of 4.8% for the Maldives.

The bottom panel of Table 1 reports the summary statistics for the local remittance shocks. The mean local remittance shock across subdistricts and years is 1.235 million rupees, or about 140 thousand US dollars. The standard deviation is about the same size as the mean. Over the period of study, average local remittances grew at 6.8% per year in real terms. Adding up across subdistricts, the average annual remittance shock to Sri Lanka is 399 million rupees, or 45 million US dollars - around 1% of GDP. This figure is lower than the actual Sri Lankan aggregate remittances, that amount to 7% of Sri Lankan GDP, implying that the shift-share (2.2) underestimates total remittances to Sri Lanka. Note that our empirical strategy will not rely on the variation in the total remittances coming into Sri Lanka, as they will be absorbed by time fixed effects. The validation exercise later in this section contains further discussion.

The right panel of Figure 3 displays the resulting geographic variation in local remittances LR_{nt} in 2000, normalized by the 2000 Sri Lankan GDP, in basis points. Comparing to the left panel of the same figure, it is clear that this variation is quite distinct from the Tamil ethnic share. Both Tamil majority and Sinhalese majority subdistricts are among the areas receiving disproportionate remittances in 2000.

Potential remittances at the conflict side level. The conflict occurs between only 2 sides, LTTE and the central government. Thus, fighting should depend not so much on the local remittances in subdistrict n, but rather on the overall resources available to each side. We assume that part of regional remittances LR_{nt} are appropriated/taxed by LTTE and the central government for financing military operations. This is consistent with the anecdotal evidence reviewed in Section 2.1. Further, we assume that LTTE and the government have higher capacity to levy taxes within their ethnic group. With that, our measure of "ethnic remittances" aggregates the local remittances, weighting by the ethnic share:[12]

$$ER_{\mathtt{L}t} = \sum_n \underbrace{\mathtt{tamil}_n}_{\text{ethnic share}} \times LR_{nt} \qquad \text{and} \qquad ER_{\mathtt{G}t} = \sum_n \underbrace{\mathtt{nontamil}_n}_{\text{ethnic share}} \times LR_{nt}. \tag{2.3}$$

Here and throughout the paper, subscripts L and G denote the LTTE and the central government, respectively. Thus, the difference between $ER_{\mathtt{L}t}$ and $ER_{\mathtt{G}t}$ can be thought of as the fiscal revenue imbalance between the two warring sides, though of course only the part driven by differential remittances. Plugging in the expression for the LR_{nt} from (2.1) and rearranging yields:

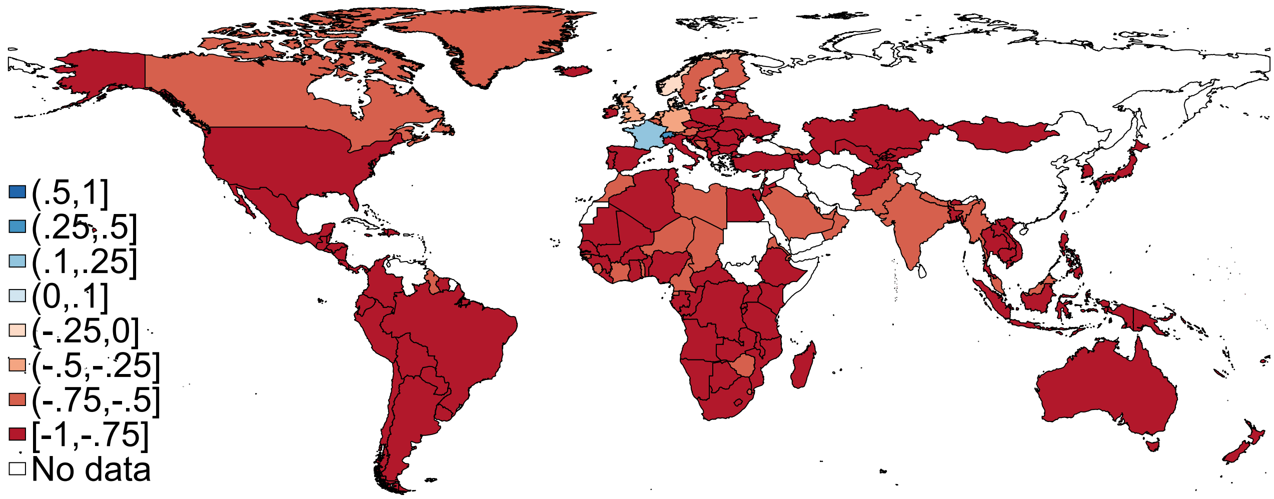
$$ER_{\mathtt{L}t} - ER_{\mathtt{G}t} = \sum_o \underbrace{\left(\sum_n \pi_{on} \times (\mathtt{tamil}_n - \mathtt{nontamil}_n) \right)}_{\text{Tamil connectedness}_o} \times \mathtt{OUTREM}_{ot}.$$

Thus, the differential $ER_{\mathtt{L}t} - ER_{\mathtt{G}t}$ in year t is essentially the covariance across remittance origin countries between aggregate outward remittances in year t and their relative Tamil connectedness. The latter is a measure of whether country o has social connections to relatively more Tamil or non-Tamil regions.

To get a feel for this variation, Figure 4 displays a map of the world in which each country is colored according to its Tamil connectedness$_o$. Tamil connectedness$_o > 0$ means that remittances from diaspora living in o favor LTTE, and vice versa. Red countries have negative net Tamil connections, while blue countries have positive net Tamil connections. Since the share of Tamils in Sri Lanka is around 15%, most countries exhibit a negative value. Some countries known to have strong Tamil diaspora, such as Canada or the United Kingdom, also have a lighter shade of red. Two countries – France and Switzerland – stand out, as Tamils make up more than half of the Sri Lankan diaspora according to our measure, in line with existing anecdotal evidence.

[12] We define $\mathtt{tamil}_n$ as the Sri Lankan Tamil share of n's population from the 2012 Census, and $\mathtt{nontamil}_n$ as the remainder. Table 6 checks robustness to using only the majority Sinhalese share for the central government side remittances.

Figure 4: Tamil connectedness



Notes: This figure depicts the map of Tamil and non-Tamil concentrations in the diaspora. Red(der) hues indicate preponderance of non-Tamils in the diaspora, whereas blue(r) hues indicate the preponderance of Tamils.

2.4 Validation

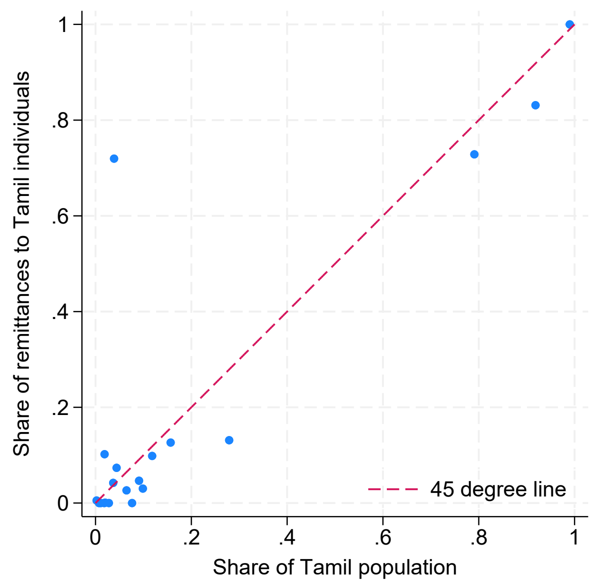
Before moving on to the econometric estimation, we perform 4 validation exercises on our local and side-specific remittance variables.

The first assumption we make (A_1) is that remittances are sent in proportion to the family ties. The most relevant violation of this assumption would be if Tamils and non-Tamils had different remittance behavior. To support A_1, we collect data from the Sri Lankan Household Income and Expenditure Survey. This survey is available for selected years going back to 1990. We use the micro data to relate Tamil ethnicity to remittances received. Figure 5 displays a binscatter plot of the share of a district's remittances received by Tamil individuals against the Tamil share of the district's population. The underlying data points are at the district-year level. The data line up along the 45-degree line: Tamil remittance share is close to the Tamil population share. Appendix Table A2 runs the estimation at the household level. It relates remittances received to the dummy variable for whether the household is Tamil (and a district fixed effect). In all available survey years, Tamil ethnicity is not a statistically significant correlate of received remittances.

The second assumption we make (A_2) is that social connectedness proxies for family ties and thus the propensity to remit. We validate the link between `SCI` and actual remittances in 2 ways: (i) at the subnational level in Sri Lanka using the Household Income and Expenditure Survey; and (ii) across countries using international data.

Table 2 correlates our imputed local remittance measures LR_{nt} to direct data on remittances received at the district-year level in the household survey. The publicly available survey data only has information at the district rather than subdistrict level, and not all district-years have data in them (see Appendix Table A1 for details). Thus, there are only 35-40 available observations. Nonetheless,

Figure 5: Local ethnic share of remittance against local ethnic share



Notes: Each dost is a (bin of) district-year observation from the Household Income and Expenditure Survey. This figure plots the share of remittances in a district-year received by Tamil respondents into the total remittances received in the district-year against the share of ethnic Tamils in the district-year.

directly observed remittances are strongly significantly correlated with our imputed remittances, whether expressed in levels (columns 1-3), or as shares of Sri-Lankan totals (columns 4-6). In spite of only having 35 observations, the significant correlation survives inclusion of both district and year fixed effects.

For the second check on the connection between SCI and remittances, we construct a version of our remittance shift-share at the recipient country level using the same formula as in (2.1):

$$R_{dt} = \sum_{o} \pi_{od} \times \mathtt{OUTREM}_{ot}, \tag{2.4}$$

where d indexes the 152 recipient countries for which inward remittance data are available. Figure 6 displays the binscatter of the (observed) log actual remittances against the imputed ones ($\ln R_{dt}$ from equation 2.4), where the underlying sample is pooling recipient countries and years. There is an evident positive relationship. Table A3 provides a summary of the variation in the actual remittances that the imputed remittances $\ln R_{dt}$ can account for. Without any fixed effects, the R^2 in the bivariate regression of log actual remittances on $\ln R_{dt}$ is 33%. With either country or year fixed effects alone, the within-R^2 attributable to $\ln R_{dt}$ is between 31% and 41%. With both country and year effects, the within-R^2 is 6%, but the regression coefficient on $\ln R_{dt}$ is still significant at 1% and not too far from 1. In changes, predictably the R^2's are lower, but the slope coefficients continue to be significant. Note that our measure underpredicts actual remittances. However, this downward bias will get absorbed

Table 2: Remittances from the Household Income and Expenditure Survey and LR_{nt}

Dep. Var.:	$\texttt{HIESremit}_{nt}$			$\frac{\texttt{HIESremit}_{nt}}{\sum_n \texttt{HIESremit}_{nt}}$		
	(1)	(2)	(3)	(4)	(5)	(6)
LR_{nt}	0.173***	0.186*	0.229***			
	(0.0391)	(0.0977)	(0.0731)			
$\frac{LR_{nt}}{\sum_n LR_{nt}}$				2.410***	0.878**	2.971***
				(0.556)	(0.410)	(0.996)
Observations	41	41	35	40	40	35
Year FE	✓		✓	✓		✓
District FE		✓	✓		✓	✓

Notes: The table reports results from regressing the total remittances at the district level from the Household Income and Expenditure Survey for a given year ($\texttt{HIESremit}_{nt}$), against our predicted "local remittance" measure LR_{nt}. District-level remittances are computed using survey weights. Robust standard errors in parenthesis. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

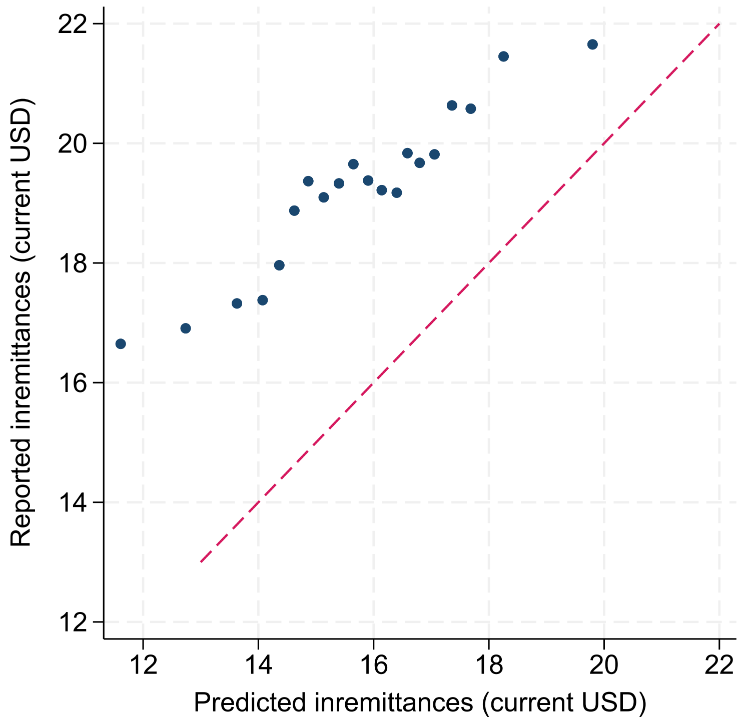
by the subdistrict or conflict side fixed effects, as the predicted remittance measures are logged in the regressions.[13] We revisit this in Section 2.6, where we also show that the results are robust to a rescaled measure of the remittance shock, where we multiply LR_{nt} by a year-specific factor such that the sum total of $\sum_n LR_{nt}$ for Sri Lanka matches the official inward remittances data in each year.

Finally, Appendix Figure A2 also shows that the correlation between total imputed remittances for Sri Lanka $R_{LKA,t}$ and the actual inward remittances rises sharply after 1995, consistent with the surge in movements of people presented in Figure 1. Hence, our main analysis sample starts in 1996 and ends in 2009 with the end of the civil war.

The last validation exercise addresses a possible concern with aggregating local remittances to the side level using ethnic shares as in (2.3). We do not observe the ethnicity of the emigrants from a subdistrict. So it could be that the local minority is actually emigrating: the Sinhalese from the Tamil districts and vice versa. If we had data on the ethnicity of Sri Lankan migrants by host country, we could check for this directly. While these data are not available for a large sample of host countries, we can construct migrant ethnicity proxies by US state using data from the American Community Survey 2012-2015, sourced through IPUMS (Ruggles et al., 2021). For each US state, we compute the

[13]In particular, suppose that the true propensity to receive remittances differs from π_{on} by a potentially subdistrict-specific constant λ_n: $\pi_{on}^{\text{true}} = \lambda_n \pi_{on}$. Then the true local remittances are: $LR_{nt}^{\text{true}} = \sum_o \pi_{on}^{\text{true}} \times \texttt{OUTREM}_{ot} = \lambda_n LR_{nt}$. Since local remittances are logged in the regressions below, the adjustment term $\ln \lambda_n$ is absorbed by subdistrict fixed effects. Then the true side-level remittances for the Tamil side are (the government side is analogous): $ER_{\text{L}t}^{\text{true}} = \sum_n \texttt{tamil}_n \times LR_{nt}^{\text{true}} = \lambda ER_{\text{L}t} + Cov(\lambda_n, \texttt{tamil}_n \times LR_{nt})$, where λ is the average of λ_n across subdistricts. Since side-level remittances are logged in the regressions, and the λ is additive, the $\ln ER_{\text{L}t}$ is a valid proxy for the true $\ln ER_{\text{L}t}^{\text{true}}$, as long as $Cov(\lambda_n, \texttt{tamil}_n \times LR_{nt}) = 0$: there is no systematic relationship between the district's ability to draw remittances and the product of its Tamil share and the local remittance proxy. One special case where this is true is if there is no variation in λ_n across subdistricts. Even when $Cov(\lambda_n, \texttt{tamil}_n \times LR_{nt}) \neq 0$, to first order the relationship between the true and the proxied remittances is affine: $\ln ER_{\text{L}t}^{\text{true}} \approx c_0 + c_1 \ln ER_{\text{L}t}$, where c_0 and $c_1 > 0$ are constants. In that case, using the inferred side-level remittances instead of the true ones will change the level of the estimated coefficients but not their sign and significance.

Figure 6: Reported vs. predicted inward remittances



Notes: This figure displays a binscatter of the actual log remittances on the y-axis against imputed remittances $\ln R_{dt}$ as in (2.4) on the x-axis. The dashed line is the 45-degree line.

number of respondents born in Sri Lanka who report speaking Tamil at home, and the number who do not report speaking Tamil at home. We use these to construct proxies for the shares of Tamils ($\texttt{tamil}_s$) and non-Tamils ($\texttt{nontamil}_s$) in the population of a given state s. We can then compute a measure of coethnicity between state s and subdistrict n as:

$$\texttt{coethnic}_{sn} = \texttt{tamil}_s \times \texttt{tamil}_n + \texttt{nontamil}_s \times \texttt{nontamil}_n. \tag{2.5}$$

We then regress the social connectedness between state s and Sri Lankan subdistrict n ($\texttt{SCI}_{sn}$) on coethnicity:

$$\ln \texttt{SCI}_{sn} = \beta \ln \texttt{coethnic}_{sn} + \delta_s + \delta_n + \varepsilon_{sn},$$

where δ_s and δ_n are US state and Sri Lankan subdistrict fixed effects. We expect β to be positive, as the social connectedness may be higher between ethnic Tamil Sri Lankan regions and states where the share of Sri Lankan Tamils is high. The first column of Table 3 confirms our hypothesis and shows that SCI is indeed correlated with whether Sri Lankan diaspora in a state is of the same ethnicity as the home subdistrict. Column 2 regresses SCI on the products of the Tamil and non-Tamil shares separately. Both are highly statistically significant. The coefficient on non-Tamil coethnicity is slightly

Table 3: SCI and coethnicity

Dep. Var.:	$\ln \texttt{SCI}_{sn}$	
$\ln \texttt{coethnic}_{sn}$	0.063***	
	(0.008)	
$\texttt{tamil}_s \times \texttt{tamil}_n$		8225***
		(590)
$\texttt{nontamil}_s \times \texttt{nontamil}_n$		835***
		(156)
s, n Fixed Effects	✓	✓
Observations	15778	16422

Notes: Standard errors are clustered at the district level. $\texttt{coethnic}_{sn}$ is constructed as in equation (2.5). $\texttt{tamil}_s$ (resp. $\texttt{nontamil}_s$) is the share of Sri Lankan Tamils (resp. Sri Lankan non-Tamils) in state s's total population. $\texttt{tamil}_n$ (resp. $\texttt{nontamil}_n$) is the share of Sri Lankan Tamils (resp., non-Tamils) in subdistrict n's total population. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

muted. This could indicate that ethnicity concerns are less pronounced for non-Tamils, or could be driven by measurement error, because we assume that any Sri Lankan migrant who does not report speaking Tamil at home is a non-Tamil, but some Tamil migrants might speak English at home.

2.5 Econometric evidence

We now relate remittances received by each fighting side to conflict outcomes. A sensible starting point is that as one side receives more potential remittances, it becomes stronger in the war. However, from a theoretical perspective, the impact of larger fiscal capacity on violence is non-trivial. The most frequent feature in the conflict literature is that "symmetric" configurations of comparable rival factions are associated with more intense fighting than "asymmetric" configurations where one side dominates (see, e.g. Konrad, 2009). A testable hypothesis is that in LTTE strongholds – regions under LTTE control and contested by the government – additional funding for LTTE decreases the intensity of violence. This is because in these areas the LTTE is already relatively more powerful, and providing it with additional resources further increases the asymmetry, making fighting less likely. By the same token, additional funding for the government side increases violence intensity in LTTE-held regions because it shrinks the asymmetry there. This key mechanism will also be captured in the theoretical model in the next section.

To test this hypothesis, we run the following regression at the subdistrict-year level:

$$\mathbb{I}(\texttt{violence}_{nt} > 0) = \beta_1 LTTE_{n,t-1} \times \ln ER_{\text{L}t} + \beta_2 LTTE_{n,t-1} \times \ln ER_{\text{G}t} + \mathbf{X}_{nt}\gamma + \delta_n + \delta_t + \varepsilon_{nt}, \quad (2.6)$$

where $\mathbb{I}(\texttt{violence}_{nt} > 0)$ is the indicator function for whether subdistrict n experiences fighting in year t, and $LTTE_{n,t-1}$ is share of subdistrict n under LTTE control in the previous year.[14] Year fixed

[14] We define $LTTE_{n,t-1}$ to be the share of subdistrict n's territory under LTTE control in year $t-1$. In the data, most

effects δ_t control for aggregate outcomes, such as the main effects of $\ln ER_{\text{L}t}$ and $\ln ER_{\text{G}t}$, and the overall progression of the war. Subdistrict fixed effects δ_n capture non-time-varying characteristics such as the subdistrict's Tamil share, the subdistrict's location, access to infrastructure, proximity to the coast, etc. These fixed effects also capture the common component of π_{on} for subdistrict n, that is, its overall emigration share/average Facebook connectedness with abroad. The baseline vector of controls $\mathbf{X}_{nt}$ includes the main effect of LTTE control, as well as the local remittances on their own and interacted with LTTE control.

According to the hypothesis spelled out above, we should expect to see $\beta_1 < 0$ and $\beta_2 > 0$. Table 4 reports the results. The first column controls only for the fixed effects. The coefficients of interest have the expected sign and are statistically significant. The second column adds local remittances $\ln LR_{nt}$ and their interaction with LTTE control. These control for both the opportunity cost and rapacity effects of remittances at the subdistrict level. The coefficients of interest barely change. Columns 3 and 4 add controls for international trade and GDP growth, constructed using π_{on} and Tamil shares similarly to the LR_{nt} and $ER_{\text{L}t}$. These controls address the possibility of other linkages between Sri Lankan subdistricts and foreign countries, beyond remittances. For example, subdistricts socially connected to foreign countries may also experience greater trade or inward investment. Thus, we construct controls in which foreign country trade and GDP are used as the "shifts" instead of remittances.[15] If anything, the coefficients of interest are larger in absolute value than without these controls. When it comes to economic significance, a 10% increase in Tamil remittances reduces the probability of a conflict event by 30 percentage points in LTTE strongholds, while a 10% increase in non-Tamil remittances raises the probability of conflict in LTTE-held areas by 22 percentage points, both relative to non-LTTE areas.[16] This is a sizeable impact: the left-hand side variable (binary indicator for violence) has the mean of 0.25 in LTTE-controlled subdistrict-years, with a standard deviation of 0.44. Thus, a 10% change in side-specific remittances raises or lowers violence by around two-thirds of its standard deviation.

It is also noteworthy that the coefficient on $\ln LR_{nt}$ is negative and statistically significant across all columns of Table 4. This estimated coefficient reflects the net impact of the opportunity cost and rapacity effects of local remittances on conflict. The former would reduce conflict, all else equal, if remittances stimulate investment in the local economy, thereby enhancing productivity and increasing the opportunity cost of engaging in conflict (see, e.g., Brinkerhoff, 2011). However, a rapacity channel may also operate: higher local remittance inflows could raise the incentive to seize territorial control in order to appropriate these resources, thereby fueling violence. The fact that the net effect of local remittances on conflict does not differ significantly for LTTE-controlled areas suggests that the balance between opportunity cost and rapacity effects is similar for the two sides.

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subdistricts are either 0 or 1 in a given year. Only frontline regions or regions that change control in a year have non-integer values. When the control changes within a year, $LTTE_{n,t-1}$ is the share of months the subdistrict was under LTTE control within the year.

[15] To be precise, for $V \in \{Trade_{ot}, GDP_{ot}\}$, we construct $LV_{nt} = \sum_o \pi_{on} \times V_{ot}$, and $EV_{\text{L}t}/EV_{\text{G}t}$ in the same way. We then use those as controls. Our measure of trade is $Trade_{ot} = Exports_{ot} + Imports_{ot}$, where we use total (multilateral) trade to mimic the multilateral outremittance data used in our local remittance measure LR_{nt}.

[16] A 0.1 change in $ER_{\text{L}t}$ or $ER_{\text{G}t}$ is a common occurrence in the data. The standard deviation of year-on-year log changes is 0.11 for Tamil remittances, and 0.15 for non-Tamil remittances.

Table 4: Fighting and remittances

Dep. Var.:	$\mathbb{I}(\texttt{violence}_{nt} > 0)$			
	(1)	(2)	(3)	(4)
$LTTE_{n,t-1} \times \ln ER_{\mathsf{L}t}$	-2.010***	-2.019***	-5.298***	-3.019*
	(0.361)	(0.343)	(1.763)	(1.676)
$LTTE_{n,t-1} \times \ln ER_{\mathsf{G}t}$	1.665***	1.614***	3.500***	2.286**
	(0.307)	(0.302)	(1.101)	(1.045)
$LTTE_{n,t-1} \times \ln LR_{nt}$		-0.0246	-0.0389	-0.0614
		(0.0343)	(0.0936)	(0.128)
$\ln LR_{nt}$		-0.252**	-0.287**	-0.293**
		(0.126)	(0.129)	(0.129)
Observations	4186	4186	4186	4186
Control for $LTTE_{n,t-1}$	✓	✓	✓	✓
Subdistrict FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
GDP shocks			✓	✓
Trade shocks				✓

Notes: results from estimating equation (2.6). Standard errors are clustered at the district-year level. All regressions control for lagged LTTE control ($LTTE_{n,t-1}$). "GDP shocks" refers to the same set of 4 variables as the remittance shocks, but constructed using foreign GDPs instead of foreign outremittances. "Trade shocks" refers to the same, but with total trade (imports plus exports) of the foreign country. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

2.6 Threats to identification and robustness

Our measure of local remittances LR_{nt} is essentially a shift-share instrumental variable (SSIV) that we use to predict regional conflict (after aggregating to the fighting side level). The shifts are the foreign countries' total outremittances, and the shares are the (non-time-varying) combinations of SCI and ethnic shares. As discussed by Borusyak, Hull, and Jaravel (2022), causal identification can be achieved if the shifts are exogenous. Endogeneity would arise if conflict in a particular Sri Lankan region caused the diaspora to send remittances to that region to help their family cope with the hardship, or to the contrary, decrease remittances if they fear that the money will be used to finance conflict. In our case, the key identifying assumption is that the total outremittances of foreign countries are unrelated to the Sri Lankan Civil War. This is likely to hold true as long as the Sri Lankan diaspora is small enough not to drive variation in aggregate outremittances at the country level, so that these are capturing shocks such as positive wage growth for the overall migrant population in the sending country. In practice, the total Sri Lankan SCI weight in a partner's total weights is never higher than 4.8% (for the Maldives), and no individual Sri Lankan subdistrict has a weight of more than 0.16%.

Another view on exogeneity of shift-share designs is that the shares need to be exogenous (Goldsmith-Pinkham, Sorkin, and Swift, 2020). To build π_{on}, we use post-sample SCI observed in 2020. Thus, in contrast with standard practice, the shares π_{on} are not observed pre-sample. There is no obvious alternative to this approach, as there was no Facebook prior to 1996. We argue that Facebook connections measure links that are quite persistent. For example, Bailey et al. (2021) show that SCI is highly correlated with trade flows in 1980. A more substantive concern is reverse causality: conflict at the district level from 1996 to 2009 caused emigration and therefore raised the π_{on}. This concern is limited because in Sri Lanka, the majority of war-induced outmigration happened before 1996 (Figure 1). Additionally, internally-displaced persons returned after 2011 to their pre-war locations (Figure 1). Finally, as emphasized by Borusyak, Hull, and Jaravel (2022), exogeneity of shares is not required for identification as long as the shifts are exogenous. Since the shifts are aggregate outgoing remittances at the country-time level, their exogeneity is plausible as argued above.

Nonetheless, to probe further the relationship between the SCI and the preceding violence, we perform the following exercises. We project the shares on subdistrict and foreign country fixed effects:

$$\ln \pi_{on} = \delta_n + \delta_o + \varepsilon_{on}, \tag{2.7}$$

and retain the estimated subdistrict fixed effect $\hat{\delta}_n$. This fixed effect picks up the common subdistrict component in social connections (and consequently emigration). As a diagnostic, we regress this fixed effect on the cumulative conflict during our sample period, as well as Tamil ethnic share. Table 5 reports the results. Since there is no strong theoretical guidance on the functional form of this relationship, we attempt several: the total number of conflict events, the indicator of whether any conflict occurred during the period, the inverse hyperbolic sine transformation of the number of events, and the log of the number of conflict events. (In the latter case the number of observations is greatly reduced, as about half of subdistricts in the sample did not experience conflict.) We also project it on the Tamil share in the last column. The coefficients are all insignificant, except for column 4 where the marginally significant coefficient has the "wrong" sign, indicating lower levels of social connection when there is more violence.

Next, we net out the subdistrict fixed effect from the shares π_{on} before constructing the local remittances. Thus, the "filtered" version of the local remittance variable is:

$$\widetilde{LR}_{nt} = \sum_o \left(e^{-\hat{\delta}_n} \times \pi_{on} \right) \times \texttt{OUTREM}_{ot}. \tag{2.8}$$

This filtered local remittance variable does not use any variation across subdistricts in overall social connectedness, and instead only uses variation across foreign countries within a subdistrict to compute the local remittances. The remaining identifying assumption is that conflict at the subdistrict level is orthogonal to *which* countries people emigrate to. Column 2 of Table 6 reports the results when the filtered $\widetilde{LR}_{nt}$ is used in (2.3) and in the estimated equation (2.6). The coefficients fall slightly, compared to the baseline in column 1, but remain strongly significant. Appendix Table A4 replicates the entire Table 4 with the filtered weights, with similar results as our baseline.

A related concern comes when aggregating local remittances LR_{nt} to side-level remittances ER_{it}

Table 5: Local social connectedness in 2020 and preceding violence

Dep. Var.:	Subdistrict FE $\hat{\delta}_n$				
	(1)	(2)	(3)	(4)	(5)
$\sum_{t=1996}^{2009} \texttt{violence}_{nt}$	-0.000288				
	(0.000927)				
$\mathbb{I}\left(\sum_{t=1996}^{2009} \texttt{violence}_{nt} > 0\right)$		0.120			
		(0.0889)			
$ihs\left(\sum_{t=1996}^{2009} \texttt{violence}_{nt}\right)$			-0.00913		
			(0.0296)		
$\ln\left(\sum_{t=1996}^{2009} \texttt{violence}_{nt}\right)$				-0.0798*	
				(0.0435)	
$\texttt{tamil}_n$					-0.137
					(0.164)
Observations	322	322	322	161	322

Notes: This table reports the results of regressing the estimated subdistrict fixed effect from (2.7) on various transformations of conflict in n from 1996 to 2009. ihs denotes the inverse hyperbolic sine transformation. $\texttt{tamil}_n$ is the Tamil ethnic share in subdistrict n. Robust standard errors in parenthesis. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

in (2.3). The aggregation uses ethnic shares from the 2012 Census. Though, as we note above, by 2012 the number of internally-displaced people within Sri Lanka fell to negligible levels (Figure 1), we use data from the 1982 Census to check whether the change in the Tamil share between 1982 and 2012 is systematically related to the wartime violence. Appendix Table A5 reports the results. Because we don't observe sub-district level information in the 1982 Census, the regressions are run at the district level. There is no significant correlation between the levels of wartime violence and change in the Tamil share from 1982 to 2012.

Table 6 reports a number of additional robustness checks. Column 3 uses the share of the Sinhalese as $\texttt{nontamil}_n$ (as opposed to 1 minus the Tamil share) to compute $ER_{\texttt{G}t}$. The results barely change. In column 4, we omit population from the calculation of the π_{on}. This is an inferior proxy for the importance of social connections, as the raw SCI is itself normalized by Facebook users in n. Nonetheless, the results survive. Column 5 reports the results of using the raw SCI index instead of normalizing by the total social connections of country o. Column 6 rescales the local remittance shocks by a year-specific factor that guarantees that the total rescaled $\sum_n LR_{nt}$ match the official inremittances into Sri Lanka in year t. Finally, column 7 extends the sample back to 1991. As mentioned above, before 1995 our imputed total remittances for Sri Lanka track more poorly actual recorded incoming remittances at the country level (see also Appendix Figure A2). The coefficients are attenuated but remain of the expected sign and strongly significant.

Because the lagged LTTE control is partly an outcome of past fighting, Appendix Table A6 also replicates the main results table using instead the non-time-varying Tamil share as the interaction variable with side-specific and local remittances. All results are similar to our baseline.

Table 6: Fighting and remittances: robustness

Dep. Var.:	$\mathbb{I}(\texttt{violence}_{nt} > 0)$						
	(1) Baseline	(2) Filter. sh.	(3) Tam.-Sinh.	(4) No pop.	(5) Raw SCI	(6) Rescaled	(7) Post 1990
$LTTE_{n,t-1}$ $\times \ln ER_{\mathsf{L}t}$	-2.019*** (0.343)	-1.574*** (0.273)	-2.230*** (0.378)	-1.094*** (0.352)	-1.707*** (0.328)	-1.283*** (0.307)	-0.484*** (0.176)
$LTTE_{n,t-1}$ $\times \ln ER_{\mathsf{G}t}$	1.614*** (0.302)	1.357** (0.244)	1.712*** (0.318)	1.018** (0.460)	1.286*** (0.284)	0.997*** (0.301)	0.343** (0.165)
$LTTE_{n,t-1}$ $\times \ln LR_{nt}$	-0.0246 (0.0343)	-0.226** (0.099)	-0.0240 (0.0344)	-0.00786 (0.0667)	0.00375 (0.0711)	-0.0222 (0.0342)	-0.0122 (0.0300)
$\ln LR_{nt}$	-0.252** (0.126)	-0.224* (0.127)	-0.252** (0.126)	-0.118 (0.0980)	-0.214* (0.115)	-0.238* (0.126)	-0.0363 (0.0956)
Observations	4186	4186	4186	4186	4186	4186	5796
Include $LTTE_{n,t-1}$	✓	✓	✓	✓	✓	✓	✓
Subdistrict FE	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓

Notes: results from estimating equation (2.6). Standard errors are clustered at the district-year level. All regressions include lagged LTTE control ($LTTE_{n,t-1}$) as a control. The first column corresponds to the baseline in Table 4. The second column constructs the weights after removing a Sri Lankan subdistrict fixed effect from the π_{on}, as in (2.8). The third column computes $ER_{\mathsf{L}t}$ using the Tamil ethnic share and $ER_{\mathsf{G}t}$ using the Sinhalese ethnic share. The fourth column does not use population when computing SCI weights in equation (2.2). The fifth column uses the raw SCI index to compute the remittance shock. The sixth column rescales the remittance shocks so that the total predicted inremittances in Sri Lanka matches the official inremittance statistics in every year. The last column starts the sample in 1991. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

Appendix Table A7 reports robustness checks with respect to the measure of violence used. Column 1 reproduces, as a benchmark, the baseline specification. Columns 2 to 4 estimate the impact of remittances on the intensive margin of conflict. They use (i) the number of conflict events; (ii) the inverse hyperbolic sine of conflict events; and (iii) deaths from conflict reported in the subdistrict. Column 5 estimates the regression in log-differences instead of log-levels (using the inverse hyperbolic sine of the conflict events as an approximation to the log). In all cases, the results are quite robust.

Appendix Table A8 reports additional robustness checks. Column 2 estimates the baseline regression weighting by population. In 2004 a tsunami hit the coast of Sri Lanka, leading to widespread destruction but also large aid inflows. Column 3 drops the tsunami-affected subdistricts from the sample. Column 4 instead keeps them, but includes interactions of an indicator for tsunami-affected district with both annual aid inflows for Sri Lanka as a whole, and with a post-2004 indicator variable, as well as a triple interaction that picks up any differential effect of aid inflows on tsunami-affected regions post-2004. None of the main results change. Column 5 interacts lagged LTTE control with the overall Sri Lanka's GDP growth and with the aggregate aid inflows into Sri Lanka. This tests for the possibility that high GDP or high aid affect the relative fighting strength of the two sides. Column 6 investigates spillovers from neighboring subdistrict's remittances. All the main coefficients remain robust. Finally, Table A9 experiments with adding lagged remittance shocks. The results show that contemporaneous remittances have a much larger impact.

3. Theory and quantification

3.1 Theoretical framework

The empirical results above provide reduced-form evidence that remittances mattered for conflict in the Sri Lankan Civil War. However, these estimates cannot be aggregated to compute the overall contribution of remittances to conflict or to perform counterfactuals. We now develop, calibrate and simulate a quantitative model of conflict that integrates remittances. Appendix B.1 contains the derivations of all the results stated in this subsection.

There are 2 sides to the conflict indexed by $i \in \{\mathtt{L}, \mathtt{G}\}$: LTTE and the central government, and a continuum of subdistricts of measure 1 indexed by n. Time is discrete and indexed by t. Each side chooses $\{f_{int}\}$, its vector of fighting efforts, across subdistricts n and time t, to maximize its intertemporal utility:

$$U_i = \max_{\{f_{int}\}} \sum_{t=0}^{\infty} (1+r)^{-t} \int_n u_{int} dn \qquad \text{with} \qquad u_{int} \equiv V_{int} \times p_{int} - c_{int} \times f_{int}, \tag{3.1}$$

where r is the discount rate and u_{int} is the flow utility enjoyed by side i in time t and subdistrict n. This flow utility is equal to V_{int}, the (strategic or economic) valuation of the subdistrict by side i times p_{int}, the endogenous share of this subdistrict controlled by i, net of the linear costs of the fighting efforts $c_{int} \times f_{int}$. We capture the opportunity cost and rapacity effects associated with local remittances—discussed in the literature reviewed in the Introduction—as follows. A district's valuation may be an increasing function of local remittances, $V_{int}(LR_{nt})$ (see equation 3.10), reflecting the rapacity effect whereby remittance-rich areas are perceived as more valuable targets by the warring sides. At the same time, the local cost of fighting may also depend positively on remittances, $c_{int}(LR_{nt})$, capturing the opportunity cost channel: wealthier areas have more to lose from conflict and may find it more costly to engage in fighting.

The share of territorial control is given by the traditional Tullock contest success function (see Konrad, 2009):

$$p_{int} \equiv \frac{\rho_{int} f_{int}}{\rho_{int} f_{int} + \rho_{-int} f_{-int}}, \tag{3.2}$$

where the parameter ρ_{int} captures the fighting efficiency of side i in subdistrict n. Alternatively, p_{int} can be interpreted as the *probability* that side i prevails in the armed conflict over control of the *entire* subdistrict n. In this case, U_i represents the expected utility because subdistricts are atomistic and the law of large numbers applies.

We assume that fighting efficiency of side i in subdistrict n is:

$$\ln \rho_{int} = \beta_i \ln APR_{it} + \ln \bar{\rho}_{int}, \tag{3.3}$$

where $\bar{\rho}_{int}$ is an exogenous baseline efficiency, and APR_{it} is total remittances appropriated in regions under i's control:

$$\underbrace{APR_{it}}_{\substack{\text{appropriated} \\ \text{remittances}}} = \int_n \underbrace{p_{int}}_{\substack{\text{territorial} \\ \text{control}}} \times \underbrace{LR_{nt}}_{\substack{\text{local remittances} \\ \text{to subdistrict } n}} \, dn, \tag{3.4}$$

where p_{int} is defined in (3.2). The elasticity β_i governs the sensitivity of side i's overall fighting ability to its remittance funding.[17]

A Nash equilibrium of this model consists of the infinite-dimensional vectors of fighting efforts $\{f_{int}\}$ for $i \in \{\mathtt{L}, \mathtt{G}\}$, such that each side best-responds to the other player's fighting efforts. Associated with these vectors of $\{f_{int}\}$ are the shares/probabilities of territorial control $\{p_{int}\}$.

We highlight three features of the setup. First, appropriated remittances APR_{it} are a side-specific object, and not a subdistrict-level object. Because there is a continuum of subdistricts in equation (3.4), the impact of territorial control p_{int} over an individual subdistrict n on APR_{it} is zero. As a result, when choosing fighting intensity in subdistrict n, the sides ignore the impact of their potential control over it on APR_{it} and APR_{-it}. Thus, the sides optimize (3.1) over $\{f_{int}\}$, taking $\{\rho_{int}\}$ in (3.2) as given. This assumption is reminiscent of the setup with a continuum of varieties in monopolistically-competitive models of trade (e.g. Krugman, 1980; Melitz, 2003), that leads firms to ignore the impact of their own price on the aggregate price index. Substantively, it amounts to assuming that each subdistrict is small from the perspective of each fighting side, and remittances from any individual subdistrict make a negligible contribution to a side's aggregate fighting strength. The continuum assumption also allows us to sidestep the technical complexities inherent in Colonel Blotto games, which model how two opponents strategically allocate fighters across multiple battlefields (see, e.g., Shubik and Weber, 1981; Roberson, 2006). These games are analytically difficult and typically yield equilibrium structures that are challenging to characterize, making them unsuitable for quantification.

Second, we abstract from any feedback effect of territorial control on local remittances. Specifically, even as control probabilities p_{int} evolve endogenously, we treat LR_{nt} as exogenous and driven purely by fixed social connections and foreign country business cycle, as in (2.1). In Section 2 this approach does not threaten identification, since LR_{nt} is effectively a shift-share instrument. However, the object of the quantitative model are actual remittances rather than their exogenous component. One might expect that when the government reconquers an ethnic Tamil region, remittances from the Tamil diaspora to that area could decline or even cease. Yet there is no compelling empirical evidence that such a mechanism was quantitatively meaningful in practice. In Section 2 we argue that there are no systematic differences in remittance behavior between Tamil and non-Tamil diaspora groups,

[17] We can accommodate the possibility that a side could access some remittances from areas controlled by the opponent: $\ln \rho_{int} = \bar{\beta}_i \ln APR_{it} + \underline{\beta}_i \ln APR_{-it} + \ln \bar{\rho}_{int}$. For example, the government could have the capacity to access remittances to all the areas of the country, even those where the LTTE has a strong presence, albeit with a different capacity ($\bar{\beta}_i \neq \underline{\beta}_i$). Our β_i parameter would then be interpreted as $(\bar{\beta}_i - \underline{\beta}_i)$, the side i's incremental ability to use remittances to the regions it controls, and the analysis would be largely unchanged.

suggesting that remittance flows are not strongly conditioned on the identity of the controlling authority. Whether the feedback from p_{int} to LR_{nt} matters quantitatively ultimately hinges on the remittance technology—especially for transfers to Tamil regions. Official remittances are cleared by the central bank, which may limit transfers to LTTE-controlled areas. However, anecdotally a non-negligible share of remittances were routed through informal channels that bypassed official scrutiny.[18] Even if a district switched from LTTE to government control, it remains unclear whether informal remittance flows would have been significantly affected.

Third, (3.4) contains a timing assumption: the p_{int} that enters APR_{it} has the same time index as the f_{int} that determines the territorial control. That is, remittances relevant to the current fighting strength are appropriated within the same period that the fighting takes place. As a result, the conflict is a repeated stage game: the sides do not engage in forward-looking strategies that target greater total territorial control today in order to appropriate future remittances. While this property is an internally-consistent outcome of agents' optimization given this theoretical setup, when taking the model to the data it raises the question of the length of t. In the quantification below, the length of the time period will be 1 year. Thus, we will assume that a conquering side can appropriate remittances within a year of taking control of a territory.[19]

The first-order conditions for the best response are:

$$\left(\rho_{int} f_{int} + \rho_{-int} f_{-int}\right)^2 = \frac{\rho_{int} V_{int}}{c_{int}} \rho_{-int} f_{-int} \quad \text{for} \quad i \in \{\mathtt{L}, \mathtt{G}\}. \tag{3.5}$$

Solving this system of equations in $f_{\mathtt{L}nt}$ and $f_{\mathtt{G}nt}$ leads to the overall efficiency-weighted Nash equilibrium level of fighting in subdistrict n and year t:

$$f_{nt} = \rho_{\mathtt{L}nt} f_{\mathtt{L}nt} + \rho_{\mathtt{G}nt} f_{\mathtt{G}nt} = \left(\frac{c_{\mathtt{G}nt}}{\rho_{\mathtt{G}nt} V_{\mathtt{G}nt}} + \frac{c_{\mathtt{L}nt}}{\rho_{\mathtt{L}nt} V_{\mathtt{L}nt}}\right)^{-1}. \tag{3.6}$$

In the empirical analysis below f_{nt} will be measured by the total yearly level of fighting observed in that subdistrict.

The equilibrium share of territory of subdistrict n controlled by the LTTE is

$$p_{\mathtt{L}nt} = \frac{v_{\mathtt{L}nt} \left(APR_{\mathtt{L}t}\right)^{\beta_{\mathtt{L}}}}{v_{\mathtt{L}nt} \left(APR_{\mathtt{L}t}\right)^{\beta_{\mathtt{L}}} + v_{\mathtt{G}nt} \left(APR_{\mathtt{G}t}\right)^{\beta_{\mathtt{G}}}} \qquad \text{where} \qquad v_{int} \equiv \frac{\bar{\rho}_{int} V_{int}}{c_{int}} \quad \text{for} \quad i \in \{\mathtt{L}, \mathtt{G}\}. \tag{3.7}$$

Here v_{int} is the composite of the subdistrict's value to side i, its cost of fighting there, and its fighting efficiency there. Only the composite enters the territorial share; we do not need to know its components separately, neither in the theoretical analysis nor in the estimation procedure.

[18] Existing reports on remittances to Sri Lanka during the war do not reach a consensus on the share of informal transfers, with estimates ranging from 5% to 40% of total remittances (ILO, 2020). Qualitative studies suggest that many Tamils in Canada used informal brokers, some of whom cleared their balances using official banking channels. There is anecdotal evidence that informal remittances were more prevalent for transfers to LTTE-controlled areas. Further anecdotes point to coercive fundraising practices abroad, including extortion from Tamil-owned businesses, with proceeds redirected to the LTTE (Cheran and Aiken, 2005; Becker, 2006; Chalk, 2008).

[19] In the empirical analysis, we experimented with lag structure and found that contemporaneous appropriated remittances have a larger impact on fighting than lagged remittances (Table A9).

Plugging (3.4) into (3.7) yields the following system of equations, with the vector of LTTE territorial shares across subdistricts and time, $\{p_{\text{L}nt}\}$, as the only endogenous variables:

$$p_{\text{L}nt} = \frac{v_{\text{L}nt}\left(\int_n p_{\text{L}nt} LR_{nt} dn\right)^{\beta_{\text{L}}}}{v_{\text{L}nt}\left(\int_n p_{\text{L}nt} LR_{nt} dn\right)^{\beta_{\text{L}}} + v_{\text{G}nt}\left(\int_n (1-p_{\text{L}nt}) LR_{nt} dn\right)^{\beta_{\text{G}}}}. \tag{3.8}$$

The equilibrium vector of LTTE territorial shares is obtained as a fixed point of equation (3.8). Government territorial shares are then computed as $p_{\text{G}nt} = 1 - p_{\text{L}nt}$. Appendix B.2 provides the complete treatment of the conditions for the stability and uniqueness of interior equilibrium. We also verify that the quantitative model satisfies those conditions under the calibrated parameter values.

Note that in spite of the property that each side neglects the contribution of local remittances to its aggregate fighting strength when choosing fighting effort in each individual subdistrict, the model solution features a positive "fiscal" feedback loop between territorial control and remittances *at the side level*. Higher $p_{\text{L}nt}$ over a positive measure of subdistricts increases remittances that can be appropriated by the LTTE, which in turn gives the LTTE greater fighting strength across the board, leading to greater territorial control.

The model predicts that an increase in side i's APR, through its positive effect on local fighting efficiency ρ_{int}, raises the equilibrium level of fighting f_{nt}, more strongly where p_{int} is low and less so where p_{int} is high:

$$\frac{\partial \ln f_{nt}}{\partial \ln \rho_{int}} = \left(1 - p_{int}\right). \tag{3.9}$$

As a consequence, an increase in remittances to the LTTE – leading to higher $\rho_{\text{L}nt}$ – increases fighting relatively less in areas with greater LTTE control: $\frac{\partial^2 \ln f_{nt}}{\partial \ln \rho_{\text{L}nt} \partial p_{\text{L}nt}} = -1$. Similarly, an increase in remittances to the government increases fighting by more in LTTE-controlled areas: $\frac{\partial^2 \ln f_{nt}}{\partial \ln \rho_{\text{G}nt} \partial p_{\text{L}nt}} = 1$. The model thus rationalizes the signs of the interaction coefficients of interest in the reduced form regression (2.6)/Table 4: the negative coefficient on the interaction between $ER_{\text{L}t}$ and LTTE control, and the positive one on the interaction between $ER_{\text{G}t}$ and LTTE control. This discussion assumes that ethnic remittances ER_{it} from Section 2 and appropriated remittances APR_{it} from this section are related. We confirm this in the structural estimation of the model below.

3.2 Taking the model to the data

To take the model to the data, we work with 322 Sri Lankan subdistricts, that we continue to index by n. We assume that the composite valuation/cost parameter has the following functional form:

$$v_{int} = \frac{\bar{\rho}_{int} V_{int}}{c_{int}} = \frac{\bar{\rho}_{int} \bar{V}_{int} LR_{nt}^{\varrho}}{\bar{c}_{int} LR_{nt}^{\omega}} = (\texttt{ethnic}_{in})^{\eta_1} (\texttt{distance}_{in})^{\eta_2} \varepsilon_{it} \mu_{nt} LR_{nt}^{\varrho - \omega}. \tag{3.10}$$

The second equality says that district valuations are composed of rapacity effects coming from remittances, as well as other determinants $\bar{V}_{int}$: $V_{int} = \bar{V}_{int} LR_{nt}^{\varrho}$. Similarly, the cost of fighting is a combination of opportunity cost effects of remittances and other determinants: $c_{int} = \bar{c}_{int} LR_{nt}^{\omega}$. The third equality states that the combination of the exogenous components of fighting efficiency, valuation and cost, $\bar{\rho}_{int}\bar{V}_{int}/\bar{c}_{int}$, can be represented by the ethnic share of fighting side i in subdistrict n ($\texttt{ethnic}_{in}$ equals $\texttt{tamil}_n$ for $i = \texttt{L}$ and $\texttt{nontamil}_n$ for $i = \texttt{G}$), the geographic distance between subdistrict n's centroid and side i's capital ($\texttt{distance}_{in}$ to Kilinochchi for $i = \texttt{L}$, Colombo for $i = \texttt{G}$), a side-time component ε_{it}, and a district-time component μ_{nt} common to both sides. The assumption is that subdistricts with a high Tamil ethnic share and closer to the core Tamil stronghold are some or all of: (i) more valuable to the Tamils; (ii) have higher Tamil fighting efficiency; and (iii) have a lower cost of fighting. The same assumption applies to the composite valuation of subdistricts by the central government. The residual component ε_{it} captures all the other possibly time-varying determinants of each side's fighting efficiency: GDP growth/government revenues, weather, foreign military and humanitarian aid, control of natural resources, etc. In the parameter estimation below, $\mu_{nt} LR_{nt}^{\varrho-\omega}$ are absorbed by subdistrict-year fixed effects. In the quantification, the terms $\mu_{nt} LR_{nt}^{\varrho-\omega}$ cancel out, as only the ratio of $v_{\texttt{L}nt}$ to $v_{\texttt{G}nt}$ matters in the model (see 3.8).[20]

Simulating the model requires the structural elasticities $\{\eta_1, \eta_2, \beta_{\texttt{L}}, \beta_{\texttt{G}}\}$, cross-sectional or subdistrict-time variables $\texttt{ethnic}_{in}$, $\texttt{distance}_{in}$, and LR_{nt}, taken or constructed directly from the data, and the side-specific idiosyncratic fighting efficiency shocks $\{\varepsilon_{it}\}$. Given these inputs, the model solves for the vector of $p_{\texttt{L}nt}$'s using an iterated fixed-point procedure applied to the discrete-district version of equation (3.8):

$$p_{\texttt{L}nt} = \frac{v_{\texttt{L}nt}\left(\sum_n p_{\texttt{L}nt} LR_{nt}\right)^{\beta_{\texttt{L}}}}{v_{\texttt{L}nt}\left(\sum_n p_{\texttt{L}nt} LR_{nt}\right)^{\beta_{\texttt{L}}} + v_{\texttt{G}nt}\left(\sum_n (1-p_{\texttt{L}nt}) LR_{nt}\right)^{\beta_{\texttt{G}}}}.$$

When moving from theory to quantification, it is important that the continuum of subdistricts assumption is well approximated by our data, in the sense that no single subdistrict's remittances make a substantial contribution to each side's overall fighting strength. Appendix Figure B2 plots the distribution of the shares of each subdistrict in each side's APR_{it}, after calibrating the model. The vast majority of the mass is concentrated on shares below 2%, with a maximum value of 6.9% for LTTE and 2.1% for the government.

Estimating η_1 and η_2. We note that the observation on whether a subdistrict is "under side i's control" is a discrete outcome of a draw from an underlying latent Bernoulli probability distribution with parameter p_{int} governed by (3.7). Plugging (3.10) into this relation, the terms $\mu_{nt} LR_{nt}^{\varrho-\omega}$ common to both sides in (3.10) drop out of the equation and this leads to a structural equation that can be used to estimate η_1 and η_2:

$$\mathbb{E}\left[\texttt{control}_{int}\right] = \exp\left[\eta_1 \ln \texttt{ethnic}_{in} + \eta_2 \ln \texttt{distance}_{in} + \delta_{it} + \psi_{nt} + \nu_{int}\right], \tag{3.11}$$

where $\texttt{control}_{int}$ is the share of subdistrict n controlled by side i at time t, and δ_{it} and ψ_{nt} are the side-time and subdistrict-time fixed effects required by theory. In particular, examining (3.7) reveals that

[20] It may be that the LTTE and the government have different rapacity and opportunity cost elasticities ϱ_i and ω_i, $i = \texttt{L}, \texttt{G}$. Appendix B.4 replicates all the structural estimates and quantitative results with this extended model. None of the qualitative or quantitative conclusions change in this less parsimonious model.

Table 7: Estimating η_1 and η_2: ethnic share, distance to capital, and territorial control

	(1)	(2)
Dep. Var.	$\texttt{control}_{int}$	
$\ln \texttt{ethnic}_{in}$	0.140***	
	(0.0535)	
$\ln \texttt{distance}_{in}$	-1.541***	-0.898***
	(0.228)	(0.296)
$\ln \texttt{ethnicTamSin}_{in}$		0.282***
		(0.0565)
Observations	9016	9016
Subdistrict-year FE	✓	✓
Side-year FE	✓	✓

Notes: results from estimating equation (3.11) using PPML. Standard errors are clustered at the district-side level. $\texttt{ethnic}_{in}$ is the (time-invariant) ethnic share of side i in subdistrict n (Tamil share for LTTE, 1 minus the Tamil share for government), $\texttt{ethnicTamSin}_{in}$ is the (time-invariant) ethnic share of side i in subdistrict n (Tamil share for LTTE, Sinhalese for government), and $\texttt{distance}_{in}$ is the distance to the capital (Kilinochchi for the LTTE and Colombo for the government). *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

the side-time effect δ_{it} absorbs the appropriated remittances and side-specific idiosyncratic shocks $\ln\left((APR_{it})^{\beta_i}\,\varepsilon_{it}\right)$, that vary at the side-time but not subdistrict level. In turn, the subdistrict-time effects subsume the denominator of (3.7), that varies by subdistrict-time but not by fighting side. The intuition is that, after controlling for the theoretically-required fixed effects, observed control over a subdistrict n by side i reveals how valuable n is to i, v_{int}. Relating the v_{int} to the ethnic share and distance to the respective capitals pins down the η's.

We estimate equation (3.11) by Poisson Pseudo-Maximum Likelihood (PPML). This estimation approach is theory-consistent and has the added benefit of accommodating zeros on the left-hand side. Table 7 displays the results. In column 1, ethic share is the share of Tamils for the LTTE and 1 minus the share of Tamils for the government. As expected, both the higher ethnic share and the proximity to the capital are associated with a higher probability of control. Both coefficients are highly significant. Column 2 uses the fraction of Sinhalese (as opposed to non-Tamil) as the ethnic share for the government side. The results are quite similar, with the ethnic indicator slightly higher, and the distance coefficient somewhat lower. The baseline analysis will use the results from column 1. We will use the Tamil/non-Tamil ethnic shares, and set $\eta_1 = 0.140$ and $\eta_2 = -1.541$.

Estimating β_L and β_G. Having estimated equation (3.11), we use it to construct predicted control probabilities $\hat{p}_{Lnt}$. To this purpose, we first notice that the structural interpretation of (3.11) implies

$$v_{int}\,(APR_{it})^{\beta_i} = (\texttt{ethnic}_{in})^{\eta_1}\,(\texttt{distance}_{in})^{\eta_2}\,\delta_{it}, \tag{3.12}$$

up to the nt-specific shifter that will cancel out when we take the ratio of this object for the two sides. Thus, we can use data on distance and ethnic shares together with the PPML estimates of $\hat{\eta}_1$, $\hat{\eta}_2$, and $\hat{\delta}_{it}$ to construct estimates of $v_{\mathtt{L}nt}\left(APR_{\mathtt{L}t}\right)^{\beta_{\mathtt{L}}}$ and $v_{\mathtt{G}nt}\left(APR_{\mathtt{G}t}\right)^{\beta_{\mathtt{G}}}$ and therefore the predicted probabilities of LTTE control $\hat{p}_{\mathtt{L}nt}$ based on (3.7). Finally, expressing (3.7) as an odds ratio and log-time-differencing leads to an estimable equation:

$$\Delta \ln \frac{\hat{p}_{\mathtt{L}nt}}{1-\hat{p}_{\mathtt{L}nt}} = \beta_{\mathtt{L}} \Delta \ln \widehat{APR}_{\mathtt{L}t} - \beta_{\mathtt{G}} \Delta \ln \widehat{APR}_{\mathtt{G}t} + \underbrace{\Delta \ln \varepsilon_{\mathtt{L}t} - \Delta \ln \varepsilon_{\mathtt{G}t}}_{\text{error term}}, \tag{3.13}$$

where the appropriated remittances by the two sides $APR_{\mathtt{L}t}$ and $APR_{\mathtt{G}t}$ are constructed by plugging the predicted probabilities $\hat{p}_{int}$ into (3.4): $\widehat{APR}_{it} = \sum_n \hat{p}_{int} LR_{nt}$.

Equation (3.13) provides a means of estimating $\beta_{\mathtt{L}}$ and $\beta_{\mathtt{G}}$ by regressing the predicted probabilities on the appropriated remittances. However, since the appropriated remittances themselves depend on the territorial control, and are computed using estimated probabilities, there is an immediate endogeneity problem. In addition, the regressors of interest are generated, potentially introducing measurement error on the right-hand side. For both of these reasons, we instrument the log changes in "actual" appropriated remittances $\Delta \ln \widehat{APR}_{\mathtt{L}t}$ and $\Delta \ln \widehat{APR}_{\mathtt{G}t}$ with the log changes in the ethnic remittances $ER_{\mathtt{L}t}$ and $ER_{\mathtt{G}t}$ defined in (2.3). As argued at length in Section 2, these variables are plausibly exogenous, as they use information only on time-invariant ethnic shares and social connectedness, and total outward remittances from foreign countries. Thus, $ER_{\mathtt{L}t}$ and $ER_{\mathtt{G}t}$ are shift-share IVs, in which the shifts are the foreign countries' total remittances, and the shares are combinations of social connectedness and ethnic shares.[21] Note that our instrument is also the regressor of interest in the reduced-form econometric results in Section 2 above. In addition to the instrument, we control for the local remittance shock LR_{nt} and add subdistrict fixed effects and subdistrict-specific time trends to all specifications in order to absorb further residual variation.

Table 8 displays the estimation results for equation (3.13). The left panel reports the OLS results, and the right panel the IV. The first stage diagnostic F-statistics of the IV regressions are above conventional levels, and the Anderson-Rubin test for significance of endogenous regressors has a low p-value, so we conclude that the estimation does not suffer from weak instruments. Appendix Table B1 displays the first stage results and shows that the coefficients have the expected sign and significance.

First, we estimate the equation restricting the elasticity to be the same for the LTTE and the government (columns 1 and 3). We then allow them to differ by side (columns 2 and 4). Throughout, the estimates of β_i's are positive and significant. When we break the equality of the LTTE and government β_i's in columns 2 and 4, we find that the coefficients are different (recall that the left hand side variable is the odds ratio of the LTTE control, so the $\Delta \ln \widehat{APR}_{\mathtt{G}t}$ enters negatively and its coefficient is an estimate of $-\beta_{\mathtt{G}}$). In the last column, $\hat{\beta}_{\mathtt{L}} > \hat{\beta}_{\mathtt{G}}$, implying that LTTE is more efficient than the central government at converting the remittance "tax base" into military strength. According

[21]The instrument can be rearranged as: $ER_{\mathtt{L}t} = \sum_o \left(\sum_n \mathtt{tamil}_n \pi_{on}\right) \times \mathtt{OUTREM}_{ot}$. The (fixed) share is thus given by the inner product of the vector of Tamil ethnic shares and connections to country o, $\sum_n \mathtt{tamil}_n \pi_{on}$, and the shift is the foreign total outremittances.

to these estimates, a 1% change in APR increases the odds ratio by 1% for LTTE and by 0.47% for the central government.

The IV coefficients are three times smaller in magnitude than OLS for $\beta_{\mathtt{G}}$, and similar for $\beta_{\mathtt{L}}$. This is consistent with the source of endogeneity sketched out above, where shocks to fighting efficiency influence both the odds ratio and the $\widehat{APR}_{\mathtt{G}t}$, artificially inflating the estimated $\beta_{\mathtt{G}}$. Once instrumented, the coefficient decreases in magnitude. The direct impact of the local remittance shock ($\Delta \ln LR_{nt}$) is sometimes positive and significant, but disappears in the IV specification allowing for different β.

In Appendix Table B2, we further control for GDP and trade growth shocks, as we did in our reduced form estimates, to distinguish remittances from other types of local connections to foreign countries. The coefficients on the $\Delta \ln \widehat{APR}_{\mathtt{G}t}$ and $\Delta \ln \widehat{APR}_{\mathtt{G}t}$ increase in magnitude in those cases, with $\beta_{\mathtt{G}}$ remaining smaller than $\beta_{\mathtt{L}}$. We do not emphasize these specifications because of the high collinearity between the remittance- and the GDP- and trade-driven shocks. Nonetheless, when subjected to this stringent test, the remittance shock survives. The table also reports the results when using as the instruments the remittance shocks constructed with the residualized SCI weights as in equation (2.8) in Section 2.6. The results are again similar to our baseline.

Based on the estimates in column 4 of Table 8, we set $\beta_{\mathtt{L}} = 1$ and $\beta_{\mathtt{G}} = 0.47$.

Recovering the $\varepsilon_{\mathtt{L}t}$'s and $\varepsilon_{\mathtt{G}t}$'s. Comparing the theoretical control probability (3.8) to its empirically-estimable counterpart (3.11) shows that the side-time fixed effect has the following structural interpretation:

$$\delta_{it} = \ln APR_{it}^{\beta_i} + \ln \varepsilon_{it} \quad i \in \{\mathtt{L}, \mathtt{G}\}. \tag{3.14}$$

Now that we have estimated $\beta_{\mathtt{L}}$ and $\beta_{\mathtt{G}}$ and the empirical proxy $\widehat{APR}_{it}$, we can recover the idiosyncratic side-specific shocks ε_{it} from the estimates of the side-time fixed effects δ_{it} after filtering out the role of incoming remittances.

Figure 7 displays the relative $\varepsilon_{\mathtt{L}t}/\varepsilon_{\mathtt{G}t}$. There is a sharp drop after 2006. In late 2005, the presidential elections resulted in a government with a much tougher stance against the LTTE. Peace talks broke down completely in 2006, and the government launched a campaign to recover the territory under the LTTE control. Our model rationalizes the drop in overall LTTE control partly with an exogenous decrease in relative fighting strength $\varepsilon_{\mathtt{L}t}/\varepsilon_{\mathtt{G}t}$.

Note that estimating all the parameters in (3.11), (3.13), and (3.14) in a single step would be more challenging, because the key variable $\widehat{APR}_{it}$ cannot be computed directly from data. And, without $\widehat{APR}_{it}$, the β_i's cannot be identified. By contrast, our two-step procedure uses the side-time effect δ_{it} and the coefficients η_1 and η_2 estimated in (3.11) to recover the composite term $v_{int}\,(APR_{it})^{\beta_i}$ (see equation 3.12). This composite, and not its constituent parts, is sufficient to construct $\hat{p}_{int}$. With $\hat{p}_{int}$ in hand, we can reconstruct $\widehat{APR}_{it}$ and estimate β_i via equation (3.13) in the second step. Estimation in one step would require fitting a non-linear equation, which is computationally more demanding and less transparent.

Table 8: Estimating β_{L} and β_{G}: remittances and territorial control

Dep. Var. :$\Delta \ln \frac{\hat{p}_{\mathsf{L}nt}}{1-\hat{p}_{\mathsf{L}nt}}$	(1)	(2)	(3)	(4)
	OLS		IV	
$\Delta \ln \frac{\widehat{APR}_{\mathsf{L}t}}{\widehat{APR}_{\mathsf{G}t}}$	1.018***		0.949***	
	(0.00631)		(0.0462)	
$\Delta \ln \widehat{APR}_{\mathsf{L}t}$		1.016***		1.069***
		(0.00577)		(0.0367)
$\Delta \ln \widehat{APR}_{\mathsf{G}t}$		-1.581***		-0.466***
		(0.194)		(0.140)
$\Delta \ln LR_{nt}$	0.563***	1.020***	0.667***	0.00259
	(0.0594)	(0.185)	(0.0680)	(0.144)
Observations	4186	4186	4186	4186
Subdistrict FE and trend	✓	✓	✓	✓
KP-F			11.12	11.01
SW-F ($\Delta \ln \widehat{APR}_{\mathsf{L}t}$)				22.24
SW-F ($\Delta \ln \widehat{APR}_{\mathsf{G}t}$)				291.24
ARF p-value			0.003	0.000

Notes: results from estimating equation (3.13). Standard errors are clustered at the district-year level. KP-F refers to the Kleibergen-Paap F-statistic of the first stage, "ARF p-value" refers to the p-value of the Anderson-Rubin first stage F-statistic for the joint significance of all endogenous variables, and SW-F to the Sanderson-Windmeijer first-stage statistics for individual regressors. First stage regressions are displayed in Appendix Table B1. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

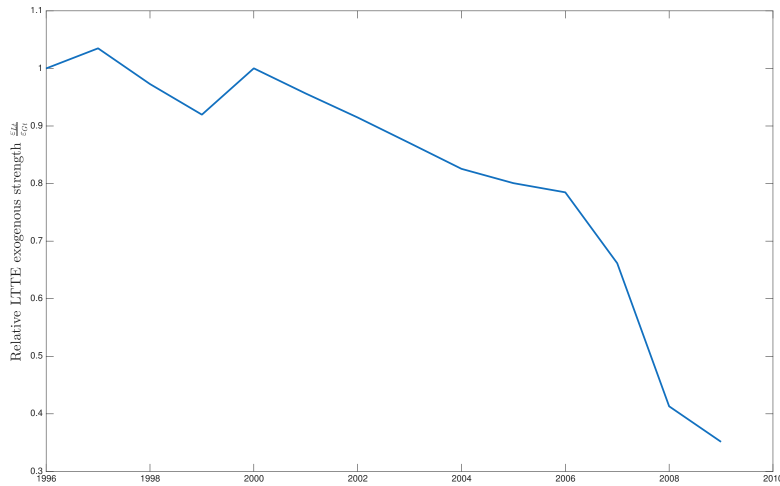
3.3 Model fit

We define a "factual" scenario as the model solution to (3.8) when feeding in data on LR_{nt} and our estimated v_{int}'s, which are in turn constructed using estimated η_1 and η_2 and the recovered ε_{it}'s.

To assess the fit of the factual, we first show that it fits well the (targeted) geographical and time variation in LTTE control. Appendix Figure B3 displays a map of Sri Lanka for different years, with the data LTTE control in the top row and the model-predicted control ($\hat{p}_{int}$) in the bottom row. The model captures well the strength of LTTE in the north and east and the time progression of the war.

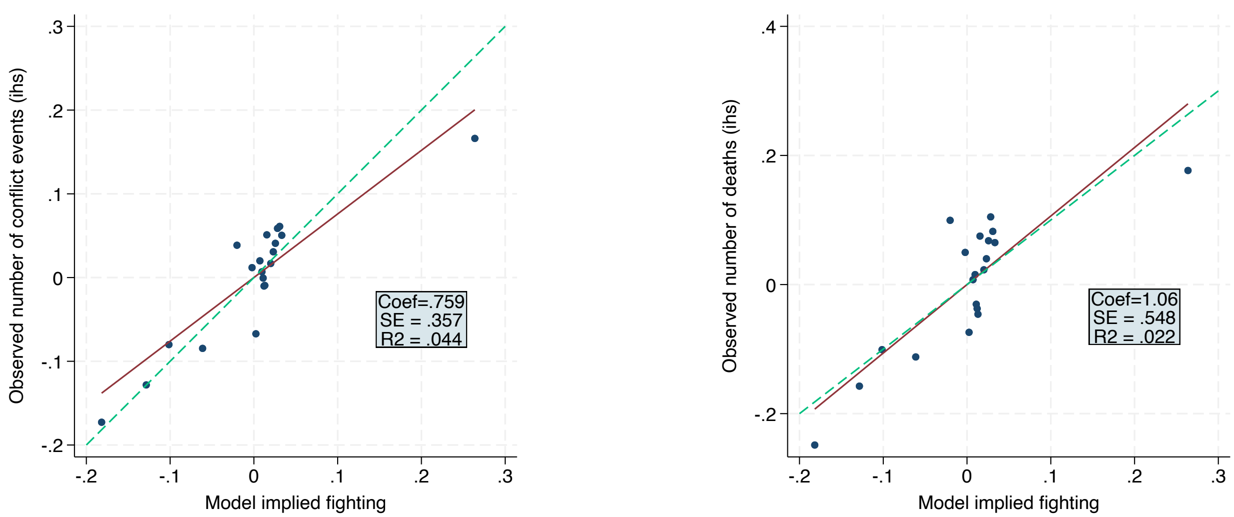
Second, we also show that the model-predicted amount of fighting in a subdistrict-year (f_{nt}) matches well untargeted data on the intensity of fighting activity. Figure 8 displays a binscatter of the model-implied fighting against the data, after partialling out subdistrict and year fixed effects. In the data, fighting is measured as the number of fighting events (left panel) or number of reported deaths (right panel). The model-implied and observed fighting are positively and significantly correlated, despite the fact that we never use data on fighting intensity while estimating the model.

Figure 7: Calibrated relative exogenous fighting strength $\varepsilon_{Lt}/\varepsilon_{Gt}$



Notes: the figure displays the relative fighting strength of LTTE calibrated to match the PPML-predicted control probabilities. The LTTE to government strength ratio is normalized to 1 in 1996.

Figure 8: Model and data fighting



Number of events

Number of deaths

Notes: the figure displays a binscatter plot of the model-implied fighting against the inverse hyperbolic sine of the number of conflict events (left panel) or number of reported deaths (right panel) in each subdistrict-year, after controlling for subdistrict and year fixed effects. The solid red line displays the linear fit, and the dashed line is a 45-degree line. The R^2 reported in the box is the within-R^2 after netting out the subdistrict and year fixed effects.

3.4 Counterfactuals

Our factual matches well the LTTE post-2006 defeat. The reduction and eventual full collapse of LTTE territorial control is triggered by the fall in the exogenous relative fighting efficiency $\varepsilon_{Lt}/\varepsilon_{Gt}$ depicted in Figure 7, amplified by the resulting decline in appropriated remittances.

The left panel of Figure 9 displays the predicted share of the Tamil Eelam territory under LTTE control, comparing the factual scenario (in blue) with two counterfactuals. The "fixed-LR_{nt}" counterfactual, in dashed red, simulates the model while keeping all the region-specific remittances constant at their 1996 level. The LTTE control decreases slightly, as overall observed remittances increase over time and LTTE is more sensitive to remittances ($\hat{\beta}_{L} > \hat{\beta}_{G}$). However the end result is fairly similar to the factual: LTTE collapses rapidly following the exogenous fall in its relative fighting efficiency post-2006, anticipating the actual data by only a year. This shows that time variation in location-specific remittances LR_{nt} *per se* was not the main determining factor in the timing of the LTTE defeat.

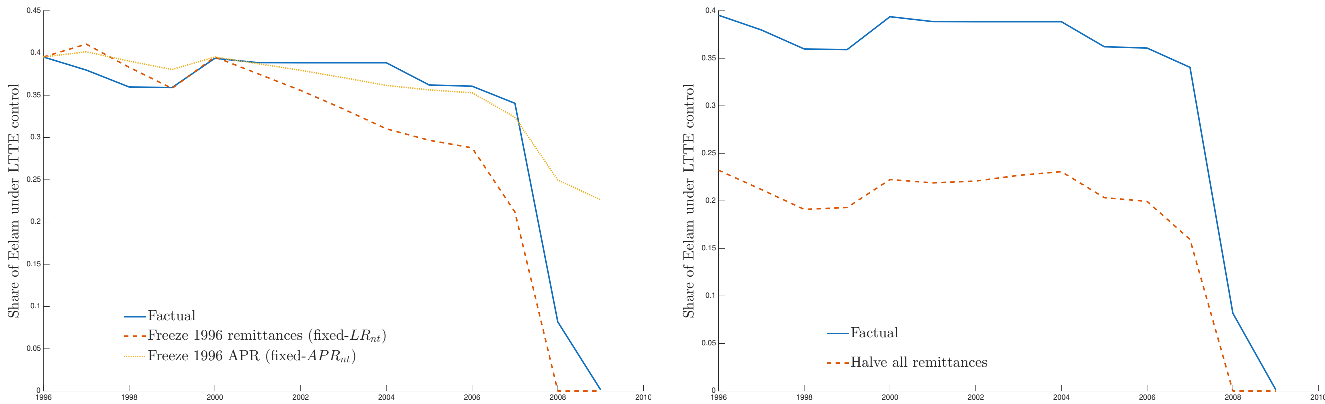
This does not imply that remittances played no role in the unraveling of the civil war. The yellow dotted line displays a "fixed-APR_{it}" counterfactual that exogenously freezes the appropriated remittances at the 1996 levels. This hypothetical scenario thus assumes that territorial control itself does not impact the sides' ability to collect remittances. In this case, LTTE's decline between 2006 and 2009 is much more limited. While LTTE territorial control collapses to zero in 2009 in the counterfactual with amplification, the LTTE would still control 0.23 of the Tamil homeland in 2009 in the counterfactual that shuts down amplification. Hence, our model suggests that while the demise of the LTTE originated from a shift in the central government policy, this exogenous shift was compounded by the remittance appropriation feedback loop.

To understand these results, note that in both counterfactuals the only shock is the exogenous (from the model's perspective) collapse in the LTTE's relative fighting efficiency, $\varepsilon_{Lt}/\varepsilon_{Gt}$, in 2007–09. The only difference between the two scenarios is that the "fixed-APR_{it}" counterfactual switches off the feedback loop between territorial control and the ability of each side to appropriate remittances. If territorial control had no effect on APR_{it}, the LTTE would have continued to draw military strength from remittances. In that case, the exogenous decline in LTTE's relative fighting strength would not, on its own, have sufficed to end the conflict by 2009. The link between territorial control and remittance appropriation thus acted as a quantitatively important amplification mechanism: as the LTTE lost territory, its access to remittances diminished, weakening its military capacity, which in turn led to further territorial losses. In sum, it was crucial that the government offensive also curtailed the LTTE's access to resources from its diaspora.

To assess the relative role of remittances in the fighting strength of the two sides, the right panel of Figure 9 displays what would happen if all remittances $\texttt{OUTREM}_{ot}$ were cut by half. In this scenario, LTTE territorial control is also halved across the board, resulting in the conflict ending one year earlier. Evidently, remittances are significantly more important for the LTTE's fighting strength than for the central government's. This can be attributed to the LTTE's greater efficiency at converting remittances into fighting strength, as implied by $\hat{\beta}_{L} > \hat{\beta}_{G}$.

We next examine the heterogeneity of remittances across source countries, by means of the following counterfactual experiment. We start from the factual equilibrium in 1996 and then remove

Figure 9: Counterfactual winning probabilities under alternative remittances



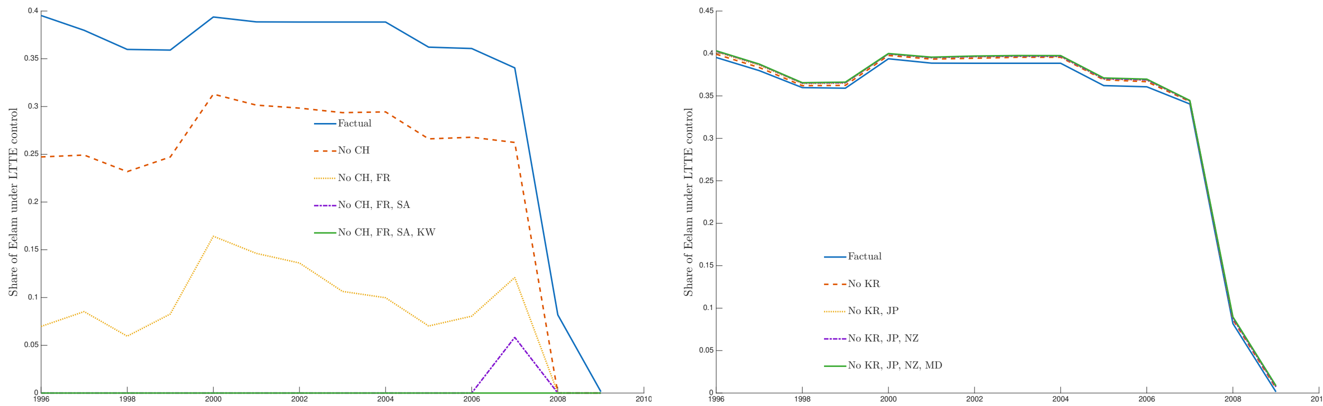
Freezing remittances at initial levels | Reducing remittances by half

Notes: the left panel displays predicted shares of territorial control under three scenarios. The factual (in solid blue) lets both remittances and ε_{it} evolve as in the calibration. The dashed red line presents a counterfactual where all remittances are frozen to 1996 levels and ε_{it} varies as in the factual. The dotted yellow line shows a counterfactual where appropriated remittances APR (equation 3.4) are exogenously kept constant to 1996 levels even while ε_{it} varies as in the factual. The right panel shows what would happen if all remittances were cut by half.

each source country's remittances one at a time in equation (2.1), re-solve the model equilibrium, and compute the change in the share of Tamil Eelam under LTTE control. This exercise identifies the "key players" for each side: countries whose removal leads to the highest decrease in LTTE control are the most "pro-LTTE" countries, while countries whose removal leads to the highest increase in LTTE control are the most "pro-government." Appendix Figure B4 displays the top pro-LTTE and pro-government countries along with their quantitative contributions. According to this exercise, the most pro-LTTE countries are Switzerland, France, Saudi Arabia, and Kuwait. This outcome aligns with our findings in Figure 4, which show that social connections in these countries are predominantly Tamil-biased. The most pro-government countries are South Korea, Japan, New Zealand, and the Maldives.

Figure 10 displays the model's predicted share of Tamil Eelam under LTTE control when sequentially removing up to four most significant key players on each side. The left panel reports the results when removing countries that matter the most for LTTE. Notably, when Switzerland, France, and Saudi Arabia are removed, the model predicts a temporary government victory as early as 1996. Furthermore, removing Kuwait leads to a complete government victory at the onset of our analysis period in 1996. The right panel presents a similar exercise for the top four countries that are key to the central government. In this case, their removal has minimal impact on the evolution of the conflict. This outcome is driven by the relatively low elasticity of fighting efficiency with respect to remittances for the government. The picture that emerges from both the right panel of Figure 9 and Figure 10 is that remittances have a disproportionately large impact on the LTTE.

Figure 10: Counterfactual winning probabilities: removing remittance source countries



Most pro-LTTE   Most pro-government

Notes: the figure displays the counterfactual results. The left panel removes the countries that have the largest positive impact on LTTE winning probability, while the right panel removes countries that have the largest positive impact on the government winning probability.

4. Conclusion

There is plenty of anecdotal evidence on the relevance of remittances for conflict outcomes. However, formal statistical and quantitative analyses have been scarce. We estimate econometrically and evaluate quantitatively the role of remittances in the evolution of the Sri Lankan Civil War. We find that remittances contributed substantially to the fighting strength of the LTTE rebels, and prolonged the war substantially.

Beyond Sri Lanka, remittances play a key role in a number of conflicts worldwide. From the Kurdish Workers Party (PKK) in Turkey, to the Provisional Irish Republican Army (PIRA), the Eritrean People's Liberation Front (EPLF), and the Hizballah in Lebanon, remittances have been linked to funding various fighting groups (Picard, 2000; Chalk, 2008; Schmitz-Pranghe, 2010). Beyond such emblematic examples, remittances correspond to a large fraction of GDP in many fragile countries: for instance, in Comoros, Haiti, Lebanon, Somalia, and South Sudan, they amount to well over one-fifth of GDP (Kane, Ratha, and Rutkowski, 2022). Depending on the context, remittances can be a double-edged sword, on the one hand constituting a indispensable lifeline to keep societies afloat, yet also bearing risks of funding organized violence. Hence, our quantitative analysis of Sri Lanka constitutes one step along the way of gaining a greater understanding of this much wider phenomenon. A long-run goal for this research program will be to identify policy choices that allow countries to optimally reap the economic and societal benefits of remittances, while minimizing the risks of armed violence.

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—*ONLINE APPENDIX*—

Feeding the Tigers: Remittances and Conflict in Sri Lanka

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A. Data and reduced-form results

A.1 Data

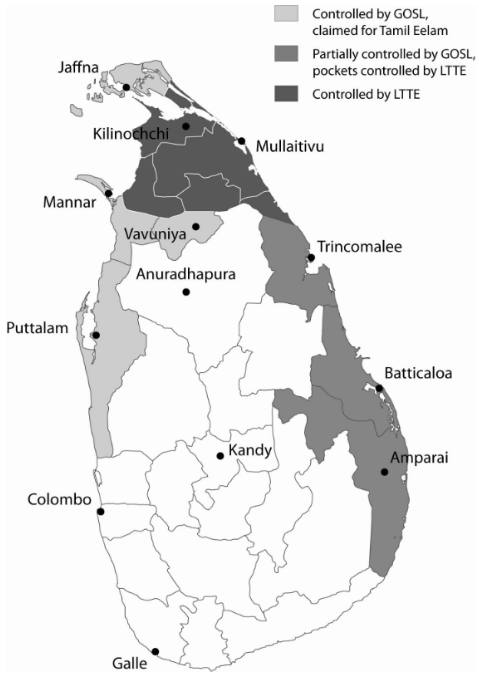
Conflict events data. The conflict data come from the Uppsala Conflict Data Program (UCDP) Georeferenced Event Dataset (GED) Version 21.1. This version of the dataset can be downloaded at https://ucdp.uu.se/downloads/olddw.html.

Refugee and internally displaced persons data. Data on internally displaced people and refugees comes from the United Nations High Commissioner for Refugees (UNHCR, 2023). The data was extracted from https://www.unhcr.org/refugee-statistics/download/?url=2ohA8N on October 24th, 2023.

LTTE territorial control. The extent of LTTE territorial control at various points is sourced from the Sri Lankan Ministry of Defence. The ministry provided an animation of the extent of territory at various intervals over the civil war. An archived version of this animation is available here: https://web.archive.org/web/20110827212530/http://www.defence.lk/new.asp?fname=Humanitarian. We use the animation from the Ministry of Defence and map it onto the shapefile for Sri Lanka from the Global Administrative Areas (GADM) dataset (https://gadm.org/download_country.html). The unit of analysis is the GADM's second subdivision corresponding to the "Divisional secretariat," which we refer to as "subdistrict." The animation provides areas under LTTE control at different months and years. For each time snapshot, we compute the share of each subdistrict under LTTE control. We then aggregate it at the year level, weighting by the number of month under control.

Figure A1 displays the Tamil homeland claimed by the LTTE.

Figure A1: LTTE claimed Tamil homeland



Notes: The figure depicts the "Tamil Eelam" area claimed by the LTTE as Tamil homeland (source: Stokke, 2006). GOSL stands for Government of Sri Lanka.

Census of Sri Lanka. The 2012 Census of Sri Lanka was sourced online from the Department of Census and Statistics - Sri Lanka (Department of Census and Statistics - Sri Lanka, 2012), at http://www.statistics.gov.lk/PopHouSat/CPH2012Visualization/htdocs/index.php?usecase=indicator&action=Map&indId=10. We extracted the Divisional Secretariat data for each subdistrict separately by clicking on the subdistrict on the main map, and using the "data" button.[22]

We use data from the 1982 ethnic share at the District level from Tim Bespyatov's database on population dynamics and statistics (http://pop-stat.mashke.org/srilanka-ethnic1981.htm, archived here).

Household Income and Expenditure Survey. We use public use micro data from the Department of Census and Statistics's Microdata Catalog. Data availability is not complete and is summarized in Table A1. Some years are unavailable and some don't contain the data related to remittances.

[22]For example, the data for the subdistrict of Jaffna would be available at the following url: http://www.statistics.gov.lk/PopHouSat/CPH2012Visualization/htdocs/index.php?usecase=indicator&action=DSData&indId=10&district=Jaffna.

Table A1: Household Income and Expenditure Survey Data Availability

Year	Public use micro-data	Contains remittance	Number of districts
1990-91	✓	✓	17
1993	×		
1995-96	✓	×	
2002	✓	×	
2005	×		
2006-07	✓	✓	3
2009-10	✓	✓	1
2012-13	×		
2019	✓	✓	25

Notes: The table displays the data availability of the micro data of Sri Lanka's Household Income and Expenditure Survey Data on the Department of Census and Statistics's Microdata Catalog (https://nada.statistics.gov.lk/index.php/home, as of September 2025). The public use micro data is accessible upon registration, and typically contains a 25% sample of the total survey, or sometimes only observations from selected districts.

SCI weights construction. We use the most disaggregated SCI dataset available ("gadm1_nuts3_counties-gadm1_nuts3_counties", October 2021 version) from https://data.humdata.org/dataset/social-connectedness-index?. We then take the average raw SCI at the country-Sri Lankan subdistrict level, and then construct our remittance weight. Our preferred weight is given by equation (2.2). Under the assumption that the number of Facebook users is proportional to population, our weight is equal to the number of friendships between a country and the Sri Lankan subdistrict as a share of total friendship in the country. Of course, Facebook penetration is not equal across the world, so our measure might be noisy. Hence, we also report results removing the population from our weight, or using the raw SCI as weight (see Table 6).

A.2 Validation of the constructed remittance measures

Table A2: Remittances by ethnicity in the Household Income and Expenditure Survey

Dep. Var.:	Remittances received			
Year:	1990	2006	2009	2019
	(1)	(2)	(3)	(4)
$\texttt{tamil}_i$	-125.4	465.6	42.21	3486.8
	(88.06)	(746.0)	(728.5)	(3202.4)
Observations	23237	17940	20299	19848
District FE	✓	✓	✓	✓
Number of clusters	1874	999	524	2411
Mean of dependent variable	63.00	2014.2	2448.8	6119.4

Notes: The table reports results from regressing respondent i's received remittances in Sri Lankan Rupees on a dummy equal to 1 if the respondent's ethinicity is tamil. Remittances received are measured as the answer to the question "Other cash receipt of the household members during last 12 months, Current remittances and transfers, from abroad". All regressions are run using survey weights and include a district fixed effect. Standard errors are clustered at the primary sampling unit level. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

To assess if our measure of local remittance is meaningful, we conduct the following exercise. First, we construct similar measures of remittances at the country-level as described in equation (2.4). We then regress the actual inward remittances of country n, as reported by the World Bank's WDI database on our predicted remittances. Table A3 shows the results in levels, in differences, and with various fixed effects. In all cases, our predicted remittance is significantly correlated with actual remittances.

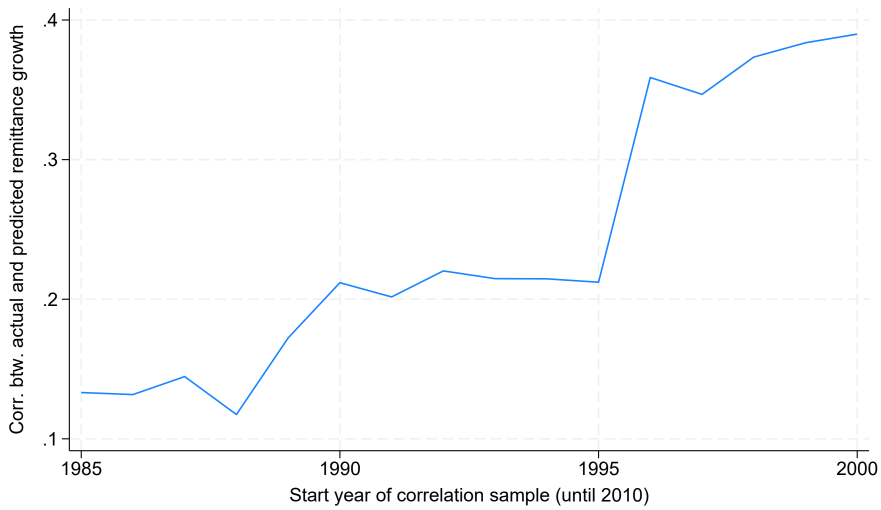
Table A3: Fit of predicted remittances

	$\ln(\texttt{INREM}_{dt})$					$\Delta\ln(\texttt{INREM}_{dt})$			
$\ln R_{dt}$	0.726***	0.695***	1.494***	1.375***	$\Delta \ln R_{dt}$	0.685***	0.551***	0.442***	0.279*
	(0.067)	(0.070)	(0.125)	(0.371)		(0.130)	(0.114)	(0.162)	(0.143)
Obs.	1879	1879	1877	1877		1729	1728	1729	1728
R^2	0.333	0.349	0.900	0.902		0.016	0.106	0.030	0.121
Within R^2		0.309	0.406	0.062			0.011	0.004	0.002
Country FE			✓	✓			✓		✓
Year FE		✓		✓				✓	✓

Notes: results from regressing log official inward remittances ($\texttt{INREM}_{dt}$, in current USD) on our constructed remittance shock in (2.4). Standard errors are clustered at the country level. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

We also assess whether our measure is performing well for Sri Lanka in particular over time. We first get the residualized growth rate of remittances and our predictor after controlling for a country

Figure A2: Fit of remittance measure in Sri Lanka



Notes: This figure displays the correlation in the residualized growth rate of actual inward remittances and residualized growth rate of our remittance predictor.

and year fixed effect on the full sample of countries and years between 1975 and 2019.[23] Figure A2 displays the correlation between the residualized growth rate of actual remittances and that of our predicted remittances, starting the sample at different years and ending in 2010, the year of the end of our analysis. The correlation is positive throughout, consistent with findings that SCI predicts past economic outcomes well.[24] That being said, the correlation jumps first in 1990, at the same time as the first wave of international refugees presented in the right panel of Figure 1. This is in line with the Facebook SCI from 2020 being a better proxy for diaspora ties after the large outmigration episode. There is a second jump in 1996 that coincides with the jump in internally displaced persons in Figure 1. Again, this is consistent with the 2020 SCI being better correlated after the large movement of people within Sri Lanka. These observations lead us to adopt 1996 as the start period of our analysis.

A.3 Robustness: reduced-form results

Table A4 replicates the results of Table 4 with "filtered" shares, as described in the main text. Table A5 relates changes in ethnic shares between 1982 and 2012 to violence in the intervening years. Table A6 uses non-time-varying ethnic Tamil shares instead of lagged LTTE control as the interaction variable. Table A7 uses intensive margin measures of conflict as outcome variables. Table A8 performs additional robustness checks, such as controlling for the 2004 tsunami or local spillovers of LR_{nt}. Table A9 shows that lagged remittances don't have a large impact on conflict.

[23]More precisely, we take the residuals of regressing R_{dt} on a country (d) and a year fixed effect, and the residuals of regressing actual remittances on the same fixed effects. We then correlate the residuals for different time windows.

[24]For example, Bailey et al. (2021) find that SCI predicts international bilateral trade flows as well in 1980 as in 2017.

Table A4: Fighting and remittances with "filtered" shares

Dep. Var.:	$\mathbb{I}(\texttt{violence}_{nt} > 0)$			
	(1)	(2)	(3)	(4)
$LTTE_{n,t-1}$ $\times \ln(ER_{\text{L}t})$	-1.595***	-1.574***	-3.627***	-2.231*
	(0.295)	(0.273)	(1.342)	(1.300)
$LTTE_{n,t-1}$ $\times \ln(ER_{\text{G}t})$	1.276***	1.357***	2.402***	1.763**
	(0.245)	(0.244)	(0.767)	(0.741)
$LTTE_{n,t-1} \times \ln LR_{nt}$		-0.226**	-0.261*	-0.189
		(0.0993)	(0.135)	(0.145)
$\ln LR_{nt}$		-0.224**	-0.253**	-0.282**
		(0.127)	(0.130)	(0.130)
Observations	4186	4186	4186	4186
Control for $LTTE_{n,t-1}$	✓	✓	✓	✓
Subdistrict FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
GDP shocks			✓	✓
Trade shocks				✓

Notes: results from estimating equation (2.6), using the filtered shares to construct local remittances as in (2.8). Standard errors are clustered at the district-year level. All regressions control for lagged LTTE control ($LTTE_{n,t-1}$). "GDP shocks" refers to the same set of 4 variables as the remittance shocks, but constructed using foreign GDPs instead of foreign outremittances. "Trade shocks" refers to the same, but with total trade (imports plus exports) of the foreign country. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

Table A5: Ethnic share evolution and violence

Dep. Var.:	$\texttt{tamil}_n^{2012} - \texttt{tamil}_n^{1982}$		
	(1)	(2)	(3)
Number of events (std)	0.0475		
	(0.0375)		
Log number of events		0.00492	
		(0.0141)	
Ever under LTTE control			0.00325
			(0.0234)
$\texttt{tamil}_n^{1982}$	0.018	0.152	0.175**
	(0.182)	(0.107)	(0.0823)
Observations	24	24	24

Notes: The table reports results from regressing the change in tamil ethnic share in district n against measures of violence or LTTE control in the district. "Number of events (std)" is the number of conflict events between LTTE and the Government of Sri Lanka reported in GED, standardized to a standard deviation of 1. All districts experienced some level of conflict. "Ever under LTTE control" is a dummy equal to 1 if part of the district was ever under LTTE control. There were 24 districts as of the 1982 Census of housing and population. Robust standard errors in parenthesis. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

Table A6: Fighting and remittances: interaction with ethnic share

Dep. Var.:	$\mathbb{I}(\texttt{violence}_{nt} > 0)$			
	(1)	(2)	(3)	(4)
$\texttt{tamil}_n \times \ln ER_{\texttt{L}t}$	-1.650***	-1.576***	-5.404***	-3.729*
	(0.489)	(0.550)	(1.904)	(2.163)
$\texttt{tamil}_n \times \ln ER_{\texttt{G}t}$	1.328***	1.305***	3.629***	2.788**
	(0.406)	(0.400)	(1.289)	(1.402)
$\texttt{tamil}_n \times \ln LR_{nt}$		-0.0502	-0.0370	0.0401
		(0.365)	(0.302)	(0.389)
$\ln LR_{nt}$		-0.00861	-0.00656	-0.0465
		(0.0796)	(0.0777)	(0.0766)
Observations	4186	4186	4186	4186
Control for $LTTE_{n,t-1}$	✓	✓	✓	✓
Subdistrict FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
GDP shocks			✓	✓
Trade shocks				✓

Notes: results from estimating equation (2.6), but using Tamil population share instead of lagged LTTE control. Standard errors are clustered at the district-year level. "GDP shocks" refers to the same set of 4 variables as the remittance shocks, but constructed using foreign GDPs instead of foreign outremittances. "Trade shocks" refers to the same, but with total trade (imports plus exports) of the foreign country. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

Table A7: Fighting and remittances: intensive margin and in differences

Dep. Var.:	Conflict					
	(1) Baseline	(2) Poisson count	(3) ihs count	(4) ihs deaths		(5) Δ ihs count
$LTTE_{n,t-1} \times$	-2.019***	-13.38***	-5.991***	-10.63***	$LTTE_{n,t-1} \times$	-2.945**
$\ln ER_{\mathrm{L}t}$	(0.343)	(4.004)	(1.209)	(2.25)	$\Delta \ln ER_{\mathrm{L}t}$	(1.361)
$LTTE_{n,t-1} \times$	1.614***	12.98***	5.088***	8.195***	$LTTE_{n,t-1} \times$	3.052***
$\ln ER_{\mathrm{G}t}$	(0.302)	(2.821)	(0.990)	(1.771)	$\Delta \ln ER_{\mathrm{G}t}$	(1.063)
$LTTE_{n,t-1} \times$	-0.0246	-0.759***	-0.119	-0.112	$LTTE_{n,t-1} \times$	-1.242
$\ln LR_{nt}$	(0.0343)	(0.288)	(0.113)	(0.186)	$\Delta \ln LR_{nt}$	(1.009)
$\ln LR_{nt}$	-0.252**	-3.770***	-0.827***	-1.580***	$\Delta \ln LR_{nt}$	-0.233
	(0.126)	(1.272)	(0.299)	(0.507)		(0.331)
Observations	4186	4186	4186	4186		4186
Subdistrict FE	✓	✓	✓	✓		✓
Year FE	✓	✓	✓	✓		✓

Notes: results from estimating equation (2.6). Standard errors are clustered at the district-year level. All regressions control for lagged LTTE ($LTTE_{n,t-1}$). The first column corresponds to the baseline in Table 4. The second column uses a Poisson regression with the number of conflict incident reported as dependent variable. The third column uses the inverse hyperbolic sine transformation (ihs) of the number of conflict events, the fourth column uses the number of deaths, and the last column regresses the change in ihs of the number of conflict events on the changes in remittances. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

Table A8: Fighting and remittances: robustness (population weights, Tsunami, country-level controls, neighbor spillovers)

Dep. Var.:	$\mathbb{I}(\texttt{violence}_{nt} > 0)$					
	(1)	(2)	(3)	(4)	(5)	(6)
$LTTE_{n,t-1} \times \ln ER_{\text{L}t}$	-2.019***	-2.352***	-1.976***	-2.306***	-1.653***	-2.024***
	(0.343)	(0.404)	(0.471)	(0.337)	(0.520)	(0.343)
$LTTE_{n,t-1} \times \ln ER_{\text{G}t}$	1.614***	1.975***	1.611***	1.789***	1.423***	1.607***
	(0.302)	(0.339)	(0.388)	(0.300)	(0.431)	(0.302)
$LTTE_{n,t-1} \times \ln LR_{nt}$	-0.0246	-0.0822*	-0.0174	-0.0145	-0.0311	-0.0268
	(0.0343)	(0.0424)	(0.0453)	(0.0341)	(0.0350)	(0.0346)
$\ln LR_{nt}$	-0.252**	-0.213*	-0.0922	-0.231**	-0.254**	-0.0563
	(0.126)	(0.115)	(0.0933)	(0.115)	(0.127)	(0.164)
$\texttt{Tsunami}_n \times \ln AID_t$				0.0870		
				(0.0695)		
$\texttt{Tsunami}_n \times Post2004_t$				-0.0184		
				(1.340)		
$\texttt{Tsunami}_n \times Post2004_t \times \ln AID_t$				0.00747		
				(0.0840)		
$LTTE_{n,t-1} \times \ln AID_t$					0.0800	
					(0.0594)	
$LTTE_{n,t-1} \times \ln LKAGDP_t$					0.995***	
					(0.242)	
$\ln LR_{nt}^{\texttt{neighbors}}$						-0.233
						(0.197)
$LTTE_{n,t-1} \times \ln LR_{nt}^{\texttt{neighbors}}$						0.00432
						(0.0814)
Observations	4186	4186	3406	4186	4186	4186
Control for $LTTE_{n,t-1}$	✓	✓	✓	✓	✓	✓
Subdistrict FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Weighting by population		✓				
Exculding Tsunami regions			✓			

Notes: results from estimating equation (2.6). $\texttt{Tsunami}_n$ is equal to 1 for subdistrict that suffered from casualties during the December 2004 Tsunami. AID_t is the total foreign aid inflow to Sri Lanka deflated by CPI. $LKAGDP_t$ is Sri Lanka's real GDP. $LR_{nt}^{\texttt{neighbors}}$ is the sum of subdistrict n's neighbors remittances: $LR_{nt}^{\texttt{neighbors}} = \sum_{m \in neighbors_n} LR_{mt}$ Standard errors are clustered at the district-year level. All regressions control for lagged LTTE control ($LTTE_{n,t-1}$). *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

Table A9: Fighting and remittances: lagged specification

Dep. var. :	Conflict: $\mathbb{I}(\texttt{violence}_{nt} > 0)$				
	(1)	(2)	(3)	(4)	(5)
$LTTE_{n,t-1} \times \ln ER_{\mathsf{L}t}$	-2.010***		-3.257***		-3.216***
	(0.361)		(0.474)		(0.501)
$LTTE_{n,t-1} \times \ln ER_{\mathsf{G}t}$	1.665***		2.412***		2.127***
	(0.307)		(0.381)		(0.431)
$LTTE_{n,t-1} \times \ln ER_{\mathsf{L},t-1}$		-0.353	1.899***	-0.353	1.854***
		(0.425)	(0.527)	(0.425)	(0.562)
$LTTE_{n,t-1} \times \ln ER_{\mathsf{G},t-1}$		0.361	-1.281***	0.375	-1.006**
		(0.356)	(0.436)	(0.364)	(0.486)
$LTTE_{n,t-1} \times \ln LR_{n,t-1}$				-0.0180	-0.205
				(0.0336)	(0.478)
$\ln LR_{n,t-1}$				0.00698	0.458**
				(0.107)	(0.220)
$LTTE_{n,t-1} \times \ln LR_{n,t}$					0.175
					(0.485)
$\ln LR_{n,t}$					-0.565***
					(0.217)
Observations	4186	4186	4186	4186	4186
Subdistrict FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓

Notes: results from estimating equation (2.6) also including lagged remittances. Standard errors are clustered at the district-year level. All regressions control for lagged LTTE ($LTTE_{n,t-1}$). *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

B. Theory and quantification

B.1 Derivations

Derivation of (3.6). Equation (3.5) comes from taking the first-order condition of (3.1) with respect to f_{int}. Writing these out for both sides leads to the following system of 2 equations in 2 unknowns $f_{\text{L}nt}$ and $f_{\text{G}nt}$:

$$
\begin{aligned}
\left(\rho_{\text{L}nt} f_{\text{L}nt} + \rho_{\text{G}nt} f_{\text{G}nt}\right)^2 &= \frac{\rho_{\text{L}nt} V_{\text{L}nt}}{c_{\text{L}nt}} \rho_{\text{G}nt} f_{\text{G}nt} \\
\left(\rho_{\text{L}nt} f_{\text{L}nt} + \rho_{\text{G}nt} f_{\text{G}nt}\right)^2 &= \frac{\rho_{\text{G}nt} V_{\text{G}nt}}{c_{\text{G}nt}} \rho_{\text{L}nt} f_{\text{L}nt}.
\end{aligned}
$$

The solution of these two equations yields the Nash equilibrium. The solution is:

$$
\begin{aligned}
\rho_{\text{L}nt} f_{\text{L}nt} &= \frac{\frac{\rho_{\text{G}nt} V_{\text{G}nt}}{c_{\text{G}nt}}}{\left(1 + \frac{c_{\text{L}nt}}{\rho_{\text{L}nt} V_{\text{L}nt}} \frac{\rho_{\text{G}nt} V_{\text{G}nt}}{c_{\text{G}nt}}\right)^2} \qquad \text{(B.1)} \\
\rho_{\text{G}nt} f_{\text{G}nt} &= \frac{\frac{\rho_{\text{L}nt} V_{\text{L}nt}}{c_{\text{L}nt}}}{\left(\frac{c_{\text{G}nt}}{\rho_{\text{G}nt} V_{\text{G}nt}} \frac{\rho_{\text{L}nt} V_{\text{L}nt}}{c_{\text{L}nt}} + 1\right)^2}.
\end{aligned}
$$

This means that, after straightforward manipulation:

$$
\begin{aligned}
\rho_{\text{L}nt} f_{\text{L}nt} + \rho_{\text{G}nt} f_{\text{G}nt} &= \frac{\frac{\rho_{\text{G}nt} V_{\text{G}nt}}{c_{\text{G}nt}}}{\left(1 + \frac{c_{\text{L}nt}}{\rho_{\text{L}nt} V_{\text{L}nt}} \frac{\rho_{\text{G}nt} V_{\text{G}nt}}{c_{\text{G}nt}}\right)^2} + \frac{\frac{\rho_{\text{L}nt} V_{\text{L}nt}}{c_{\text{L}nt}}}{\left(\frac{c_{\text{G}nt}}{\rho_{\text{G}nt} V_{\text{G}nt}} \frac{\rho_{\text{L}nt} V_{\text{L}nt}}{c_{\text{L}nt}} + 1\right)^2} \\
&= \frac{1}{\frac{c_{\text{G}nt}}{\rho_{\text{G}nt} V_{\text{G}nt}} + \frac{c_{\text{L}nt}}{\rho_{\text{L}nt} V_{\text{L}nt}}}, \qquad \text{(B.2)}
\end{aligned}
$$

which is equation (3.6).

Derivation of (3.7). Plugging (B.1) and (B.2) into the expression for $p_{\text{L}nt}$:

$$
\begin{aligned}
p_{\text{L}nt} &= \frac{\rho_{\text{L}nt} f_{\text{L}nt}}{\rho_{\text{L}nt} f_{\text{L}nt} + \rho_{\text{G}nt} f_{\text{G}nt}} \qquad \text{(B.3)} \\
&= \rho_{\text{L}nt} f_{\text{L}nt} \left(\frac{c_{\text{G}nt}}{\rho_{\text{G}nt} V_{\text{G}nt}} + \frac{c_{\text{L}nt}}{\rho_{\text{L}nt} V_{\text{L}nt}}\right) \\
&= \frac{\frac{\rho_{\text{G}nt} V_{\text{G}nt}}{c_{\text{G}nt}}}{\left(1 + \frac{c_{\text{L}nt}}{\rho_{\text{L}nt} V_{\text{L}nt}} \frac{\rho_{\text{G}nt} V_{\text{G}nt}}{c_{\text{G}nt}}\right)^2} \left(\frac{c_{\text{G}nt}}{\rho_{\text{G}nt} V_{\text{G}nt}} + \frac{c_{\text{L}nt}}{\rho_{\text{L}nt} V_{\text{L}nt}}\right) \\
&= \frac{\frac{\rho_{\text{L}nt} V_{\text{L}nt}}{c_{\text{L}nt}}}{\frac{\rho_{\text{L}nt} V_{\text{L}nt}}{c_{\text{L}nt}} + \frac{\rho_{\text{G}nt} V_{\text{G}nt}}{c_{\text{G}nt}}}, \qquad \text{(B.4)}
\end{aligned}
$$

which becomes (3.7) after applying the functional form (3.3).

Derivation of (3.9). The probability of LTTE control (B.4) can be rearranged as:

$$\begin{aligned} p_{\mathrm{L}nt} &= \frac{\frac{\rho_{\mathrm{L}nt}V_{\mathrm{L}nt}}{c_{\mathrm{L}nt}}}{\frac{\rho_{\mathrm{L}nt}V_{\mathrm{L}nt}}{c_{\mathrm{L}nt}}+\frac{\rho_{\mathrm{G}nt}V_{\mathrm{G}nt}}{c_{\mathrm{G}nt}}} \\ &= \frac{1}{1+\frac{\rho_{\mathrm{G}nt}V_{\mathrm{G}nt}}{c_{\mathrm{G}nt}}\frac{c_{\mathrm{L}nt}}{\rho_{\mathrm{L}nt}V_{\mathrm{L}nt}}} \\ &= \frac{1}{\frac{\rho_{\mathrm{G}nt}V_{\mathrm{G}nt}}{c_{\mathrm{G}nt}}\left(\frac{c_{\mathrm{G}nt}}{\rho_{\mathrm{G}nt}V_{\mathrm{G}nt}}+\frac{c_{\mathrm{L}nt}}{\rho_{\mathrm{L}nt}V_{\mathrm{L}nt}}\right)} \\ &= \frac{\frac{c_{\mathrm{G}nt}}{\rho_{\mathrm{G}nt}V_{\mathrm{G}nt}}}{\frac{c_{\mathrm{G}nt}}{\rho_{\mathrm{G}nt}V_{\mathrm{G}nt}}+\frac{c_{\mathrm{L}nt}}{\rho_{\mathrm{L}nt}V_{\mathrm{L}nt}}} \end{aligned}$$

This implies that the probability of government control is:

$$\begin{aligned} 1-p_{\mathrm{L}nt} &= \frac{\frac{c_{\mathrm{L}nt}}{\rho_{\mathrm{L}nt}V_{\mathrm{L}nt}}}{\frac{c_{\mathrm{G}nt}}{\rho_{\mathrm{G}nt}V_{\mathrm{G}nt}}+\frac{c_{\mathrm{L}nt}}{\rho_{\mathrm{L}nt}V_{\mathrm{L}nt}}} \\ &= \frac{c_{\mathrm{L}nt}}{\rho_{\mathrm{L}nt}V_{\mathrm{L}nt}}f_{nt}. \end{aligned}$$

Solving for f_{nt} and taking logs:

$$\ln f_{nt} = \ln \rho_{\mathrm{L}nt} + \ln V_{\mathrm{L}nt} + \ln\left(1-p_{\mathrm{L}nt}\right) - \ln c_{\mathrm{L}nt}$$

The elasticity is:

$$\frac{\partial \ln f_{nt}}{\partial \ln \rho_{\mathrm{L}nt}} = 1 + \frac{\partial \ln\left(1-p_{\mathrm{L}nt}\right)}{\partial \ln \rho_{\mathrm{L}nt}}.$$

In turn:

$$\ln\left(1-p_{\mathrm{L}nt}\right) = \ln\left(\frac{\rho_{\mathrm{G}nt}V_{\mathrm{G}nt}}{c_{\mathrm{G}nt}}\right) - \ln\left(\frac{\rho_{\mathrm{L}nt}V_{\mathrm{L}nt}}{c_{\mathrm{L}nt}}+\frac{\rho_{\mathrm{G}nt}V_{\mathrm{G}nt}}{c_{\mathrm{G}nt}}\right).$$

Differentiating with respect to $\ln \rho_{\mathrm{L}nt}$:

$$\begin{aligned} \frac{\partial \ln\left(1-p_{\mathrm{L}nt}\right)}{\partial \ln \rho_{\mathrm{L}nt}} &= \frac{\partial \ln\left(1-p_{\mathrm{L}nt}\right)}{\partial \rho_{\mathrm{L}nt}}\frac{\partial \rho_{\mathrm{L}nt}}{\partial \ln \rho_{\mathrm{L}nt}} \\ &= -\frac{\frac{V_{\mathrm{L}nt}}{c_{\mathrm{L}nt}}}{\frac{\rho_{\mathrm{L}nt}V_{\mathrm{L}nt}}{c_{\mathrm{L}nt}}+\frac{\rho_{\mathrm{G}nt}V_{\mathrm{G}nt}}{c_{\mathrm{G}nt}}}\rho_{\mathrm{L}nt} \\ &= -p_{\mathrm{L}nt}, \end{aligned}$$

yielding (3.9).

B.2 Conditions for existence and uniqueness of interior equilibrium

Setup. For convenience, we reproduce the key equations from the main text:

$$\begin{aligned} APR_{\mathsf{L}t} &= \int_n p_{\mathsf{L}nt} LR_{nt} dn \\ APR_{\mathsf{G}t} &= \int_n (1 - p_{\mathsf{L}nt}) LR_{nt} dn \\ p_{\mathsf{L}nt} &= \frac{v_{\mathsf{L}nt} \left(APR_{\mathsf{L}t}\right)^{\beta_{\mathsf{L}}}}{v_{\mathsf{L}nt} \left(APR_{\mathsf{L}t}\right)^{\beta_{\mathsf{L}}} + v_{\mathsf{G}nt} \left(APR_{\mathsf{G}t}\right)^{\beta_{\mathsf{G}}}}. \end{aligned}$$

Let $R_t \equiv \int_n LR_{nt} dn$ denote total remittances. Note that

$$R_t = APR_{\mathsf{L}t} + APR_{\mathsf{G}t}.$$

Define a to be the share of remittances going to the LTTE:

$$a \equiv \frac{APR_{\mathsf{L}t}}{R_t}.$$

Then with some manipulation:

$$p_{\mathsf{L}nt} = \frac{a^{\beta_{\mathsf{L}}}}{a^{\beta_{\mathsf{L}}} + \mathcal{A}_{nt} (1-a)^{\beta_{\mathsf{G}}}}$$

where

$$\mathcal{A}_{nt} \equiv \frac{v_{\mathsf{G}nt}}{v_{\mathsf{L}nt}} R_t^{\beta_{\mathsf{G}} - \beta_{\mathsf{L}}}.$$

Note that $a \in [0,1]$. Define a mapping $G : [0,1] \to [0,1]$ to be:

$$G(a) = \int_n \frac{a^{\beta_{\mathsf{L}}}}{a^{\beta_{\mathsf{L}}} + \mathcal{A}_{nt} (1-a)^{\beta_{\mathsf{G}}}} \frac{LR_{nt}}{R_t} dn. \tag{B.5}$$

Thus, $G(a)$ just takes a and returns the next guess for a. An equilibrium is an a_0 such that $G(a_0) = a_0$. Note that all of the above are just redefinitions to make $G(a)$ a mapping from a compact set to itself. There are no simplifications relative to the model in the paper. Note that $a = 0$ and $a = 1$ are both fixed points of this mapping. Thus, the equilibrium is never unique, but these extreme equilibria may not be stable.

The derivative of $G(a)$ is:

$$\frac{dG(a)}{da} = \left(\frac{\beta_{\mathsf{L}}}{a} + \frac{\beta_{\mathsf{G}}}{1-a}\right) \int_n p_{\mathsf{L}nt}(1 - p_{\mathsf{L}nt}) \frac{LR_{nt}}{R_t} dn.$$

Lemma 1 (Existence of a stable interior equilibrium). A necessary and sufficient condition for having a stable interior equilibrium is that:

$$\left.\frac{dG(a)}{da}\right|_{a=0} \geq 1 \qquad \text{and} \qquad \left.\frac{dG(a)}{da}\right|_{a=1} \geq 1.$$

This implies:

- $\beta_{\mathsf{L}} < 1$ and $\beta_{\mathsf{G}} < 1$ is a sufficient condition for existence of a stable interior equilibrium.

- When $\beta_{\mathsf{L}} = 1$ and $\beta_{\mathsf{G}} < 1$, the interior equilibrium is stable if and only if $\int_n \frac{LR_{nt}}{\mathcal{A}_{nt} R_t} dn > 1$.

Proof. Because $G(.)$ is continuously differentiable, a necessary and sufficient condition for having a stable interior equilibrium is that the exterior equilibria (i.e. in $a = 0$ and $a = 1$) are unstable, which happens when

$$\left.\frac{dG(a)}{da}\right|_{a=0} \geq 1 \qquad \text{and} \qquad \left.\frac{dG(a)}{da}\right|_{a=1} \geq 1.$$

Taking these limits of $\frac{dG(a)}{da}$, we have:

$$\left.\frac{dG(a)}{da}\right|_{a=0} = \lim_{a\to 0}\left(\frac{\beta_{\mathsf{L}}}{a} + \frac{\beta_{\mathsf{G}}}{1-a}\right)\int_n \frac{a^{\beta_L}}{a^{\beta_L} + (1-a)^{\beta_G}\mathcal{A}_{nt}} \frac{(1-a)^{\beta_G}\mathcal{A}_{nt}}{a^{\beta_L} + (1-a)^{\beta_G}\mathcal{A}_{nt}} \frac{LR_{nt}}{R_t} dn.$$

We get:

$$\left.\frac{dG(a)}{da}\right|_{a=0} = \lim_{a\to 0} \beta_{\mathsf{L}} a^{\beta_{\mathsf{L}}-1} \int_n \frac{LR_{nt}}{\mathcal{A}_{nt} R_t} dn.$$

Similarly, we have

$$\left.\frac{dG(a)}{da}\right|_{a=1} = \lim_{a\to 1} \beta_{\mathsf{G}} (1-a)^{\beta_{\mathsf{G}}-1} \int_n \frac{\mathcal{A}_{nt} LR_{nt}}{R_t} dn.$$

Remark. Whenever $\beta_{\mathsf{L}} > 1$ or $\beta_{\mathsf{G}} > 1$, the interior equilibrium is unstable. Indeed, in these cases, $\left.\frac{dG(a)}{da}\right|_{a=0} = 0$ or $\left.\frac{dG(a)}{da}\right|_{a=1} = 0$.

Lemma 2 (Uniqueness of a stable interior equilibrium). A sufficient condition for the uniqueness of an interior equilibrium is that at any interior equilibrium,

$$\beta_{\mathsf{L}} \frac{\int_n p_{\mathsf{L}nt}(1-p_{\mathsf{L}nt})\frac{LR_{nt}}{R_t} dn}{\int_n p_{\mathsf{L}nt}\frac{LR_{nt}}{R_t} dn} + \beta_{\mathsf{G}} \frac{\int_n p_{\mathsf{L}nt}(1-p_{\mathsf{L}nt})\frac{LR_{nt}}{R_t} dn}{\int_n (1-p_{\mathsf{L}nt})\frac{LR_{nt}}{R_t} dn} < 1. \tag{B.6}$$

Proof. An interior equilibrium is stable if at this equilibrium $\left.\frac{dG(a)}{da}\right|_{G(a)=a} < 1$. This derivative at an interior equilibrium is:

$$\begin{aligned}\left.\frac{dG(a)}{da}\right|_{G(a)=a} &= \left(\frac{\beta_{\mathsf{L}}}{\int_n \frac{a^{\beta_{\mathsf{L}}}}{a^{\beta_{\mathsf{L}}}+\mathcal{A}_{nt}(1-a)^{\beta_{\mathsf{G}}}}\frac{LR_{nt}}{R_t} dn} + \frac{\beta_{\mathsf{G}}}{1-\int_n \frac{a^{\beta_{\mathsf{L}}}}{a^{\beta_{\mathsf{L}}}+\mathcal{A}_{nt}(1-a)^{\beta_{\mathsf{G}}}}\frac{LR_{nt}}{R_t} dn}\right)\int_n p_{\mathsf{L}nt}(1-p_{\mathsf{L}nt})\frac{LR_{nt}}{R_t} dn \\ &= \beta_{\mathsf{L}} \underbrace{\frac{\int_n p_{\mathsf{L}nt}(1-p_{\mathsf{L}nt})\frac{LR_{nt}}{R_t} dn}{\int_n p_{\mathsf{L}nt}\frac{LR_{nt}}{R_t} dn}}_{<1} + \beta_{\mathsf{G}} \underbrace{\frac{\int_n p_{\mathsf{L}nt}(1-p_{\mathsf{L}nt})\frac{LR_{nt}}{R_t} dn}{\int_n (1-p_{\mathsf{L}nt})\frac{LR_{nt}}{R_t} dn}}_{<1}.\end{aligned}$$

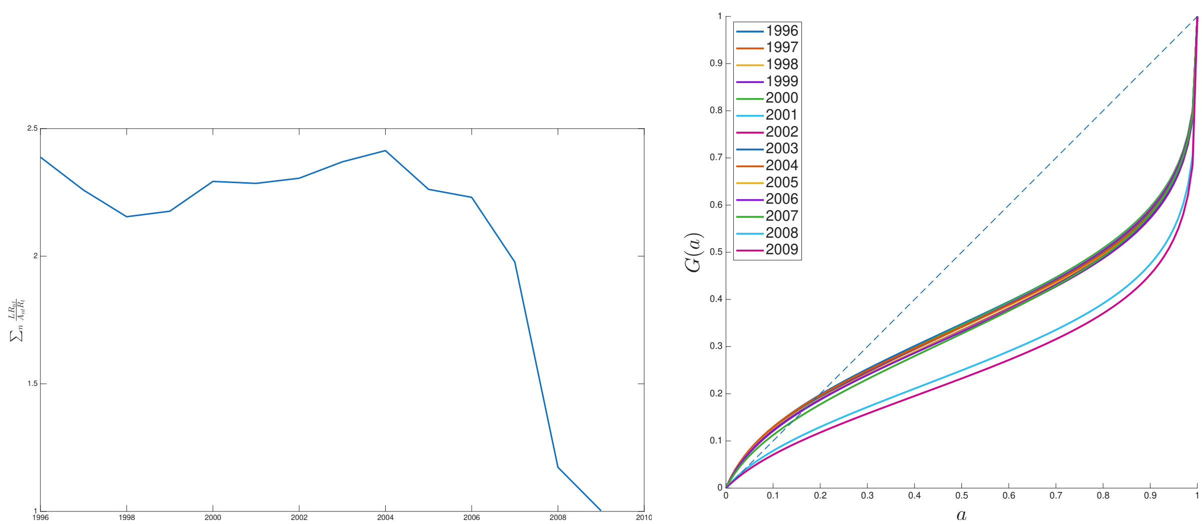
If the value of this derivative is always < 1 at any interior equilibrium, there cannot be more than 1 interior equilibrium. To see this, suppose there are 2 stable equilibria, a_0^1 and a_0^2. Define $g(a) = G(a) - a$. Then $g(a_0^1) = g(a_0^2) = 0$. If, WLOG, $a_0^1 < a_0^2$, $\exists \varepsilon_1 > 0$ s.t. $g(a_0^1 + \varepsilon_1) < 0$ and $g(a_0^2 - \varepsilon_1) > 0$. Because $g(.)$ is continuous and $g(a_0^1 + \varepsilon_1) < 0 < g(a_0^2 - \varepsilon_1)$, the Intermediate Value Theorem implies there must exist a non empty set M of elements c_i such that for all indices i we have $a_0^1 < c_i < a_0^2$ and $g(c_i) = 0$. Take $c = \min\{c_i \in M\}$. It must be that $\exists \varepsilon_2 > 0$ s.t. $g(c - \varepsilon_2) < 0$ and $g(c + \varepsilon_2) > 0$. If true this means that $G(a)$ curve crosses the 45-degree line from below at c. Proof by contradiction: if not true it implies that $g(a_0^1) < 0 < g(c - \varepsilon_2)$. Hence the Intermediate Value Theorem implies that there exists a d such that $g(d) = 0$ and $a_0^1 < d < c$. This contradicts the definition of c is a minimum of the set M. Thus, if there is a c such that $a_0^1 < c < a_0^2$ and $g(c) = 0$, then it must be that at c, $G(a)$ curve crosses the 45-degree line from below, $\left.\frac{dG(a)}{da}\right|_{a=c} > 1$. This violates the condition of the Lemma that at any interior equilibrium $\frac{dG(a)}{da} < 1$.

Remark. Note that each of the fractions multiplying $\beta_{\mathtt{L}}$ and $\beta_{\mathtt{G}}$ in (B.6) is less than 1. A sufficient condition for $\left.\frac{dG(a)}{da}\right|_{G(a)=a} < 1$ is that $\beta_{\mathtt{L}} + \beta_{\mathtt{G}} \leq 1$. This is violated by our calibrated parameters but clearly too stringent.

Stability and uniqueness in our calibration. In our calibration, $\beta_L = 1$ and $\beta_G < 1$ so that the necessary and sufficient condition for the existence of an interior stable equilibrium is that $\int_n \frac{LR_{nt}}{\mathcal{A}_{nt} R_t} dn > 1$. The left panel of Figure B1 plots this object for each year of our calibration. In all years, the condition is satisfied. In the last period, it converges towards 1. This is actually reassuring, as it implies that the exterior equilibrium with $a = 0$ (total LTTE defeat) is stable.

We can check uniqueness numerically. The right panel of Figure B1 plots $G(a)$ for the different years of our sample. It is clear that in each year, the stable interior equilibrium is unique. The 2009 equilibrium is not interior, but is stable as well.

Figure B1: Stability of the interior equilibrium in our calibration



(a) $\int_n \frac{LR_{nt}}{\mathcal{A}_{nt} R_t} dn$ in the calibration

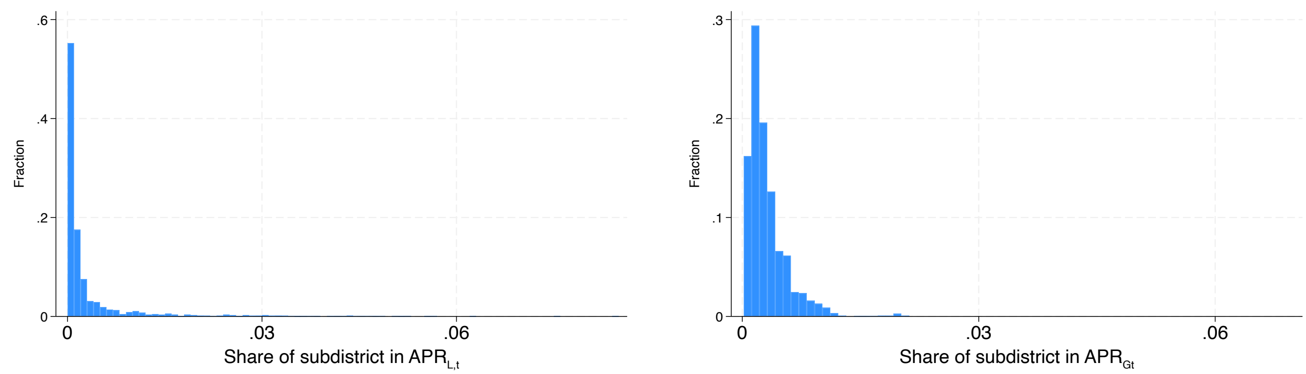
(b) $G(a)$ mapping

Notes: the left panel displays the value of $\int_n \frac{LR_{nt}}{\mathcal{A}_{nt} R_t} dn$ in the model. Since the model is made of discrete regions, we compute it as $\sum_n \frac{LR_{nt}}{\mathcal{A}_{nt} R_t}$. The right panel plots the function $G(a)$ defined in B.5 for the different years in our calibration.

B.3 Quantification: additional tables and figures

Figure B2 displays the histograms of the shares of each subdistrict in the total side's appropriated remittances APR. Tables B1 and B2 display respectively the first stage regression of the estimation regression for β_i (3.13), and robustness checks for the same estimation. Figure B3 displays a map of Sri Lanka for various years. The top panel shows the LTTE territorial control in the data. The bottom panel displays the model-implied LTTE territorial control ($\hat{p}_{Lnt}$). Figure B4 depicts the "key players" for the LTTE and the government, defined as the countries that affect the probability of winning of each side the most.

Figure B2: Shares of subdistricts in total APR



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Notes: the figure displays histograms of the share of an individual subdistrict in a side's total appropriated remittances under our calibration, computed as $\frac{\hat{p}_{int} LR_{nt}}{\sum_n \hat{p}_{int} LR_{nt}}$.

Table B1: Estimating β_i: first stage regressions

	(1)	(2)	(3)
	$\Delta \ln \frac{APR_{\mathsf{L}t}}{APR_{\mathsf{G}t}}$	$\Delta \ln APR_{\mathsf{L}t}$	$\Delta \ln APR_{\mathsf{G}t}$
$\Delta \ln \frac{ER_{\mathsf{L}t}}{ER_{\mathsf{G}t}}$	2.782***		
	(0.834)		
$\Delta \ln ER_{\mathsf{L}t}$		3.719***	-0.176***
		(0.822)	(0.0338)
$\Delta \ln ER_{\mathsf{G}t}$		-0.496	0.989***
		(0.857)	(0.0291)
$\Delta \ln LR_{nt}$	2.345***	0.425	-0.00825
	(0.333)	(0.777)	(0.0283)
N	4186	4186	4186
Subdistrict FE, trend	✓	✓	✓
KP-F	11.12	11.01	11.01
SW-F	11.12	22.24	291.24

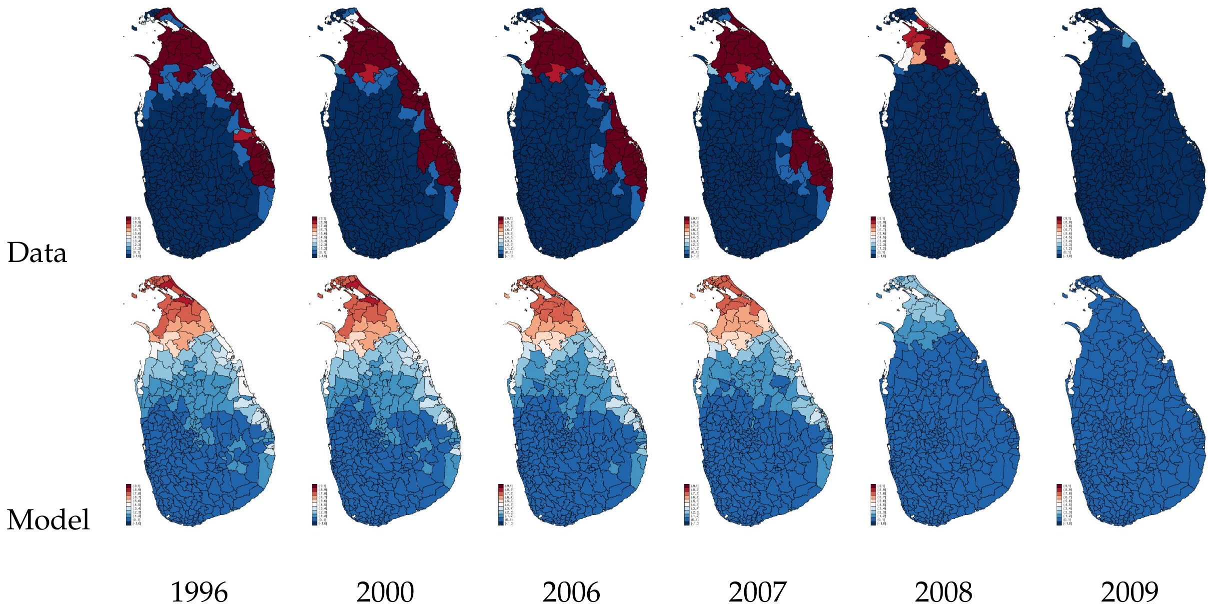
Notes: first-stage results from estimating equation (3.13). Column 1 corresponds to the first IV column of Table 8. Columns 2-3 to the second IV column. SW-F refers to the Sanderson-Windmeijer statistics for individual endogenous regressors. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

Table B2: Estimating β_i: controlling for GDP and trade

Dep. Var.: $\Delta \ln \frac{p_{Lnt}}{1-p_{Lnt}}$	(1)	(2)	(3)	(4)	(5)	(6)
	OLS		IV (baseline)		IV ("filtered" sh.)	
$\Delta \ln APR_{Lt}$	1.016***	2.323***	1.069***	2.298***	1.054***	2.514***
	(0.00577)	(0.181)	(0.0367)	(0.405)	(0.0294)	(0.370)
$\Delta \ln APR_{Gt}$	-1.581***	-1.550***	-0.466***	-1.402***	-0.390***	- 1.505***
	(0.194)	(0.133)	(0.140)	(0.290)	(0.143)	(0.266)
$\Delta \ln APGDP_{Lt}$		-2.157***		-1.996***		-2.339***
		(0.129)		(0.310)		(0.277)
$\Delta \ln APGDP_{Gt}$		0.801***		1.353***		1.462***
		(0.115)		(0.187)		(0.164)
$\Delta \ln APTRADE_{Lt}$		0.845***		0.748***		0.878***
		(0.0781)		(0.110)		(0.114)
$\Delta \ln APTRADE_{Gt}$		-0.710***		-0.576***		-0.785***
		(0.0624)		(0.0844)		(0.0896)
$\Delta \ln LR_{nt}$	1.020***	0.143***	0.00259	0.0117	-0.0244	-0.0188
	(0.185)	(0.0351)	(0.144)	(0.0580)	(0.142)	(0.0493)
$\Delta \ln LGDP_{nt}$		0.416***		-0.128		-0.137
		(0.0678)		(0.119)		(0.107)
$\Delta \ln LTRADE_{nt}$		-0.0365**		-0.0525*		0.00668
		(0.0159)		(0.0299)		(0.0292)
N	4186	4186	4186	4186	4186	4186
Subdistrict FE, trend	✓	✓	✓	✓	✓	✓
KP-F			11.01	16.78	18.18	14.62
ARF p-value			0.000	0.000	0.000	0.000

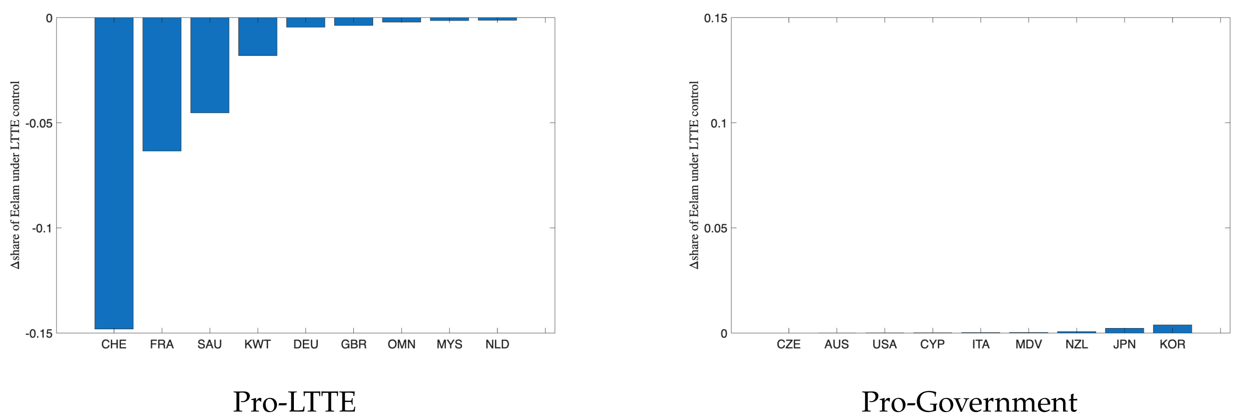
Notes: results from estimating equation (3.13) with additional controls. $\Delta \ln LGDP_{nt}$ refers to the same shock as $\Delta \ln LR_{nt}$, but replacing $\texttt{OUTREM}_{ct}$ by GDP_{ct} in equation (2.1). $\Delta \ln LTRADE_{nt}$ does the same, but replacing remittances with total trade of the foreign country (total imports plus total imports). $APGDP$ and $APTRADE$ are defined similarly to APR, but replacing LR_{nt} by in $LGDP_{nt}$ and $LTRADE_{nt}$ in equation (3.4). The last two columns construct the instruments by using the residualized SCI shares to construct the shocks. Standard errors are clustered at the district-year level. KP-F refers to the Kleibergen-Paap F statistic of the first stage, "ARF p-value" refers to the p-value of the Anderson-Rubin first stage F-state for the joint significance of all endogenous variables. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

Figure B3: Fit of the model: LTTE territorial control (targeted moments)



Notes: the figure shows a map of Sri Lanka, where each subdistrict is colored according to the share of territory controlled by the LTTE in the data (top panel) or the model probability of LTTE control (bottom panel).

Figure B4: Removing one remittance source country at a time



Notes: the figure shows the impact of removing one country's remittances on the share of the Tamil Eelam controlled by the LTTE. The left panel displays the countries whose *removal* hurts the LTTE the most. These are the countries whose remittances are the most pro-LTTE. The right panel depicts the countries whose *removal* hurts the government the most.

B.4 Extension: Side-specific rapacity and opportunity cost elasticities

This appendix estimates and quantifies an extended model in which the rapacity elasticity ϱ_i and the opportunity cost elasticity ω_i are side-specific. In this case, equation (3.10) becomes:

$$v_{int} = \frac{\bar{\rho}_{int} V_{int} LR_{nt}^{\varrho_i}}{c_{int} LR_{nt}^{\omega_i}} = \mathtt{ethnic}_{in}^{\eta_1} \mathtt{distance}_{in}^{\eta_2} LR_{nt}^{\varrho_i - \omega_i} \mu_{nt} \varepsilon_{it}.$$

Then the estimating equation (3.11) becomes:

$$\mathbb{E}\left[\mathtt{control}_{int}\right] = \exp\left[\eta_1 \ln \mathtt{ethnic}_{in} + \eta_2 \ln \mathtt{dist}_{in} + \eta_3 LTTE \ln LR_{nt} + \delta_{it} + \mu_{nt} + \nu_{int}\right], \tag{B.7}$$

where $LTTE$ is a binary indicator for whether $i = \mathtt{L}$, and $\eta_3 = (\varrho_\mathtt{L} - \omega_\mathtt{L}) - (\varrho_\mathtt{G} - \omega_\mathtt{G})$ is the differential net rapacity to opportunity cost elasticity between LTTE and the government. (We cannot separately estimate $\varrho_\mathtt{L} - \omega_\mathtt{L}$ and $\varrho_\mathtt{G} - \omega_\mathtt{G}$ because equation (B.7) includes subdistrict-time effects. But η_3 is all that is needed for model implementation.)

The extended version of (3.12) is:

$$v_{int} \left(APR_{it}\right)^{\beta_i} = \mathtt{ethnic}_{in}^{\eta_1} \mathtt{distance}_{in}^{\eta_2} LR_{nt}^{\varrho_i - \omega_i} \delta_{it}, \tag{B.8}$$

up to the location-time specific shifter μ_{nt} that will cancel out when we take the ratio of this object for the two sides. Though we don't know each of the $\varrho_i - \omega_i$, we can proceed to construct probabilities from (B.8) and (3.7):

$$\begin{aligned} p_{\mathtt{L}nt} &= \frac{v_{\mathtt{L}nt} \left(APR_{\mathtt{L}t}\right)^{\beta_\mathtt{L}}}{v_{\mathtt{L}nt} \left(APR_{\mathtt{L}t}\right)^{\beta_\mathtt{L}} + v_{\mathtt{G}nt} \left(APR_{\mathtt{G}t}\right)^{\beta_\mathtt{G}}} \\ &= \frac{\mathtt{ethnic}_{\mathtt{L}n}^{\eta_1} \mathtt{distance}_{\mathtt{L}n}^{\eta_2} LR_{nt}^{\varrho_\mathtt{L} - \omega_\mathtt{L}} \delta_{\mathtt{L}t}}{\mathtt{ethnic}_{\mathtt{L}n}^{\eta_1} \mathtt{distance}_{\mathtt{L}n}^{\eta_2} LR_{nt}^{\varrho_\mathtt{L} - \omega_\mathtt{L}} \delta_{it} + \mathtt{ethnic}_{\mathtt{G}n}^{\eta_1} \mathtt{distance}_{\mathtt{G}n}^{\eta_2} LR_{nt}^{\varrho_\mathtt{G} - \omega_\mathtt{G}} \delta_{\mathtt{G}t}} \\ &= \frac{\mathtt{ethnic}_{\mathtt{L}n}^{\eta_1} \mathtt{distance}_{\mathtt{L}n}^{\eta_2} LR_{nt}^{\eta_3} \delta_{\mathtt{L}t}}{\mathtt{ethnic}_{\mathtt{L}n}^{\eta_1} \mathtt{distance}_{\mathtt{L}n}^{\eta_2} LR_{nt}^{\eta_3} \delta_{it} + \mathtt{ethnic}_{\mathtt{G}n}^{\eta_1} \mathtt{distance}_{\mathtt{G}n}^{\eta_2} \delta_{\mathtt{G}t}}. \end{aligned}$$

Finally, equation (3.13) becomes:

$$\Delta \ln \frac{\hat{p}_{\mathtt{L}nt}}{1 - \hat{p}_{\mathtt{L}nt}} = \beta_\mathtt{L} \Delta \ln \widehat{APR}_{\mathtt{L}t} - \beta_\mathtt{G} \Delta \ln \widehat{APR}_{\mathtt{G}t} + + \eta_3 \ln LR_{nt} + \underbrace{\Delta \ln \varepsilon_{\mathtt{L}t} - \Delta \ln \varepsilon_{\mathtt{G}t}}_{\text{error term}}. \tag{B.9}$$

Note that even in the baseline, $\ln LR_{nt}$ was included as a control when estimating (3.13).

Tables B3 and B4 and Figure B5 report the estimation results. The coefficient capturing η_3 is marginally significant in column 1 of Table B3, but esssentially zero and insignificant in collumn 2. In Table B4 the results are quite similar to the baseline, though the point estimate for $\beta_\mathtt{G}$ is slightly higher than the baseline at 0.85. Note that Table B4 provides an alternative way of estimating η_3. Notably, the estimate of η_3 in the IV results is quite close to what is reported in column 1 of Table B3. Based on these estimates, we set $\eta_1 = 0.140$, $\eta_2 = -1.541$, $\eta_3 = 0.425$, $\beta_\mathtt{L} = 1$ and $\beta_\mathtt{G} = 0.85$. Figure B5 shows that the resulting relative exogenous strengths $\varepsilon_{\mathtt{L}t}/\varepsilon_{\mathtt{G}t}$ are virtually identical to the baseline. Figure B6 displays model fit, and shows that it is very similar to the baseline.

Finally, Figures B7 and B8 report the results of our counterfactuals. Both the qualitative and quantitative conclusions are virtually indistinguishable from the baseline. We conclude that allowing for differential rapacity-cum-opportunity cost elasticities to local remittances by fighting side does not have a material effect on the results.

Table B3: Estimating η_1, η_2, and η_3: ethnic share, distance to capital, and territorial control

	(1)	(2)
Dep. Var.	$\texttt{control}_{int}$	
$\ln \texttt{ethnic}_{in}$	0.099*	
	(0.059)	
$\ln \texttt{distance}_{in}$	-1.724***	-0.895***
	(0.274)	(0.308)
$\ln \texttt{ethnicTamSin}_{in}$		0.282***
		(0.0596)
$LTTE_i \times \ln LR_{nt}$	0.425*	-0.006
	(0.227)	(0.236)
Observations	9016	9016
Subdistrict-year FE	✓	✓
Side-year FE	✓	✓

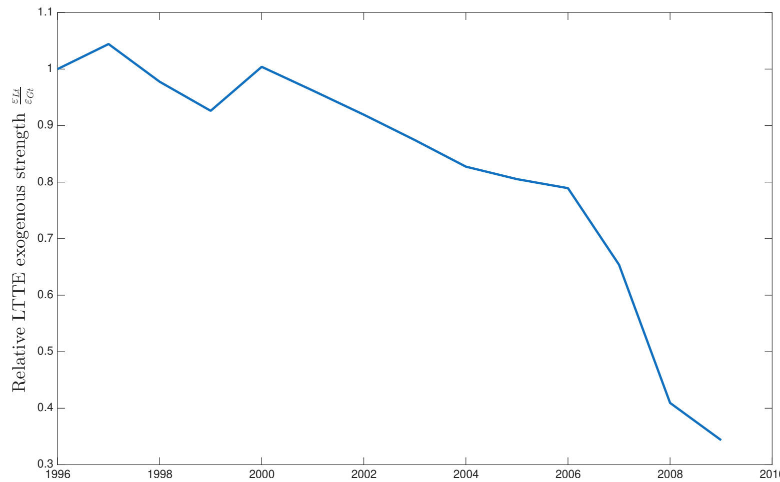
Notes: results from estimating equation (3.11) using PPML. Standard errors are clustered at the district-side level. $\texttt{ethnic}_{in}$ is the (time-invariant) ethnic share of side i in subdistrict n (Tamil share for LTTE, rest for government), $\texttt{ethnicTamSin}_{in}$ is the (time-invariant) ethnic share of side i in subdistrict n (Tamil share for LTTE, Sinhalese for government) and $\texttt{distance}_{in}$ is the distance to the capital (Kilinochchi for the LTTE and Colombo for the government). *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

Table B4: Estimating β_{L} and β_{G}: remittances and territorial control

Dep. Var. :$\Delta \ln \frac{\hat{p}_{\mathsf{L}nt}}{1-\hat{p}_{\mathsf{L}nt}}$	(1)	(2)	(3)	(4)
	OLS		IV	
$\Delta \ln \frac{\widehat{APR}_{\mathsf{L}t}}{\widehat{APR}_{\mathsf{G}t}}$	1.018***		1.008***	
	(0.00664)		(0.0364)	
$\Delta \ln \widehat{APR}_{\mathsf{L}t}$		1.014***		1.052***
		(0.00537)		(0.0369)
$\Delta \ln \widehat{APR}_{\mathsf{G}t}$		-2.005***		-0.847***
		(0.186)		(0.128)
$\Delta \ln LR_{nt}$	0.648***	1.440***	0.664***	0.437***
	(0.0606)	(0.163)	(0.0525)	(0.135)
Observations	4186	4186	4186	4186
Subdistrict FE and trend	✓	✓	✓	✓
KP-F			10.69	10.50
SW-F ($\Delta \ln \widehat{APR}_{\mathsf{L}t}$)				21.22
SW-F ($\Delta \ln \widehat{APR}_{\mathsf{G}t}$)				326.50
ARF p-value			0.001	0.000

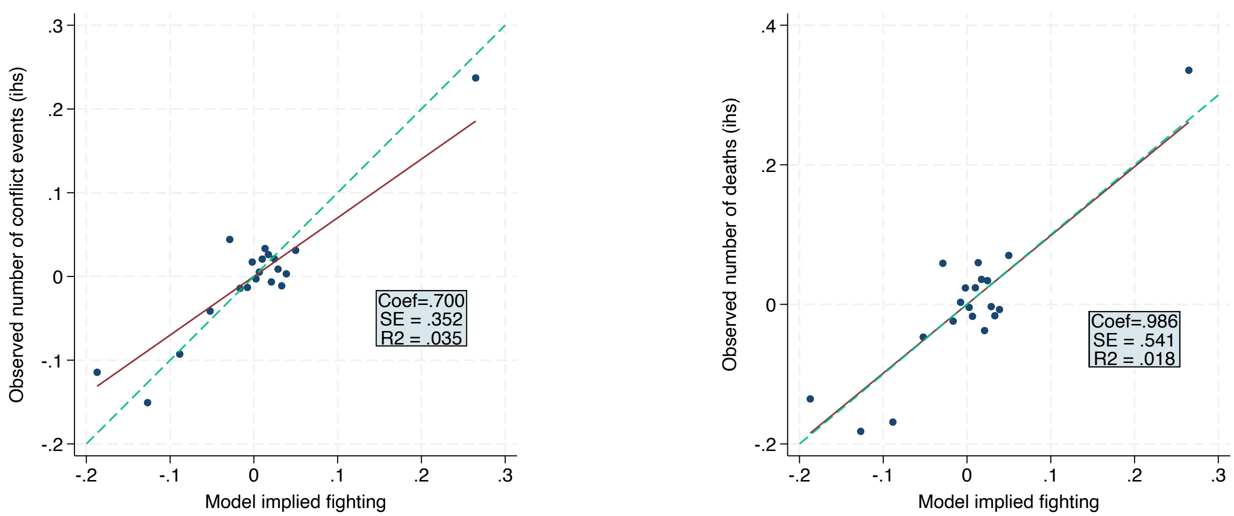
Notes: results from estimating equation (3.13). Standard errors are clustered at the district-year level. KP-F refers to the Kleibergen-Paap F-statistic of the first stage, "ARF p-value" refers to the p-value of the Anderson-Rubin first stage F-statistic for the joint significance of all endogenous variables, and SW-F to the Sanderson-Windmeijer first-stage statistics for individual regressors. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

Figure B5: Calibrated relative exogenous fighting strength $\varepsilon_{\mathrm{L}t}/\varepsilon_{\mathrm{G}t}$



Notes: the figure displays the relative fighting strength of LTTE calibrated to match the PPML-predicted control probabilities. The LTTE to government strength ratio is normalized to 1 in 1996.

Figure B6: Model and data fighting

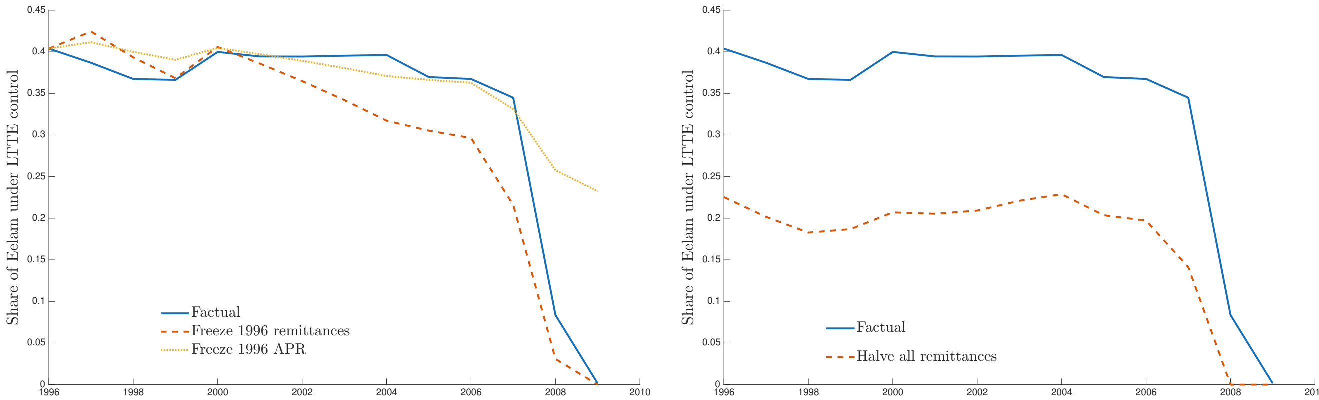


Number of events

Number of deaths

Notes: the figure displays a binscatter plot of the model-implied fighting against the inverse hyperbolic sine of the number of conflict events (left panel) or number of reported deaths (right panel) in each subdistrict-year, after controlling for subdistrict and year fixed effects. The solid red line displays the linear fit, and the dashed line is a 45-degree line. The R^2 reported in the box is the within-R^2 after netting out the subdistrict and year fixed effects.

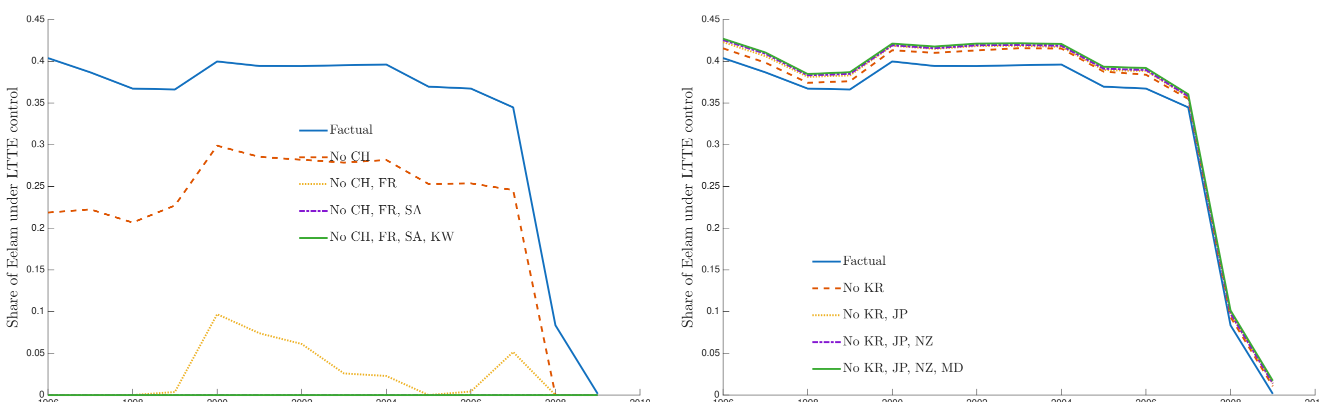
Figure B7: Counterfactual winning probabilities under alternative remittances



Freezing remittances at initial levels | Reducing remittances by half

Notes: the left panel displays predicted shares of territorial control under three scenarios. The factual (in solid blue) lets both remittances and ε_{it} evolve as in the calibration. The dashed red line presents a counterfactual where all remittances are frozen to 1996 levels and ε_{it} varies as in the factual. The dotted yellow line shows a counterfactual where appropriated remittances APR (equation 3.4) are exogenously kept constant to 1996 levels even while ε_{it} varies as in the factual. The right panel shows what would happen if all remittances were cut by half.

Figure B8: Counterfactual winning probabilities: removing remittance source countries



Most pro-LTTE | Most pro-government

Notes: the figure displays the counterfactual results. The left panel removes the countries that have the largest positive impact on LTTE winning probability, while the right panel removes countries that have the largest positive impact on the government winning probability.