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Do Perceptions of Economic Well-Being Predict the Onset of War and Peace?

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ABSTRACT

Do Perceptions of Economic Well-Being Predict the Onset of War and Peace?*

While economic deprivation is an important determinant of civil conflict, it cannot completely explain the incentives for warfare. In irregular wars, for example, both incumbents and insurgents may employ various tactics to win the hearts and minds of civilians in order to muster territorial control. This paper considers whether and to what extent civilian perception of economic well-being, possibly influenced by such tactics, predicts war and peace onset. Using unique data bracketing the onset of the Nepalese Civil War, we find that higher levels of perceived income adequacy are associated with later war onset during periods of rebel recruitment, and with earlier peace onset in general. These results hold regardless of whether we account for actual economic circumstance, and are especially strong among marginalised communities. Our results suggest that civilian perception of 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 economic 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 grievance (Collier and Hoeffler, 2004; Miguel, Satyanath, and Sergenti, 2004; Berman, Shapiro, and Felter, 2011; Besley and Persson, 2011; Dube and Vargas, 2013; Nunn and Qian, 2014). Economic conditions, however, cannot completely explain the incentives for warfare. Given two communities with identical income, the one that perceives itself as being poorer may be more likely to choose combat ahead of compromise (Hirshleifer, 1995). Consequently, perceptions of economic well-being may also determine conflict.

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). Such contests typically feature state investment in development projects (Crost, Felter, and Johnston, 2014; Beath, Christia, and Enikolopov, 2017; Khanna and Zimmermann, 2017) and insurgent coercion or indoctrination (Berman, Shapiro, and Felter, 2011; Subedi, 2013), triggering variations in actual and perceived economic well-being respectively. Civilians who perceive themselves as economically deprived 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. Therefore, localities that perceive themselves to be poor are more likely to enter war and less likely to enter peace.

In this paper, we test the aforementioned idea on the Nepalese Civil War. At first glance, spatial differences in conflict intensity appear to be inversely correlated with perceptions of economic well-being (Figure 1), suggesting that districts with inferior perception of economic well-being did experience higher levels of conflict during the war. Our intent, however, is to take this one step further by examining whether districts with perceivably-poorer civilians were more likely to enter war and less likely to enter peace. To this end, we combine conflict data that provide information about the onset of war and peace across different districts with nationally-representative survey data on subjective assessment of income adequacy to create a district-time panel data set. The subject assessment modules were uniquely employed both before and during the war, which allow us to construct district-level perception measures that coincide with different stages of the war at a particularly high frequency (month).

We find that higher levels of perceived income adequacy are associated with later war onset during periods of rebel recruitment when the insurgents were expanding territorial control, more

than two years after the official start of the war (Macours, 2010). For those districts that joined the war during the insurgent expansion, a one-standard deviation increase in perceived income adequacy is associated with a delay of war onset by 128-133 days. This is equivalent to a delay of up to 13 percent given that districts took an average of 35 months to sink into conflict.[1] Once a district experiences war onset, higher levels of perceived income adequacy will induce peace onset by 23-30 days, which translates into a hastening of peace by about 1 percent given an average conflict duration of 90 months. This implies that in general the 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.

Our empirical findings are qualitatively similar whether we consider perceived income adequacy, or a regression-adjusted measure (Di Tella, MacCulloch, and Oswald, 2001) where the level of perceived income adequacy is not explained by individual or household circumstances, including per capita consumption. The latter specification is particularly useful for isolating perception from actual economic circumstances, which demonstrates the role of perceived economic well-being in predicting war and peace onset. Moreover, we detect evidence of a stronger relationship between perceived income adequacy and conflict among low caste households, which is consistent with notion that marginalised populations are the primary target of propaganda campaigns.

This paper 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 an important actor (Berman and Matanock, 2015; Berman, Shapiro, and Felter, 2011; Beath, Christia, and Enikolopov, 2017; Khanna and Zimmermann, 2017). We add perception of well-being to the list of determinants of civil war, and clarify conceptually the channels through which it relates to war and peace onset. While we are not the first to suggest that feelings of grievance can incentivise participation in conflict, to our knowledge this paper is the first to document this phenomenon empirically.

On consequences of civil wars, recent research have demonstrated that wars can be detrimental to subjective well-being in general (Shemyakina and Plagnol, 2013; Coupe and Obrizan, 2016); we show here that the relationship in fact exists in the other direction. Our findings are also 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), efforts at the workplace (Oswald, Proto, and Sgroi, 2015), voting behaviours (Ward, 2019), and the decision to engage in risky health behaviours (Goudie,

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[1]The 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.

Mukherjee, De Neve, Oswald, and Wu, 2014).

The rest of the paper is structured as follows. We first describe the background on the Nepalese Civil War in Section 2 and explain our data in Section 3. Next, we present our empirical strategy in Section 4 and discuss our main results in Section 5. Robustness checks are presented in Section 6. Section 7 concludes.

2 Background

Nepal is a small landlocked country in South Asia that is predominantly agrarian. Geographically, it comprises 75 districts across five geographical regions (eastern, central, western, mid-western and far-western). For much of its modern history, it 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 *janajatis*) fighting for equal opportunity on their behalf and promising change for the better. Marginalised Nepalese who held strong frustrations and grievances towards the state are 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 western Nepal 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 began to execute coordinated attacks across the country (Sharma, 2004).

During this period of Maoist expansion, many youths especially those from poor and marginalised background who saw a bleak future were motivated by Maoist ideology and joined their ranks as combatants. Many others were also compelled by the Maoists' "One House-One Guerrilla" campaign and indoctrination camps to participate in the insurgency (Human Rights Watch, 2007;

Macours, 2010; Mehta and Lawoti, 2010).[2] It is thus unsurprising to find that rebel troop strength rose steeply as the conflict intensified.[3] Indeed, as the Maoists changed their combat strategy from hit-and-run in a few districts to organised attacks across the country, we expect them to step up their rebel recruitment campaign, so we hypothesize that districts with perceivably-poorer civilians were more likely to enter the war during this period.

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. A large wave of violence soon followed, which led Nepal to its highest annual death toll in 2002.

After nearly all of the country's districts became engulfed in conflict, the Maoists relied heavily on civilians for manpower, food, and shelter (Davis, Larson, Haldeman, Oguz, and Rana, 2012; Zhan, 2019). Civilian support was in turn elicited through various means of propaganda. For example, mass political gatherings that emphasized ideas of economic deprivation and social oppression were held constantly, with the objective of bringing the exploiters (landowners and government officials) to justice (Eck, 2010; Human Rights Watch, 2007). Furthermore, they ran door-to-door campaign to discuss with villagers about their economic difficulties and framed the Maoist movement as a means to address their issues (Eck, 2010). As such, they not only reinforced the villagers' feelings of grievance but connected those perceptions with the necessity of using violence to improve their circumstances. These activities were very effective as the Maoists were able to advocate their complex ideology in an easy and emotional manner to engage with civilians (Subedi, 2013). Such indoctrination campaigns were the key to the Maoists' ability to prolong localised contests with the state, and we hypothesize that districts with perceivably-poorer civilians were less likely to exit the war during this period.

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

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[2]Counter-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 Maoist. This drove some civilians into joining the Maoists to avenge the death of their kin or to seek for protection from state abuse (Tiwari, 2001; Pettigrew, 2003).

[3]According to Holtermann (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.

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 adequacy.

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 a total death toll of 13,329.[4] 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.[5] Districts incur an average of 207 casualties during the war, but there is substantial spatial variation (Figure 2) as the maximum (814) is nearly 40 times that of 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.[6] 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 3). By our definition, Surkhet is the first district to sink into conflict in January 1996 (month=10), while Bhaktapur and

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[4]This 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).

[5]To 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.

[6]In what follows, we 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.

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 Figure 4.

The NLSS surveys cover nearly all 75 Nepalese districts, with the exception of Mustang, Rasuwa, Dolpa, and Achham.[7] 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 adequacy for each district at a given point in time; potential oversampling issues are addressed in Section 6.3. After removing observations with missing information, this 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 demographics, consumption expenditure and most importantly, perceived income adequacy. 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 adequacy). The summary statistics are presented in Table 1.

We retrieve perceptions of income adequacy from the subjective assessment modules that were employed in NLSS I and NLSS II. The survey question asks household heads to provide their

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[7]Mustang 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.

opinion on whether their household income over the past one month is "inadequate" (0), "just adequate" (1), or "more than adequate" (2) for their family's needs. 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 adequacy in the data is 0.348, which leans toward inadequacy. Indeed, the vast majority (68 percent) of respondents perceived their income to be inadequate and barely one percent indicated that their income was more than adequate.

It is possible that perceptions of income adequacy simply reflect actual economic circumstance. To isolate perception, therefore, we follow Di Tella, MacCulloch, and Oswald (2001) to construct a regression-adjusted measure of perceived income adequacy. We regress the household's perceived income adequacy on its observed characteristics, including per capita consumption, to partial out the observed components and take the residuals as our regression-adjusted measure of (unob-served) perception.[8] The regression results are shown in Table Appendix A1. It shows that per capita consumption, household size, household head's age, caste and schooling attainment are all correlated with perceived income adequacy in very sensible ways. This gives us confidence that our regression-adjusted measure of perceived income adequacy is void of observable components and thus likely to perception net of actual economic circumstance. For subsequent analyses, we present empirical results based on perceived income adequacy (as per the data) and the regression-adjusted equivalent, for comparison.

Since the enumeration of the surveys took several months to complete within a district (the average survey duration was 3.6 months and 5 months in NLSS I and II respectively), we are able to then aggregate reported as well as regression-adjusted perceived income adequacy up to the district-month level, to create temporal (month) variation on top of spatial (district) variation.[9] This aggregated measure of perceived income adequacy (regression-adjusted or not) then becomes our key independent variable, which we standardize to become a measure with zero mean and standard deviation of one, for ease of interpretation.

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

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[8]The household characteristics that we employ 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. 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.

[9]Appendix Figure A1 shows the density of districts that were surveyed in each month.

(of the district) and survey month (of the household).[10] 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).

4 Empirical Strategy

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

$$y_{drm} = \beta w_{drm} + \alpha_{rm} + \varepsilon_{drm} \tag{1}$$

where w_{drm} is perceived income adequacy (regression-adjusted or not), averaged across households who were surveyed in district d of region r, in month m. Recall 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. α_{rm} denotes region-month fixed effects, which control for region specific determinants for war and peace onset, for example Maoist influence; month specific effects such as cease fire or peace negotiation between Maoist and the government; and possible differential time effects among regions. ε_{drm} is the error term, allowed to be correlated within a district. District-month observations are weighted by sample size (i.e. the number of households surveyed in that district in that month).

Since our dependent variable decreases linearly over time (month) in a given district by design, we are unable to include both district fixed effects and month fixed effects. As such, we can only include region fixed effects and month fixed effects (or region-month fixed effects) in our analysis.[11]

Equation (1) effectively examines perceived income adequacy as a predictor of war and peace onset. Our coefficient of interest here is β. Guided by our hypotheses, we expect higher levels of perceived income adequacy to delay a district's war onset (i.e. longer time to war) and hasten a

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[10]Three 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, and furthermore we confirm in Appendix Table A2 that our results are robust to the exclusion of these eight observations.

[11]In theory, the pseudo panel is unbalanced – since districts were surveyed across different months, so not every district is observed in every month – and should offer the variation that allows us to estimate district fixed effects. In practice, however, district fixed effects will explain most of the variation in the dependent variable.

district's peace onset (i.e. shorter 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). Odd-numbered columns show regressions where we include region fixed effects and month fixed effects; these would account for region-specific factors and time-specific factors. Even-numbered columns go further by controlling for region-month fixed effects to additionally account for the differential time-specific factors for each region.

The effects on war onset are presented in columns (1)-(4). Columns (1)-(2) show the regression output where we use perceived income adequacy (as per the data) averaged at the district-month level, while columns (3)-(4) show the regression output where we use the regression-adjusted equivalent. Contrary to expectations, our results across all four specifications suggest that perceived income adequacy does not, on average, predict the length of time it takes for a district to sink into conflict.

On the other hand, our analyses of peace onset in columns (5)-(8) reveal that higher levels of perceived income adequacy do usher in peace sooner. Our results differ quantitatively (albeit only slightly) depending on whether perceived income adequacy 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 particular, based on the estimate in column (8), a one standard deviation increase in regression-adjusted perceived income adequacy will induce peace onset by 0.752 months (23 days). This is equivalent to a hastening of peace by about 1 percent given an average conflict duration of 90 months. This result suggests that civilian's grievance is essential to the rebels in prolonging localised contests with the state. This finding is consistent with the winning hearts and minds literature that has demonstrated the phenomenon elsewhere (Berman, Shapiro, and Felter, 2011; Crost, Felter, and Johnston, 2016).

5.2 Why Not War Onset?

Why would we find an asymmetric effect on war and peace onset? One possible explanation is that the complexity of insurgent warfare over space and time could lead to substantial heterogeneity in the need for civilian support, which in turn precludes us from detecting an average effect on war onset.

Spatially, the need for civilian support could vary depending on pre-existing Maoist influence across districts. We know that the Maoists were active only in the central and mid-western regions during the initial stages of the conflict. In these regions, they might have needed to recruit more fighters in order to initiate guerilla warfare (or less fighters since they already have strong bases). Can we then detect variation in the effect of perceived income adequacy on war onset if we compare Maoist strongholds against other districts?

To this end, we make use of 1991 parliamentary election data (Election Commission, 1992) to construct a measure of pre-war Maoist presence. In particular, we locate electoral candidates from the United People's Front (UPF) in the data, and construct an district-specific dummy variable indicating that the UPF fielded at least one candidate. There were 27 such districts in our sample. UPF was the mother party of the Maoists before the latter broke away to form the political entity Communist Party of Nepal-Maoist (CPN-M) in 1994; hence it is our best proxy for pre-war Maoist presence. We then proceed to estimate equation (1), by splitting the sample into those districts with UPF candidates in 1991 and those without (Table 4). Therefore, the results suggest that the spatial variation in pre-war Maoist presence cannot explain the non-effect of perceived income adequacy on war onset.

Alternatively, the need for civilian support could vary across time due to Maoist strategy change. 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.

To test this second 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.[12] While October 1998 is the median war 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.[13] In our data, early-joiners 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).

By estimating equation (1) separately on the sample of early and late-joiners, find that higher levels of perceived income adequacy do delay war onset among the late-joiners but not the early-

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

[13]Indeed, 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).

joiners (Table 5). Indeed, the effect that we find among the late-joiners is rather large: based on the the estimate in column (8), a one-standard deviation improvement in regression-adjusted perceived income adequacy will postpone war onset by 4.275 months (128 days). This implies a delay of 12 percent, given that districts take an average of 35 months, from the official start of the war in February 1996, to sink into war.

Our investigation here reveals the likely reason for not detecting an average effect of perceived income adequacy on war onset, but it also connects closely with the existing literature. For instance, 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, our results suggest that insurgency expansion may also rely on the rebels' ability to tap on local civilians.

5.3 Household Heterogeneity

It is conceivable that perceived income adequacy has a non-linear relationship with war and peace onset, for example, where a change in perception of income adequacy from "inadequate" to "just adequate" may be more crucial than one from "just adequate" to "more than adequate"(Ferrer-i Carbonell and Frijters, 2004). In this case, however, the underlying variation in perceived income adequacy 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).

That being said, because our results seem to reflect rebel recruitment, or more generally, collaborative support from civilians, it might be interesting to investigate whether these phenomena are more visible among the most marginalised segment of the population. To this end, we restrict our attention to high and low caste households in Tables 6 and 7 respectively.[14] The results line up fairly well with our intuition – that that low caste households are likely to be the ones driving the main result since marginalised populations are the main target of propaganda campaigns; on the other hand, the high caste segment of the population do not matter. Taking the β coefficient in column (8) of Table 7, in particular, we find that a one standard deviation increase in regression-adjusted perceived income adequacy among low caste households will induce peace onset by 0.921 months (28 days), indicating that the effects are much stronger than those found in Table 3 for the full sample of households. Among low caste households, we even detect a relationship between perceived income adequacy and war onset (Table 7, column (4)), which we did not find for the full

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[14]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.

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 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, and then identify the month in which each district attains x percent of its cumulative casualties (remaining casualties) to define war (peace) onset, where x takes integer values 1-15.[15] In other words, we allow the time stamps of war (peace) onset to be moved later (earlier) as we increase the value of x. We then repeat our two-stage regression analyses with region-month fixed effects, using onset definitions that vary over x. The β coefficients for war and peace onset are plotted in Figures 5 and 6 respectively. Evidently, we continue to see very little predictive power of perceived income adequacy on war onset (Figure 5), and a generally robust negative relationship between perceived income adequacy and peace onset (Figure 6).

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[15]We 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).

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 equation (1) using alternative dependent variables (i) war or peace onset month and (ii) district rank of war or peace onset, in Table 8. War (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. These specifications allow us to sidestep within-district sample selection although they come at a 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 adequacy predicts peace onset but not war onset. In addition, 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 A3). This suggests that within-district selection on observables are unlikely to be an issue.

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. Indeed, 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 A4 and A5), although there is some evidence suggesting that wealthier districts were surveyed first in NLSS I. In our war onset regressions, this could bias 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 our sample of households in the analysis of peace onset. Given that the cross sectional component covers 71 districts and panel component only covers 60 districts, this potentially introduces two sampling issues.

Firstly, the panel households may be systematically different from their cross-sectional counterparts. In other words, households in the panel sample might not be representative and are subject to selective attrition. To examine this possibility, we test for observable differences between the two sets of households from the same 60 districts (Appendix Table A6). Our results reveal that cross sectional and panel households are different in terms of household head's age, education, and religion; however, they are broadly similar in terms of other characteristics, including household wealth and perceived income adequacy.

Another concern is oversampling of the 60 panel districts after pooling them together. To address this concern, we first down-weight each household-level observation based on the share of cross-sectional households (out of all cross-sectional and panel households) in a district-month. This preserves the informational gain that we get from a pooled sample while reducing the effective sample size to that of the cross section. The estimation of equation (1) then proceeds as before, where the district-month observations are weighted by household sample size (Table 9). We obtain nearly identical results to those of Table 3, qualitatively and quantitatively.

6.4 Relative Income

It is well established that income inequality is an important determinant of civil conflict (Macours, 2010; Panza and Swee, 2018; Guariso and Rogall, 2017); 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. To account for this, we additionally net out the effect of relative income on perceived income adequacy when we construct the regression-adjusted measure of perceived income adequacy. The results are shown in Table 10. We try two measures for this exercise: a (discrete) household consumption rank among all households surveyed within the district-month (columns (1)-(2) and (5)-(6)) and a (continuous) household consumption z-score in a district-month (columns (3)-(4) and (7)-(8)). The empirical results mirrors those that we found previously in Table 3, giving some assurances that income inequality is not a confounder for our earlier estimates.

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 adequacy, which will result in omitted variable biases. 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 cereal suitability index in Table 11.[16] Again, these additional controls do not change our earlier findings.

7 Conclusions

This paper examines whether civilian perceptions of economic well-being influence war and peace. We test these relationships by drawing on unique household survey data on perceived income adequacy, 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 adequacy are associated with later war onset during periods of rebel recruitment, and with earlier 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 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, has devoted resources to reduce poverty among developing countries, many of which were at risk of civil war. As an early warning indicator of conflict, however, poverty is relatively easy to compute and monitor whereas perception of economic deprivation is not. As such, our results highlight the need for researchers, governments,

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[16]Geographical 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). Cereal suitability index is provided by the FAO.

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.

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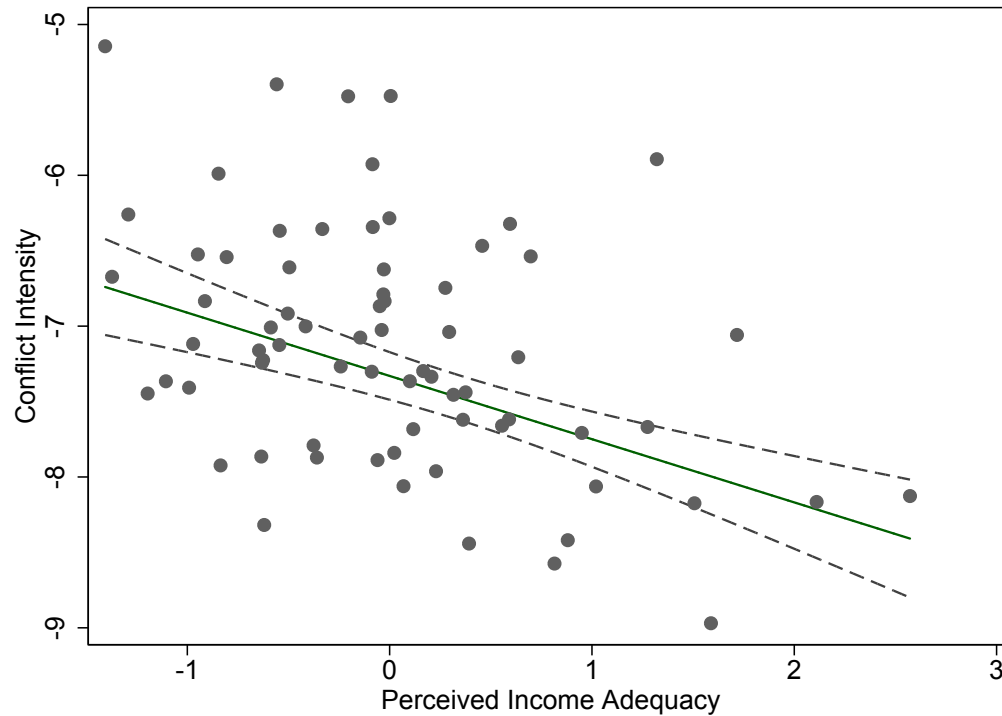
Notes: Based on data for 71 districts in the Nepal Living Standards Survey. Conflict intensity is the log of war casualties normalised by district population in 1991. Perceived Income Adequacy is the district average of household-level perceived income adequacy, standardized to be mean zero and standard deviation one. The linear fit, with 95% confidence interval shown, is weighted by the number of households sampled in each district.

Figure 1: Perceived Income Adequacy and War Onset

Conflict Intensity
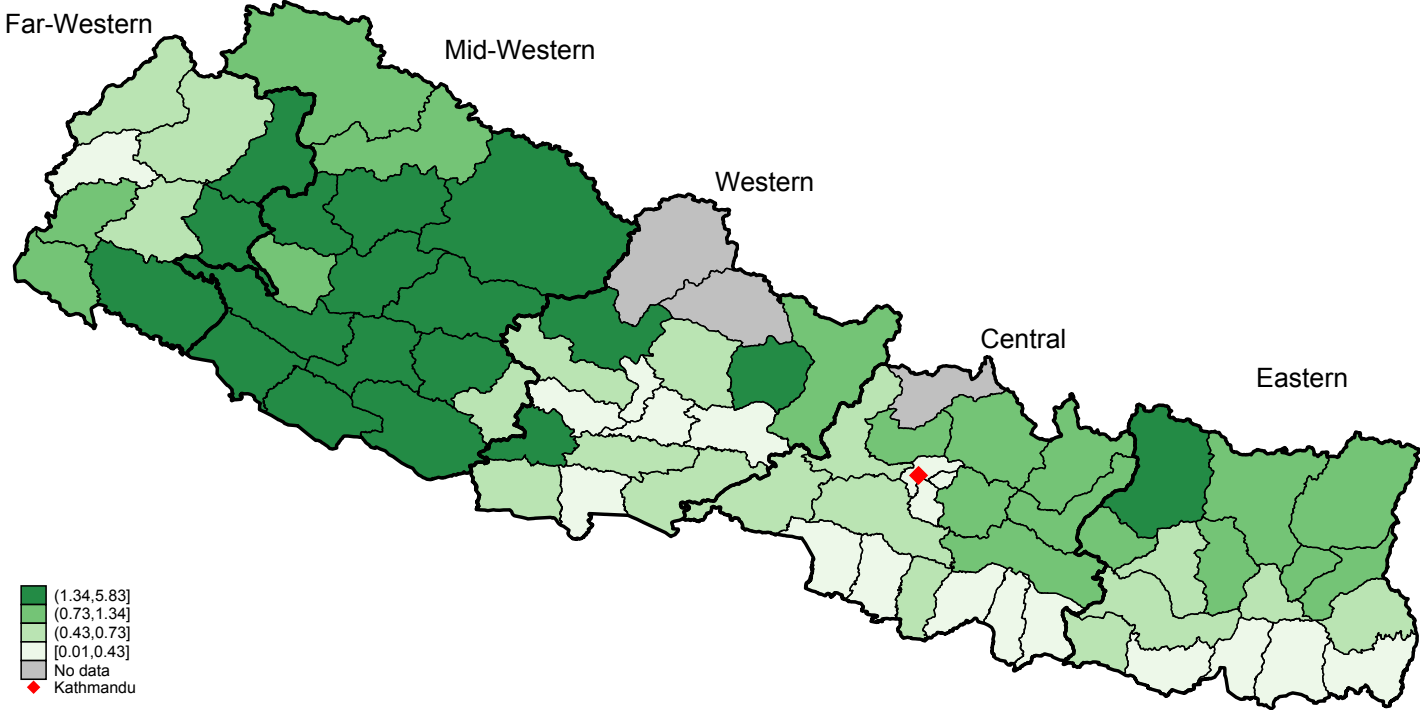
Figure 2: Spatial Variation in War Casualties
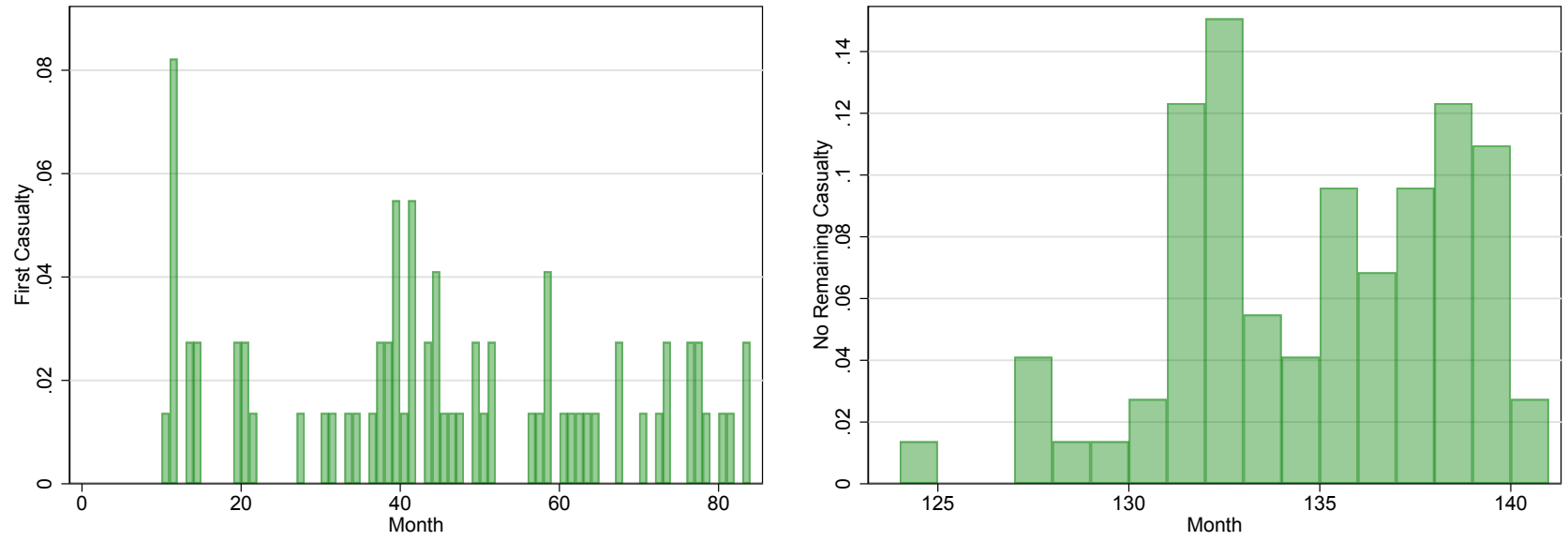
Figure 3: Histograms of War Onset and Peace Onset

Civil War

Feburary 1996 (Month=11)

November 2006 (Month=140)

82.73% HH

17.27% HH

NLSS I April 1995 – June 1996 (Month 1-15)

NLSS II March 2003 – May 2004 (Month 96-110)
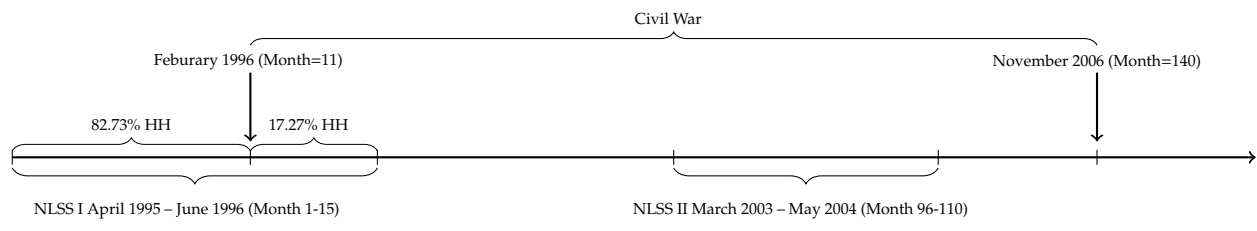
Figure 4: Timeline of the NLSS and War
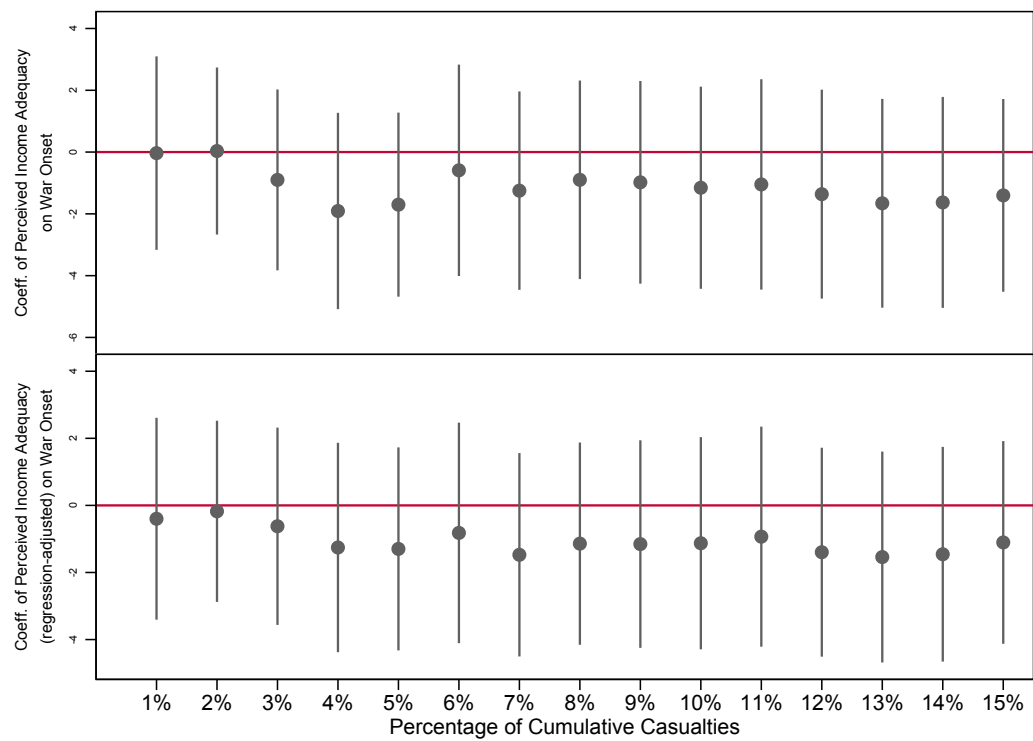
Notes: For each coefficient, vertical bars represent the 90% confidence interval.

Figure 5: Alternative Definitions of War Onset
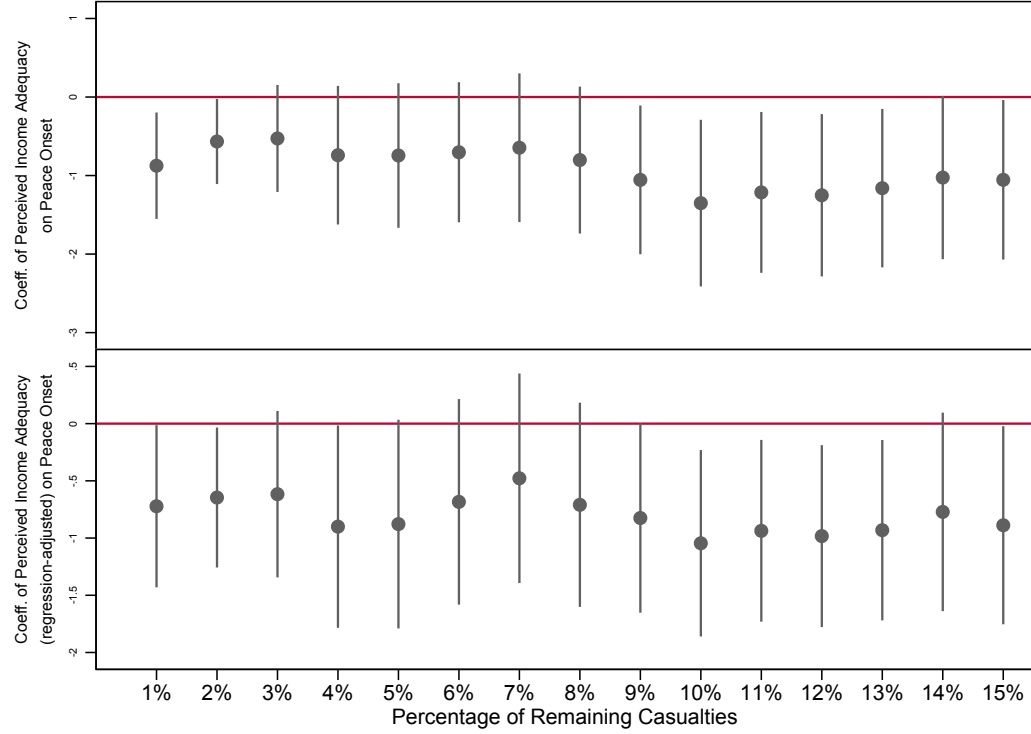
Notes: For each coefficient, vertical bars represent the 90% confidence interval.

Figure 6: Alternative Definitions of Peace Onset

	All	NLSS I	NLSS II
	(1)	(2)	(3)
Per Capita Consumption in ,000	8.365	7.117	9.176
	[12.364]	[11.174]	[13.018]
Perceived Income Adequacy	0.342	0.306	0.366
	[0.494]	[0.477]	[0.503]
Household Size	5.748	6.035	5.560
	[2.774]	[2.933]	[2.650]
High Caste	0.462	0.454	0.467
	[0.499]	[0.498]	[0.499]
Low Caste	0.147	0.120	0.164
	[0.354]	[0.325]	[0.370]
Male Household Head	0.831	0.865	0.809
	[0.375]	[0.342]	[0.393]
Age	45.594	44.764	46.135
	[14.280]	[14.438]	[14.151]
Ability to Read	0.505	0.457	0.536
	[0.500]	[0.498]	[0.499]
Complete Primary School	0.247	0.206	0.273
	[0.431]	[0.405]	[0.445]
Minority (Religion)	0.027	0.012	0.037
	[0.162]	[0.109]	[0.188]
Minority (Language)	0.125	0.082	0.152
	[0.330]	[0.275]	[0.359]
Observations	8012	3158	4854

Notes: Perceived income adequacy is the household head's subjective assessment of whether their household income over the past one month is inadequate (0), just adequate (1), or more than adequate (2). 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 1: Summary Statistics (Household Characteristics)

	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-Months			255					355		

Table 2: Summary Statistics (NLSS Surveys)

Dependent Variable:	Number of Months to War Onset				Number of Months to Peace Onset			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Perceived Income Adequacy	0.214	0.402			-0.852**	-1.013**		
	(2.175)	(2.189)			(0.411)	(0.478)		
Perceived Income Adequacy (regression-adjusted)			-0.444	-0.503			-0.689**	-0.752**
			(2.194)	(2.247)			(0.312)	(0.370)
Observations	255	255	255	255	355	355	355	355
R-squared	0.269	0.410	0.269	0.410	0.541	0.602	0.534	0.593
Region FE & Month FE	Y	N	Y	N	Y	N	Y	N
Region-Month FE	N	Y	N	Y	N	Y	N	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. In columns (3)-(4) and (7)-(8), regression-adjusted perceived income adequacy is the district-month average of household-level perceived income adequacy 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 adequacy, 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 3: War and Peace Onset

Dependent Variable:	Number of Months to War Onset							
	UPF				Non-UPF			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Perceived Income Adequacy	0.221	0.541			0.509	0.386		
	(3.652)	(3.749)			(2.104)	(2.451)		
Perceived Income Adequacy (regression-adjusted)			-0.468	0.032			0.017	-0.328
			(3.784)	(3.975)			(2.137)	(2.405)
Observations	118	118	118	118	137	137	137	137
R-squared	0.160	0.346	0.160	0.345	0.508	0.657	0.508	0.657
Region FE & Month FE	Y	N	Y	N	Y	N	Y	N
Region-Month FE	N	Y	N	Y	N	Y	N	Y

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 sample of 27 districts with one or more United People's Front (UPF) candidate in the 1991 elections. Columns (5)-(8) use the sample of 44 districts with no UPF candidate in the 1991 elections. In columns (3)-(4) and (7)-(8), regression-adjusted perceived income adequacy is the district-month average of household-level perceived income adequacy 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 adequacy, 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 (UPF vs Non-UPF Districts)

Dependent Variable:	Number of Months to War Onset							
	Early-Joiners				Late-Joiners			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Perceived Income Adequacy	1.712	2.054			4.101*	4.428**		
	(1.919)	(2.344)			(2.049)	(2.080)		
Perceived Income Adequacy (regression-adjusted)			0.621	0.799			3.888*	4.275**
			(1.829)	(2.336)			(2.070)	(2.061)
Observations	135	135	135	135	120	120	120	120
R-squared	0.269	0.448	0.255	0.431	0.278	0.502	0.266	0.492
Region FE & Month FE	Y	N	Y	N	Y	N	Y	N
Region-Month FE	N	Y	N	Y	N	Y	N	Y

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 sample of 36 districts that experienced war onset before October 1998. Columns (5)-(8) use the sample of 35 districts that experienced war onset after October 1998. In columns (3)-(4) and (7)-(8), regression-adjusted perceived income adequacy is the district-month average of household-level perceived income adequacy 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 adequacy, 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 Onset (Early-Joiners vs Late-Joiners)

Dependent Variable:	Number of Months to War Onset				Number of Months to Peace Onset			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Perceived Income Adequacy	0.598	0.922			-0.621	-0.425		
	(2.103)	(2.341)			(0.442)	(0.404)		
Perceived Income Adequacy (regression-adjusted)			0.292	0.369			-0.680*	-0.434
			(2.305)	(2.550)			(0.366)	(0.332)
Observations	193	193	193	193	303	303	303	303
R-squared	0.358	0.565	0.357	0.564	0.546	0.650	0.547	0.650
Region FE & Month FE	Y	N	Y	N	Y	N	Y	N
Region-Month FE	N	Y	N	Y	N	Y	N	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. The sample is restricted to high castes households only, where high castes are identified in the surveys as Chhetri, Brahman, Newar, Other High Caste. In columns (3)-(4) and (7)-(8), regression-adjusted perceived income adequacy is the district-month average of household-level perceived income adequacy 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 adequacy, 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 Households)

Dependent Variable:	Number of Months to War Onset				Number of Months to Peace Onset			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Perceived Income Adequacy	2.061	4.882*			-0.897***	-0.923***		
	(2.430)	(2.608)			(0.281)	(0.304)		
Perceived Income Adequacy (regression-adjusted)			2.394	5.173**			-0.899***	-0.921***
			(2.381)	(2.525)			(0.265)	(0.282)
Observations	127	127	127	127	233	233	233	233
R-squared	0.433	0.645	0.435	0.647	0.611	0.681	0.611	0.681
Region FE & Month FE	Y	N	Y	N	Y	N	Y	N
Region-Month FE	N	Y	N	Y	N	Y	N	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. The sample is restricted to low castes households only, where low castes are identified in the surveys as Damai, Kami, Muslim, Surki, and Other Low Caste. In columns (3)-(4) and (7)-(8), regression-adjusted perceived income adequacy is the district-month average of household-level perceived income adequacy 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 adequacy, 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 (Low Caste Households)

Panel A

Dependent Variable:	War Onset Month				Peace Onset Month			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Perceived Income Adequacy	-0.469	0.312			-1.234***	-1.322**		
	(2.508)	(2.425)			(0.449)	(0.607)		
Perceived Income Adequacy (regression-adjusted)			-1.324	-0.357			-1.210**	-1.199**
			(2.786)	(2.730)			(0.488)	(0.522)
R-squared	0.001	0.226	0.004	0.226	0.134	0.143	0.111	0.117

Panel B

Dependent Variable:	War Onset Rank				Peace Onset Rank			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Perceived Income Adequacy	1.369	0.404			-7.609**	-7.472*		
	(2.608)	(2.395)			(3.024)	(3.758)		
Perceived Income Adequacy (regression-adjusted)			2.028	0.801			-7.549**	-6.920**
			(2.761)	(2.606)			(3.192)	(3.105)
R-squared	0.005	0.258	0.010	0.259	0.140	0.144	0.119	0.124
Observations	71	71	71	71	71	71	71	71
Region FE	N	Y	N	Y	N	Y	N	Y

Notes: Robust standard errors are shown in parentheses. *significant at 10%; *significant at 5%; ***significant at 1%. Results are based on a cross-sectional sample of 71 districts. Dependent variable is war (peace) onset month in Panel A and war (peace) onset rank in Panel B. Rank is a running number where the first district to experience war (peace) is assigned 1, and so on. In columns (3)-(4) and (7)-(8), regression-adjusted perceived income adequacy is the district average of household-level perceived income adequacy 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 adequacy, 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: War and Peace Onset Month/Rank

Dependent Variable:	Number of Months to Peace Onset			
	(1)	(2)	(3)	(4)
Perceived Income Adequacy	-0.828**	-0.976**		
	(0.408)	(0.479)		
Perceived Income Adequacy (regression-adjusted)			-0.683**	-0.739**
			(0.310)	(0.370)
Observations	355	355	355	355
R-squared	0.537	0.598	0.531	0.590
Region FE & Month FE	Y	N	Y	N
Region-Month FE	N	Y	N	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; *significant at 5%; ***significant at 1%. In our aggregation of households to the district-month level, household observations are re-weighted to account for oversampling due to the pooling of cross-sectional and panel components in NLSS II. In columns (3)-(4), regression-adjusted perceived income adequacy is the district-month average of household-level perceived income adequacy 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 adequacy, 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: Peace Onset (Re-weighted)

Dependent Variable:	Number of Months to War Onset				Number of Months to Peace Onset			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Perceived Income Adequacy (regression-adjusted, incld. consumption rank)	-0.486	-0.480			-0.571*	-0.591†		
	(2.013)	(2.074)			(0.318)	(0.371)		
Perceived Income Adequacy (regression-adjusted, incld. consumption z score)			-0.322	-0.360			-0.628**	-0.692**
			(2.131)	(2.162)			(0.280)	(0.333)
Observations	255	255	240	240	355	355	335	335
R-squared	0.269	0.410	0.271	0.414	0.531	0.589	0.536	0.595
Region FE & Month FE	Y	N	Y	N	Y	N	Y	N
Region-Month FE	N	Y	N	Y	N	Y	N	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. †significant at 15%; *significant at 10%; *significant at 5%; ***significant at 1%. Regression-adjusted perceived income adequacy is the district-month average of household-level perceived income adequacy netting out household characteristics, household per capita consumption, and a relative income measure. The relative income measure is either a household's consumption rank within district-month (columns (1)-(2) and (5)-(6)) or consumption z-score within district-month (columns (3)-(4) and (7)-(8)). Regression-adjusted perceived income adequacy 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 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)	(7)	(8)
Perceived Income Adequacy	-1.693	-1.326			-0.532*	-0.616**		
	(2.220)	(2.314)			(0.283)	(0.291)		
Perceived Income Adequacy (regression-adjusted)			-2.373	-2.374			-0.554**	-0.596**
			(2.097)	(2.168)			(0.266)	(0.293)
Observations	255	255	255	255	355	355	355	355
R-squared	0.310	0.433	0.314	0.438	0.646	0.701	0.648	0.702
District Controls	Y	Y	Y	Y	Y	Y	Y	Y
Region FE & Month FE	Y	N	Y	N	Y	N	Y	N
Region-Month FE	N	Y	N	Y	N	Y	N	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. †significant at 15%; *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, and road length before war onset. Regression-adjusted perceived income adequacy is the district-month average of household-level perceived income adequacy 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 adequacy is standardized to be mean zero and standard deviation one. All regressions are weighted by the number of households sampled in each district-month.

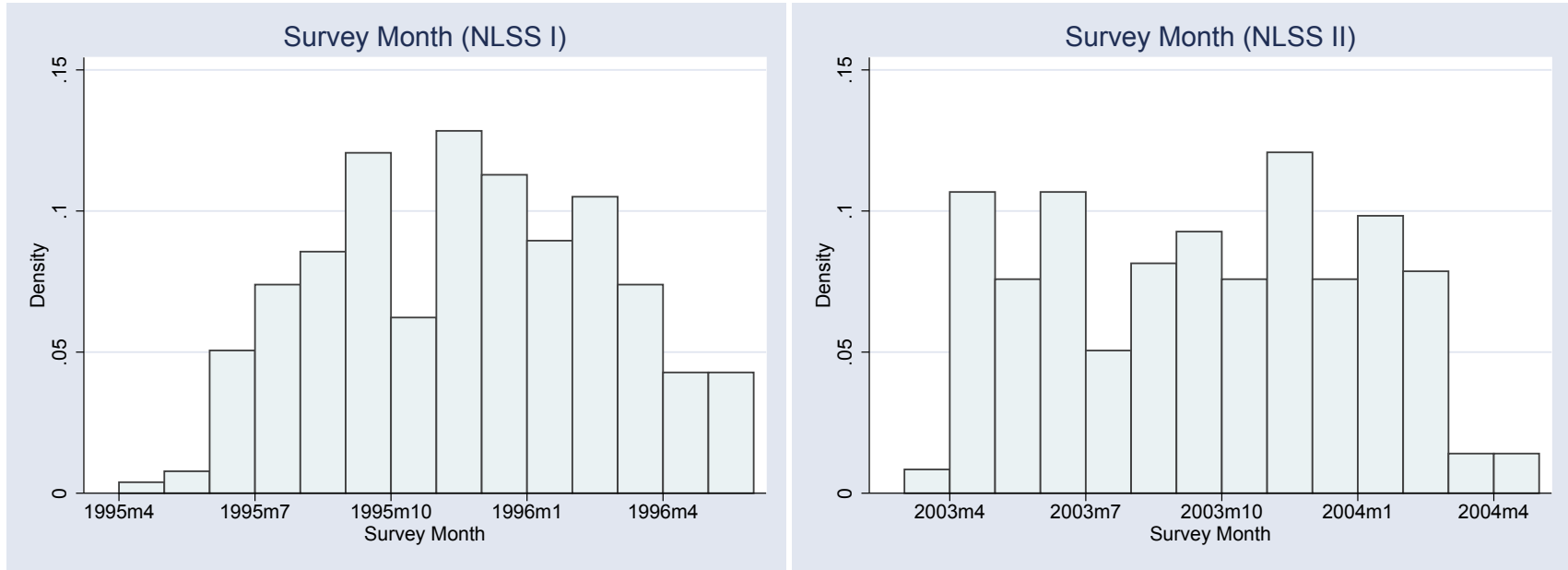Table 11: War Onset (with District Characteristics)
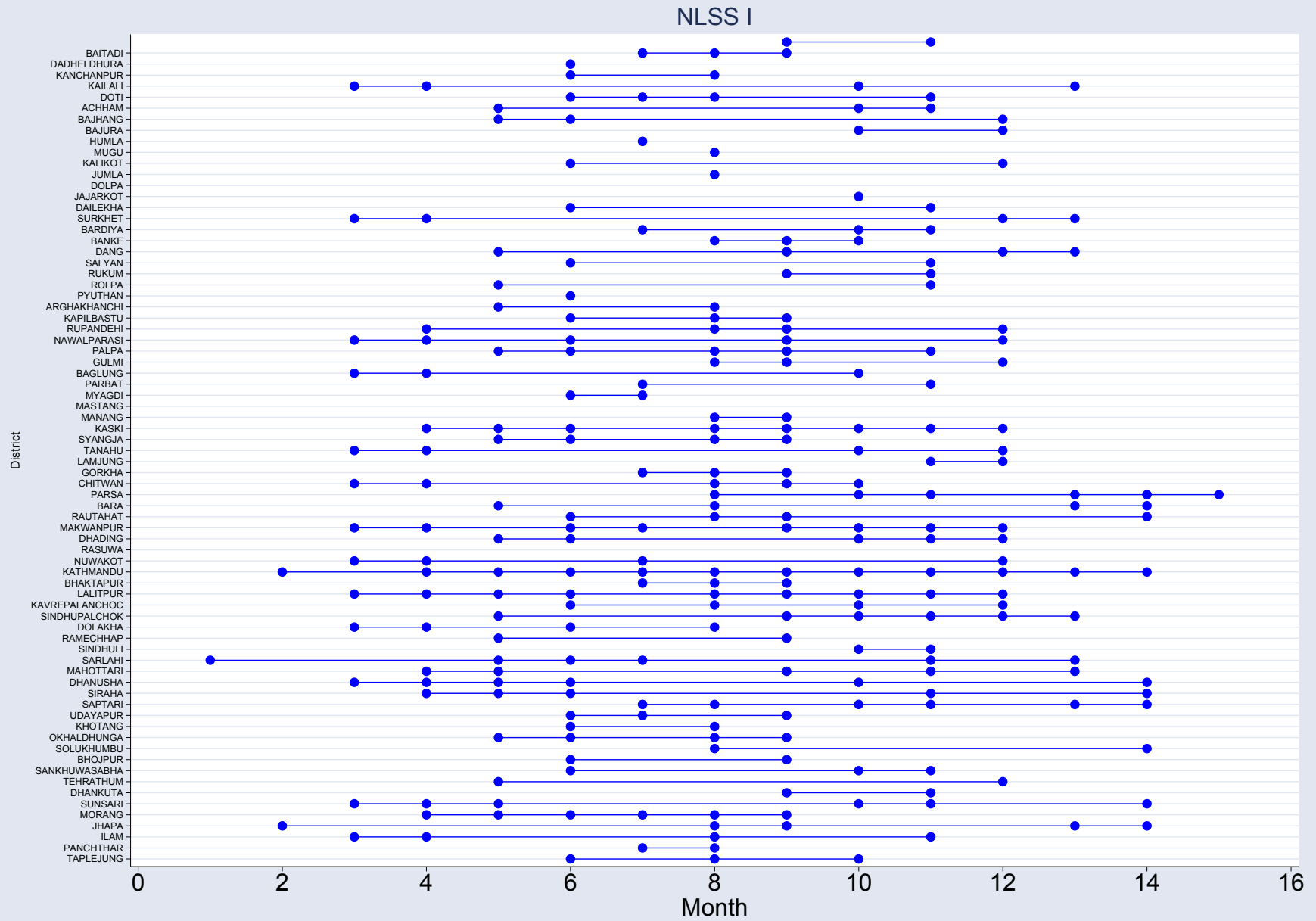
A Appendix

Figure A1: Density of Survey Month

Figure A2: NLSS I Survey Month
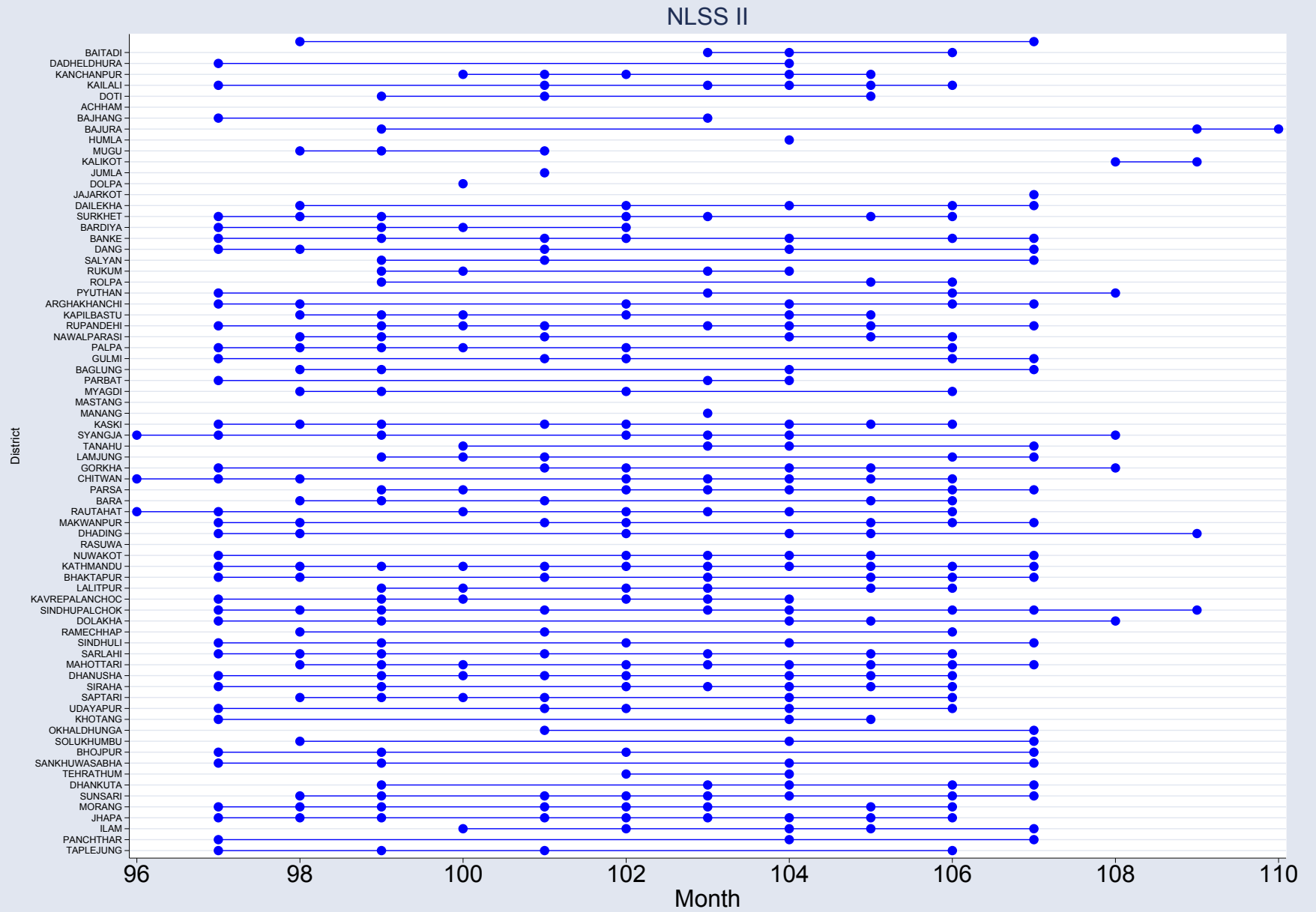
Figure A3: NLSS II Survey Month

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Dependent Variable:	Perceived Income Adequacy	
	NLSS I	NLSS II
	(1)	(2)
Per Capita Consumption in ,000	0.004***	0.005***
	(0.001)	(0.001)
Household Size	0.006**	0.005*
	(0.003)	(0.003)
High Caste	0.030	0.010
	(0.019)	(0.018)
Low Caste	-0.102***	-0.064***
	(0.027)	(0.022)
Male Household Head	-0.049*	-0.017
	(0.025)	(0.019)
Age	0.003***	0.003***
	(0.001)	(0.001)
Ability to Read	0.135***	0.109***
	(0.021)	(0.018)
Complete Primary School	0.115***	0.095***
	(0.025)	(0.020)
Minority (Religion)	-0.082	-0.092**
	(0.076)	(0.039)
Minority (Language)	-0.007	-0.035
	(0.031)	(0.022)
Observations	3,158	4,854
R-squared	0.077	0.068

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; *significant at 5%; ***significant at 1%. Columns (1) and (2) use the NLSS I and NLSS samples respectively to estimate residual perceived income adequacy 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.

Table A1: First Stage Regression

Dependent Variable:	Number of Months to War Onset			
	(1)	(2)	(3)	(4)
Perceived Income Adequacy	-0.124	-0.072		
	(2.219)	(2.243)		
Perceived Income Adequacy (regression-adjusted)			-0.573	-0.707
			(2.234)	(2.302)
Observations	247	247	247	247
R-squared	0.223	0.374	0.224	0.375
Region FE & Month FE	Y	N	Y	N
Region-Month FE	N	Y	N	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; *significant at 5%; ***significant at 1%. The sample is restricted to district-months where households are interviewed before war onset. In columns (3)-(4), regression-adjusted perceived income adequacy is the district-month average of household-level perceived income adequacy 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 adequacy, 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 A2: War Onset (Uncensored)

	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	6.890	-0.373	8.976	9.494	0.518
	[10.100]	[12.669]	(0.476)	[10.816]	[15.903]	(0.501)
Perceived Income Adequacy	0.299	0.318	0.019	0.368	0.363	-0.006
	[0.477]	[0.478]	(0.026)	[0.504]	[0.503]	(0.022)
Household Size	6.014	6.070	0.056	5.604	5.490	-0.114
	[2.813]	[3.112]	(0.131)	[2.683]	[2.595]	(0.086)
High Caste	0.478	0.417	-0.060	0.481	0.444	-0.037
	[0.500]	[0.493]	(0.040)	[0.500]	[0.497]	(0.024)
Low Caste	0.126	0.110	-0.016	0.164	0.164	-0.000
	[0.332]	[0.313]	(0.020)	[0.370]	[0.370]	(0.016)
Male Household Head	0.859	0.874	0.016	0.807	0.812	0.005
	[0.348]	[0.332]	(0.014)	[0.395]	[0.391]	(0.013)
Age	45.044	44.327	-0.718	45.850	46.589	0.739
	[14.593]	[14.186]	(0.616)	[14.096]	[14.231]	(0.472)
Ability to Read	0.453	0.463	0.010	0.546	0.521	-0.026
	[0.498]	[0.499]	(0.028)	[0.498]	[0.500]	(0.018)
Complete Primary School	0.197	0.221	0.024	0.278	0.265	-0.013
	[0.398]	[0.415]	(0.021)	[0.448]	[0.441]	(0.015)
Minority (Religion)	0.009	0.016	0.007	0.035	0.040	0.005
	[0.096]	[0.126]	(0.004)	[0.183]	[0.196]	(0.008)
Minority (Language)	0.076	0.092	0.016	0.147	0.160	0.013
	[0.265]	[0.290]	(0.019)	[0.354]	[0.367]	(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 A3: Balance Test (Within-District Selection)

| | NLSS I | | | NLSS II | | |
| | Started Early | Started Late | Diff (2)-(1) | Started Early | Started Late | Diff (5)-(4) |
	(1)	(2)	(3)	(4)	(5)	(6)
War Onset Month	44.599	46.096	1.497	-	-	-
	[19.586]	[23.466]	(6.397)	-	-	-
Peace Onset Month	-	-	-	134.421	134.776	0.355
	-	-	-	[3.694]	[3.440]	(1.094)
Per Capita Consumption in ,000	7.651	4.906	-2.746***	10.033	7.444	-2.589*
	[12.291]	[3.194]	(0.867)	[15.157]	[6.570]	(1.342)
Perceived Income Adequacy	0.315	0.270	-0.045	0.379	0.340	-0.039
	[0.480]	[0.462]	(0.067)	[0.503]	[0.502]	(0.054)
Household Size	6.002	6.174	0.172	5.464	5.755	0.292
	[2.953]	[2.844]	(0.182)	[2.552]	[2.828]	(0.231)
High Caste	0.447	0.485	0.039	0.486	0.427	-0.059
	[0.497]	[0.500]	(0.098)	[0.500]	[0.495]	(0.077)
Low Caste	0.114	0.142	0.027	0.145	0.203	0.058*
	[0.318]	[0.349]	(0.036)	[0.352]	[0.402]	(0.035)
Male Household Head	0.862	0.875	0.012	0.807	0.811	0.004
	[0.345]	[0.331]	(0.026)	[0.395]	[0.391]	(0.019)
Age	44.825	44.508	-0.317	45.958	46.494	0.536
	[14.470]	[14.313]	(0.722)	[14.245]	[13.957]	(0.694)
Ability to Read	0.467	0.414	-0.053	0.563	0.483	-0.079
	[0.499]	[0.493]	(0.053)	[0.496]	[0.500]	(0.049)
Complete Primary School	0.213	0.179	-0.034	0.300	0.217	-0.083*
	[0.410]	[0.384]	(0.044)	[0.458]	[0.413]	(0.044)
Minority (Religion)	0.014	0.003	-0.011	0.038	0.035	-0.003
	[0.118]	[0.057]	(0.008)	[0.190]	[0.184]	(0.017)
Minority (Language)	0.081	0.088	0.007	0.153	0.151	-0.002
	[0.273]	[0.283]	(0.040)	[0.360]	[0.358]	(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 A4: Balance Test (Between-District Selection: Survey Start Month)

	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	45.149	0.737	-	-	-
	[23.222]	[18.699]	(5.507)	-	-	-
Peace Onset Month	-	-	-	135.652	132.782	-2.870***
	-	-	-	[3.274]	[3.427]	(1.054)
Per Capita Consumption in ,000	5.448	8.022	2.575*	8.503	10.238	1.735
	[3.947]	[13.483]	(1.001)	[9.292]	[17.285]	(2.009)
Perceived Income Adequacy	0.232	0.347	0.115**	0.340	0.407	0.067
	[0.435]	[0.494]	(0.052)	[0.499]	[0.506]	(0.058)
Household Size	6.077	6.013	-0.065	5.701	5.339	-0.362
	[2.854]	[2.975]	(0.208)	[2.753]	[2.464]	(0.227)
High Caste	0.508	0.425	-0.083	0.402	0.568	0.166**
	[0.500]	[0.494]	(0.083)	[0.490]	[0.495]	(0.075)
Low Caste	0.145	0.106	-0.039	0.194	0.116	-0.078**
	[0.352]	[0.308]	(0.031)	[0.396]	[0.321]	(0.035)
Male Household Head	0.844	0.876	0.032	0.811	0.805	-0.006
	[0.363]	[0.330]	(0.023)	[0.392]	[0.396]	(0.019)
Age	44.559	44.875	0.315	45.950	46.427	0.477
	[14.327]	[14.499]	(0.688)	[13.957]	[14.451]	(0.690)
Ability to Read	0.414	0.480	0.066	0.506	0.583	0.077
	[0.493]	[0.500]	(0.051)	[0.500]	[0.493]	(0.064)
Complete Primary School	0.163	0.230	0.067*	0.245	0.316	0.070
	[0.370]	[0.421]	(0.039)	[0.430]	[0.465]	(0.064)
Minority (Religion)	0.008	0.014	0.006	0.039	0.033	-0.005
	[0.090]	[0.118]	(0.010)	[0.193]	[0.180]	(0.018)
Minority (Language)	0.076	0.086	0.010	0.157	0.145	-0.012
	[0.265]	[0.280]	(0.036)	[0.363]	[0.352]	(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 A5: Balance Test (Between-District Selection: Survey Duration)

	Cross-Sectional households	Panel households	Difference (2) - (1)
	(1)	(2)	(3)
Household Size	5.502	5.741	0.239**
	[2.638]	[2.698]	(0.115)
High Caste	0.453	0.481	0.028
	[0.498]	[0.500]	(0.033)
Low Caste	0.164	0.173	0.009
	[0.370]	[0.379]	(0.024)
Male Household Head	0.805	0.811	0.006
	[0.396]	[0.392]	(0.014)
Age	45.628	48.815	3.188***
	[14.256]	[13.526]	(0.585)
Ability to Read	0.554	0.472	-0.081***
	[0.497]	[0.499]	(0.026)
Complete Primary School	0.287	0.243	-0.044**
	[0.452]	[0.429]	(0.018)
Minority (Religion)	0.041	0.027	-0.014**
	[0.199]	[0.162]	(0.006)
Minority (Language)	0.146	0.171	0.025
	[0.353]	[0.377]	(0.032)
Per Capita Consumption in ,000	9.352	9.349	-0.003
	[12.099]	[17.077]	(0.510)
Perceived Income Adequacy	0.372	0.370	-0.002
	[0.504]	[0.504]	(0.024)
Survey Month	102.125	102.319	0.194
	[3.271]	[3.479]	(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.

Table A6: Balance Test (NLSS II Cross-Sectional Versus Panel Households)