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. If the global diaspora were a country, it would be the 4th most populous in the world, behind only China, India and the United States. Emigrants remain connected to their origin countries both economically and politically. On the economic side, the total annual remittances sent home by the diaspora amount to over US$700 billion, roughly equivalent to the GDP of a top-20 economy (e.g. Poland or Argentina). Politically, numerous qualitative case studies highlight the significant influence that diasporas exert, particularly in revolutions and wars (Horowitz, 2000; Shain, 2002; Smith and Stares, 2007).[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 in 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, which 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; BBC, 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.

The conflict had a strong ethnic component, with Tamil areas generally supporting the LTTE and Sinhalese areas leaning toward the government. Taking this into account, we then 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, 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,

[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.

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 2 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 endogenous fighting effort, and exogenous fighting efficiency. In turn, a side's fighting efficiency is a function of the remittances that it can appropriate.

The model is structurally estimated and calibrated to the 322 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 an 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 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

[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).

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 economics of conflict (for recent surveys, see Anderton and Brauer, 2021; Rohner and Thoenig, 2021; Rohner, 2024), and in particular the international dimension of civil conflicts (e.g. Martinez, 2017; Durante and Zhuravskaya, 2018; World Bank, 2020; Anderson et al., 2022; Malik, Ali Mirza, and Rehman, 2023). 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).[3] 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.[4] Our work is also related to structural models of conflict that take network links and spatial factors into account (König et al., 2017; Mueller, Rohner, and Schönholzer, 2022; Couttenier et al., 2023), and that investigate the spread of violence over time (Novta, 2016).

The second is the literature is 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. In particular, Mariani, Mercier, and Verdier (2018) build a theoretical model showing how transfers from diasporas can affect fighting, and Escribà-Folch, Meseguer, and Wright (2018) conclude that remittances lead to more protests in non-democratic recipient countries. 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), and Batu (2019) conclude that remittances are on average negatively associated with conflict, while Mahmood (2024) finds a positive impact of remittances on domestic terrorism activity.[5] Our paper is the first to our knowledge to study the impact of exogenous remittance shocks on the victory chances of all warring factions in a given conflict. Empirically, we develop a novel approach to estimating bilateral remittance flows to specific subnational regions. On the theory side, our structural model allows us to quantify the role of remittances in the evolution of the Sri Lankan Civil War, and to perform counterfactual experiments.

The remainder of the paper is organized as follows: Section 2 describes the historical background

[3]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).

[4]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; Premand and Rohner, 2024).

[5]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).

and data used in the paper, and presents reduced-form econometric evidence that remittances affected the course of 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 short beacon 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 (Becker, 2006; Chalk, 2008). While some financial contributions were voluntary, and 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 home in Sri Lanka but also taxing them in their country of residence, usually under threat to their family remaining in Sri Lanka (Gunaratna, 2003).[7] As documented by Chalk (2008), the LTTE has also derived funding from investments in overseas Tamil businesses and commercial holdings. These were sometimes "owned by proxy,"

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

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.

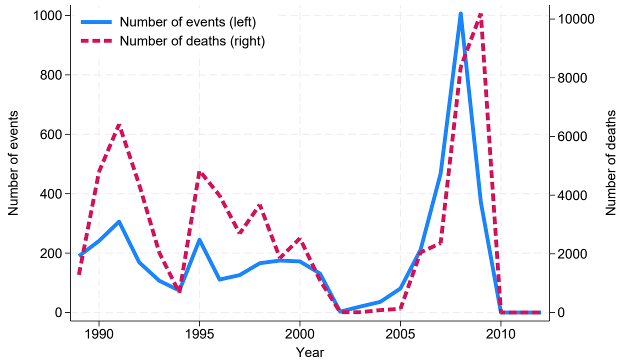
The Sri Lankan economy was also reliant on remittances, which financed around 75% of the country's trade deficit in 2005. Hence, the government of Sri Lanka also partially depended on the diaspora for funds. For example, a 2006 speech by the Deputy Governor of the Central Bank of Sri Lanka highlighted 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 of the importance of remittances and funding from the diaspora both for the LTTE and the central government.

2.2 Data and basic patterns

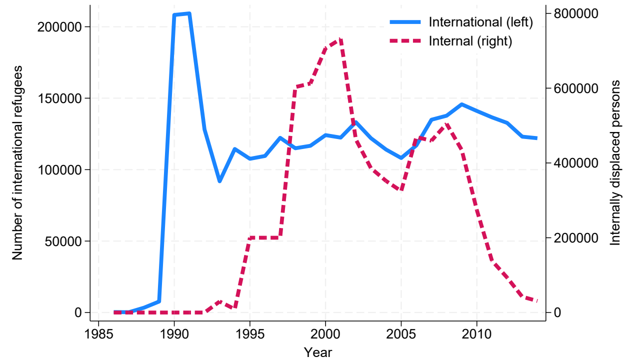
Our empirical analysis combines data on conflict events, time-varying LTTE territorial control, ethnic shares at the Sri-Lankan subdistrict level, remittances at the source country level, and Facebook social connections at the subdistrict-foreign country pair level. Appendix A.1 includes additional details 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. As it contains information on the date of each event and its geo-coordinates, these data allow us to build a panel dataset of conflict at the Sri Lankan subdistrict ("divisional secretariat") level over time. 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 after a ceasefire during 1995.

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).

The extent of LTTE territorial control at various points 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 Population and Housing (Department of Census and Statistics - Sri Lanka, 2012). The 2012 Census was the first post-civil war full census since 1981. It reports population by ethnicity and subdistrict, which we use to compute ethnic shares in the different regions. Remittance data come from the World Bank's World Development Indicator dataset (World Bank, 2024). 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]

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

2.3 Measuring region-specific remittances

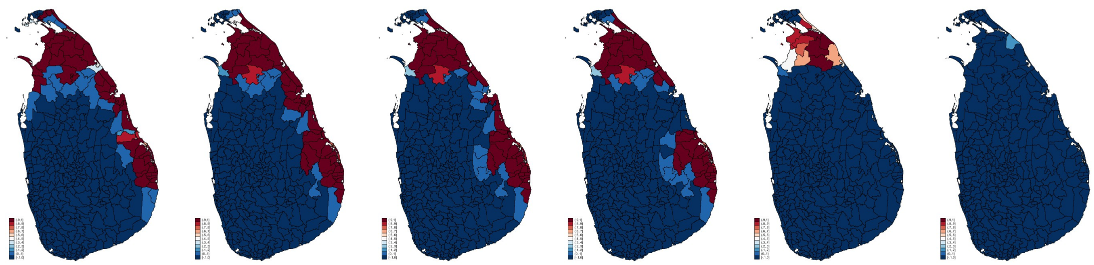
Our main hypothesis is that remittances received by a particular side to the conflict have an impact on fighting outcomes. The challenge we face is that there are no available data on remittances received at the subnational level.[10]

[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: `https://web.archive.org/web/20110827212530/http://www.defence.lk/new.asp?fname=Humanitarian`. We converted it to GIS shapefiles and computed the share of each subdistrict under LTTE control for each year between 1989 and 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.

[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.

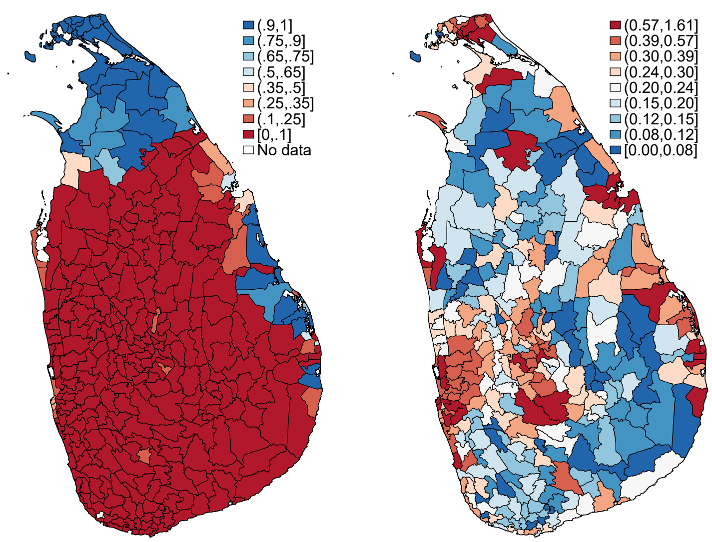
Figure 2: Sri Lankan Civil War: LTTE territorial control



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.

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.

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:

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

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 $1,000 LKR \approx 8.8 USD$)						
LR_{nt} (000s)	4,522	1,235	1,105	896	0	11,158
$\Delta \ln LR_{nt}$	4,186	0.068	0.145	0.054	-0.170	0.779
$\sum_n LR_{nt}$ (million)	14	399	133	368	267	653
GDP (million)	14	38,394	7,671	36,124	28,048	51,359

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).

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 (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. 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:

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

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

[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).

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 the total family ties between o and everyone else. 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, 2022; 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 middle 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:

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

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 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.

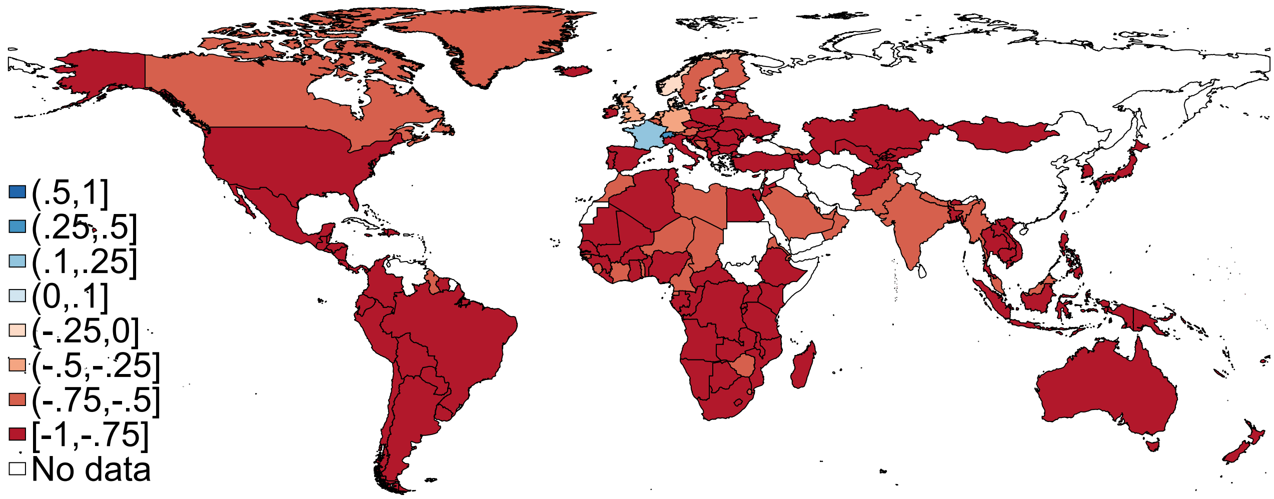
While Tamil connectedness varies only cross-sectionally, outward remittances vary differentially across countries over time. Thus, depending on the shocks in remittance-originating countries, the relative ethnic remittances in Sri Lanka will change. Figure 5 depicts this variation. It ranges from 0.3 at the beginning of the sample to 0.23 at the end. This time series behavior is one dimension of variation to be exploited in the econometric estimation below. Intriguingly, the final collapse of LTTE is preceded by about 1 year by an abrupt drop in the relative Tamil remittances.[13]

Validation. Before moving on to the econometric estimation, we perform 2 validation exercises on our local remittance variable. First, one possible concern is that we do not observe the ethnicity of

[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 5 checks robustness to using only the majority Sinhalese share for the central government side remittances.

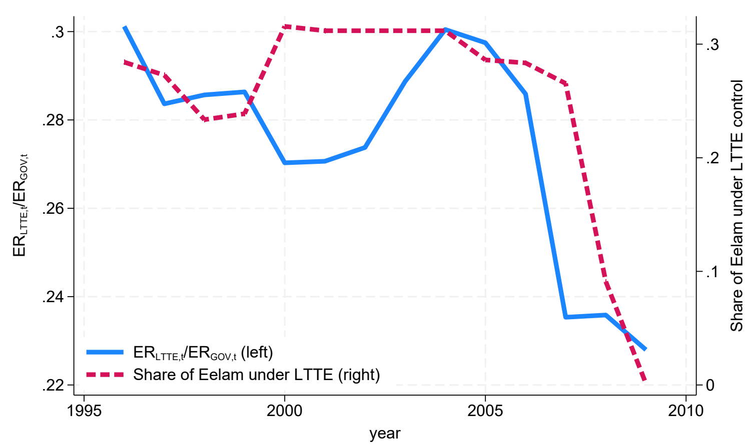
[13] Note that there is no mechanical relationship, as the relative Tamil remittances variable does not use any information on LTTE territorial control, only on the (non-time-varying) Tamil ethnic shares. All the time variation in the relative ethnic remittances comes from the changing cross-sectional covariation between Tamil connectedness and $\mathtt{OUTREM}_{ot}$.

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.

Figure 5: Differential remittances and conflict dynamics



Notes: This figure depicts the time series of relative ethnic remittances (solid blue line), along with the share of LTTE territorial control (dashed red line).

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 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

Table 2: 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 subdistrict (n) level. $\texttt{coethnic}_{sn}$ is constructed as in equation (2.4). $\texttt{tamil}_s$ (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. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

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:

$$\texttt{coethnic}_{sn} = \texttt{tamil}_s \times \texttt{tamil}_n + \texttt{nontamil}_s \times \texttt{nontamil}_n. \tag{2.4}$$

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 2 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 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.

A second assumption we make is that social connectedness proxies for the propensity to remit. While we never observe remittances at the subnational level, we can construct a version of our remittance shift-share at the recipient country level using the same formula as in (2.1):

$$R_{dt} = \sum_o \pi_{od} \times \texttt{OUTREM}_{ot}, \tag{2.5}$$

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 2.5), where the underlying sample is pooling recipient countries and years. There is an evident positive relationship. Table A1 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 by the subdistrict or conflict side fixed effects, as the predicted remittance measures are logged in the regressions.[14] We revisit this in Section 2.5, where we also show that the results are robust to a rescaled measure of the remittance shock, where we multiply L_{nt} by a year-specific factor such that the sum total of $\sum_n L_{nt}$ for Sri Lanka matches the official inward remittances data in each year.

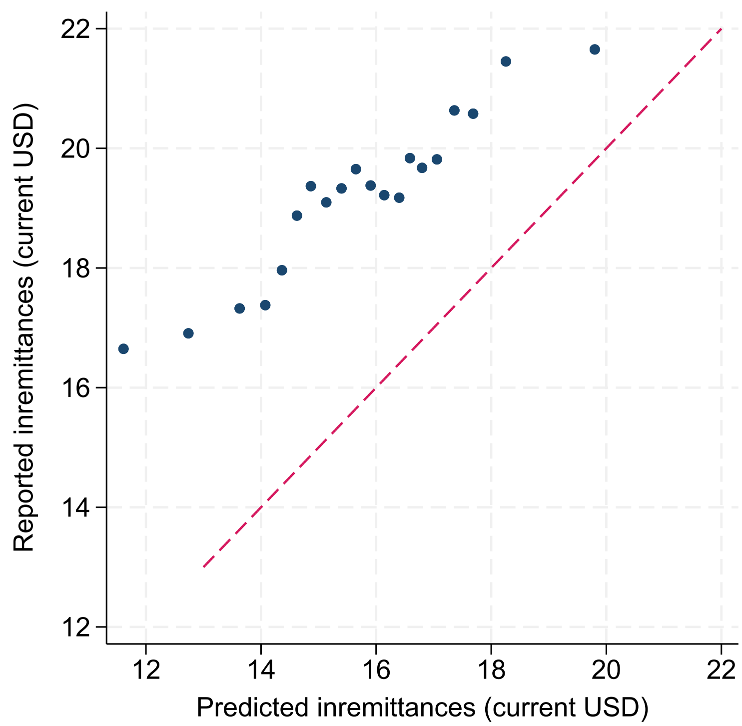
Finally, Appendix Figure A2 also shows that the correlation between total imputed remittances for Sri Lanka $R_{LKA,t}$ and the actual inward remittances rises sharply after 1995, consistent with the surge in movements of people presented in Figure 1. Hence, our main analysis sample starts in 1996 and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

2.4 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.

[14] 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 (2.5) on the x-axis. The dashed line is the 45-degree line.

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.[15] Year fixed 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 3

[15] 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 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.

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. 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.[16] If anything, the coefficients of interest are larger in absolute value than without these controls. In terms of economic significance, a 1% increase in Tamil remittances reduces the probability of a conflict event by 3% in LTTE strongholds, while a 1% increase in non-Tamil remittances raises the probability of conflict in LTTE-held areas by 2.2%, both relative to non-LTTE areas.[17]

2.5 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 foreign 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}.

[16] 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}.

[17] It is also noteworthy that the coefficient of $\ln LR_{nt}$ is negative and statistically significant in all columns of Table 3. A conflict-reducing impact of local remittances could be in line with arguments that remittances fuel investments in the local economy, thereby raising its productivity and the opportunity cost of conflict (see e.g. the discussion in Brinkerhoff, 2011).

Table 3: 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 subdistrict-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. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

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).

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 4 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

Table 4: 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. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

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 5 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 A2 replicates the entire Table 3 with the filtered weights, with similar results as our baseline.

Table 5 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 $ER_{\mathsf{G}t}$. 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

Table 5: 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
$LTTE_{n,t-1} \times \ln ER_{\mathrm{L}t}$	-2.019***	-1.574***	-2.230***	-1.094***	-1.707***	-1.283***	-0.484***
	(0.343)	(0.273)	(0.378)	(0.352)	(0.328)	(0.307)	(0.176)
$LTTE_{n,t-1} \times \ln ER_{\mathrm{G}t}$	1.614***	1.357**	1.712***	1.018**	1.286***	0.997***	0.343**
	(0.302)	(0.244)	(0.318)	(0.460)	(0.284)	(0.301)	(0.165)
$LTTE_{n,t-1} \times \ln LR_{nt}$	-0.0246	-0.226**	-0.0240	-0.00786	0.00375	-0.0222	-0.0122
	(0.0343)	(0.099)	(0.0344)	(0.0667)	(0.0711)	(0.0342)	(0.0300)
$\ln LR_{nt}$	-0.252**	-0.224*	-0.252**	-0.118	-0.214*	-0.238*	-0.0363
	(0.126)	(0.127)	(0.126)	(0.0980)	(0.115)	(0.126)	(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 subdistrict-year level. All regressions include lagged LTTE control ($LTTE_{n,t-1}$) as a control. The first column corresponds to the baseline in Table 3. 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 $ER_{\mathrm{L}t}$ using the Tamil ethnic share and $ER_{\mathrm{G}t}$ 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. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

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.

Appendix Table A3 reports further robustness checks. 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.

3. Theory and quantification

3.1 Theoretical framework

The empirical results above are *prima facie* 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 $c_{int} \times f_{int}$. 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:

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

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.[18]

[18] 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 ($\bar{\beta}_i \neq \underline{\beta}_i$).

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 two features of the setup. First, appropriated remittances APR_{it} are a conflict-side-level 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. Somewhat relatedly, we also assume there is no feedback from local conflict to foreign remittances: LR_{nt} is exogenous and driven purely by fixed social connections and foreign country business cycle, as in (2.1).

Second, (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:

$$f_{nt} = \rho_{\mathtt{L}nt} f_{\mathtt{L}nt} + \rho_{\mathtt{G}nt} f_{\mathtt{G}nt} = \frac{1}{\frac{c_{\mathtt{G}nt}}{\rho_{\mathtt{G}nt} V_{\mathtt{G}nt}} + \frac{c_{\mathtt{L}nt}}{\rho_{\mathtt{L}nt} V_{\mathtt{L}nt}}}. \tag{3.6}$$

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

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.

[19] In the empirical analysis, we experimented with lag structure and found that contemporaneous appropriated remittances have a much larger impact on both fighting intensity and territorial control than remittances lagged by 1 year or more.

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

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

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.

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

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

The equilibrium vector of LTTE territorial shares is obtained as a fixed point of equation (3.8). Government territorial shares are then computed as $p_{\mathtt{G}nt} = 1 - p_{\mathtt{L}nt}$.

Note that in spite of the property that each side ignores local remittances 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 $p_{\mathtt{L}nt}$ 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 a change in side i's APR is associated with a relative increase in fighting, more so where p_{int} is low and less so where p_{int} is high:

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

An increase in remittances to the LTTE – leading to higher $\rho_{\mathtt{L}nt}$ – increases fighting relatively less in areas with greater LTTE control: $\frac{\partial^2 \ln f_{nt}}{\partial \ln \rho_{Lnt} \partial p_{Lnt}} = -1$. Similarly, an increase in remittances to the government increases fighting by more in LTTE-controlled areas: $\frac{\partial^2 \ln f_{nt}}{\partial \ln \rho_{Gnt} \partial p_{Lnt}} = 1$. The model thus rationalizes the signs of the interaction coefficients of interest in the reduced form regression (2.6)/Table 3: the negative coefficient on the interaction between $ER_{\mathtt{L}t}$ and LTTE control, and the positive one on the interaction between $ER_{\mathtt{G}t}$ 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:

$$v_{int} = \frac{\bar{\rho}_{int} V_{int}}{c_{int}} = (\mathtt{ethnic}_{in})^{\eta_1} (\mathtt{distance}_{in})^{\eta_2} \varepsilon_{it}, \tag{3.10}$$

where $\mathtt{ethnic}_{in}$ is the ethnic share of fighting side i in subdistrict n (equal to $\mathtt{tamil}_n$ for $i = \mathtt{L}$ and $\mathtt{nontamil}_n$ for $i = \mathtt{G}$), and $\mathtt{distance}_{in}$ is the geographic distance between subdistrict n's centroid and side i's capital (Kilinochchi for $i = \mathtt{L}$, Colombo for $i = \mathtt{G}$). 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 a side's fighting efficiency: GDP growth/government revenues, weather, foreign military and humanitarian aid, control of natural resources, etc.[20]

Implementing the model requires the structural elasticities $\{\eta_1, \eta_2, \beta_{\mathtt{L}}, \beta_{\mathtt{G}}\}$, cross-sectional or subdistrict-time variables $\mathtt{ethnic}_{in}$, $\mathtt{distance}_{in}$, 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 $p_{\mathtt{L}nt}$'s using an iterated fixed-point procedure applied to the discrete-district version of equation (3.8):

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

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 B1 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 (3.8). Plugging (3.10) into this relation leads to a structural equation that can be used to estimate η_1 and η_2:

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

[20] The composites v_{int} could also include features common to both sides, but these would cancel out, as only the ratio of $v_{\mathtt{L}nt}$ to $v_{\mathtt{G}nt}$ matters in the model. In our empirical estimation, those common features would be absorbed in a subdistrict fixed effect.

Table 6: Estimating η_1 and η_2: ethnic share, distance to capital, and territorial control

	(1)
	$\texttt{control}_{int}$
$\ln \texttt{ethnic}_{in}$	0.140***
	(0.0535)
$\ln \texttt{distance}_{in}$	-1.541***
	(0.228)
Observations	9016
Subdistrict-year FE	✓
Side-year FE	✓

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

where $\texttt{control}_{int}$ is the share of subdistrict n controlled by side i at time t, and δ_{it} and δ_{nt} are the side-time and subdistrict-time fixed effects required by theory. In particular, examining (3.8) reveals that 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 (3.8), 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 6 displays the results. 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. Based on these estimates we set $\eta_1 = 0.140$ and $\eta_2 = -1.541$.

Estimating $\beta_{\mathtt{L}}$ and $\beta_{\mathtt{G}}$. Having estimated equation (3.11), we use it to construct predicted control probabilities $\hat{p}_{\mathtt{L}nt}$. The theoretically-consistent equation (3.11) implies that

$$v_{\mathtt{L}nt}\,(APR_{\mathtt{L}t})^{\beta_{\mathtt{L}}} = (\texttt{ethnic}_{in})^{\eta_1}\,(\texttt{distance}_{in})^{\eta_2}\,\delta_{it}.$$

Thus, we can use data on distance and ethnic shares together with the estimates of $\hat{\eta}_1$, $\hat{\eta}_2$, and $\hat{\delta}_{it}$ to construct estimates of $v_{\mathtt{L}nt}\,(APR_{\mathtt{L}t})^{\beta_{\mathtt{L}}}$ and $v_{\mathtt{G}nt}\,(APR_{\mathtt{G}t})^{\beta_{\mathtt{G}}}$, and therefore the predicted probabilities of LTTE control $\hat{p}_{\mathtt{L}nt}$ based on (3.7). Expressing (3.7) as an odds ratio and log-time-differencing leads to an estimable equation:

$$\Delta \ln \frac{\hat{p}_{\mathrm{L}nt}}{1-\hat{p}_{\mathrm{L}nt}} = \beta_{\mathrm{L}} \Delta \ln \widehat{APR}_{\mathrm{L}t} - \beta_{\mathrm{G}} \Delta \ln \widehat{APR}_{\mathrm{G}t} + \underbrace{\Delta \ln \varepsilon_{\mathrm{L}t} - \Delta \ln \varepsilon_{\mathrm{G}t}}_{\text{error term}}, \tag{3.12}$$

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

Equation (3.12) provides a means of estimating β_{L} and β_{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 $\Delta \ln \widehat{APR}_{\mathrm{L}t}$ and $\Delta \ln \widehat{APR}_{\mathrm{G}t}$ with the log changes in the ethnic remittances $ER_{\mathrm{L}t}$ and $ER_{\mathrm{G}t}$ 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, $ER_{\mathrm{L}t}$ and $ER_{\mathrm{G}t}$ 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 has also been used as the regressor of interest in the reduced-form econometric results in Section 2 above. In addition to the instrument, we add subdistrict fixed effects and subdistrict-specific time trends to all specifications in order to absorb further residual variation.

Table 7 displays the results of estimating equation (3.12). 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 $\Delta \ln \widehat{APR}_{\mathrm{G}t}$ enters negatively and its coefficient is an estimate of $-\beta_{\mathrm{G}}$). In the last column, $\hat{\beta}_{\mathrm{L}} > \hat{\beta}_{\mathrm{G}}$, implying that LTTE is more efficient than the central government at converting the remittance "tax base" into military strength. According 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 β_{G}, and similar for β_{L}. This is consistent with the source of endogeneity sketched out above, where shocks to fighting efficiency

[21] The instrument can be rearranged as: $ER_{\mathrm{L}t} = \sum_o \left(\sum_n \mathtt{tamil}_n \pi_{on}\right) \times \mathtt{OUTREM}_{ot}$. 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.

Table 7: 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

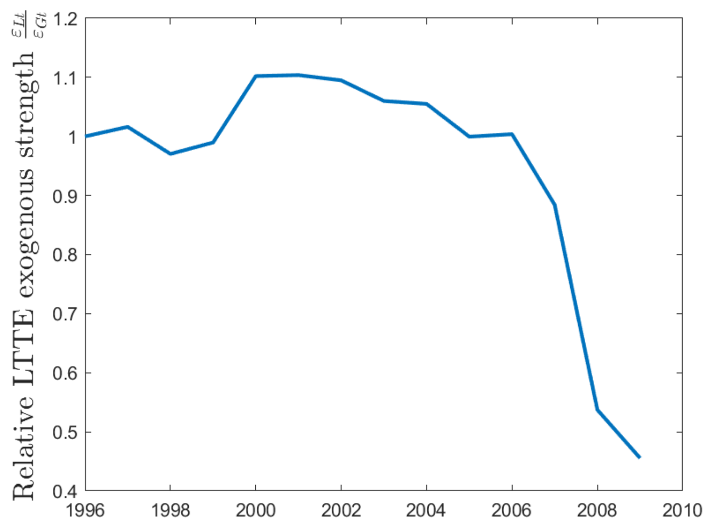
Notes: results from estimating equation (3.12). Standard errors are clustered at the subdistrict-year level. KP-F refers to the Kleibergen-Paap F-statistic of the first stage, "ARF p-value" refers to the p-value of the Anderson-Rubin first stage F-statistic for the joint significance of all endogenous variables, and SW-F to the Sanderson-Windmeijer first-stage statistics for individual regressors. First stage regressions are displayed in Appendix Table B1. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

influence both the odds ratio and the $\widehat{APR}_{\mathsf{G}t}$, artificially inflating the estimated β_{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 $\Delta \ln \widehat{APR}_{\mathsf{G}t}$ and $\Delta \ln \widehat{APR}_{\mathsf{G}t}$ increase in magnitude in those cases, with β_{G} remaining smaller than β_{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 2.5. The results are again similar to our baseline.

Based on the estimates in column 4 of Table 7, we set $\beta_{\mathsf{L}} = 1$ and $\beta_{\mathsf{G}} = 0.47$.

Figure 7: Calibrated relative exogenous fighting strength $\varepsilon_{\mathtt{L}t}/\varepsilon_{\mathtt{G}t}$



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.

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:

$$\delta_{it} = \ln APR_{it}^{\beta_i} + \ln \varepsilon_{it} \quad i \in \{\mathtt{L}, \mathtt{G}\}. \tag{3.13}$$

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.

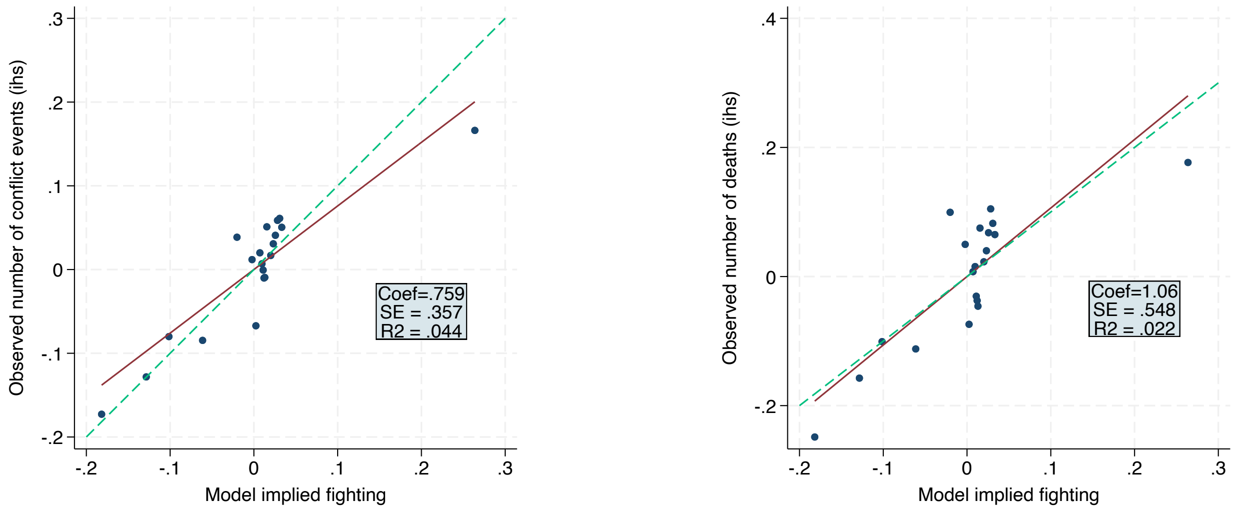
Figure 7 displays the relative $\varepsilon_{\mathtt{L}t}/\varepsilon_{\mathtt{G}t}$. There is a sharp drop after 2006. In late 2005, the presidential elections resulted in a government with a much tougher stance against the LTTE. Peace talks broke down completely in 2006, and the government launched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

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 B2 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.

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.

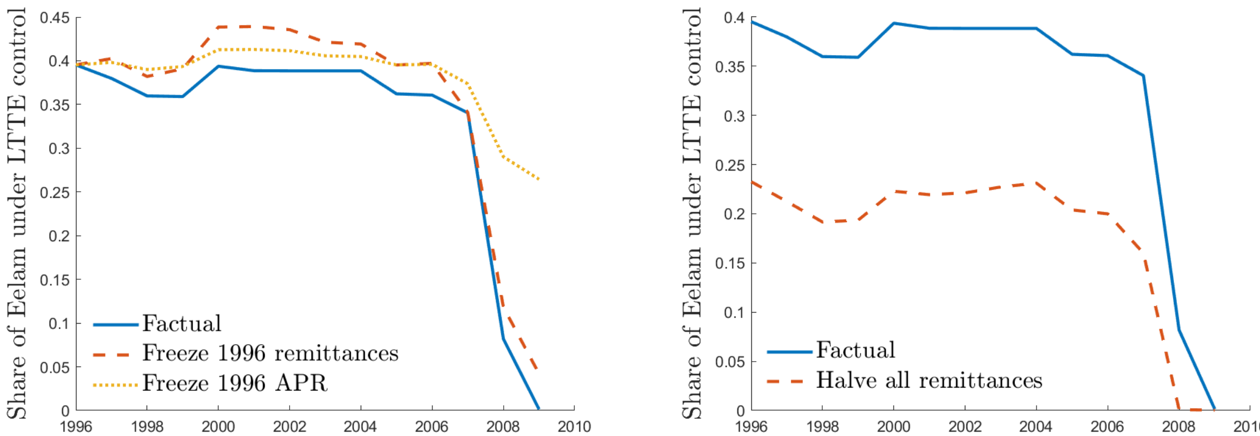
Second, we also show that the model-predicted amount of fighting in a subdistrict-year (f_{nt}) matches well untargeted data on the intensity of fighting activity. Figure 8 displays a binscatter of the model-implied fighting against the data, after controlling for subdistrict and year fixed effects. 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.

3.4 Counterfactuals

Our factual matches well the LTTE progressive defeat. Quantitatively, the LTTE decline is mostly driven by the fall in the exogenous relative fighting efficiency $\varepsilon_{\mathrm{L}t}/\varepsilon_{\mathrm{G}t}$. 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 first counterfactual, in dashed red, simulates the model while keeping all the region-specific remittances LR_{nt} constant at their 1996 level. The end result is fairly similar to the factual: the share of LTTE-controlled territory would drastically diminish starting in 2007 and vanish by 2009. This is consistent with the decline in $\varepsilon_{\mathrm{L}t}/\varepsilon_{\mathrm{G}t}$ depicted in Figure 7, due to the shift in the central government policy against the LTTE.

This does not imply that remittances played no role in the unraveling of the civil war. The yellow dotted line presents a counterfactual that exogenously freezes the appropriated remittances (APR) at 1996 levels. This hypothetical scenario assumes that the exogenous ratio $\varepsilon_{\mathrm{L}t}/\varepsilon_{\mathrm{G}t}$ evolves to

Figure 9: Counterfactual winning probabilities under alternative remittances



Freezing remittances at initial levels

Reducing remittances by half

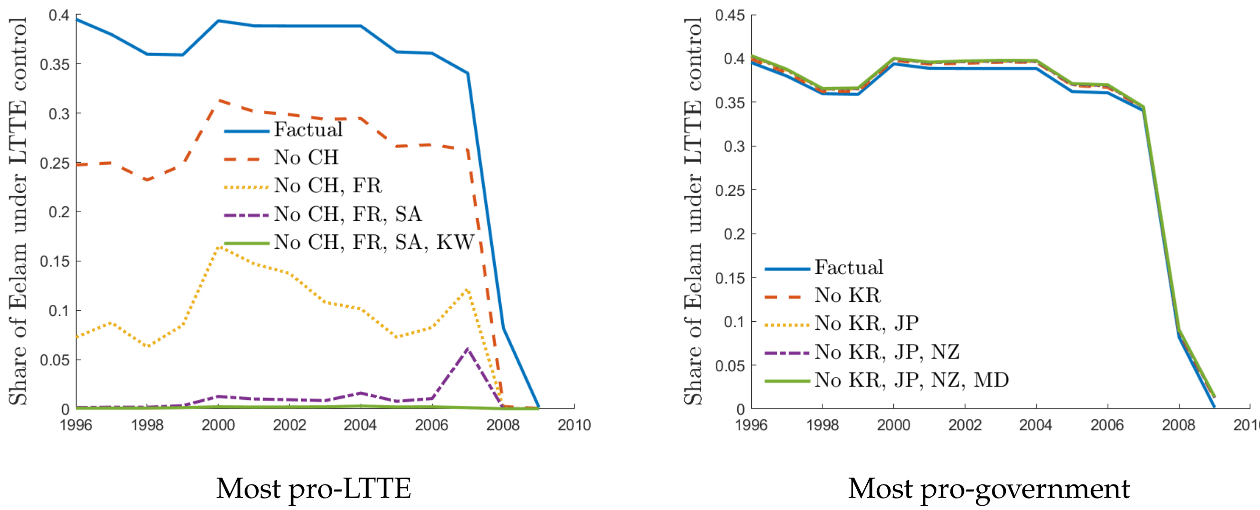
Notes: the left panel displays predicted shares of territorial control under three scenarios. The factual (in solid blue) lets both remittances and ε_{it} evolve as in the calibration. The dashed red line presents a counterfactual where all remittances are frozen to 1996 levels and ε_{it} varies as in 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.

affect territorial control, while the territorial control itself does not impact the sides' ability to collect remittances (APR remains fixed throughout). Thus, this counterfactual shuts down the amplification channel from fighting strength to reduced access to remittances. In this case, the decline between 2006 and 2009 would have been much more limited. While both counterfactuals predict a share of territorial control of around 0.4 in 2006, that share collapses to 0.05 in 2009 in the counterfactual with amplification, whereas it only falls to 0.25 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 alone would not have been sufficient to bring the conflict to an end. It was crucial that the government offensive also cut off the LTTE's access to remittances.

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 $\hat{\beta}_{\texttt{L}} > \hat{\beta}_{\texttt{G}}$.

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 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

Figure 10: Counterfactual winning probabilities: removing remittance source countries



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.

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 B3 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 the 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.

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), to the Eritrean People's Liberation Front (EPLF), remittances have been linked to funding various fighting groups (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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A. Data and reduced-form results

A.1 Data

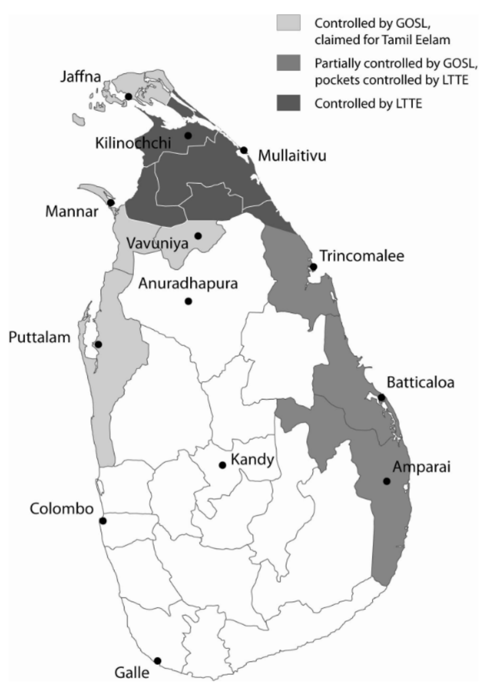
Conflict events data. The conflict data come from the Uppsala Conflict Data Program (UCDP) Georeferenced Event Dataset (GED) Version 21.1. This version of the dataset can be downloaded at https://ucdp.uu.se/downloads/olddw.html.

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]

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 5).

A.2 Fit of predicted remittances

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 (2.5). We then regress the actual inward remittances of country n, as reported by the World Bank's WDI database on our predicted remittances. Table A1 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 A1: Fit of predicted remittances

	$\ln(\texttt{INREM}_{dt})$					$\Delta \ln(\texttt{INREM}_{dt})$			
$\ln R_{dt}$	0.726***	0.695***	1.494***	1.375***	$\Delta \ln R_{nt}$	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		✓		✓				✓	✓

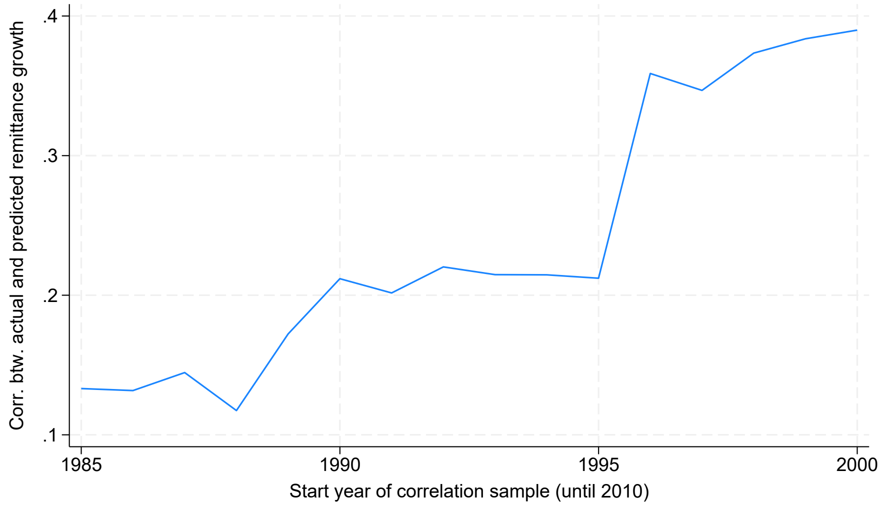
Notes: results from regressing log official inward remittances ($\texttt{INREM}_{dt}$, in current USD) on our constructed remittance shock in (2.5). Standard errors are clustered at the country level. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

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 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

[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.

[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.

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.

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

Tables A2 and A3 provide results of robustness checks for our reduced form results presented in Table 3, replicating the results of Table 3 with "filtered" shares (A2), and using intensive margin measures of conflict (A3).

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

Table A2: Fighting and remittances with "filtered" shares

Dep. Var.:	$\mathbb{I}(\texttt{violence}_{nt} > 0)$			
	(1)	(2)	(3)	(4)
$LTTE_{n,t-1}$	-1.595***	-1.574***	-3.627***	-2.231*
$\times \ln(ER_{\text{L}t})$	(0.295)	(0.273)	(1.342)	(1.300)
$LTTE_{n,t-1}$	1.276***	1.357***	2.402***	1.763**
$\times \ln(ER_{\text{G}t})$	(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 subdistrict-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 A3: 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
$LTTE_{n,t-1}\times$ $\ln ER_{\mathrm{L}t}$	-2.019*** (0.343)	-13.38*** (4.004)	-5.991*** (1.209)	-10.63*** (2.25)	$LTTE_{n,t-1}\times$ $\Delta \ln ER_{\mathrm{L}t}$	-2.945** (1.361)
$LTTE_{n,t-1}\times$ $\ln ER_{\mathrm{G}t}$	1.614*** (0.302)	12.98*** (2.821)	5.088*** (0.990)	8.195*** (1.771)	$LTTE_{n,t-1}\times$ $\Delta \ln ER_{\mathrm{G}t}$	3.052*** (1.063)
$LTTE_{n,t-1}\times$ $\ln LR_{nt}$	-0.0246 (0.0343)	-0.759*** (0.288)	-0.119 (0.113)	-0.112 (0.186)	$LTTE_{n,t-1}\times$ $\Delta \ln LR_{nt}$	-1.242 (1.009)
$\ln LR_{nt}$	-0.252** (0.126)	-3.770*** (1.272)	-0.827*** (0.299)	-1.580*** (0.507)	$\Delta \ln LR_{nt}$	-0.233 (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 subdistrict-year level. All regressions control for lagged LTTE ($LTTE_{n,t-1}$). The first column corresponds to the baseline in Table 3. 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. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

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 $f_{\mathrm{L}nt}$ and $f_{\mathrm{G}nt}$:

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

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

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

This means that, after straightforward manipulation:

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

which is equation (3.6).

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

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

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:

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

This implies that the probability of government control is:

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

Solving for f_{nt} and taking logs:

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

The elasticity is:

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

In turn:

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

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

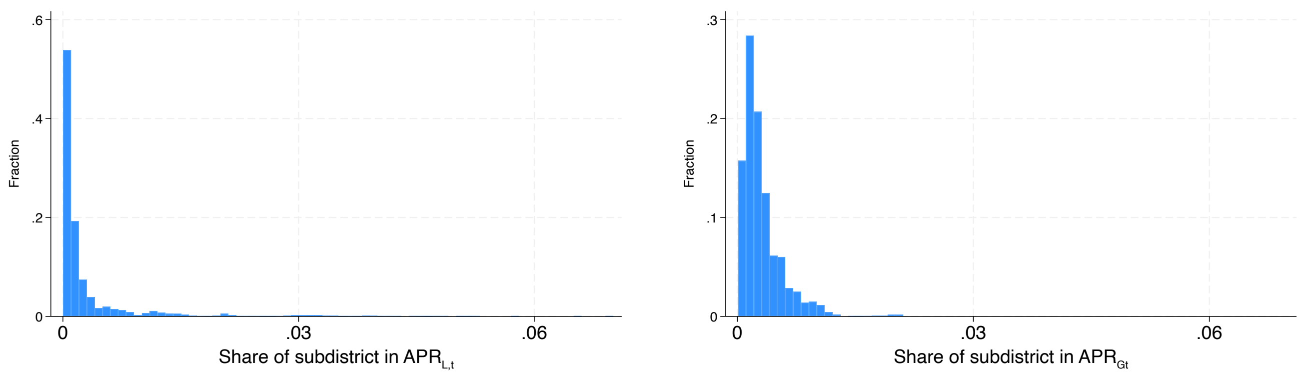
$$\begin{aligned}
\frac{\partial\ln\left(1-p_{\text{L}nt}\right)}{\partial\ln\rho_{\text{L}nt}} &= \frac{\partial\ln\left(1-p_{\text{L}nt}\right)}{\partial\rho_{\text{L}nt}}\frac{\partial\rho_{\text{L}nt}}{\partial\ln\rho_{\text{L}nt}} \\
&= -\frac{\frac{V_{\text{L}nt}}{c_{\text{L}nt}}}{\frac{\rho_{\text{L}nt}V_{\text{L}nt}}{c_{\text{L}nt}}+\frac{\rho_{\text{G}n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

yielding (3.9).

B.2 Quantification: additional tables and figures

Figure B1 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 (3.12), and robustness checks for the same estimation. Figure B2 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 ($\hat{p}_{\mathrm{L}nt}$). Figure B3 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 B1: Shares of subdistricts in total APR



LTTE

Government

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

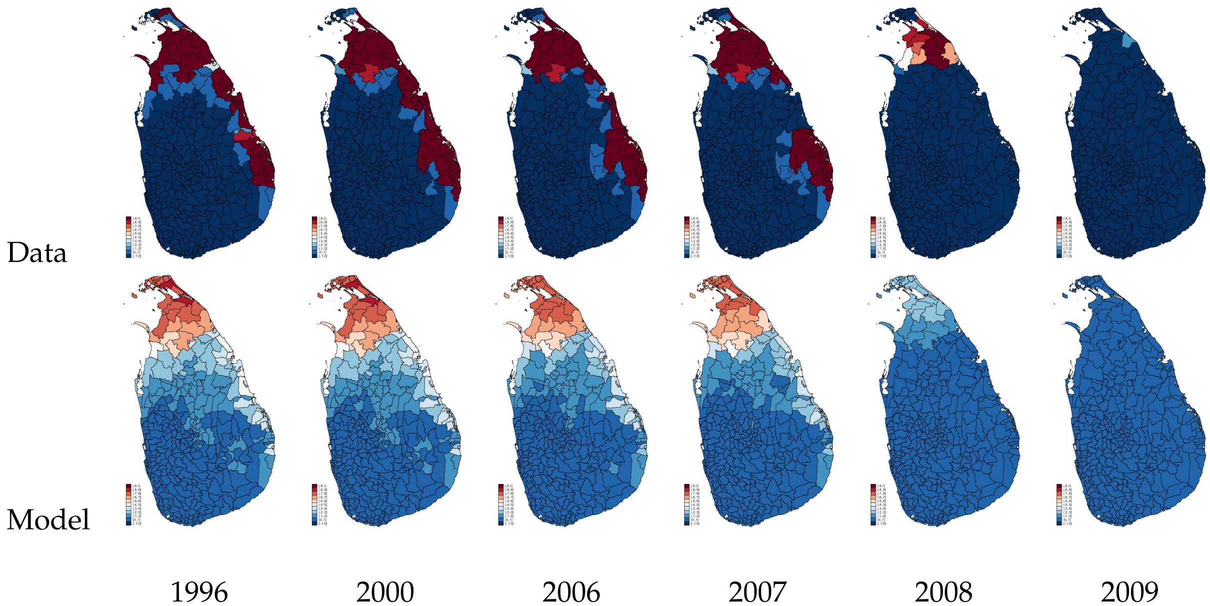
Notes: first-stage results from estimating equation (3.12). Column 1 corresponds to the first IV column of Table 7. Columns 2-3 to the second IV column. SW-F refers to the Sanderson-Windmeijer statistics for individual endogenous regressors. *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$.

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

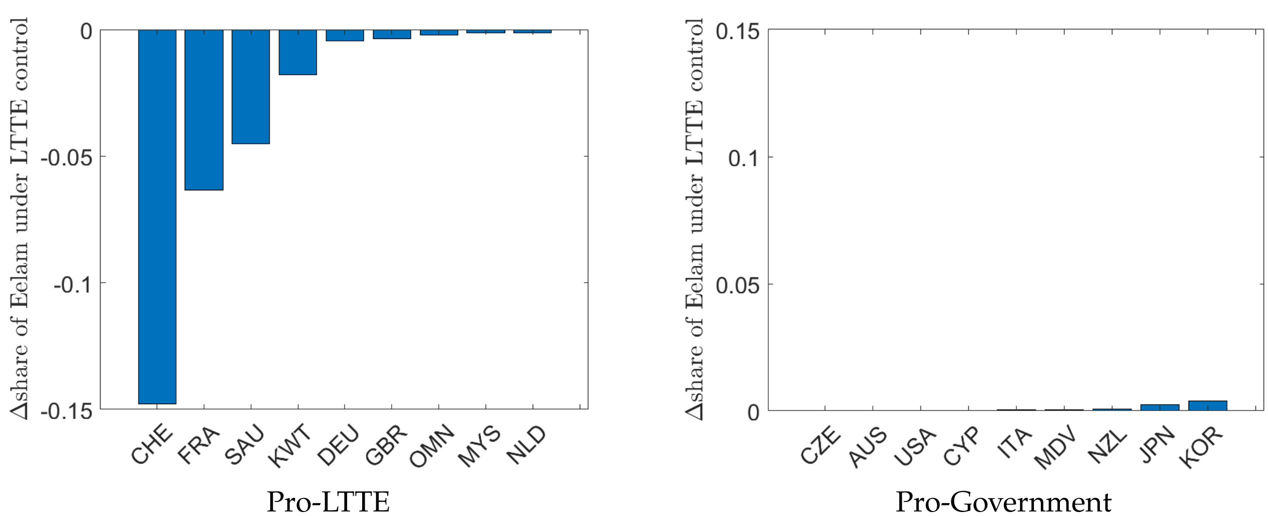
Notes: results from estimating equation (3.12) with additional controls. $\Delta \ln LGDP_{nt}$ refers to the same shock as $\Delta \ln LR_{nt}$, but replacing $\texttt{OUTREM}_{ct}$ by GDP_{ct} in equation (2.1). $\Delta \ln LTRADE_{nt}$ does the same, but replacing remittances with total trade of the 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 subdistrict-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 B2: 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 B3: 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.