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DO PERCEPTIONS OF ECONOMIC WELL-BEING PREDICT THE ONSET OF WAR AND PEACE?*

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Abstract

While material deprivation is an important determinant of civil conflict, psychological factors can also explain the incentives for warfare. This paper considers whether and to what extent civilian perception of individual economic well-being, possibly influenced by hearts-and-minds tactics that are employed by insurgents, predicts war and peace onset. Using unique micro data bracketing the onset of the Nepalese Civil War, we find that perceived income inadequacy is associated with earlier war onset during periods of rebel recruitment, and with later peace onset in general. These results are mainly driven by the effect of perceived deprivation among marginalised communities on rebel-initiated violence, and hold regardless of whether we account for actual economic circumstance. Our results suggest that civilian perception of economic well-being ought to be considered seriously as a determinant of war and peace.

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1 Introduction

It is well known that material deprivation is an important determinant of civil conflict. Impoverished groups have less to lose and more to gain in a fight; moreover, poverty could have been a consequence of unequal political representation, in which case violence may be deployed as a means to address grievances (Collier and Hoeffler, 2004; Miguel et al., 2004; Besley and Persson, 2011; Dube and Vargas, 2013; Nunn and Qian, 2014). Nonetheless, economic conditions constitute only one of many micro-level factors for warfare. Psychological drivers, such as the perception of economic well-being, may also determine conflict (Hirshleifer, 1995).

Yet, under what circumstances might perceptions of economic well-being deviate from actual economic circumstance, and matter for conflict? In irregular wars where popular support is essential for territorial control, incumbents and insurgents often engage in contests over the hearts and minds of civilians (Kalyvas and Kocher, 2009; Berman and Matanock, 2015). Such contests typically feature state investment in development projects (Croft et al., 2014; Beath et al., 2017; Khanna and Zimmermann, 2017; Lyall et al., 2019) and insurgent coercion or indoctrination (Berman et al., 2011; Subedi, 2013), triggering variations in actual and perceived economic well-being respectively. In turn, perception of economic well-being may project effects onto behaviors in a way that is separate from that of actual economic circumstance. For instance, civilians who perceive themselves as economically deprived – regardless of actual economic well-being – are not only easy targets for rebel recruitment in the initial stages of an insurgency, but also useful collaborators for sustained guerilla campaigns against the state after an insurgency has begun. Consequently, localities that perceive themselves to be poor are likely to enter the war sooner, and to exit the war later.

In this paper, we test the aforementioned idea on the Nepalese Civil War (1996-2006). Nepal is an ideal testbed for two reasons. First, there is considerable spatial and temporal variation in insurgent tactics and war casualties; the fact that Nepal comprises 75 districts across five geographical regions (Eastern, Central, Western, Mid-Western and Far-Western) then allows us to capture these variations. Second, nationally-representative survey modules on subjective assessment of income inadequacy were employed both before and during the war; these permit the construction of district-level perception measures that coincide with different stages of the war at a particularly high frequency (month). The combination of two district-month panel data sets – on conflict and

subjective income inadequacy – thus grants us a unique opportunity to identify the effects of subjective income inadequacy on war and peace onset.

Although we are fortunate to have novel data to test our hypotheses, our research is not without its challenges. Most notable is the fact that war and peace onset are typically defined (spatially) at the national level and (temporally) at annual frequency in the existing conflict literature. Being one of the first papers to estimate war and peace onset at the subnational level, we necessarily have to confront the question: how best to define war and peace onset? We tackle this head on by first applying the convention of using the first and last casualty in each district as a guide, and subsequently by checking whether our results are sensitive to alternative definitions that rely on cumulative casualties.

We first document a significant difference between perceived and actual economic well-being; that is, there is a large variation in perceived economic well-being that cannot be explained by actual economic well-being. Then, in our regression analyses, we find that perceived income inadequacy is associated with earlier war onset during periods of rebel recruitment when the insurgents were expanding territorial control. For those districts that joined the war during the insurgent expansion, a one-standard deviation increase in perceived income inadequacy is associated with a hastening of war onset by 128-133 days. This is equivalent to speeding up war onset by up to 13 percent given that districts took an average of 35 months to enter into conflict.¹ Once a district experiences war onset, higher levels of perceived income inadequacy will delay peace onset by 23-30 days, which translates into a postponement of peace by about 1 percent given an average conflict duration of 90 months. Our results suggests that insurgents relied on the support of civilians to prolong localised contests with the state, which is consistent with evidence produced in other contexts in the “winning hearts and minds” literature.

We use two approaches to represent perceived income inadequacy, both of which produce qualitatively-similar conclusions. First, we use perceived income inadequacy as reported by households in the data set. Second, we construct a regression-adjusted measure (Di Tella et al., 2001) where the level of perceived income inadequacy is not explained by individual or household circumstances, including per capita consumption. The second approach is particularly useful for

¹The 35-month average reflects the amount of time it took for districts to suffer their first casualty since the official start of the war in February 1996.

isolating perception from actual economic circumstances.

In our supplementary analyses, we detect evidence of a stronger relationship between perceived income inadequacy and conflict among low caste households, and that the association is driven by rebel-initiated violence (but not government-initiated violence). These results support the notion that rebel recruitment is a key underlying mechanism, and that marginalised populations are the primary target of propaganda campaigns.

Our paper is the first, to our knowledge, to demonstrate empirically that feelings of economic deprivation can incentivise conflict participation. In this regard, it relates to the growing literature on the economics of conflict (see Blattman and Miguel, 2010, for a review), especially in the context of insurgency warfare where civilians are important actors (Kalyvas and Kocher, 2009; Berman et al., 2011; Subedi, 2013; Crost et al., 2014; Berman and Matanock, 2015; Beath et al., 2017; Khanna and Zimmermann, 2017; Lyall et al., 2019).² Crucially, while the aforementioned literature suggests that perception of economic well-being may influence conflict, it is less clear about whether the effect speaks to conflict onset/offset or conflict intensity (or both). In the context of Nepalese Civil War, however, we believe that it is more relevant to study conflict onset/offset because of the highly asymmetric military strength between the Maoists and the Nepalese state, which led the former to rely heavily on civilian support to initiate warfare with the latter. As such, although we do not preclude the possibility that perception of economic well-being may also matter for conflict intensity, we do not consider it to be the main focus of our paper.

Our research adds perception of economic well-being to the list of conflict determinants, and clarifies conceptually the channels through which it relates to war and peace onset. As such, our work is connected to an emerging body of work that confirms the existence of psychological drivers of warfare (Miodownik and Nir, 2016; Rustad, 2016; Dyrstad and Hillesund, 2020; Mironova et al., 2020).³ In addition, recent research has demonstrated that wars can be detrimental to subjective well-being in general (Shemyakina and Plagnol, 2013; Coupé and Obrizan, 2016); we show here that the relationship in fact exists in the other direction.

²Contextually, our work here also speaks to the economics and political science literature on the Maoist insurgencies in Nepal and India (Do and Iyer, 2010; Macours, 2010; Murshed and Gates, 2005; Gomes, 2015; Singhal and Nilakantan, 2016; Gawande et al., 2017; Vanden Eynde, 2018).

³In fact, our work is tangentially connected to the literature on terrorism participation, which finds that feelings of indignity and frustration, as well as political repressions are more important causes than economics per se (Krueger and Malečková, 2003; Krueger and Laitin, 2008). See Gaibulloev and Sandler (2019) for a review.

Finally, our findings are consistent with previous studies that found subjective well-being to be a powerful predictor of future behaviours. This includes, for example, one's willingness to engage in a job search after becoming unemployed (Clark, 2003), to quit a job (Card et al., 2012), to put in effort at the workplace (Oswald et al., 2015), to engage in risky health behaviours (Goudie et al., 2014), and to engage with politics (Ward, 2020).

The rest of the paper is structured as follows. We first provide a brief background to the Nepalese Civil War, highlighting in particular the dynamics in insurgent tactics and how they relate to our hypotheses in Section 2. We then explain our data in Section 3. Our empirical strategy and main results are discussed in Sections 4 and 5 respectively. Robustness checks are presented in Section 6. Section 7 concludes.

2 Insurgent Tactics, Civilian Perception, and the Dynamics of War

For much of its modern history, Nepal was ruled by a monarchy until widespread protests led to the establishment of multi-party democracy and the introduction of a new constitution in 1990. Democratisation, however, failed to address long-standing issues of poverty, ethnic oppression and inequality, as advantaged castes – such as the Brahman, Chhetri, and Newar – maintained political power and the control of resources. Resentment towards the state and its elites became widespread, and years of political instability would ultimately sow the seeds of war.

In February 1996, civil war broke out as the Communist Party of Nepal (Maoist) began its insurgency against the ruling government of Nepal. The Maoists positioned themselves as a voice for all marginalised groups – including women, the poor, and the indigenous people (*dalits* and *janaajatis*) – fighting for equal opportunity on their behalf and promising change for the better. Marginalised Nepalese who held strong feelings of frustration towards the state were thus more sympathetic to the Maoist movement and consequently became the prime targets of rebel recruitment.

The Maoists were not initially equipped with organised militants. They only had a few dozen fighters and were active in a few isolated districts in the Western region such as Rolpa and Rukum, operating on a hit-and-run basis (Kumar, 2006). From 1998, the insurgents began to intensify their attacks and expanded their efforts geographically, covering nearly the entire Central and Mid-Western regions. In response, the government stepped up their counter-insurgency efforts

(e.g. operation Kilo-Sierra II) which eventually drove the Maoists into establishing an organised military wing of their own (Ogura, 2008).

Late-1998 then marked an important turning point of the war as the Maoists changed their combat strategy from hit-and-run in a few districts to coordinated attacks across the country (Sharma, 2004). To support territorial expansion beyond their strongholds in the Western and Far-Western regions, the insurgents recruited intensively to bolster rebel troop strength during this period.⁴ Militia groups were mobilised by local village committees, indicating that recruitment efforts were highly localised (Sharma, 2004; International Crisis Group, 2005). They ran multiple operations, such as the “one-house-one-guerrilla campaign” and the “shoe campaign”, to enlist civilians to join their ranks as combatants (Human Rights Watch, 2007; Macours, 2010; Mehta and Lawoti, 2010; Subedi, 2014).⁵

Many of these recruitment campaigns targeted high school graduates and unemployed youths – especially those from poor and marginalised backgrounds who were most susceptible to Maoist ideology.⁶ The key was to evoke feelings of economic inadequacy and to imprint onto these youths expectations of a bleak future. Indeed, one seventeen year-old girl said, in an interview with (Human Rights Watch, 2007):

The Maoists took me from home for a campaign. I had finished sixth grade by then. They were saying that young girls like me should join them because in Nepal there was no point in studying, since in any case I would not be able to get a job. [I decided that] I wanted to stay with the Maoists.

In particular, we expect that the insurgents would want to convince civilians into feeling that they are more deprived than in reality – because the perception of economic well-being is context-dependent (Ravallion and Lokshin, 2002; Powdthavee, 2009) – so as to elicit higher degrees

⁴According to Holtermann’s (2016) monthly data on rebel-to-government troops ratio for the period February 1996 to December 2004, relative rebel strength remained weak through the first few years and then climbed above the period average in January 1999.

⁵Counter-insurgency efforts may have also inadvertently fostered support for the Maoists. During operation Kilo-Sierra II, many innocent people were killed by the police and some were arrested on the suspicion of being a member or sympathiser of the Maoists. This drove some civilians into joining the Maoists to avenge the death of their kin or to seek protection from state abuse (Tiwari, 2001; Pettigrew, 2003).

⁶Such tactics are consistent with the “winning hearts and minds” literature that has demonstrated the phenomenon elsewhere (Kalyvas and Kocher, 2009; Berman and Matanock, 2015). Of course, indoctrination is only one of several strategies that can be adopted to induce rebel support. More extreme forms of coercion, such as massacres, can also be implemented to punish or deter civilian defection (Kalyvas, 1999), but we do not observe such cases of mass violence in the Nepalese context.

of economic dissatisfaction and, in turn, support for rebel violence (Miodownik and Nir, 2016; Rustad, 2016; Dyrstad and Hillesund, 2020; Mironova et al., 2020). Therefore, we hypothesize that: districts with civilians who perceive themselves as being poorer are likely to enter the war sooner, especially during periods of intense rebel recruitment.

The spread of the war was fast and furious thereafter. Over the next few years, the insurgents gained total control of several Mid-Western hill districts. In November 2001, a state of emergency was declared. All of the country's districts eventually became engulfed in conflict. A large wave of violence soon followed, which led Nepal to its highest annual death toll in 2002.

During this phase of the war, the Maoists relied heavily on civilians for manpower, food, and shelter across the country (Davis et al., 2012; Zhan, 2019). Various means of propaganda were employed to elicit civilian support. For example, they ran door-to-door campaigns to discuss with villagers about their economic difficulties, and to frame the Maoist movement as a means to address such issues (Eck, 2010). Mass political gatherings were also held to emphasize ideas of economic deprivation and social oppression, with the objective of bringing the "exploiters" (landowners and government officials) to justice (Eck, 2010; Human Rights Watch, 2007).

These indoctrination campaigns became an effective tool for the Maoists to advocate their complex ideology to the civilians in an easy and emotional manner (Subedi, 2013). They not only reinforced the villagers' feelings of grievance but connected those perceptions with the necessity of using violence to improve their circumstances. Two ex-combatants, in particular, revealed their experiences from having attended those campaigns (Subedi, 2013):

I joined the Maoist army because I was motivated that the pro-poor agendas of the armed conflict could liberate people like me who were oppressed by high caste people for a very long time.

I decided to become a combatant because I was impressed by the political teaching of Shanti "didi" (sister) (who was killed in an army encounter). I believed in the Maoist philosophy because I was taught that only the Jan Yuddha (People's War) could end all forms of feudalistic exploitation and oppression.

While the insurgency was centralised to the extent that the Maoist had a coordinated, national strategy, local indoctrination operations became the key to prolonging localised contests with the state and thus played an important role in determining the actual timing of a district's exit from

the war. We thus hypothesize that: conditional on war onset, districts with civilians who perceive themselves as being poorer are likely to exit the war (enter peace) later.

Several rounds of peace talks ensued in the following years, however with little success. The insurgents had grown to become a dominant force with 30,000 fighters during the late stages of the conflict (Eck, 2010), and began to hold talks with seven major political parties to present a common front against the monarchy. The Nepalese monarch finally relinquished power, and a comprehensive peace accord was signed in November 2006, formally ending the decade-long conflict that claimed more than 13,000 lives and displaced thousands more.

3 Data

In this section, we describe two main sources of data – Nepalese conflict data and the Nepal Living Standards Survey (NLSS) – and in particular, how we go about ultimately constructing a district-month pseudo panel on war and peace onset and perceived income inadequacy.

3.1 Conflict Data

Nepalese conflict data are published by the Informal Sector Service Center (INSEC), an independent human rights non-government organisation based in Kathmandu, via the Annual Human Rights Yearbooks. These yearbooks provide, in effect, a census of the war casualties which amount to 14,940.⁷ This data set is well-regarded and commonly employed by researchers working on the Nepalese conflict (Do and Iyer, 2010; Valente, 2013; Menon and Van der Meulen Rodgers, 2015; Pivovarova and Swee, 2015; Libois, 2016; Mitra and Mitra, 2016).

For the purpose of our paper, we extract spatial-time (district-month) information on war casualties that took place between 1996 and 2006.⁸ In the sample of districts that we eventually merge with the NLSS, an average of 207 casualties were incurred per district during the war. These casualties were spatially varied (as seen in Figure 1) as the maximum (814) is nearly 40 times that of

⁷Out of 14,940 casualties, 13,329 are deaths, and the rest are battle-related disabilities and disappearances. The death toll is consistent with estimates from other entities such as BBC News (2009) and Human Rights Watch (2007). Details of the data set can be found in Joshi and Pyakurel (2015).

⁸To ensure that our casualty data relate to the Nepalese Civil War, we excluded casualties that fall outside of the 1996-2006 period. These are: four cases in the 1940s, one case each in July 1994, April 1995, February 2007, October 2007, and February 2008, and three cases in April 2007.

the minimum (22). From a district-month perspective, the average number of war casualties was 2.6 (min=0, max=24).

We assign a running count number to *month*, where month=1 refers to April 1995, the first survey month in NLSS I (to be described below). We then define, for each district, *war onset month* as the month in which the district incurred its first war casualty, and correspondingly, *peace onset month* as the month in which a district incurred no more casualties from then on.⁹ These would provide the basis for spatial variation in war and peace onset for subsequent analyses.

The complexity of the insurgency, in terms of tactical changes and geographical coverage, meant that there is substantial district variation in war and peace onset (see Figure 2). By our definition, Surkhet is the first district to experience conflict in January 1996 (month=10), while Bhaktapur and Humla are the last two districts to do so, in March 2002 (month=84). On the other hand, Pyuthan and Dailekha are the first and last district to experience peace, in July 2005 (month=124) and December 2006 (month=141) respectively. We also explore alternative definitions of war and peace onset later, in Section 6.1.

3.2 NLSS Data

The NLSS was conducted by the Nepal Central Bureau of Statistics with assistance from the World Bank as a part of the Living Standards Measurement Study series. The household surveys are nationally representative. We use data from the first two survey rounds: NLSS I and NLSS II.

The enumeration of NLSS I was conducted from April 1995 (month=1) to June 1996 (month=15). More than 97 percent of households were surveyed before any war casualty occurred in their district (82 percent of them were surveyed before February 1996) making the data appropriate for studying factors that are relevant in the run-up to war. NLSS II was run from March 2003 (month=96) to May 2004 (month=110), more than two years before the signing of the peace accord; this allows us to study the determinants of peace onset. A timeline of the war and the two rounds of surveys is depicted in the Appendix Figure A1.

The NLSS surveys cover nearly all 75 Nepalese districts, with the exception of Mustang, Rasuwa,

⁹We exclude the district of Manang because it has only a single recorded casualty (in September 2002) which, by our definition, would imply that war and peace onset occurred simultaneously. Manang's casualty data may not be very reliable in any case since districts surrounding it had reported much higher casualty counts.

Dolpa, and Achham.¹⁰ NLSS I contains 3,373 households. A unique feature of the sampling design is that NLSS II comprises two components: a cross section of 3,912 households and a (mutually exclusive) panel tracking 962 households from NLSS I. We pool both components to improve our estimation of perceived income inadequacy for each district at a given point in time; potential oversampling issues are addressed in Section 6.3. Removing observations with missing information leaves us with 3,158 households from 71 districts (interviewed over 15 months) in NLSS I, and 4,854 households from 71 districts (interviewed over 15 months) in NLSS II.

Both NLSS I and NLSS II provide detailed information on household-level information. We use data about the household head (e.g. age, gender, caste, language, religion, education) as well as the household itself (e.g. size, consumption, perceived income inadequacy). The summary statistics are presented in Table 1.

We retrieve perception of income inadequacy from the subjective assessment modules that were employed in NLSS I and NLSS II.¹¹ The survey question asks household heads to provide their opinion on whether their household income over the past one month is “inadequate” (2), “just adequate” (1), or “more than adequate” (0) for their family’s needs.¹² Adequacy in this case refers to “neither more nor less than what the respondent considers to be the minimum consumption needs of the family”, as prompted by the enumerator. The mean value of perceived income inadequacy in the data is 1.658, which leans toward inadequacy. Indeed, the majority (68 percent) of respondents perceived their income to be inadequate and barely one percent indicated that their income was more than adequate.

Could it be that perceptions of income inadequacy simply reflect actual economic circumstance? To answer this, we present a scatter plot to compare perceived income inadequacy with per capita consumption, at the district-month level (Figure 3, top panel).¹³ Evidently, the perception of

¹⁰Mustang and Rasuwa are not selected by design (using stratified sampling by geography and ecology) while Dolpa and Achham are missing from the data in NLSS I and NLSS II respectively. In addition, we drop Manang from our sample because of issues with its casualty data, as explained in an earlier footnote. Altogether, we are left with 71 districts in each wave.

¹¹Pradhan and Ravallion (2000) propose an alternative approach to measure subjective perception of income inadequacy by making use of household consumption data to estimate a subjective poverty line. We are, however, unable to use their approach because the sample size requirements for estimating such a measure are too high for us to implement it at the district-month level. For instance, even the smallest sample that Pradhan and Ravallion (2000) used in their paper was 336 households whereas the average number of households in our district-month cells is only 12-14.

¹²Since it is the household head whose opinion was sought, our analyses therefore assume that feelings (of income inadequacy) also extend to other members of the same household, including youths who may be targets of rebel recruitment, for example.

¹³Per capita consumption is defined as the total value of a household’s food consumption (purchased, home-produced,

income inadequacy is not simply a proxy for actual income, that is, there is a large variation in perceived income inadequacy that cannot be explained by actual income – the correlation between the two is only -0.226. Nonetheless, to isolate perception, we draw inspiration from Di Tella et al. (2001) to construct a regression-adjusted measure of perceived income inadequacy. We regress the household’s perceived income inadequacy on its observed characteristics, including per capita consumption, to partial out the observed components and take the residuals as our regression-adjusted measure of (unobserved) perception.¹⁴ The regression outputs using NLSS I and NLSS II are shown in columns (1) and (5) of Appendix Table A1 respectively. They show that observable attributes such as per capita consumption, household size, caste, and schooling attainment, are all correlated with perceived income inadequacy in very sensible ways. This gives us confidence that our regression-adjusted measure of perceived income inadequacy is void of observable components and thus likely to represent perception net of actual economic circumstance. In fact, the scatter plot in Figure 3 (bottom panel) confirms that this regression adjustment would further reduce the correlation between perceived income inadequacy and per capita consumption, at the district-month level, to only -0.017.

It is important to clarify that perceived income inadequacy could in principle depend not only on a household’s resources but also the demands made on them, and our regression adjustment procedure is designed to isolate feelings of deprivation from both income and needs. For instance, per capita consumption – which includes purchased as well as self-produced food consumption – is likely to reflect income as well as needs.¹⁵ Our suite of observed household characteristics – which includes household size, caste, and schooling attainment – should also reflect consumption needs. Therefore, our regression-adjusted measure of perceived income inadequacy should contain only the variation in perception that is not determined by actual economic circumstances. For

or received in-kind) and non-food expenditure (purchased or received in kind) in the past 12 months, divided by the number of household members, and adjusted for spatial-year inflation.

¹⁴A regression representation of this is $w_{idrm} = \nu + \delta X_{idrm} + \epsilon_{idrm}$, where w_{idrm} is household i ’s perceived income inadequacy, and X_{idrm} is a vector of household characteristics. The residuals of this regression, $\hat{\epsilon}_{idrm}$, are then aggregated to become the regression-adjusted perceived income inadequacy w_{drm} for each district d in a given month m . The household characteristics include household size, per capita consumption, the household head’s age, gender, caste, primary school completion, and ability to read, and indicators for minority language and minority religion, etc. Minority languages are those other than Nepali, Maithili, Bhojpuri, Tamang, and Nawar. Minority religions are those other than Hinduism, Buddhism, and Islam. The average schooling attainment is 3.36 years, which makes primary school completion (5 years) a relevant indicator of educational advantage.

¹⁵In addition, consumption values are adjusted for spatial-year specific inflation to account for price variations that in turn impact affordability. Broader market fluctuations would also be absorbed by the region-month fixed effects in our regressions.

subsequent analyses, we present empirical results based on perceived income inadequacy (as per the data) and the regression-adjusted equivalent, for comparison.

Our main dependent variables measure the time to war and peace onset; we call them *number of months to war onset* and *number of months to peace onset* respectively. For each household in NLSS I, we construct the number of months to war onset by taking the difference between war onset month (of the district) and survey month (of the household).¹⁶ Similarly, for each household in NLSS II, the number of months to peace onset is defined as peace onset month (of the district) minus survey month (of the household). On average, NLSS I households were surveyed 36 months before their district joined the war and NLSS II households were surveyed 32 months before their district exited the war. The data offer substantial time variation in the number of months to war and peace onset across districts (see Table 2 for details).¹⁷

Notice that perception of income inadequacy is reported at the household level while war and peace onset can only be defined meaningfully at the district level. It stands to reason that our analyses cannot be run at the household level but rather at the district level. Nevertheless, our regressions need not rely on between-district variation only. Indeed, by exploiting the long period of enumeration within districts – the average survey duration within a district was 3.6 months and 5 months in NLSS I and II respectively – we are able to generate district-month averages of perceived income inadequacy to coincide with war and peace onset that also vary by district and month.¹⁸ In other words, our data inherently provide temporal (month) and spatial (district) variation for us to compare between and within districts, which facilitates more comprehensive analyses.

Despite the fact that our panel analyses cannot be run at the household level, we can still make use of the household-level variation in the data, albeit indirectly. For instance, household-level characteristics, including per capita consumption, are utilised in the regression adjustment of

¹⁶Three percent of households were surveyed after war onset month and so we set their number of months to war onset to zero; in other words, we censor the variable at zero. This censoring issue is likely not problematic, however, since such households only contribute to eight district-month observations (out of 255) in our pseudo panel. In any case, our results are robust to the exclusion of these eight observations (see Appendix Table A2).

¹⁷While it is possible to construct our dependent variables at a finer level – at the ward level, for example – we do not pursue this because of data coverage issues. Specifically, the NLSS covered nearly all Nepalese districts but only 273 wards covered in NLSS I and 420 wards covered in NLSS II out of 6684 wards, hence any analysis conducted at the ward level may be subject to severe sample selection bias.

¹⁸Note, however, that this aggregation is performed with an average of 12-14 households per district-month cell. In addition, the resulting pseudo panel is unbalanced since districts were surveyed across different months. We address issues about population representation of the pseudo panel in Section 6.2.

perceived income inadequacy, as described earlier.¹⁹

We make two final notes about our data. First, we assume cardinality in the perception data; this allows us to aggregate the perceived income inadequacy residuals obtained in the first-stage regression by district-month.²⁰ Second, for ease of interpretation, perceived income inadequacy is standardised to have zero mean and standard deviation of one.

4 Empirical Strategy

To study the relationship between perceived income inadequacy and the onset of war and peace, we estimate the following regression:

$$y_{drm} = \beta w_{drm} + \alpha_{rm} + \varepsilon_{drm} \quad (1)$$

where w_{drm} is perceived income inadequacy (regression-adjusted or not), averaged across households who were surveyed in district d of region r , in month m . Recall that the regression-adjusted measure is particularly useful for isolating perception from actual economic circumstances, and that w_{drm} is standardized with a zero mean and standard deviation of one. y_{drm} represents the number of months to war onset or the number of months to peace onset, depending on the hypothesis that we are testing. α_{rm} denotes region-month fixed effects, which control for region specific determinants for war and peace onset (Maoist influence, for example), month specific effects (such as cease fire or peace negotiation between Maoist and the government), and possible differential time effects across regions (such as seasonality). ε_{drm} is the error term, allowed to be correlated within a district. Our empirical design precludes the joint identification of district and month fixed effects.²¹

¹⁹The Di Tella et al. (2001) procedure also allows us to circumvent the potential confounding effects of per capita income if we were to include it as an additional control in our district-month regressions.

²⁰Alternatively, we can code perceived income inadequacy into a dummy variable; however, this will not preserve the sanctity of the original rankings (in the raw data) since the regression-adjusted measure will still have to be derived from residuals in the first-stage. In addition, the decision to go with the cardinal assumption is bolstered by the fact that (i) valuable information would be discarded by binarising the raw data (which already contain only three response categories), and (ii) treating subjective well-being measures in an ordinal or cardinal way makes little difference in practice (Ferrer-i Carbonell and Frijters, 2004). Indeed, binarising perceived income inadequacy will not change our qualitative conclusions (see Appendix Table A3).

²¹To clarify, the joint identification of district and month fixed effects would be precluded – due to perfect collinearity – in a balanced panel setting. Although our pseudo panel is unbalanced, we lack statistical power to jointly identify these fixed effects since district fixed effects alone would absorb most of the variation in our dependent variable.

In what follows, we report robust standard errors clustered at the district level, unless otherwise specified. Moreover, to account for the generated regressor, we also report bootstrapped standard errors for the coefficients of regression-adjusted perceived income inadequacy.²² District-month observations are weighted by sample size (i.e. the number of households surveyed in that district-month). Since more populous districts will have more surveyed households in the NLSS, these weights will ensure that our pseudo-panel sample remain representative.

Equation (1) effectively uses the month-on-month variation in perceived income inadequacy to examine its role in the determination of war and peace onset. Our coefficient of interest here is β . Guided by our hypotheses, we expect higher levels of perceived income inadequacy to hasten a district's war onset (i.e. shorter time to war) and delay a district's peace onset (i.e. longer time to peace). As such, we expect $\beta < 0$ on war onset and $\beta > 0$ on peace onset.

5 Results

5.1 War and Peace Onset

Table 3 presents our estimates from equation (1).²³ The effects on war onset are presented in columns (1)-(2). Column (1) shows the regression output where we use perceived income inadequacy averaged at the district-month level, while column (2) shows the regression output where we use the regression-adjusted equivalent. Our results across both specifications suggest that perceived income inadequacy does not, on average, predict the length of time it takes for a district to enter into conflict; this raises some doubts about our hypothesis that districts with civilians who perceive themselves as being poorer are likely to enter the war sooner.

On the other hand, our analyses of peace onset in columns (3)-(4) reveal that higher levels of

²²The bootstrapped standard errors are computed based on Ashraf and Galor (2013) and Lavy and Megalokonomou (2019). We draw a random sample (with replacement) from each district-month, which we then aggregate at the district-month to construct the regression-adjusted perceived income inadequacy. The process is repeated 1,000 times and the coefficients for regression-adjusted perceived income inadequacy are stored in each repetition. The bootstrapped standard errors are the standard deviations of the 1,000 coefficient estimates.

²³Note: although the regression adjustment procedure (Di Tella et al., 2001) already helps sidestep the potential confounding effects of per capita income, we can nonetheless demonstrate that our results are robust to the inclusion of controls such as a district's per capita consumption and poverty rate (Appendix Table A4). In fact, we find that neither a district's per capita consumption nor its poverty rate predicts war and peace onset (Appendix Table A5). In addition, our results are also qualitatively robust to the inclusion of an additional squared consumption term, and to using non-linear specifications such as the Cox proportional-hazards model; we omit the tabulated results here for brevity, but are happy to provide them upon request.

perceived income inadequacy do delay the onset of peace, confirming the hypothesis that districts with civilians who perceive themselves as being poorer are likely to exit the war (enter peace) later. Our results differ quantitatively depending on whether perceived income inadequacy is simply averaged at the district-month level or regression-adjusted to rid of observed household characteristics, but qualitatively we reach the same conclusion. In other words, our conclusions hold whether or not perceived income inadequacy is isolated from actual economic circumstance. In particular, based on the estimate in column (4), a one standard deviation increase in regression-adjusted perceived income inadequacy will delay peace onset by 0.752 months (23 days). This is equivalent to a postponement of peace by about one percent given an average conflict duration of 90 months. This result suggests that civilian perception of well-being is useful to the rebels in prolonging localised contests with the state.

5.2 Why Not War Onset?

Why did we not find an average effect on war onset? The Nepalese context – in which the state is very much stronger, militarily, than the insurgents – suggests an important “devil in the detail”: that the need for civilian support is what governs the relationship between perceived income inadequacy and war onset. Hence, we perhaps should not expect to find an association between perceived income inadequacy and war onset throughout the entire sample period, but only when propaganda campaigns were intensively executed.

Indeed, the need for civilian support varied markedly across time. We know, for example, that the insurgents adopted hit-and-run campaigns in the initial stages of the conflict, which may not require much manpower, whereas in subsequent phases they might have recruited more aggressively as they rapidly expanded geographical control. Intensive recruitment campaigns and rebel training camps also took place in several districts that entered the war during this expansionary phase; for example, in Dhading, Sankhuwa, and Sunsari (International Crisis Group, 2005; Subedi, 2013).

To test this “rebel recruitment period” scenario, we divide the 71 districts into 36 early-joiners (districts that experienced war onset first) and 35 late-joiners (war onset later) by using the median war onset month (October 1998, month=43) as the cutoff.²⁴ While October 1998 is the median war

²⁴Alternatively, we use August 1998 (in which case, 34 districts are defined as early-joiners and 37 districts are late-

onset month and hence a natural data-driven choice, it also marked the turning point of the conflict as the insurgents began to expand militarily around that time.²⁵ Hence, we expect late-joiner districts to better reflect the period of intense rebel recruitment.

By estimating equation (1) separately on the sample of early and late-joiners, we find that higher levels of perceived income inadequacy do indeed hasten war onset among the late-joiners, but not among the early-joiners (Table 4). Notably, the effect that we find among the late-joiners is rather large: based on the the estimate in column (4), a one-standard deviation increase in regression-adjusted perceived income inadequacy will induce war onset by 4.275 months (128 days). This implies an acceleration of 12 percent, given that districts take an average of 35 months, from the official start of the war in February 1996, to enter into war.

Our investigation here reveals how the complexity of insurgent warfare introduced heterogeneity in the need for civilian support, which in turn precludes us from detecting an average effect on war onset. Putting the results in Tables 3 and 4 into perspective, we conclude that perceived income inadequacy is a good predictor for both war and peace onset, but only when propaganda campaigns that evoke feelings of deprivation were intensively executed. In addition, our results complement those of Holtermann (2016) who finds that pre-existing rebel networks are important tools to sustain insurgency warfare especially when rebels are relatively weak; here, we find that insurgency expansion may also rely on the rebels' ability to tap into the local civilian pool.

5.3 Initiator of Violence

One additional feature that is unique to our conflict data is that war casualties can be traced to the violence perpetrator (either the government or the Maoists). This allows us to further determine whether the relationship between perceived income inadequacy and conflict is brought about by government-initiated violence or Maoist-initiated violence. If the underlying mechanism behind our main results is rebel recruitment, then we expect the perceived income inadequacy to be more robustly associated with Maoist-initiated violence than with government-initiated violence.

joiners) and December 1998 (in which case, 40 early-joiner districts and 31 late-joiner districts) as the cutoff point, and find qualitatively similar results.

²⁵In fact, the Maoists announced plans to develop their own military wings during the fourth expanded central committee meeting in August 1998, and then adopted a new strategy plan that emphasized stronger collaborations with civilians in October 1998. Consequently, relative rebel strength rose steeply in that period (Holtermann, 2016). In addition, early-joiners in our data tend to be districts clustered in the Central and Mid-Western regions, which is consistent with what we know from the existing literature (Sharma, 2004).

To check this, we first redefine war and peace onset by creating new dependent variables *number of months to first casualty* and *number of months to last casualty*, where the casualties are a result of either government-initiated (Table 5, Panel A) or Maoist-initiated violence (Table 5, Panel B). These dependent variables essentially capture the idea of war and peace onset in the same way as we have done previously, except that we additionally consider the identity of the initiator as reported in the conflict data. The regression results reveal that the perceived income inadequacy is indeed more strongly attached to Maoist-initiated violence than to government-initiated violence; the β coefficient in column (4) for instance is more than twice as large in Panel B as compared with that in Panel A (although both estimates are statistically significant).

Of course, the exercise above is imperfect to the extent that casualties that were caused by Maoist-initiated violence could reflect both extensive (ability to stage attacks) and intensive (kill efficiency) margins. Civilians who were recruited by the insurgents might have raised the Maoists' ability to initiate warfare, but they probably could not increase the deadliness of the rebel army. Nonetheless, we believe that the results in Table 5 are useful for demonstrating the importance of rebel recruitment.

5.4 Household Heterogeneity

If our results are indeed driven by rebel recruitment – or more generally, collaborative support from civilians – it may be worthwhile to investigate whether these phenomena are stronger among particular subsets of the population.

For instance, it is conceivable that households who experience a change in their perceived income inadequacy between “inadequate” and “just adequate” may be more crucial in this setting than those who switch between “just adequate” and “more than adequate” (Ferrer-i Carbonell and Frijters, 2004). In other words, it is conceivable that perceived income inadequacy has a non-linear relationship with war and peace onset. In this case, however, the underlying variation in perceived income inadequacy mainly stems from “inadequate” and “just adequate” since very few respondents (i.e. less than one percent) reported “more than adequate” income. As such, there is very little value in estimating a non-linear version of equation (1).

What we can do, however, is to check whether the effects are more visible among the most

marginalised groups – the low caste households – since they are more likely to be the target population of propaganda campaigns.²⁶ To this end, we extract high and low caste households from the sample and run the analyses respectively for each group.²⁷ The results, shown in Table 6, line up fairly well with our intuition. We find that low caste households are the ones driving our main result: in column (4) where we estimate the effects on peace onset, the β coefficient in Panel B (low caste households) is more than twice that of Panel A (high caste households), although both estimates are statistically significant. Specifically, a one standard deviation increase in regression-adjusted perceived income inadequacy among low caste households will postpone peace onset by 0.921 months (28 days), which is substantially larger than that found for the full sample in Table 3.

6 Robustness Checks

6.1 Alternative Definitions of War and Peace Onset

In the existing conflict literature, war and peace onset are typically defined (spatially) at the national level and (temporally) at annual frequency. Papers that attempt to examine war onset at more granular levels are often constrained by the variation in conflict determinants (see Silwal, 2013, for example). While we do not face such data constraints, we had to make decisions on how best to define war and peace onset at the district-month level. By using the first and last casualty in each district as a guide, we are in fact applying a convention that the literature uses at the national-year level to a much finer level (district-month). This raises, firstly, the issue of whether the occurrence of the first (last) casualty is a true reflection of war (peace) onset in a district, and secondly, whether our results are sensitive to alternative definitions. To address these concerns, we test the sensitivity of our results to several alternative definitions of war and peace onset here.

We begin by asking: what would be a reasonable range of dates for defining war and peace onset? It is natural to think of the first casualty of a given district to mark the earliest month that one might consider to be war onset; all other reasonable definitions of war onset should point to

²⁶Alternatively, one might expect rebel recruitment to be more intense (or more effective) towards rural households. However, we find that the effects which are estimated off the rural sample are not too different from those estimated off the full sample (see Appendix Table A6). This is likely due to the combination of two facts: (i) Maoist propaganda was not only aimed at rural households but more broadly at marginalised groups (low caste), and (ii) marginalised groups resided in both rural and urban areas.

²⁷The high castes are identified in the surveys as Chhetri, Brahman, Newar, Other High Caste; low castes are Damai, Kami, Muslim, Surki, and Other Low Caste. The reference category is the middle castes.

dates later than this point. Similarly, the last casualty of a given district would mark the latest date for peace onset; reasonable alternatives should place peace onset earlier than this point.

We then search for alternative definitions of war and peace onset that would conform to the time bands as suggested above. To do this, we first compute the cumulative casualties suffered by each district in the period 1996-2006. We then consider the onset of war to have occurred once the district has incurred x percent of its cumulative casualties, and the onset of peace to have taken place when x percent of cumulative casualties remain, where x takes integer values 1-15.²⁸ In other words, we allow the time stamps of war (peace) onset to be moved later (earlier) as we increase the value of x . Our regression analyses are then repeated using onset definitions that vary over x . The β coefficients for war and peace onset are plotted in Figures 4 and 5 respectively. Evidently, we continue to see very little predictive power of perceived income inadequacy on war onset (Figure 4), and a generally robust relationship between perceived income inadequacy and peace onset (Figure 5).

6.2 Pseudo Panel Construction

Because we do not observe every district in every month, our analyses rely on a district-month pseudo panel that is unbalanced to the extent that we only observe data from surveyed households. Consequently, two sample selection issues may arise. First is within-district selection: for a given district, surveyed households may be systematically different across time. Second is between-district selection: at a given point in time, surveyed districts (and therefore households) may be systematically different. Either of the above will render our pseudo panel a non-representative draw and therefore induce a sample selection bias.

To check for within-district selection, we collapse the district-month pseudo panel to a district cross-section, and estimate cross-sectional equivalents of equation (1) in Table 7, using alternative dependent variables (i) war or peace onset month, and (ii) district rank of war or peace onset.²⁹ These specifications allow us to sidestep within-district sample selection although they come at a

²⁸We could in principle try many more values of x , but 15 percent seems to be a reasonable upper bound. This is because the median percentage of cumulative casualties is 15.97 at the point in time when all districts have at least one casualty (March 2002, month=84), while the median percentage of remaining casualties is 6.94 when we observe for the first time a district to have no more casualty (July 2005, month=124).

²⁹War (peace) onset rank in this case is a running number such that the first district to encounter war (peace) is assigned a rank one, and so on.

cost of reduced sample variation (from district-month to district only). Nevertheless, we find that the results are qualitatively similar from those found in Table 3 – that perceived income inadequacy predicts peace onset but not war onset. Moreover, when we run balance tests across households by survey month – comparing households that were surveyed earlier or later than the median survey month in each district – we find that observed household characteristics are generally similar across households surveyed early or late, and this is true in both NLSS I and NLSS II (Appendix Table A7). Together, our results suggest that within-district selection on observables is unlikely to be problematic.

Moving on to between-district selection, we present several pieces of evidence. Firstly, we check to see if there is any heterogeneity in survey duration and survey start/end months across districts (Appendix Figures A2 and A3, for NLSS I and NLSS II respectively). To this end, we find that there are generally no large variations. The average survey duration was only about 4-5 months, and most districts begin their surveys in the same month (June 1995 for NLSS I, and June 2003 for NLSS II). It is unlikely therefore that between-district selection, if any, will be severe. Secondly, we look for balance in observables across districts that were (i) surveyed earlier or later than the median survey start month (September 1995 in NLSS I; April 2004 in NLSS II), or (ii) surveyed for a duration shorter or longer than the median (5 months in NLSS I; 9 months in NLSS II). Generally, we find no significant differences across observable characteristics (Appendix Tables A8 and A9), although there is some evidence suggesting that wealthier districts were surveyed first in NLSS I. In our war onset regressions, this could bias the size of our β estimates upward, raising concerns, although ultimately we did not detect an effect in Table 3.

6.3 Selective Sampling

Recall that we pool cross-sectional and panel data components from NLSS II to maximise the sample size of households in our analysis of peace onset. The spatial coverage of the panel component, however, is limited to 60 of the 71 districts represented in the cross-sectional counterpart, which potentially raises two sampling issues.

First, panel households may be systematically different from their cross-sectional counterparts, for instance, due to selective attrition. To examine this possibility, we focus on the 60 districts

covered in both the cross-sectional and panel data components, and test for observable differences between households across the two NLSS II components (Appendix Table A10). Our results show that that characteristics of these two sets of households are broadly similar along key dimensions such as per capita consumption and perceived income inadequacy, although there were differences in the characteristics of the household head. Nonetheless, a more direct test may be to simply remove the panel component and see if our earlier conclusions on peace onset hold; results from columns (1)-(2) of Table 8 show that they do.

A second issue is that the 60 panel districts may be oversampled. To address this, we employ a reweighting procedure that involves down-weighting each household-level observation by a factor that is equivalent to the share of cross-sectional households in a district-month. This preserves the information from a pooled sample while reducing the effective sample size to that of the cross section. The results, shown in columns (3)-(4) of Table 8, are nearly identical to what we found before, both qualitatively and quantitatively.

6.4 Relative Income

It is well established that income inequality is an important determinant of civil conflict (Maccours, 2010; Guariso and Rogall, 2017; Panza and Swee, 2020); thus, if a household's perception of economic well-being is possibly influenced by its relative position in a district's income distribution (Fafchamps and Shilpi, 2008), then our previous findings may in part be due to income dispersion rather than perceived economic well-being per se. In fact, in several other contexts, Miodownik and Nir (2016) and Rustad (2016) find that perception of income inequality can also amplify support for violence. To account for this, we additionally net out the effect of relative income on perceived income inadequacy when we construct the regression-adjusted measure of perceived income inadequacy. The results are shown in Table 9, and the accompanying regression-adjustment output are provided in columns (2)-(4) and (6)-(8) of Appendix Table A1. We construct three measures for this exercise: a (discrete) household consumption rank among all households surveyed within the district-month [columns (1) and (4)], a (continuous) household consumption z-score in a district-month [columns (2) and (5)], and an indicator for households whose per capita consumption is below the poverty line [columns (3) and (6)]. The empirical results mirror those

that we found earlier in Table 3, giving us assurances that our previous findings are not driven by income inequality.

6.5 District Characteristics

Since district fixed effects cannot be identified in equation (1), it is possible that some district characteristics might be correlated with war and peace onset as well as perceived income inadequacy, which may confound our estimates. To address this concern, we additionally control for a district's observed geographical factors — district highest elevation, road length (before war onset), and proportion of forest areas – as well as its climatic factors — sufficiency of (previous year) monsoon rainfall and a cereal suitability index.³⁰ In the peace onset regressions, we also include a control for the number of months since war onset. These additional controls do not change our earlier findings (see Table 10).

7 Conclusions

This paper examines whether civilian perception of economic well-being influences war and peace. We test these relationships by drawing on unique household survey data on perceived income inadequacy, and combining them with high-frequency (monthly) data on war and peace onset among 71 districts during the Nepalese Civil War.

We find that higher levels of perceived income inadequacy are associated with earlier war onset during periods of rebel recruitment, and with later peace onset in general. Importantly, our results hold regardless of whether we account for observed household characteristics, such as per capita consumption, which imply that perceptions of economic well-being matter for war and peace, over and above actual economic circumstances.

Our analyses confirm that civilian perception of economic well-being can affect their incentives to participate in irregular wars. In the eyes of the insurgents, civilians who perceive themselves as economically deprived are easy targets for rebel recruitment during the expansionary stage of their campaign, and useful collaborators for sustained guerilla warfare against the state after war

³⁰Geographical variables are from Do and Iyer (2010), which have been found to be correlated with conflict intensity. Monsoon rainfall is reported in the community module of NLSS in a categorical way: too low, sufficient, too high. We control for two out of the three categories in the regression (with too high being the reference category). The cereal suitability index is provided by the FAO.

onset. Insurgents therefore have strong incentives to influence the civilian perception, which in turn affects the course of the civil war, as we have demonstrated here empirically.

Our paper also brings to light important policy implications. In past decades, many international organisations, such as the World Bank, have devoted resources to reduce poverty among developing countries, many of which were at risk of civil war. While poverty is arguably an important factor to tackle, our results suggest that perception of economic well-being, which has so far been overlooked, should also be considered. In fact, as an early warning indicator of conflict, poverty is relatively easy to compute and monitor (because poverty data are widely available) whereas perception of economic deprivation is not. As such, our results highlight the need for researchers, governments, and policymakers, to pay more attention to collecting data on civilian perception of well-being as a potential source of policy-relevant information, in the context of civil war.

References

- Ashraf, Q. and O. Galor (2013). Genetic diversity and the origins of cultural fragmentation. *American Economic Review* 103(3), 528–33.
- BBC News (2009, September). Nepal raises conflict death toll. <http://news.bbc.co.uk/2/hi/8268651.stm>.
- Beath, A., F. Christia, and R. Enikolopov (2017). Can development programs counter insurgencies?: Evidence from a field experiment in afghanistan. *SSRN Working Paper* 1809677.
- Berman, E. and A. M. Matanock (2015). The empiricists' insurgency. *Annual Review of Political Science* 18, 443–464.
- Berman, E., J. N. Shapiro, and J. H. Felter (2011). Can hearts and minds be bought? the economics of counterinsurgency in iraq. *Journal of Political Economy* 119(4), 766–819.
- Besley, T. and T. Persson (2011). The logic of political violence. *The Quarterly Journal of Economics* 126(3), 1411–1445.
- Blattman, C. and E. Miguel (2010). Civil war. *Journal of Economic literature* 48(1), 3–57.
- Card, D., A. Mas, E. Moretti, and E. Saez (2012). Inequality at work: The effect of peer salaries on job satisfaction. *American Economic Review* 102(6), 2981–3003.
- Clark, A. E. (2003). Unemployment as a social norm: Psychological evidence from panel data. *Journal of Labor Economics* 21(2), 323–351.
- Collier, P. and A. Hoeffler (2004). Greed and grievance in civil war. *Oxford Economic Papers* 56(4), 563–595.
- Coupé, T. and M. Obrizan (2016). The impact of war on happiness: The case of ukraine. *Journal of Economic Behavior & Organization* 132, 228–242.
- Crost, B., J. Felter, and P. Johnston (2014). Aid under fire: Development projects and civil conflict. *American Economic Review* 104(6), 1833–56.

- Davis, P. K., E. V. Larson, Z. Haldeman, M. Oguz, and Y. Rana (2012). *Understanding and Influencing Public Support for Insurgency and Terrorism*. RAND Corporation.
- Di Tella, R., R. J. MacCulloch, and A. J. Oswald (2001). Preferences over inflation and unemployment: Evidence from surveys of happiness. *American Economic Review* 91(1), 335–341.
- Do, Q.-T. and L. Iyer (2010). Geography, poverty and conflict in nepal. *Journal of Peace Research* 47(6), 735–748.
- Dube, O. and J. F. Vargas (2013). Commodity price shocks and civil conflict: Evidence from colombia. *The Review of Economic Studies* 80(4), 1384–1421.
- Dyrstad, K. and S. Hillesund (2020). Explaining support for political violence: Grievance and perceived opportunity. *Journal of Conflict Resolution* forthcoming(1), 106–139.
- Eck, K. (2010). Recruiting rebels: indoctrination and political education in nepal. In M. Lawoti and A. K. Pahari (Eds.), *The Maoist Insurgency in Nepal*, pp. 33–41. Routledge.
- Fafchamps, M. and F. Shilpi (2008). Subjective welfare, isolation, and relative consumption. *Journal of Development Economics* 86(1), 43–60.
- Ferrer-i Carbonell, A. and P. Frijters (2004). How important is methodology for the estimates of the determinants of happiness? *The Economic Journal* 114(497), 641–659.
- Gaibullov, K. and T. Sandler (2019). What we have learned about terrorism since 9/11. *Journal of Economic Literature* 57(2), 275–328.
- Gawande, K., D. Kapur, and S. Satyanath (2017). Renewable natural resource shocks and conflict intensity: findings from india's ongoing maoist insurgency. *Journal of Conflict Resolution* 61(1), 140–172.
- Gomes, J. F. (2015). The political economy of the maoist conflict in india: an empirical analysis. *World Development* 68, 96–123.
- Goudie, R. J., S. Mukherjee, J.-E. De Neve, A. J. Oswald, and S. Wu (2014). Happiness as a driver of risk-avoiding behaviour: Theory and an empirical study of seatbelt wearing and automobile accidents. *Economica* 81(324), 674–697.

- Guariso, A. and T. Rogall (2017). Rainfall inequality, political power, and ethnic conflict in africa. *LICOS Discussion Paper Series*.
- Hirshleifer, J. (1995). Theorizing about conflict. *Handbook of Defense Economics 1*, 165–189.
- Holtermann, H. (2016). Relative capacity and the spread of rebellion: insights from nepal. *Journal of Conflict Resolution 60*(3), 501–529.
- Human Rights Watch (2007). Children in the ranks: The maoists' use of child soldiers in nepal. *Human Rights Watch*.
- International Crisis Group (2005). Nepal's maoists: Their aims, structure, and strategy. *Asia Report*.
- Joshi, M. and S. R. Pyakurel (2015). Individual-level data on the victims of nepal's civil war, 1996–2006: A new data set. *International Interactions 41*(3), 601–619.
- Kalyvas, S. N. (1999). Wanton and senseless? the logic of massacres in algeria. *Rationality and Society 11*(3), 243–285.
- Kalyvas, S. N. and M. A. Kocher (2009). The dynamics of violence in vietnam: An analysis of the hamlet evaluation system (hes). *Journal of Peace Research 46*(3), 335–355.
- Khanna, G. and L. Zimmermann (2017). Guns and butter? fighting violence with the promise of development. *Journal of Development Economics 124*, 120–141.
- Krueger, A. B. and D. D. Laitin (2008). Kto kogo?: A cross-country study of the origins and targets of terrorism. In P. Keefer and N. Loayza (Eds.), *Terrorism, economic development, and political openness*, pp. 148–173. Cambridge University Press New York.
- Krueger, A. B. and J. Malečková (2003). Education, poverty and terrorism: Is there a causal connection? *Journal of Economic perspectives 17*(4), 119–144.
- Kumar, D. (2006). Military dimension of the maoist insurgency. In L. R. Baral (Ed.), *Nepal: Facets of Maoist Insurgency*, pp. 85–117. Adroit, New Delhi.
- Lavy, V. and R. Megalokonomou (2019). Persistency in teachers' grading bias and effects on longer-term outcomes: University admissions exams and choice of field of study. *NBER Working Paper 26021*.

- Libois, F. (2016). Households in times of war. *Working Paper*.
- Lyall, J., Y.-Y. Zhou, and K. Imai (2019). Can economic assistance shape combatant support in wartime? experimental evidence from afghanistan. *American Political Science Review* forthcoming.
- Macours, K. (2010). Increasing inequality and civil conflict in nepal. *Oxford Economic Papers* 63(1), 1–26.
- Mehta, A. and M. Lawoti (2010). *Military dimensions of the “People’s War”*. Routledge, New York.
- Menon, N. and Y. Van der Meulen Rodgers (2015). War and women’s work: Evidence from the conflict in nepal. *Journal of Conflict Resolution* 59(1), 51–73.
- Miguel, E., S. Satyanath, and E. Sergenti (2004). Economic shocks and civil conflict: An instrumental variables approach. *Journal of Political Economy* 112(4), 725–753.
- Miodownik, D. and L. Nir (2016). Receptivity to violence in ethnically divided societies: A micro-level mechanism of perceived horizontal inequalities. *Studies in Conflict & Terrorism* 39(1), 22–45.
- Mironova, V., L. Mrie, and S. Whitt (2020). Commitment to rebellion: Evidence from syria. *Journal of Conflict Resolution* 64(4), 614–639.
- Mitra, A. and S. Mitra (2016). Redistribution of economic resources due to conflict: The maoist uprising in nepal. *MPRA Paper No. 75545*.
- Murshed, S. M. and S. Gates (2005). Spatial–horizontal inequality and the maoist insurgency in nepal. *Review of development economics* 9(1), 121–134.
- Nunn, N. and N. Qian (2014). Us food aid and civil conflict. *American Economic Review* 104(6), 1630–66.
- Ogura, K. (2008). *Seeking state power: The communist party of Nepal (Maoist)*. Berghof Forschungszentrum für Konstruktive Konfliktbearbeitung.
- Oswald, A. J., E. Proto, and D. Sgroi (2015). Happiness and productivity. *Journal of Labor Economics* 33(4), 789–822.

- Panza, L. and E. L. Swee (2020). Inter-ethnic income inequality and conflict intensification in mandate palestine. *CEPR Discussion Paper No. DP14366*.
- Pettigrew, J. (2003). Living between the maoists and the army in rural nepal. *Himalaya* 23(1), 9–20.
- Pivovarova, M. and E. L. Swee (2015). Quantifying the microeconomic effects of war using panel data: Evidence from nepal. *World Development* 66, 308–321.
- Powdthavee, N. (2009). How important is rank to individual perception of economic standing? a within-community analysis. *Journal of Economic Inequality* 7(3), 225–248.
- Pradhan, M. and M. Ravallion (2000). Measuring poverty using qualitative perceptions of consumption adequacy. *Review of Economics and Statistics* 82(3), 462–471.
- Ravallion, M. and M. Lokshin (2002). Self-rated economic welfare in russia. *European Economic Review* 46(8), 1453–1473.
- Rustad, S. A. (2016). Socioeconomic inequalities and attitudes toward violence: A test with new survey data in the niger delta. *International Interactions* 42(1), 106–139.
- Sharma, S. (2004). The maoist movement: an evolutionary perspective. In M. Hutt (Ed.), *Himalayan people's war: Nepal's Maoist rebellion*, pp. 38–57. Bloomington, Indiana: Indiana University Press.
- Shemyakina, O. N. and A. C. Plagnol (2013). Subjective well-being and armed conflict: Evidence from bosnia-herzegovina. *Social Indicators Research* 113(3), 1129–1152.
- Silwal, S. (2013). A spatial-temporal analysis of civil war: The case of nepal. *The Economics of Peace and Security Journal* 8(2), 20–25.
- Singhal, S. and R. Nilakantan (2016). The economic effects of a counterinsurgency policy in india: A synthetic control analysis. *European Journal of Political Economy* 45, 1–17.
- Subedi, D. B. (2013). From civilian to combatant: armed recruitment and participation in the maoist conflict in nepal. *Contemporary South Asia* 21(4), 429–443.
- Subedi, D. B. (2014). Mobilising insurgents: Ideology, coercion and security in the maoist insurgency in nepal. In H. Ware, B. Jenkins, M. Branaga, and D. B. Subedi (Eds.), *Cultivating*

Peace: Contexts, approaches and multidimensional models, pp. 55–70. United Kingdom: Cambridge Academic Publishing.

Tiwari, C. K. (2001). Maoist insurgency in nepal: internal dimensions. *South Asia Analysis Group* 187(1), 1–8.

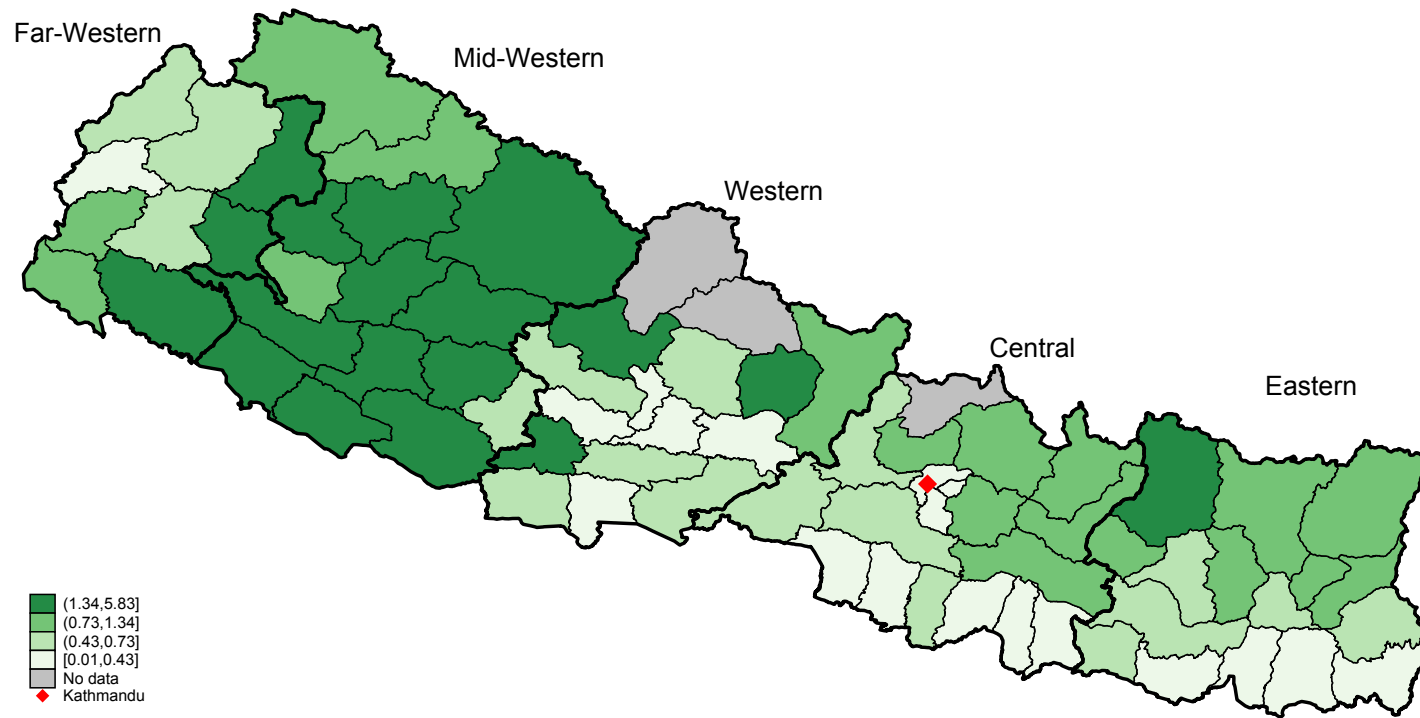
Valente, C. (2013). Education and civil conflict in nepal. *The World Bank Economic Review* 28(2), 354–383.

Vanden Eynde, O. (2018). Targets of violence: Evidence from india’s naxalite conflict. *The Economic Journal* 128(609), 887–916.

Ward, G. (2020). Happiness and voting: Evidence from elections in europe 1973-2014. *American Journal of Political Science* 64, 504–518.

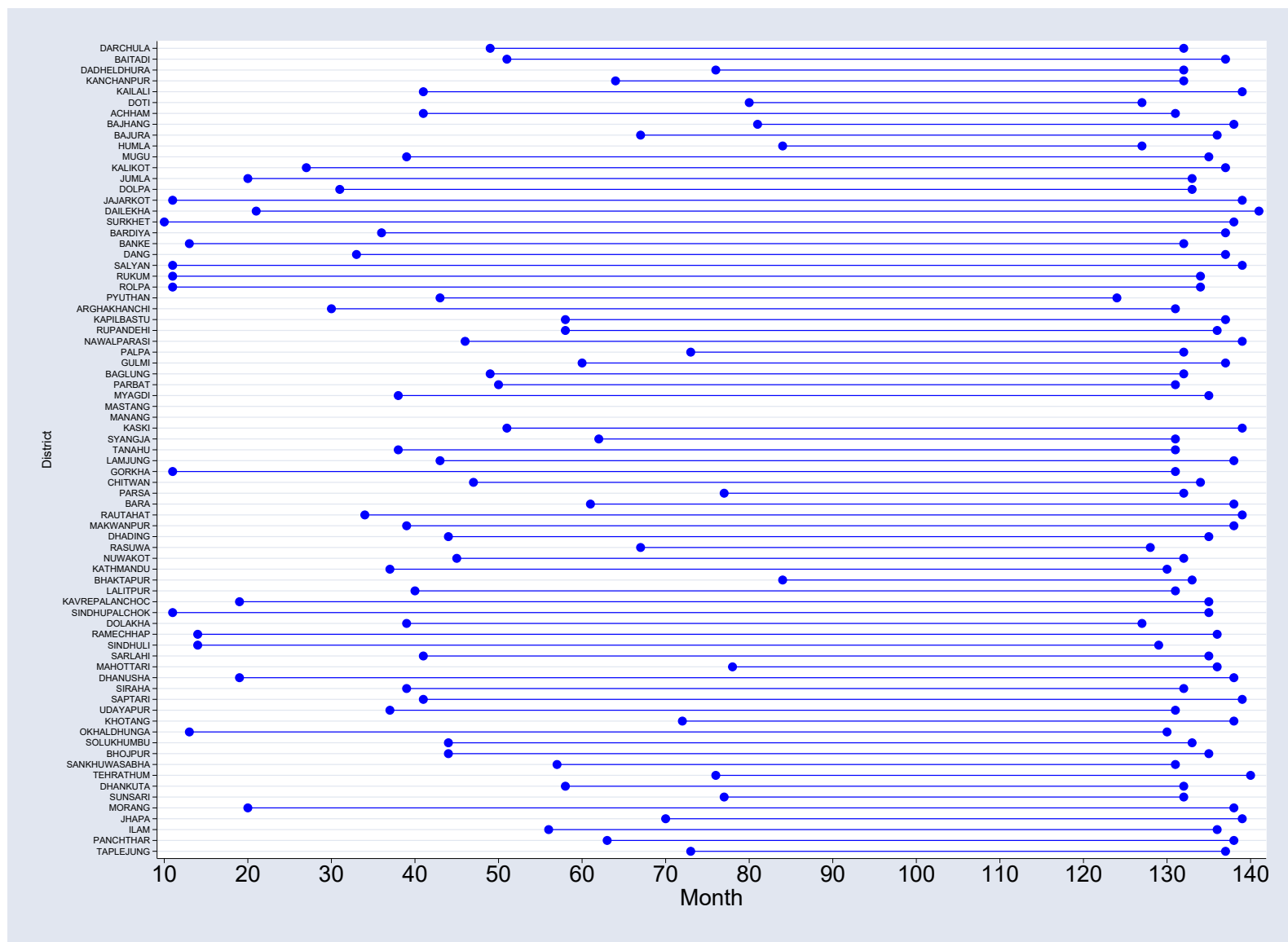
Zhan, H. (2019). Hidden costs of war: Evidence from nepal’s maoist insurgency. *SSRN Working Paper* 3677836.

Figure 1: Spatial Variation in War Casualty Rate



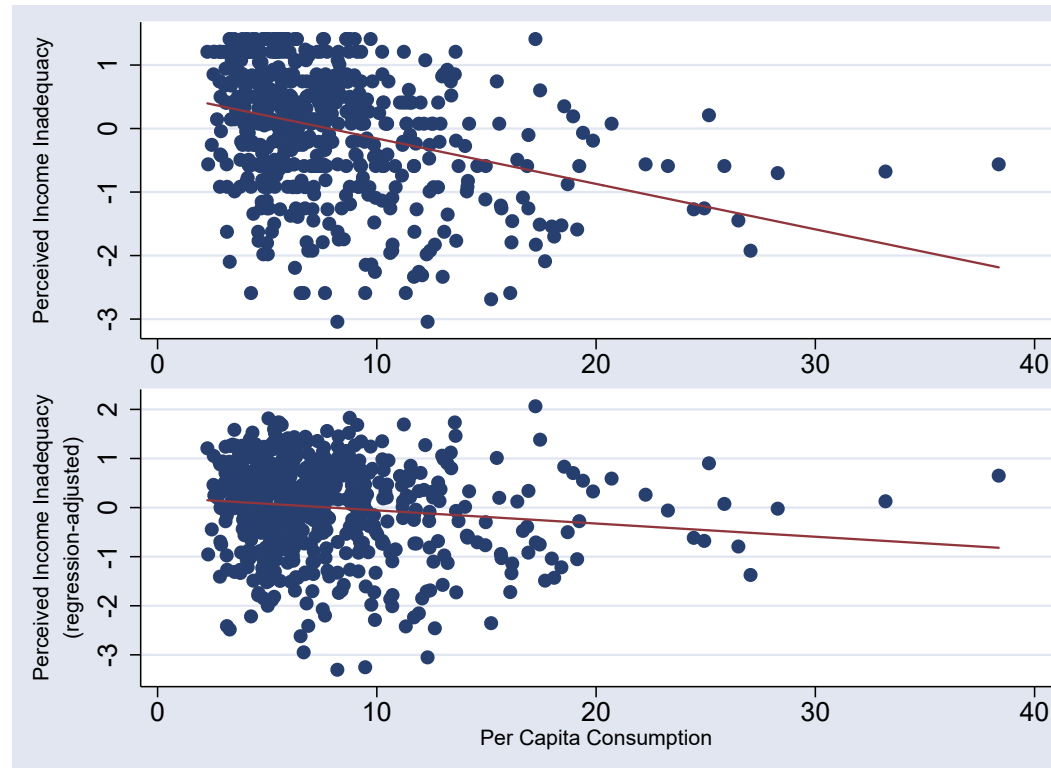
Notes: War casualty rate is defined as total casualties in each district normalized by thousand district population in 1991. Districts are categorised into four quartiles of casualty rate as depicted above.

Figure 2: District Heterogeneity in War and Peace onset



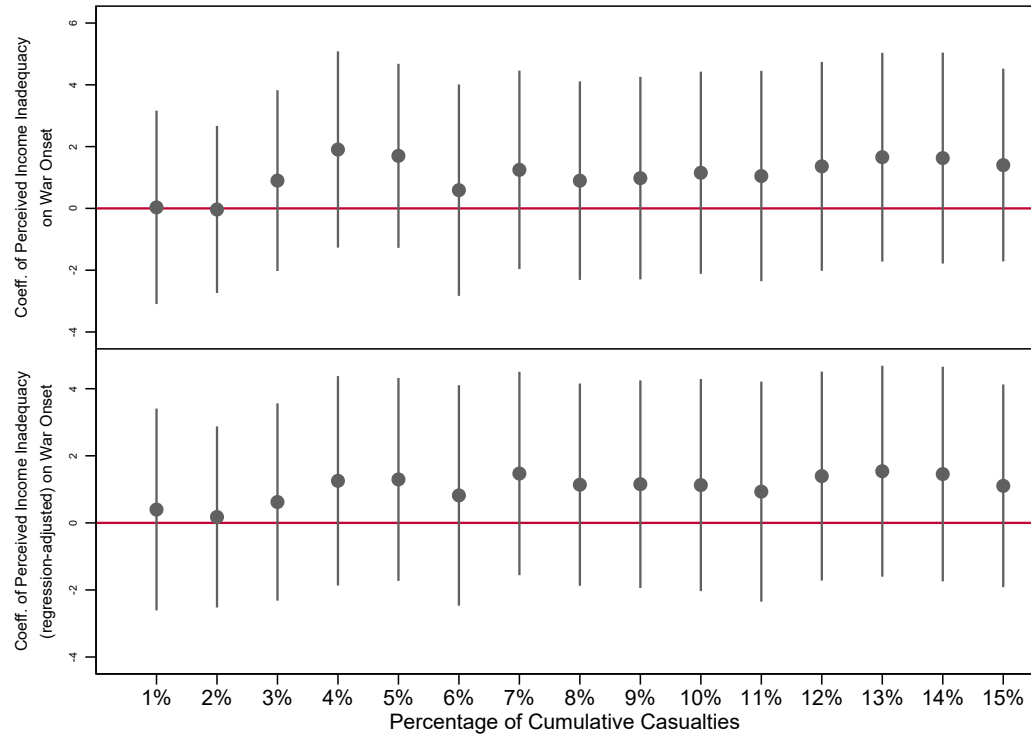
Notes: War duration depicted for each district, where the left point depicts war onset month (i.e. month in which the district incurred its first war casualty) and the right point depicts peace onset month (i.e. month in which the district incurred no more casualties from then on). The month counter is set such that month=1 refers to April 1995, the first survey month in NLSS I.

Figure 3: Perceived Income Inadequacy and Per Capita Consumption



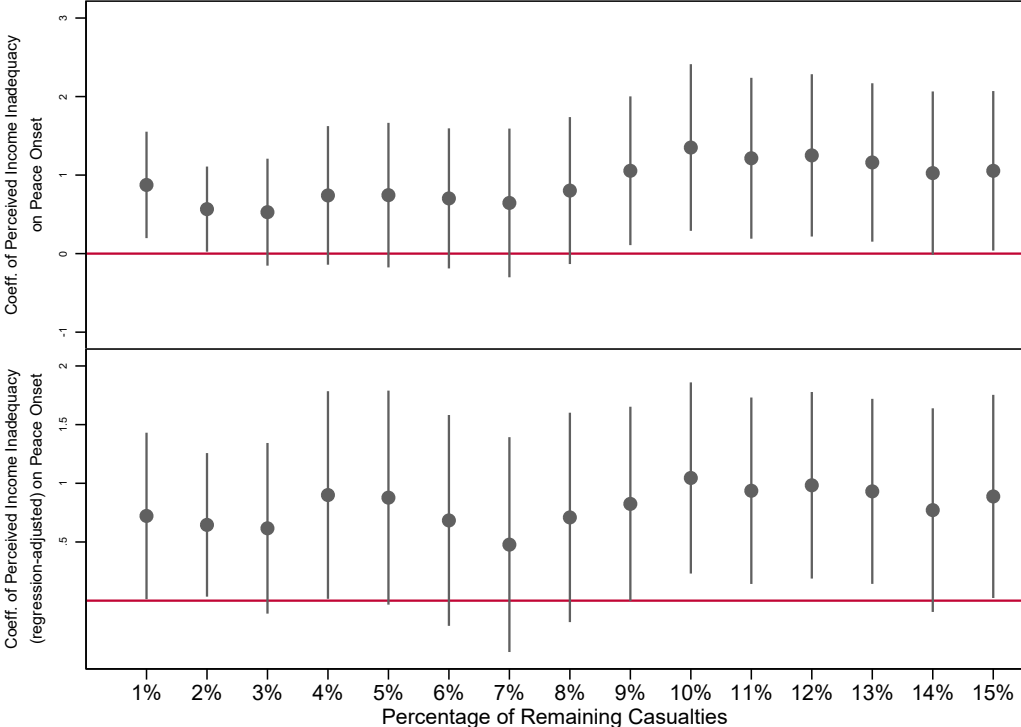
Notes: Scatter plots depict district-month averages of perceived income inadequacy and per capita consumption across households. Perceived income inadequacy is the household head's subjective assessment of whether their household income over the past one month is below the minimum consumption needs of the family. Regression-adjusted perceived income inadequacy additionally nets out household characteristics – household head's age, gender, caste, language, religion, and education, as well as household size and per capita consumption. Perceived income inadequacy, whether regression adjusted or not, are standardized to be mean zero and standard deviation one. Per capita consumption is measured in thousands of Nepalese rupee. The correlations in the top and bottom panels are -0.226 (p-value=0.000) and -0.017 (p-value=0.669) respectively.

Figure 4: Alternative Definitions of War Onset



Notes: Point estimates (with 90% confidence intervals) shown for each coefficient.

Figure 5: Alternative Definitions of Peace Onset



Notes: Point estimates (with 90% confidence intervals) shown for each coefficient.

Table 1: Summary Statistics (Household Characteristics)

	All	NLSS I	NLSS II
	(1)	(2)	(3)
Per Capita Consumption in ,000	8.365 [12.364]	7.117 [11.174]	9.176 [13.018]
Perceived Income Inadequacy	1.658 [0.494]	1.694 [0.477]	1.634 [0.503]
Household Size	5.748 [2.774]	6.035 [2.933]	5.560 [2.650]
High Caste	0.462 [0.499]	0.454 [0.498]	0.467 [0.499]
Low Caste	0.147 [0.354]	0.120 [0.325]	0.164 [0.370]
Male Household Head	0.831 [0.375]	0.865 [0.342]	0.809 [0.393]
Age	45.594 [14.280]	44.764 [14.438]	46.135 [14.151]
Ability to Read	0.505 [0.500]	0.457 [0.498]	0.536 [0.499]
Complete Primary School	0.247 [0.431]	0.206 [0.405]	0.273 [0.445]
Minority (Religion)	0.027 [0.162]	0.012 [0.109]	0.037 [0.188]
Minority (Language)	0.125 [0.330]	0.082 [0.275]	0.152 [0.359]
Observations	8012	3158	4854

Notes: Perceived income inadequacy is the household head's subjective assessment of whether their household income over the past one month is inadequate (2), just adequate (1), or more than adequate (0). Survey specifies that "adequate" means no more or less than what the respondent considers to be the minimum consumption needs of the family. The high castes are identified in the surveys as Chhetri, Brahman, Newar, Other High Caste; low castes are Damai, Kami, Muslim, Surki, and Other Low Caste. The reference category is the middle castes. Minority language refers to languages other than Nepali, Maithili, Bhojpuri, Tamang, Nawari. Minority religion refers to religions other than Hinduism, Buddhism, Islam. Households means are shown in each column. Standard deviations are in brackets.

Table 2: Summary Statistics (NLSS Surveys)

	NLSS I					NLSS II				
	Mean	SD	Median	Min	Max	Mean	SD	Median	Min	Max
Survey Month Number	8.504	2.961	9	1	15	102.164	3.318	102	96	110
Number of Months to Onset (First Casualty)	36.207	20.168	34	0	77					
Number of Months to Offset (No Remaining Casualty)						32.374	4.959	33	16	43
Survey Start Month	5.592	2.162	6	1	11	98.225	2.218	97	96	108
Survey End Month	10.915	2.156	11	6	15	106.127	1.788	106	100	110
Survey Duration										
Survey End Month minus Survey Start Month	5.324	3.409	5	0	12	7.901	2.924	9	0	12
Number of Survey Months	3.592	2.039	3	1	12	5.000	2.255	5	1	11
Number of District-Month Observations			255					355		

Table 3: War and Peace Onset

Dependent Variable:	Number of Months to War Onset		Number of Months to Peace Onset	
	(1)	(2)	(3)	(4)
Perceived Income Inadequacy	-0.402 (2.189)		1.013 (0.478)**	
Perceived Income Inadequacy (regression-adjusted)		0.503 (2.247) {0.718}		0.752 (0.370)** {0.163}***
Observations	255	255	355	355
R-squared	0.410	0.410	0.602	0.593
Region-Month FE	Y	Y	Y	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. Bootstrapped standard errors are shown in curly brackets. *significant at 10%; **significant at 5%; ***significant at 1%. In columns (2) and (4), regression-adjusted perceived income inadequacy is the district-month average of household-level perceived income inadequacy netting out household characteristics - household head's age, gender, caste, language, religion, and education, as well as household size and per capita consumption. Perceived income inadequacy, whether regression adjusted or not, are standardized to be mean zero and standard deviation one. All regressions are weighted by the number of households sampled in each district-month.

Table 4: War Onset (Early-Joiners vs Late-Joiners)

Dependent Variable:	Number of Months to War Onset			
	Early-Joiners		Late-Joiners	
	(1)	(2)	(3)	(4)
Perceived Income Inadequacy	-2.054 (2.344)		-4.428 (2.080)**	
Perceived Income Inadequacy (regression-adjusted)		-0.799 (2.336) {0.647}		-4.275 (2.061)** {0.800}***
Observations	135	135	120	120
R-squared	0.448	0.431	0.502	0.492
Region-Month FE	Y	Y	Y	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. Bootstrapped standard errors are shown in curly brackets. *significant at 10%; **significant at 5%; ***significant at 1%. The sample is split into 36 districts that experienced war onset before October 1998 (columns (1) and (2)) and 35 districts that experienced war onset after October 1998 (columns (3) and (4)). In columns (2) and (4), regression-adjusted perceived income inadequacy is the district-month average of household-level perceived income inadequacy netting out household characteristics - household head's age, gender, caste, language, religion, and education, as well as household size and per capita consumption. Perceived income inadequacy, whether regression adjusted or not, are standardized to be mean zero and standard deviation one. All regressions are weighted by the number of households sampled in each district-month.

Table 5: War and Peace Onset (Government vs Maoist-Initiated Violence)

Panel A: Government-Initiated Violence				
Dependent Variable:	Number of Months to First Casualty		Number of Months to Last Casualty	
	(1)	(2)	(3)	(4)
Perceived Income Inadequacy	0.128 (2.361)		0.556 (0.279)**	
Perceived Income Inadequacy (regression-adjusted)		0.844 (2.328) {0.751}		0.345 (0.256) {0.140}***
R-squared	0.448	0.449	0.648	0.644
Panel B: Maoist-Initiated Violence				
Dependent Variable:	Number of Months to First Casualty		Number of Months to Last Casualty	
	(1)	(2)	(3)	(4)
Perceived Income Inadequacy	-1.014 (2.263)		0.893 (0.554)	
Perceived Income Inadequacy (regression-adjusted)		-0.490 (2.215) {0.700}		0.848 (0.475)* {0.222}***
Observations	255	255	355	355
R-squared	0.453	0.452	0.430	0.428
Observations	255	255	355	355
Region-Month FE	Y	Y	Y	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. Bootstrapped standard errors are shown in curly brackets. *significant at 10%; **significant at 5%; ***significant at 1%. Panels A and B define casualties from violence initiated by the government and the Maoist respectively. In columns (2) and (4) of Panels A and B, regression-adjusted perceived income inadequacy is the district-month average of household-level perceived income inadequacy netting out household characteristics - household head's age, gender, caste, language, religion, and education, as well as household size and per capita consumption. Perceived income inadequacy, whether regression adjusted or not, are standardized to be mean zero and standard deviation one. All regressions are weighted by the number of households sampled in each district-month.

Table 6: War and Peace Onset (High Caste vs Low Caste Households)

Panel A: High Caste				
Dependent Variable:	Number of Months to War Onset		Number of Months to Peace Onset	
	(1)	(2)	(3)	(4)
Perceived Income Inadequacy	-0.922 (2.341)		0.425 (0.404)	
Perceived Income Inadequacy (regression-adjusted)		-0.369 (2.550) {1.193}		0.434 (0.332) {0.215}**
Observations	193	193	303	303
R-squared	0.565	0.564	0.650	0.650
Panel B: Low Caste				
Dependent Variable:	Number of Months to War Onset		Number of Months to Peace Onset	
	(1)	(2)	(3)	(4)
Perceived Income Inadequacy	-4.882 (2.608)*		0.923 (0.304)***	
Perceived Income Inadequacy (regression-adjusted)		-5.173 (2.525)** {1.742}***		0.921 (0.282)*** {0.225}***
Observations	127	127	233	233
R-squared	0.645	0.647	0.681	0.681
Region-Month FE	Y	Y	Y	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. Bootstrapped standard errors are shown in curly brackets. *significant at 10%; **significant at 5%; ***significant at 1%. Panels A and B use subsamples of high caste and low caste households respectively. High castes are: Chhetri, Brahman, Newar, and Other High Caste. Low castes are: Damai, Kami, Muslim, Surki, and Other Low Caste. In columns (2) and (4) of Panels A and B, regression-adjusted perceived income inadequacy is the district-month average of household-level perceived income inadequacy netting out household characteristics - household head's age, gender, caste, language, religion, and education, as well as household size and per capita consumption. Perceived income inadequacy, whether regression adjusted or not, are standardized to be mean zero and standard deviation one. All regressions are weighted by the number of households sampled in each district-month.

Table 7: War and Peace Onset (District-Level Specifications)

Dependent Variable:	Onset Month				Onset Rank			
	War Onset Month (1)	Peace Onset Month (2)	War Onset Month (3)	Peace Onset Month (4)	War Onset Rank (5)	Peace Onset Rank (6)	War Onset Rank (7)	Peace Onset Rank (8)
Perceived Income Inadequacy	-0.312 (2.425)		1.322 (0.607)**		-0.404 (2.395)		7.472 (3.758)*	
Perceived Income Inadequacy (regression-adjusted)		0.357 (2.730) {0.976}		1.199 (0.522)** {0.284}***		-0.801 (2.606) {0.944}		6.920 (3.105)** {1.692}***
Observations	71	71	71	71	71	71	71	71
R-squared	0.226	0.226	0.143	0.117	0.258	0.259	0.144	0.124
Region FE	Y	Y	Y	Y	Y	Y	Y	Y

Notes: Robust standard errors are shown in parentheses. Bootstrapped standard errors are shown in curly brackets. *significant at 10%; **significant at 5%; ***significant at 1%. Results are based on a cross-sectional sample of 71 districts. The dependent variable is war (peace) onset month in the left panel and war (peace) onset rank in the right panel. Rank is a running number where the first district to experience war (peace) is assigned 1, and so on. In even numbered columns, regression-adjusted perceived income inadequacy is the district average of household-level perceived income inadequacy netting out household characteristics - household head's age, gender, caste, language, religion, and education, as well as household size and per capita consumption. Perceived income inadequacy, whether regression adjusted or not, are standardized to be mean zero and standard deviation one. All regressions are weighted by the number of households sampled in each district.

Table 8: Peace Onset (Oversampling)

Dependent Variable:	Number of Months to Peace Onset			
	Cross-Sectional Sample		Reweighted	
	(1)	(2)	(3)	(4)
Perceived Income Inadequacy	0.887 (0.465)*		0.976 (0.479)**	
Perceived Income Inadequacy (regression-adjusted)		0.701 (0.357)* {0.169}***		0.739 (0.370)** {0.163}***
Observations	294	294	355	355
R-squared	0.618	0.611	0.598	0.590
Region-Month FE	Y	Y	N	N

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. Bootstrapped standard errors are shown in curly brackets. *significant at 10%; **significant at 5%; ***significant at 1%. Columns (1) and (2) use the cross-sectional component of NLSS II. In columns (3) and (4), household observations are re-weighted in our aggregation of households to the district-month level, to account for oversampling due to the pooling of cross-sectional and panel components of NLSS II. In columns (2) and (4), regression-adjusted perceived income inadequacy is the district-month average of household-level perceived income inadequacy netting out household characteristics - household head's age, gender, caste, language, religion, and education, as well as household size and per capita consumption. Perceived income inadequacy, whether regression adjusted or not, are standardized to be mean zero and standard deviation one. All regressions are weighted by the number of households sampled in each district-month.

Table 9: War and Peace Onset (Relative Income)

Dependent Variable:	Number of Months to War Onset			Number of Months to Peace Onset		
	(1)	(2)	(3)	(4)	(5)	(6)
Perceived Income Inadequacy (regression-adjusted, incld. consumption rank)	0.480 (2.074) {0.750}			0.591 (0.371) {0.164}***		
Perceived Income Inadequacy (regression-adjusted, incld. consumption z score)		0.360 (2.162) {0.694}			0.692 (0.333)** {0.149}***	
Perceived Income Inadequacy (regression-adjusted, incld. poverty indicator)			0.682 (2.315) {0.712}			0.786 (0.352)** {0.164}***
Observations	255	240	255	355	335	355
R-squared	0.410	0.414	0.411	0.589	0.595	0.594
Region-Month FE	Y	Y	Y	Y	Y	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. Bootstrapped standard errors are shown in curly brackets. *significant at 10%; **significant at 5%; ***significant at 1%. Regression-adjusted perceived income inadequacy is the district-month average of household-level perceived income inadequacy netting out household characteristics, household per capita consumption, and a relative income measure. Three relative income measures are considered: a household's per-capita consumption rank within district-month (columns (1) and (4)), a household's per-capita consumption z-score within district-month (columns (2) and (5)), and an indicator for households whose per-capita consumption is below the poverty line (columns (3) and (6)). Regression-adjusted perceived income inadequacy is standardized to be mean zero and standard deviation one. All regressions are weighted by the number of households sampled in each district-month.

Table 10: War Onset (with District Characteristics)

Dependent Variable:	Number of Months to War Onset		Number of Months to Peace Onset	
	(1)	(2)	(3)	(4)
Perceived Income Inadequacy	1.326 (2.314)		0.588 (0.285)**	
Perceived Income Inadequacy (regression-adjusted)		2.374 (2.168) {0.855}***		0.572 (0.285)** {0.139}***
Observations	255	255	355	355
R-squared	0.437	0.442	0.727	0.727
District Controls	Y	Y	Y	Y
Region-Month FE	Y	Y	Y	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. Bootstrapped standard errors are shown in curly brackets. *significant at 10%; **significant at 5%; ***significant at 1%. The district-level controls are: highest elevation, forest coverage, cereal suitability, average monsoon rainfall in the past year, road length before war onset, and [in columns (3) and (4)] the number of months since war onset. Regression-adjusted perceived income inadequacy is the district-month average of household-level perceived income inadequacy netting out household characteristics - household head's age, gender, caste, language, religion, and education, as well as household size and per capita consumption. Regression-adjusted perceived income inadequacy is standardized to be mean zero and standard deviation one. All regressions are weighted by the number of households sampled in each district-month.

A Appendix – Not For Publication

Figure A1: Timeline of the NLSS and War

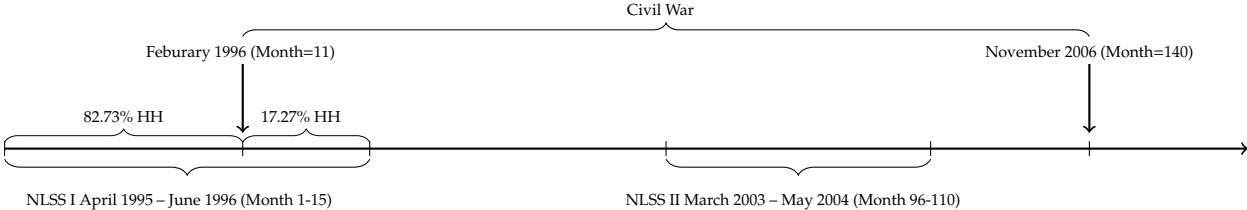
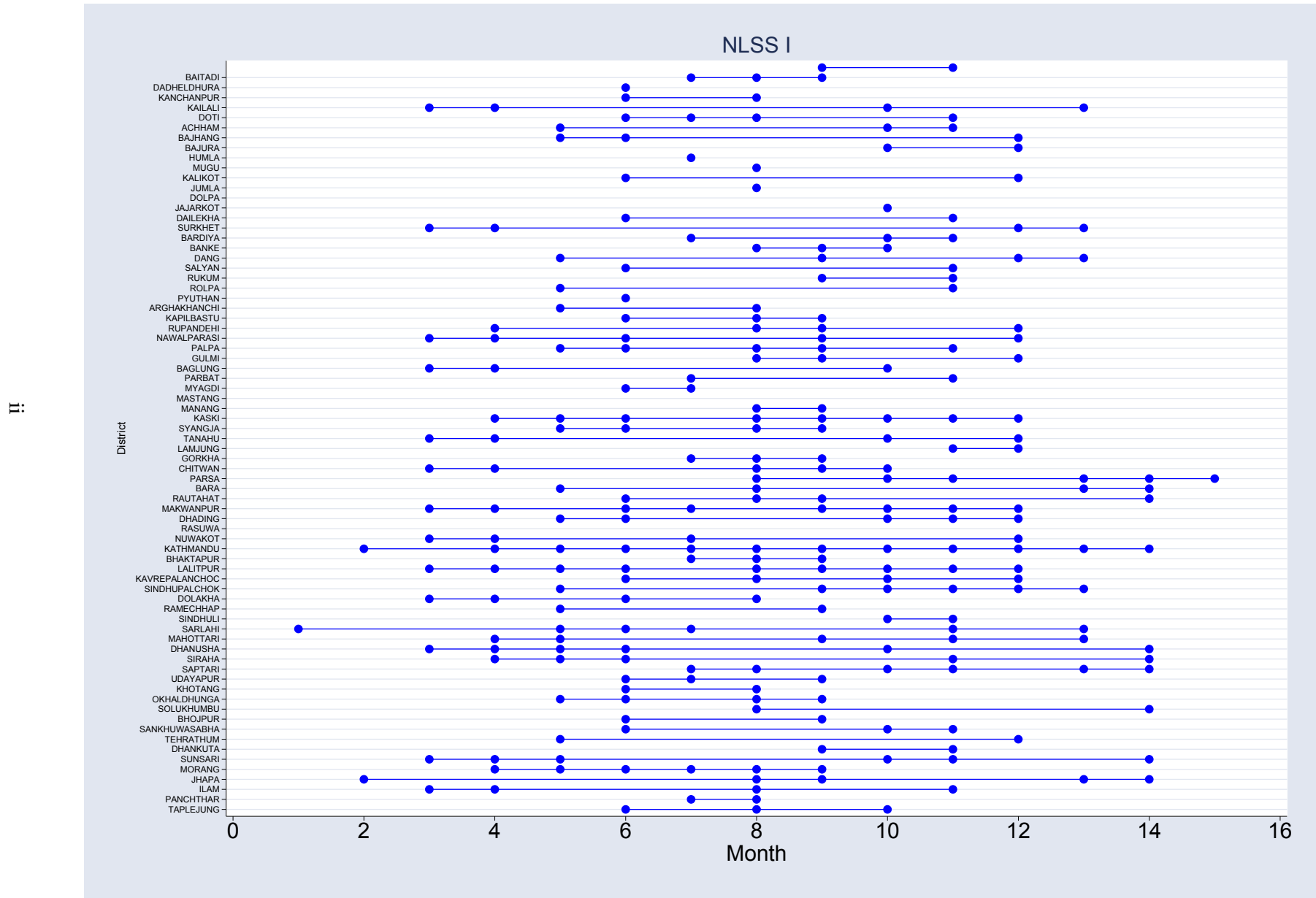
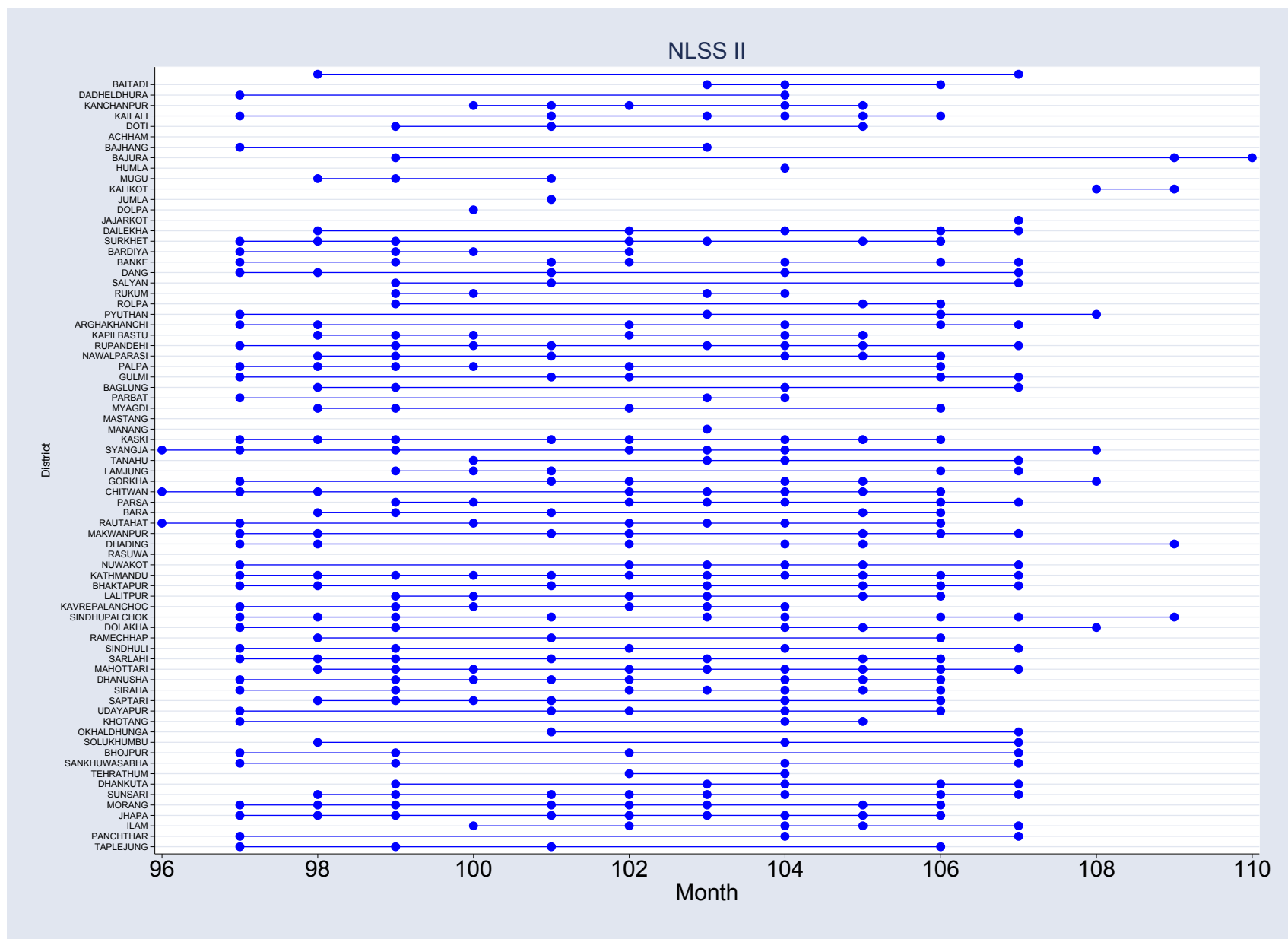


Figure A2: NLSS I Survey Month



Notes: Survey months depicted for each district, where the first point depicts survey start month and the last point depicts survey end month. The month counter is set such that month=1 refers to April 1995, the first survey month in NLSS I.

Figure A3: NLSS II Survey Month



Notes: Survey months depicted for each district, where the first point depicts survey start month and the last point depicts survey end month. The month counter is set such that month=1 refers to April 1995, the first survey month in NLSS I.

Table A1: First Stage Regression

Dependent Variable:	Perceived Income Inadequacy							
	NLSS I				NLSS II			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Per Capita Consumption in ,000	-0.004*** (0.001)	-0.002* (0.001)	-0.002** (0.001)	-0.003*** (0.001)	-0.005*** (0.001)	-0.003** (0.002)	-0.004*** (0.001)	-0.003*** (0.001)
Household Size	-0.006 (0.004)	-0.010** (0.004)	-0.009** (0.005)	-0.010** (0.004)	-0.005 (0.003)	-0.007** (0.003)	-0.006* (0.004)	-0.009*** (0.003)
High Caste	-0.030 (0.033)	-0.027 (0.031)	-0.029 (0.034)	-0.024 (0.033)	-0.010 (0.026)	-0.004 (0.026)	-0.007 (0.027)	-0.002 (0.025)
Low Caste	0.102*** (0.031)	0.095*** (0.033)	0.098*** (0.032)	0.092*** (0.032)	0.064*** (0.020)	0.059*** (0.019)	0.060*** (0.020)	0.057*** (0.020)
Male Household Head	0.049** (0.024)	0.054** (0.022)	0.057** (0.024)	0.049** (0.024)	0.017 (0.021)	0.017 (0.020)	0.021 (0.021)	0.009 (0.020)
Age	-0.003*** (0.001)	-0.002** (0.001)	-0.002** (0.001)	-0.002** (0.001)	-0.003*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)
Ability to Read	-0.135*** (0.031)	-0.122*** (0.026)	-0.130*** (0.032)	-0.114*** (0.027)	-0.109*** (0.021)	-0.102*** (0.019)	-0.107*** (0.021)	-0.087*** (0.018)
Complete Primary School	-0.115*** (0.028)	-0.089*** (0.029)	-0.102*** (0.030)	-0.098*** (0.030)	-0.095*** (0.021)	-0.077*** (0.018)	-0.093*** (0.021)	-0.075*** (0.019)
Minority (Religion)	0.082 (0.107)	0.068 (0.106)	0.076 (0.106)	0.095 (0.108)	0.092** (0.036)	0.087** (0.037)	0.093** (0.037)	0.085** (0.037)
Minority (Language)	0.007 (0.044)	0.026 (0.043)	0.006 (0.044)	0.005 (0.043)	0.035 (0.034)	0.033 (0.034)	0.035 (0.034)	0.032 (0.032)
Consumption Rank		-0.011*** (0.002)				-0.006*** (0.001)		
Consumption z-Score			-0.065*** (0.013)				-0.030*** (0.010)	
Below Poverty Line				0.117*** (0.029)				0.141*** (0.025)
Observations	3,158	3,158	3,143	3,158	4,854	4,854	4,834	4,854
R-squared	0.077	0.102	0.090	0.089	0.068	0.076	0.070	0.080

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. Columns (1)-(4) use the NLSS I samples and column (5)-(8) use the NLSS II samples to estimate residual perceived income inadequacy for the two-stage procedure. The high castes are identified in the surveys as Chhetri, Brahman, Newar, Other High Caste; low castes are Damai, Kami, Muslim, Surki, and Other Low Caste. The reference category is the middle castes. Minority language refers to languages other than Nepali, Maithili, Bhojpuri, Tamang, Nawari. Minority religion refers to religions other than Hinduism, Buddhism, Islam. Columns (2)-(4) and columns (6)-(8) also include an additional relative income measure. Three relative income measures are considered: a household's per-capita consumption rank within district-month (columns (2) and (6)), a household's per-capita consumption z-score within district-month (columns (3) and (7)), and an indicator for households whose per-capita consumption is below the poverty line (columns (4) and (8)).

Table A2: War Onset (Uncensored)

Dependent Variable:	Number of Months to War Onset	
	(1)	(2)
Perceived Income Inadequacy	0.072 (2.243)	
Perceived Income Inadequacy (regression-adjusted)		0.707 (2.302) {0.733}
Observations	247	247
R-squared	0.374	0.375
Region-Month FE	Y	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. Bootstrapped standard errors are shown in curly brackets. *significant at 10%; **significant at 5%; ***significant at 1%. The sample is restricted to district-months where households are interviewed before war onset. In column (2), regression-adjusted perceived income inadequacy is the district-month average of household-level perceived income inadequacy netting out household characteristics - household head's age, gender, caste, language, religion, and education, as well as household size and per capita consumption. Perceived income inadequacy, whether regression adjusted or not, are standardized to be mean zero and standard deviation one. All regressions are weighted by the number of households sampled in each district-month.

Table A3: Dummy Measure of Perceived Income Inadequacy

Dependent Variable:	Number of Months to War Onset		Number of Months to Peace Onset	
	(1)	(2)	(3)	(4)
Perceived Income Inadequacy (Dummy)	-0.543 (2.136)		0.929 (0.472)*	
Perceived Income Inadequacy Dummy (regression-adjusted)		0.319 (2.184) {0.699}		0.668 (0.372)* {0.160}***
Observations	255	255	355	355
R-squared	0.411	0.410	0.600	0.591
Region-Month FE	Y	Y	Y	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. Bootstrapped standard errors are shown in curly brackets. *significant at 10%; **significant at 5%; ***significant at 1%. Perceived income inadequacy is a dummy measure that takes value one if income is perceived to be “inadequate”, and zero if income is perceived to be “just adequate” or “more than adequate”. In columns (2) and (4), regression-adjusted perceived income inadequacy is the district-month average of household-level perceived income inadequacy netting out household characteristics - household head’s age, gender, caste, language, religion, and education, as well as household size and per capita consumption. Perceived income inadequacy, whether regression adjusted or not, are standardized to be mean zero and standard deviation one. All regressions are weighted by the number of households sampled in each district-month.

Table A4: War and Peace Onset: Perceived vs Objective

Panel A: Controlling for Per Capita Consumption				
Dependent Variable:	Number of Months to War Onset		Number of Months to Peace Onset	
	(1)	(2)	(3)	(4)
	Perceived Income Inadequacy	0.280 (2.465)		0.910 (0.379)**
Perceived Income Inadequacy (regression-adjusted)		0.792 (2.283) {0.758}		0.691 (0.362)* {0.165}***
Per Capita Consumption in ,000	0.439 (0.493)	0.441 (0.446)	-0.037 (0.121)	-0.078 (0.120)
R-squared	0.415	0.416	0.603	0.598
Panel B: Controlling for Poverty Rate				
Dependent Variable:	Number of Months to War Onset		Number of Months to Peace Onset	
	(1)	(2)	(3)	(4)
	Perceived Income Inadequacy	0.381 (2.462)		0.922 (0.385)**
Perceived Income Inadequacy (regression-adjusted)		0.769 (2.281) (2.281)		0.663 (0.369)* {0.166}***
% Below Poverty	-10.360 (8.947)	-10.196 (8.114)	0.588 (2.137)	1.445 (2.198)
R-squared	0.421	0.421	0.603	0.597
Observations	255	255	355	355
Region-Month FE	Y	Y	Y	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. Bootstrapped standard errors are shown in curly brackets. *significant at 10%; **significant at 5%; ***significant at 1%. In columns (2) and (4), regression-adjusted perceived income inadequacy is the district-month average of household-level perceived income inadequacy netting out household characteristics - household head's age, gender, caste, language, religion, and education, as well as household size and per capita consumption. Poverty rate is the percentage of households whose per capita consumption is below the poverty line in the district-month. Perceived income inadequacy, whether regression adjusted or not, are standardized to be mean zero and standard deviation one. All regressions are weighted by the number of households sampled in each district-month.

Table A5: War and Peace Onset: Objective

Dependent Variable:	Number of Months to War Onset		Number of Months to Peace Onset	
	(1)	(2)	(3)	(4)
Per Capita Consumption in ,000	0.411 (0.438)		-0.088 (0.118)	
% Below Poverty		-9.903 (8.007)		1.747 (2.189)
Observations	255	255	355	355
R-squared	0.415	0.420	0.590	0.590
Region-Month FE	Y	Y	Y	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. Poverty rate is the percentage of households whose per-capita consumption is below the poverty line in the district-month. All regressions are weighted by the number of households sampled in each district-month.

Table A6: Rural Sample

Dependent Variable:	Number of Months to War Onset		Number of Months to Peace Onset	
	(1)	(2)	(3)	(4)
	Perceived Income Inadequacy	1.056 (2.072)		0.860 (0.434)*
Perceived Income Inadequacy (regression-adjusted)		1.965 (2.042) {0.889}**		0.734 (0.407)* (0.203)***
Observations	206	206	301	301
R-squared	0.444	0.448	0.624	0.620
Region-Month FE	Y	Y	Y	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. Bootstrapped standard errors are shown in curly brackets. *significant at 10%; **significant at 5%; ***significant at 1%. The sample is restricted to rural households only. In columns (2) and (4), regression-adjusted perceived income inadequacy is the district-month average of household-level perceived income inadequacy netting out household characteristics - household head's age, gender, caste, language, religion, and education, as well as household size and per capita consumption. Perceived income inadequacy, whether regression adjusted or not, are standardized to be mean zero and standard deviation one. All regressions are weighted by the number of households sampled in each district-month.

Table A7: Balance Test (Within-District Selection)

	NLSS I			NLSS II		
	Surveyed Early	Surveyed Late	Diff (2)-(1)	Surveyed Early	Surveyed Late	Diff (5)-(4)
	(1)	(2)	(3)	(4)	(5)	(6)
Per Capita Consumption in ,000	7.263 [10.100]	6.890 [12.669]	-0.373 (0.476)	8.976 [10.816]	9.494 [15.903]	0.518 (0.501)
Perceived Income Inadequacy	1.701 [0.477]	1.682 [0.478]	-0.019 (0.026)	1.632 [0.504]	1.637 [0.503]	0.006 (0.022)
Household Size	6.014 [2.813]	6.070 [3.112]	0.056 (0.131)	5.604 [2.683]	5.490 [2.595]	-0.114 (0.086)
High Caste	0.478 [0.500]	0.417 [0.493]	-0.060 (0.040)	0.481 [0.500]	0.444 [0.497]	-0.037 (0.024)
Low Caste	0.126 [0.332]	0.110 [0.313]	-0.016 (0.020)	0.164 [0.370]	0.164 [0.370]	-0.000 (0.016)
Male Household Head	0.859 [0.348]	0.874 [0.332]	0.016 (0.014)	0.807 [0.395]	0.812 [0.391]	0.005 (0.013)
Age	45.044 [14.593]	44.327 [14.186]	-0.718 (0.616)	45.850 [14.096]	46.589 [14.231]	0.739 (0.472)
Ability to Read	0.453 [0.498]	0.463 [0.499]	0.010 (0.028)	0.546 [0.498]	0.521 [0.500]	-0.026 (0.018)
Complete Primary School	0.197 [0.398]	0.221 [0.415]	0.024 (0.021)	0.278 [0.448]	0.265 [0.441]	-0.013 (0.015)
Minority (Religion)	0.009 [0.096]	0.016 [0.126]	0.007 (0.004)	0.035 [0.183]	0.040 [0.196]	0.005 (0.008)
Minority (Language)	0.076 [0.265]	0.092 [0.290]	0.016 (0.019)	0.147 [0.354]	0.160 [0.367]	0.013 (0.021)
Observations	1924	1234	3158	2981	1873	4854

Notes: Households means are shown in columns (1)-(2) and (4)-(5) based on NLSS I and NLSS II respectively. Standard deviations are shown in brackets. Difference-in-means depicted in columns (3) and (6), where the corresponding standard errors are clustered at the district level and shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. Columns (1) and (4) use the sample of households that were surveyed before the median survey month in their district. Columns (2) and (5) use the sample of households that surveyed after the median survey month in their district. The high castes are identified in the surveys as Chhetri, Brahman, Newar, Other High Caste; low castes are Damai, Kami, Muslim, Surki, and Other Low Caste. The reference category is the middle castes. Minority language refers to languages other than Nepali, Maithili, Bhojpuri, Tamang, Nawari. Minority religion refers to religions other than Hinduism, Buddhism, Islam.

Table A8: Balance Test (Between-District Selection: Survey Start Month)

	NLSS I			NLSS II		
	Started Early (1)	Started Late (2)	Diff (2)-(1) (3)	Started Early (4)	Started Late (5)	Diff (5)-(4) (6)
War Onset Month	44.599 [19.586]	46.096 [23.466]	1.497 (6.397)	- -	- -	- -
Peace Onset Month	- -	- -	- -	134.421 [3.694]	134.776 [3.440]	0.355 (1.094)
Per Capita Consumption in ,000	7.651 [12.291]	4.906 [3.194]	-2.746*** (0.867)	10.033 [15.157]	7.444 [6.570]	-2.589* (1.342)
Perceived Income Inadequacy	1.685 [0.480]	1.730 [0.462]	0.045 (0.067)	1.621 [0.503]	1.660 [0.502]	0.039 (0.054)
Household Size	6.002 [2.953]	6.174 [2.844]	0.172 (0.182)	5.464 [2.552]	5.755 [2.828]	0.292 (0.231)
High Caste	0.447 [0.497]	0.485 [0.500]	0.039 (0.098)	0.486 [0.500]	0.427 [0.495]	-0.059 (0.077)
Low Caste	0.114 [0.318]	0.142 [0.349]	0.027 (0.036)	0.145 [0.352]	0.203 [0.402]	0.058* (0.035)
Male Household Head	0.862 [0.345]	0.875 [0.331]	0.012 (0.026)	0.807 [0.395]	0.811 [0.391]	0.004 (0.019)
Age	44.825 [14.470]	44.508 [14.313]	-0.317 (0.722)	45.958 [14.245]	46.494 [13.957]	0.536 (0.694)
Ability to Read	0.467 [0.499]	0.414 [0.493]	-0.053 (0.053)	0.563 [0.496]	0.483 [0.500]	-0.079 (0.049)
Complete Primary School	0.213 [0.410]	0.179 [0.384]	-0.034 (0.044)	0.300 [0.458]	0.217 [0.413]	-0.083* (0.044)
Minority (Religion)	0.014 [0.118]	0.003 [0.057]	-0.011 (0.008)	0.038 [0.190]	0.035 [0.184]	-0.003 (0.017)
Minority (Language)	0.081 [0.273]	0.088 [0.283]	0.007 (0.040)	0.153 [0.360]	0.151 [0.358]	-0.002 (0.052)
Observations	2544	614	3158	3248	1606	4854

Notes: Households means are shown in columns (1)-(2) and (4)-(5) based on NLSS I and NLSS II respectively. Standard deviations are shown in brackets. Difference-in-means depicted in columns (3) and (6), where the corresponding standard errors are clustered at the district level and shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. Columns (1) and (4) use the sample of households in districts with survey start month earlier than the median survey start month. Columns (2) and (5) use the sample of households in districts with survey start month later than the median survey start month. The high castes are identified in the surveys as Chhetri, Brahman, Newar, Other High Caste; low castes are Damai, Kami, Muslim, Surki, and Other Low Caste. The reference category is the middle castes. Minority language refers to languages other than Nepali, Maithili, Bhojpuri, Tamang, Nawari. Minority religion refers to religions other than Hinduism, Buddhism, Islam.

Table A9: Balance Test (Between-District Selection: Survey Duration)

	NLSS I			NLSS II		
	Short Duration	Long Duration	Diff (2)-(1)	Short Duration	Long Duration	Diff (5)-(4)
	(1)	(2)	(3)	(4)	(5)	(6)
War Onset Month	44.412 [23.222]	45.149 [18.699]	0.737 (5.507)	- -	- -	- -
Peace Onset Month	- -	- -	- -	135.652 [3.274]	132.782 [3.427]	-2.870*** (1.054)
Per Capita Consumption in ,000	5.448 [3.947]	8.022 [13.483]	2.575* (1.001)	8.503 [9.292]	10.238 [17.285]	1.735 (2.009)
Perceived Income Inadequacy	1.768 [0.435]	1.653 [0.494]	-0.115** (0.052)	1.660 [0.499]	1.593 [0.506]	-0.067 (0.058)
Household Size	6.077 [2.854]	6.013 [2.975]	-0.065 (0.208)	5.701 [2.753]	5.339 [2.464]	-0.362 (0.227)
High Caste	0.508 [0.500]	0.425 [0.494]	-0.083 (0.083)	0.402 [0.490]	0.568 [0.495]	0.166** (0.075)
Low Caste	0.145 [0.352]	0.106 [0.308]	-0.039 (0.031)	0.194 [0.396]	0.116 [0.321]	-0.078** (0.035)
Male Household Head	0.844 [0.363]	0.876 [0.330]	0.032 (0.023)	0.811 [0.392]	0.805 [0.396]	-0.006 (0.019)
Age	44.559 [14.327]	44.875 [14.499]	0.315 (0.688)	45.950 [13.957]	46.427 [14.451]	0.477 (0.690)
Ability to Read	0.414 [0.493]	0.480 [0.500]	0.066 (0.051)	0.506 [0.500]	0.583 [0.493]	0.077 (0.064)
Complete Primary School	0.163 [0.370]	0.230 [0.421]	0.067* (0.039)	0.245 [0.430]	0.316 [0.465]	0.070 (0.064)
Minority (Religion)	0.008 [0.090]	0.014 [0.118]	0.006 (0.010)	0.039 [0.193]	0.033 [0.180]	-0.005 (0.018)
Minority (Language)	0.076 [0.265]	0.086 [0.280]	0.010 (0.036)	0.157 [0.363]	0.145 [0.352]	-0.012 (0.047)
Observations	1110	2048	3158	2970	1884	4854

Notes: Households means are shown in columns (1)-(2) and (4)-(5) based on NLSS I and NLSS II respectively. Standard deviations are shown in brackets. Difference-in-means depicted in columns (3) and (6), where the corresponding standard errors are clustered at the district level and shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. Columns (1) and (4) use the sample of households in districts with survey duration shorter than the median survey duration. (2) and (5) use the sample of households in districts with survey duration longer than the median survey duration. The high castes are identified in the surveys as Chhetri, Brahman, Newar, Other High Caste; low castes are Damai, Kami, Muslim, Surki, and Other Low Caste. The reference category is the middle castes. Minority language refers to languages other than Nepali, Maithili, Bhojpuri, Tamang, Nawari. Minority religion refers to religions other than Hinduism, Buddhism, Islam.

Table A10: Balance Test (NLSS II Cross-Sectional Versus Panel Households)

	Cross-Sectional households	Panel households	Difference (2) - (1)
	(1)	(2)	(3)
Household Size	5.502 [2.638]	5.741 [2.698]	0.239** (0.115)
High Caste	0.453 [0.498]	0.481 [0.500]	0.028 (0.033)
Low Caste	0.164 [0.370]	0.173 [0.379]	0.009 (0.024)
Male Household Head	0.805 [0.396]	0.811 [0.392]	0.006 (0.014)
Age	45.628 [14.256]	48.815 [13.526]	3.188*** (0.585)
Ability to Read	0.554 [0.497]	0.472 [0.499]	-0.081*** (0.026)
Complete Primary School	0.287 [0.452]	0.243 [0.429]	-0.044** (0.018)
Minority (Religion)	0.041 [0.199]	0.027 [0.162]	-0.014** (0.006)
Minority (Language)	0.146 [0.353]	0.171 [0.377]	0.025 (0.032)
Per Capita Consumption in ,000	9.352 [12.099]	9.349 [17.077]	-0.003 (0.510)
Perceived Income Inadequacy	1.628 [0.504]	1.630 [0.504]	0.002 (0.024)
Survey Month	102.125 [3.271]	102.319 [3.479]	0.194 (0.483)
Observations	3668	959	4627

Notes: Households means are shown in columns (1)-(2), standard deviations shown in brackets. Difference-in-means depicted in column (3), where the corresponding standard errors are clustered at the district level and shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. The 3668 cross-sectional households belong to the same 60 districts of the panel households. The high castes are identified in the surveys as Chhetri, Brahman, Newar, Other High Caste; low castes are Damai, Kami, Muslim, Surki, and Other Low Caste. The reference category is the middle castes. Minority language refers to languages other than Nepali, Maithili, Bhojpuri, Tamang, Nawari; Minority religion refers to religions other than Hinduism, Buddhism, Islam.