Essays on Tribes and States

Resem Makan

A dissertation
submitted in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy

University of Washington

2024

Reading Committee:

Rachel M. Heath, Co-Chair

Alan Griffith, Co-Chair

Fahad Khalil

Program Authorized to Offer Degree:
Economics

University of Washington

Abstract

Essays on Tribes and States

Resem Makan

Co-Chairs of the Supervisory Committee:
Rachel M. Heath
Department of Economics

Alan Griffith
Department of Economics

This dissertation comprises three chapters that study the interactions of institutions, culture, and economic outcomes.

In Chapter 1, I ask what happens when a state absorbs a historically stateless, tribal society, and what the consequences and mechanisms are of such a process. At the turn of the 19^{th} century the British Empire in the northeastern front of India drew an imperial border that divided a tribal people into administered versus un-administered regions. Using a spatial regression discontinuity design (RDD) to study the long-run effects of state exposure in the region, I find that the areas falling within the former British administrative border have higher years of schooling, higher rates of literacy, and more wealth today. Villages in the formerly administered regions also have better public goods/services and a smaller agricultural share in the labor force. Using census data I am also able to study time varying effects of this historical state exposure—gaps in literacy rates are very persistent with little signs of convergence even 70 years after independence in 1947. In uncovering deeper channels that are potentially driving these results, I find evidence of the emergence of pro-social traits: those formerly under the British state identify more strongly with non-kin members, reflecting an expansion of the in-group. This chapter thus contributes to our understanding of the

immediate changes that occur in a society transitioning from tribe to state.

Chapter 2 examines the impacts of a forced urbanization program implemented by the Indian government on the citizens of Mizoram, a mountainous, tribal state in the country's northeast. In response to an insurgent uprising in the 1960s, the government enacted a policy that forcibly relocated residents from over 500 villages into 103 designated "Grouping Centers" (GCs) to facilitate surveillance and control, while approximately 110 villages remained ungrouped. Official reports suggest that this policy was also intended to promote economic development within the largely rural population. Using a historical difference-in-differences approach between grouped and ungrouped villages, this study finds that the policy resulted in significant population divergence lasting into the long run. The analysis further reveals a modest reduction in agricultural employment share in the GCs, suggesting the possibility of structural transformation even in a highly agrarian, low-state capacity setting. Upon further investigation, I also find evidence that the institutional capacity of the GCs predict their ability to absorb the refugees, highlighting the importance of pull factors in achieving successful urbanization.

In Chapter 3, I show how customary laws around land inheritance can shape spatial growth and polity size. Looking at two sets of tribes in India's Manipur state, I find that among the group practicing a chief-based custom of land inheritance, there is a tendency for villages to fragment into smaller ones. Sons of chiefs who are not in line to inherit land split up to establish villages of their own. The consequences of having to build villages from scratch are smaller village size and fewer public good amenities for the chief-based villages. This chapter therefore highlights the effect culture has on agglomeration and space.

Lastly, Chapter 4 asks if geography in historical contexts can be treated as an endogenous left-hand-side variable. This paper provides evidence that groups can and do selectively migrate based on certain pre-existing practices. It examines the historical migration of two language families from Southern China, the Kra-Dai and Hmong-Mien. Due primarily to Han Chinese expansion,

these groups moved into the Zomia Highlands of Southeast Asia. Despite facing the same pressure, however, their migration patterns differed: the Kra-Dai, traditionally practicing wet-rice cultivation along river valleys, resettled in flatter areas, while the Hmong-Mien, practicing slash-and-burn agriculture on hilly slopes, moved to rugged mountains. Furthermore they carried with them other institutions to the new lands. This chapter thus highlights the possibility of geography being endogenous in the sense that pre-determined factors at the group-level shape subsequent movements across time and space.

TABLE OF CONTENTS

Page

LIST OF FIGURES

LIST OF TABLES

ACKNOWLEDGMENTS

This dissertation owes its completion to a wide range of people, far and near. I list here a few.

First, as to be rightfully acknowledged, are my chairs, Rachel Heath and Alan Griffith. From first encountering them in the second year elective courses to our most recent email exchanges I have learned from them so much of the art and science of doing valuable research—from Rachel teaching me how I could make a referee interested in an idea to Alan wanting for me to have an answer to every technical question, from the both of them encouraging me to apply to conferences to helping me prepare for the job market, for all these investments they made I will forever be grateful. And as someone whose thesis speaks to the importance of cultural transmission from older (slightly older, in our case) to younger generations, it was a joy to see this mechanism at play these past few years.

I am also indebted to Emma Riley who, as a committee member, always pushed me to go further and not be complacent. My exchanges with her always left me thinking of ways to improve my writing and delivering my story to a wider audience. And I feel proud to be the first student for whom she served as part of a PhD committee. I am also grateful to Fahad Khalil who, despite the late hour, accepted to be a part of my reading committee. And not to forget, my sincere thanks to Simon Reeve-Parker and Heidi Hannah, unseen yet impactful contributors to this chapter of my life.

I also thank the cohort who joined me in the program, all sixteen of them. When we entered as young scholars in 2018 we weren't sure if we knew enough to handle the weight of the coming years. As we graduate one by one, we still remain unsure. That, I take, is a sign of maturing. And to randomly pick a few names, I thank Amre, Abby, Raj, and Jorge (whom I've always called

George).

Outside of the academic circle, while in the United States, I had the good fortune of having the enriching company of fellow Nagas, all of whom I came to know for the first time in this new country. A particular encouragement came from the interest they took in my research and the moral support they gave. Names in this list sound like Toshi, Ben, Anung, Khaks, Johnny, Soya...

And in an unconventional way, I would also like to acknowledge a few people who never met me yet who I got to meet through their writings and their lives. One set of them was tied directly to the British Empire: John Henry Hutton, James Phillips Mills, Charles Pawsey, Connie Shakespear, Mildred Archer, Alexander McKenzie. Another set took the form of missionaries and anthropologists: the American Baptists from upstate New York Edwin Winter Clark and Mary Mead Clark, the Austrian ethnologist Christoph von Fürer-Haimendorf, and the Scottish Anglicans William Pettigrew and Alice Goreham. These people, though imperfect, taught my people of an outside world, and left us with two great technologies—statecraft and literacy—and one great virtue—confidence to be a united people. To this day they remain venerated in our lands.

And lastly, I thank Meba, who knows why.

DEDICATION

to James C. Scott (1936-2024), gentleman and scholar,

whose ideas gave life to these pages.

Chapter 1

FROM TRIBE TO STATE: A CASE OF NAGALAND

1.1 Introduction

The transition from tribal anarchy, by which I mean the absence of government, to more formal state structures is one virtually every society has experienced at some point in its past. But the fact that the vast majority of people today are a part of states is not necessarily a consequence of endogenous, historical state formation but rather a result of having being absorbed into states, often by annexation and conquests (Scott (2017); Diamond (1998)). Despite this recurring fact of societal evolution we know very little of the immediate consequences (as well as mechanisms) of such a process. A number of influential studies document strong correlations between long-run exposure to states and economic growth and political stability (Putterman and Weil (2010); Bockstette et al. (2002)). But what about at the relatively early stages of state exposure?

This paper takes advantage of a natural experiment to get some answers to these questions. In the late 19$^{\text{th}}$ century the British Empire brought under its administration a historically stateless, tribal population in northeast India. With an intention to 'pacify' the warring tribes in the region the British established what Weber (2004) calls a 'monopoly of violence within a defined territory.' A rich set of theories—eg., Bisin and Verdier (2017), Tabellini (2008)—predict that exogenous shocks to the rules of the game can produce a dynamic interaction between institutions and culture that over time allows societies to achieve new economic possibilities. In the case of my study region, over the decades under foreign rule the native peoples came to gradually adopt new, colonially-constructed identities which, I argue in the paper, expanded the composition of the in-group and allowed for economic growth that persist to this day.

Nagaland, a small state in north-east India inhabited by a historically stateless, tribal popula-

tion, has an interesting and rather unique experience of having its western population ruled under British India and its eastern side left non-administered. A wide set of evidence in the form of reports, letters, and other documents support strongly a case for a quasi-exogenous nature of the border drawing. In particular, bureaucratic disagreements between colonial officers that resulted in an arbitrary border serve as my identification strategy.[1]

Using a regression discontinuity design at the colonial border, I find that those living in regions formerly administered have today about 1.3 more years of schooling and 25% more wealth than those in regions formerly un-administered. To address some of the criticisms in the persistence literature for overlooking the period between treatment in the past and outcomes in the future, I also study time-varying effects of colonial rule using census data going back to 1971. Gaps in literacy rates remain very persistent with no signs of convergence. Also, gaps in the labor force start to appear over time as those in the formerly administered regions become less reliant on agriculture. My results are robust to different bandwidths as well as various specifications of the RDD polynomial function, including quadratic and cubic polynomials in distance to major cities. In addition I run placebo checks using other non-historical border rivers in which I find no systematic differences on either side of the border.

I then look into potential channels of persistence. The peoples of this region prior to annexation were village-based societies, a form of organisation anthropologists term as acephalous. For administrative purposes the British named the newly-annexed region the 'Naga Hills District.' Over the decades under formal state administration what appears to have happened is a gradual emergence of new identities. Numerous historical narratives show how starting around the 1920s the local population begun identifying with this new Naga identity, a group that encompassed distant people not linked by kinship, as opposed to the pre-colonial period where the clan and the village comprised the main unit of cooperation and identification. This trait, as evidenced from more recent surveys, persists well into the present era. Looking at responses from 2008, more than sixty

[1] Reed (1942) gives a detailed account of annexation and administration of the northeastern region of India. Chapter 3 deals with the colonial expansion to the area that later came to be called the Naga Hills District.

years after independence, I find that those formerly administered identify more strongly with the Naga identity. This, I argue, potentially reflects an increase in the scope of cooperation and/or more generalized trust (Durante et al. (2021), Tabellini (2008), Becker et al. (2016)).

I also produce a list of narratives supporting a quasi-exogenous nature to the border drawing. Though initially having taken a resolute non-interference policy towards the native tribes of present-day northeast India and Burma, the British were ultimately pushed to extend their rule to the region. The never-ceasing raids by unconquered villages into already annexed regions forced the British to expand their territory and gradually absorb the many tribes into the empire. In the case of Nagaland once a wide enough buffer zone was created in the western region, colonial expansion stopped. Rivers were used to demarcate the frontiers of the empire. Frequent requests—as time went on—by ground officers to continue marching eastward were vetoed by higher-level officials living thousands of miles away (Reed (1942)).

One important discourse that this paper extends is on the political economy of *Zomia*, a geographic area popularized by James C. Scott in his seminal work, The Art of Not Being Governed (Scott (2009); Van Schendel (2005)). According to Scott, Zomia—the highlands of Southeast Asia with a population of 100 million—is made up numerous tribes who for two millennia have been evading states in the valleys. He argues that

"hill peoples are best understood as runaway, fugitive, maroon communities who have, over the course of two millennia, been fleeing the oppressions of state-making projects in the valleys—slavery, conscription, taxes, corvée labor, epidemics, and warfare..... Virtually everything about these people's livelihoods, social organization, ideologies, and (more controversially) even their largely oral cultures, can be read as strategic positionings designed to keep the state at arm's length."

Scott's narrative, however, ends around the early-twentieth century when colonial powers, with their superior weapons and distance-breaking technologies, annexed vast tracts of the highlands into imperial territory. What happened when the peoples of this region finally got incorporated into states? Did the "livelihoods, social organization, ideologies" of the tribes evolve in response? A large

body of work has examined the colonial experience in Africa and the Americas (Michalopoulos and Papaioannou (2016), Lowes and Montero (2021); Valencia Caicedo (2019); Dell (2010); Bergeron (2019)). Zomia, however, remains poorly understood. My study explores the consequences of the colonial (and post-colonial) epoch in this area and suggests counters to Scott's argument. Another departure of my study from previous ones focusing on British rule in India, eg., Banerjee and Iyer (2005); Iyer (2010), is that I analyze the introduction of formal state administration at the extensive margin.

This study also adds to the growing literature on kinship and development (Ghosh et al. (2023); Schulz et al. (2019); Henrich (2020); Schulz (2022); Bahrami-Rad et al. (2022)). These studies focus primarily on the historical Catholic Church and its ban on cousin-marriage as well as policy interventions in the marriage market. My study differs from earlier ones, first, by studying the policies of a very different type of centralized institution—the colonial British state—but also suggesting a much more rapid shift and economic evolution than those experienced historically by European tribes. It also proposes alternate paths societies may take—reinventing identities—in the cultural evolutionary process.

The third contribution of this paper is to the literature on state expansion. Most quantitative studies focus on crop appropriability for taxation or resource extraction as precursors to the growth of states (Mayshar et al. (2022); Dell (2010)). Few have looked at another cause: power projection. A case in point is the Roman conquest of the many *Germanic* tribes north of their territory wherein expansionist policies were crafted around a desire to establish their military and cultural superiority on the so called barbarians. Similar stories can be found in Chinese state expansion southward. One of the few studies in this vein is the recent one by Fernández-Villaverde et al. (2020) in which they run simulations to understand differences in state centralization between China and Europe. Likewise, Lecce et al. (2022) look at how historical experiences can produce differences in a society's reaction to state annexation.

Lastly, this paper is one that takes seriously the idea that the transition from anarchy to the

state involves not just economic changes but also the weakening of kinship ties, theories that have long occupied social scientists (Goody (1983); Macfarlane (1978); Henrich (2020)). It also proposes that new identities may have to take the place of older ones in order to sustain a new equilibrium.

1.2 Historical context

Figure 1.1: Physical Map of Northeast India.

My study region is the state of Nagaland, a highland state in the northeastern region of India inhabited by an indigenous people who today collectively identify as *Naga*. In the terminology of Van Schendel (2005) and Scott (2009) this region forms the western frontier of the *Zomia* country.[2] Prior to the arrival of the British the highlands of the northeast region (comprising 5 states today, all

[2]Scott's narrative on the many stateless societies of Highland Southeast Asia ends with the colonial era, when state structures were finally able to penetrate deeply among the indigenous peoples.

formed post-independence) as well as those of Burma, remained by-and-large outside the ambit of state structures.[3] The "hill-valley" dichotomy, expounded by anthropologists like Edmund Leach, was one of state-based (valley) versus stateless (hill) societies. Whereas the valley states were hierarchical (ruled by a king and a standing army) the hill regions were self governing at the village level (led by petty chiefs or village elders). The former kept detailed written accounts of their existence while the latter remained an oral culture. Relations between and among these two groups oscillated between trade and warfare. The latter took the form of raids by hill village on hill village as well as hill village on valley region. Chronicle accounts from the valley states speak of the constant need of their king and armies to lead punitive expeditions up the hills to either punish or project their power.[4] But such acts had effects that were rather temporary, as seen by the fact that the religion and language of the valley often ended right where the mountains began. In other words the valley states, with their fairly limited technology, never quite established what Weber might call 'a legitimate monopoly of violence over the hill region.' But this would all change with the coming of European powers.

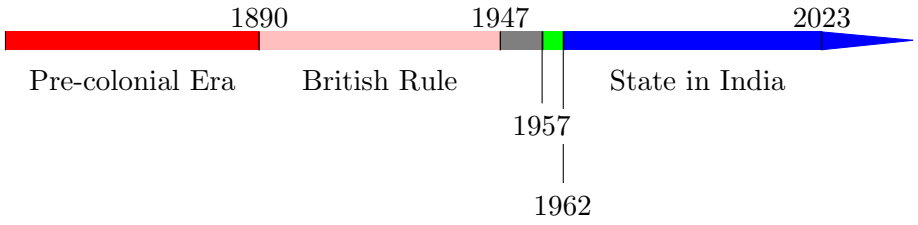


Figure 1.2: Historical timeline. 1947 is the year of independence. In 1957 the eastern and western regions were administratively unified and named the Naga Hills-Tuensang region. In 1962 they were granted statehood within the constitution of India.

Initially, though, the British were scarcely interested in governing the hill regions, and were

[3] A similar story can be said of the many provinces of southwestern China, a rugged region that even the mighty centralized Chinese state struggled for centuries to bring within their fold.

[4] See The Ahom Buranjis, The Chronicles of Manipur.

instead much more keen on annexing the more fertile and centralized valley states. And so they did. But once the valley regions were brought under Pax Britannica, those from the hills, continuing in the age-old tradition, would often raid the newly annexed territories in the plains. Aided by their superior military technology and bureaucratic efficiency the British responded by taking over vast tracts of the hills under their administration, something no power before had succeeded in doing so so systematically.[5] Even though I focus on a small subset of this vast highland region (for identification reasons), the manner of annexation and, later, administration was similar in spirit to just about all of the other peoples of *Zomia* (the *Mizos* (formerly called *Lushais*), *Kachins, Karens, Tsingphos, Chins*, etc).

1.2.1 Local population characteristics

A feature of the indigenous Naga people, as pointed out by every anthropologist familiar with the region, is that they are a village-based society (Mills 1922, Hutton 1928, Furer-Haimendorf 1976, Wouters 2017). People identify first with their village.[6] Customary laws applied to dealings within a village only. Consequently, skirmishes between villages were often dealt with war. Most glaringly the practice of headhunting colored the lives of the people, serving as a rite-of-passage for boys. This is best reflected in the fact that every village locates itself on a hilltop or close to it and never at a valley, giving the village a strategic advantage in the face of an attack. In addition the religious, economic, and political life of the people did not extend beyond the village, so much so that languages often differ from village to village, each unintelligible to the other. The former District Commissioner Hutton (1965) wrote-

> "At the time of the British acquaintance with them, many villages were still iso-

[5] One military invention of the time was the screw gun (1870s). This compact cannon could be transported with more ease up rugged mountains. Years later Kipling, in a poem named after the weapon, would write, "We've chived the *Naga* and the *Looshai*..... For you all love the screw-guns."

[6] Of the 1155 ethnic groups in the Ethnographic Atlas, 45% are classified as acephalous (level 0). Only 11% fall under states (levels 3 or 4). The remaining two levels in between are classified as belonging to either petty chiefdoms or large chiefdoms.

Figure 1.3: The northeastern region of India. Map taken from *The Excluded Areas of Assam* by Robert Reid (1944), The Geographical Journal, Jan.-Feb., 1944, Vol. 103, No. 1/2, pp. 18-29.

> lated from their neighbours by thickly forested hills and by rivers unfordable for several months in the year, and they tended to be on terms of head-hunting warfare with their nearest neighbours, or at best of an armed and ever suspect truce, almost every village being an independent political entity."

The in-group, therefore, was the village. Each was heavily fortified with bamboo spikes, and the main entrance was guarded by a huge door and village sentries. The state of things—institutionalized warfare—seems to have been a very stable equilibrium. Chronicles of neighboring kingdoms that go back centuries document the hills tribes as being extremely warlike. Why this was so remains an open question. The rugged mountains and thick jungle hypothesis of state impediment seems to

be the best one. It was only when distance-reducing technologies of western powers (Scott (2009)) entered this region of southeast Asia that the many historically stateless societies got absorbed into colonial states.

Technology-wise, the evidence points to a late-Neolithic epoch. Though metals were used (in the form of spears and machetes), iron smelting was not yet known. Metal was rather obtained from trade or raids with the neighboring groups in the plains. No evidence of writing exists, and, with the exception of the southern region where irrigated rice cultivation was known, the practice of slash-and-burn dominated.

1.2.2 Colonization and boundary drawing

The British had by 1839 annexed the neighboring state of Assam to the west of present-day Nagaland (see Figure 1.1). Tea-estates sprung up near the foothills. However, it was never in the intention of the British to move east or south and take over the mountains inhabited by numerous indigenous peoples. Two reasons forced the empire to eventually expand into the hills. One was a desire to find a route to Burma which required a march through some of the jungles. Second, and perhaps less obvious, was the need to subdue the constant raids by the hill villages on British settlements in the newly established Assam state. But early proposals saw resistance from the top-most authorities. Respoding to requests to annex the Naga territory the Governor-General of India in 1850, Dalhousie, said,

> "I dissent entirely from the policy which is recommended of what is called obtaining a control, that is to say, of taking possession of these hills, and of establishing our sovereignty over their savage inhabitants. Our possession could bring no profit to us, and would be as costly as it would be unproductive. The only advantage which is expected from our having possession of the country by those who advocate the measure, is the termination of the plundering inroads which the tribes now make from the hills on our subjects at the foot of them. But this advantage may more easily, more cheaply, and

> more justly be obtained by refraining from all seizure of the territory of these Nagas, and by confining ourselves, to the establishment of effective means of defence on the line of our own frontier."

The annexation of Nagaland was gradual, starting in 1866, and moving from two directions, the south and the northwest. More interesting was the nature of this expansion—a cycle of events was to occur. Initially intended to prevent raids a newly annexed village was made to submit their authority to the British. But this was soon followed by further raids by villages outside the border, from what was called the 'trans-frontier' region. To prevent this the border was expanded to include these new perpetrators who were then raided by those beyond the newly created border. And so on and so on.[7] As of 1884 the western and south-western regions were annexed and christened "The Naga Hills district" of Assam province. Ambitions to proceed further were already in the making. In the words of the Chief Commissioner, dated 31st October, 1887,

> "Now it seems to be admitted by all who have from time to time considered this question, that is our destiny, if not our duty, to bring these wild tribes more and more under control, and there can be no doubt that in time the tract in question, and a great deal more besides, will come to be included in our ordinary fully administered districts."

Experience in another hill district to the south, the Lushai Hills district, gave the upper-rank officials caution. In the fiscal year 1891 expenditures amounting to 500,000 rupees stood against revenues of a meagre 7,000 rupees. In the face of this impending reality the northern regions (what in Figure 1.4 (below) would comprise the northern areas west of the boundary line) were annexed and incorporated into the district.

By the turn of the century the southern region too was brought under British administration. These are the episodes that gave us the border in Figure 1.4, a line that established the official

[7] One can notice the village-based nature of the people by the fact that in the absence of any centralised political authority it was necessary for the British to annex the territory village by village.

Naga Hills district until Independence Day on 15th August, 1947.

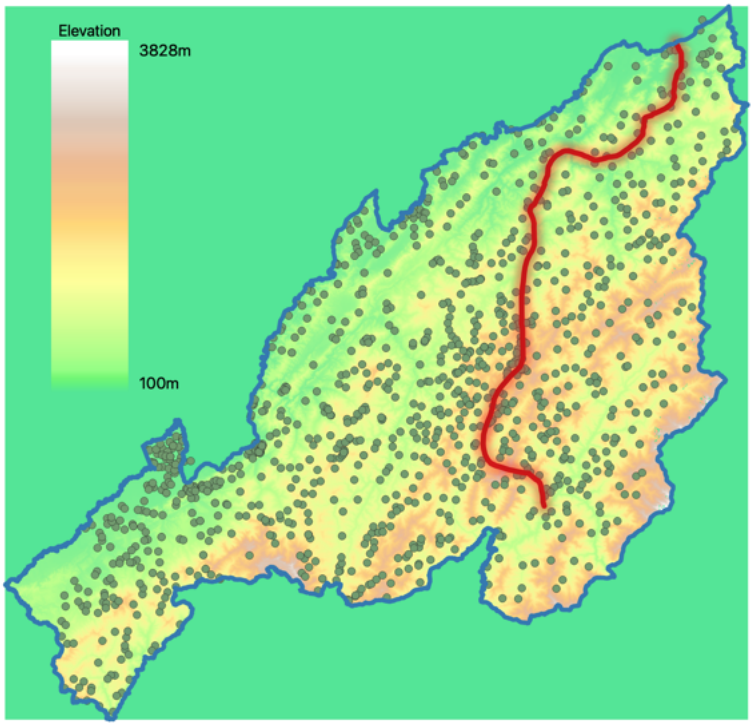


Figure 1.4: Topography of Nagaland state. Dots indicate village locations (exhaustive list of villages geocoded from 2011 Census). The red line is the region I focus for my study.

1.2.2.1 Narratives suggesting a quasi-exogenous nature to further annexation

Then, we ask, what was the basis on which this 'final' boundary was drawn? Why did it stop where it did? The colonial officers, as we continue to discover, were torn on this issue. First, the border as we see it in Figure 1.4 had a distinct geographical flow: rivers—and in some regions, large streams—were used to demarcate the colonial boundary, the *Dikhu* and *Tizu* rivers being the

major ones. In the words of the then Deputy Commissioner in 1903, "A river is a natural feature, which the meanest savage understands, and is, to a great extent, a dividing line between villages and village interest, which the crest of the hill most certainly is not." Rivers, according to him, were easy to identify for the locals unlike, say, a mountain crest. A similar historical account comes from the Roman Empire. To demarcate their territory from the raiding Germanic tribes up north, they used the Rhine and Danube rivers wherever they could, a line that later scholars would call the *Limes Germanicus*.

Soon after, however, it became clear to on-ground officers, that if long-term stability of the annexed territory was to be achieved a complete annexation of all the trans-frontier regions was necessary. Inter-village fueds from across were worrying the administered villages. In a 1905 letter by the Deputy Commissioner (D.C) to the Government of India (in Delhi) it was clear the mood was unambiguous,

> "If the present awful condition of affairs is to cease, the only solution as far as I can see is annexation."

The Government of India took over seven months to respond. Unsympathetic to the request they emphasized the "the principle of accepting no responsibility for the protection of life and property beyond the administrative line of British territory"..... and "had no desire to hasten the day when the outlying tribes would fall under the administration." The main reason cited was finance.

That very year Major H.W.G Cole, the former D.C, wrote about the need to "accept as inevitable the ultimate absorption of all non-administered territory between India and Burma." The then D.C, A.W. Davis, went on to say that "we shall have no real peace until we have absorbed the whole hill area...."

In response to these further requests the Government of India acquiesced and wrote directly to the Secretary of State in a letter dated 16th July, 1908. Four months later, on the 13th of November,

a rejection letter was issued which concluded as follows-

> "I am therefore compelled to withhold my sanction from the measure which you submit for my approval."

A few years later the Great War came to be and all expansionist policies were set aside. Many ground officers would later write of their regret in being unable to convince the higher authorities. The sentiment is captured well by Christoph von Fürer-Haimendorf, an anthropologist who worked with a few villages in the northern part of Nagaland in the 1930s, and who had close affiliations with the then Deputy Commissioner. He would in 1969 write of those who remained outside British rule as follows: "it was [historically] accidental.....that during the British period their villages had remained outside the administered region then known as the Naga Hills district."[8]

After independence the non-administered region was brought under political control by the Indian state and named the Tuensang Frontier District. In 1957, the Tuensang Frontier Division was merged with the Naga Hills District (then still a district within Assam state) to form an administrative unit called the Naga Hills Tuensang Area (NHTA). In 1962 NHTA became a fully-fledged state and renamed Nagaland.

1.2.3 What did it mean to be administered?

The first policy of the British was to ban all tribal feuds and warfare. All weapons were confiscated and village fortifications were to be removed (Reed (1942)). Prior to annexation the tribes in this region were known for their practice of head-hunting, which involved chopping off the head of an enemy following a raid. So deeply institutionalized was this practice that participation in it served as a rite-of-passage for boys.[9] With the new foreign rule, this practice was forever ended. Military

[8] Taken from *The Konyak Nagas; an Indian frontier tribe*, 1969.

[9] The effect on head-hunting ban was apparent for certain visitors. In 1937 the D.C, in one of his once-in-a-while visits across the border, was accompanied by the anthropologist Christoph von Fürer-Haimendorf (mentioned earlier) who noted the discrete jump in atmosphere as they entered a trans-frontier village. "Walking through the village," he would note, "you recognize the houses of the renowned heroes, for the taking part in a successful

outposts and jails were established and a large security personnel was stationed.

In terms of administration the British established a two-tier system of village governance, what came to be called the *gaonbura-dobashi* system of governance. A *goanbura* (which is an Assamese word for 'village elder') was selected from each clan in a village. To legitimize his role he was given a plain-red shawl, a concrete mark of authority that over time would become highly-coveted.[10] The role of the *goanbura* was to collect a house tax and report monthly to the District Commissioner. These revenues were expected as payment for protection and security. In other words, it created a social contract between state and society.[11] The *dobashi* (meaning 'man of two words') served as interpreter to the colonial officers and acted as their eyes and ears in the village. They were powerful and each was put in charge of several villages. Carefully selected based on their knowledge of customary law the *dobashis* also assisted in dispute resolution Sema, 1985.

Investments in human capital and infrastructure followed thereafter. The former was delegated largely to missionaries and came in the form of conversion as well as investments in education and healthcare. But in the case of the Naga Hills District actual foreign missionary presence was trivial compared to the local population (roughly 15-20 American/European missionaries over a span of 70 years).[12] Much of the proselytizing and cultural transmission works occurred, instead, via a local-to-local channel. This was, in large part, a result of both the state and missions having as their objective the need to reduce the isolation of villages so as to diminish historical hostilities. As Eaton (1984) points out, "One way this [breaking village isolation] was done...was by training village students in Impur or Kohima where they were mixed with 300 to 800 other youths from scattered origins, and then sent as primary teachers not to their native villages, but to some other

head-hunting raid means another plaited cane ball on the string hanging from the gable of the house; on one string I counted no less than thirty trophies [skulls]."

[10]During the Second World War Ursula Graham Bower, a documentarian working with the locals, was put in charge of mobilizing some villagers to serve as non-combatant officers and spies. Some of her men requested the government issue them the red shawl so as to legitimize their authority as employees of the British state.

[11]From the Gazetteer of Naga Hills and Manipur, 1905.

[12]Eaton (1984) gives a rich account (using several primary sources) of mission and state interactions.

village....” In fact by 1951, four years after independence, roughly half the population within the border was Christianized.[13]

1.3 Theory

Recall first that tribal warfare was the social contract that had existed in the region for thousands of years. Thus the banning of all inter-village warfare by the British state can be interpreted in this study's context as an exogenous shock to the existing 'rules of the game.' For this policy to bind, however, the British had to establish themselves physically in the region (annexation). This required them to connect all the villages by bridles paths and roads so as to patrol the region when required. In addition, an administrative apparatus was set up and put under the charge of a Deputy Commissioner and his subordinates.

The evolutionary models of Bisin and Verdier (2017) and Tabellini (2008) predict that such an exogenous shock should then drive interactions between institutions and culture. It appears, based on this paper's findings, that a shift in norms began as people gradually perceived themselves as belonging to a larger group. To use the terminology of Platteau (2015) society seemed to transition from limited to more generalized morality: villagers in the administered region started building ties with more distant and unrelated people. This can be further interpreted in the context of multiple-equilibria cultural models as a transition from one basin of attraction to the other (Besley (2020)) in response to a parameter shift.

In this paper's context, one important effect of administration in the Naga Hills District, I argue, was a codification of the Naga identity. As mentioned in the previous section policies of state and church centered at breaking down old barriers: over time a sense of inter-tribal oneness took form among the natives. Social Identity Theory tells us that such an identification with a new group then feeds into one's utility and proscribes how one is to treat those within the group (Akerlof and Kranton (2000); Tajfel (2010)). Reading historical accounts we observe how the natives seem to

[13]Census of India, 1951.

have come around this by creating institutions around this new Naga identity. One well-known case is the Naga Club founded by a group of literates and local administrators in 1918 "with the objective to unite the Nagas and look onto the socio-economic and political upkeep of the Naga society."[14] This was, to my knowledge, the first endogenously formed institution that spanned the entire district. Likewise the emerging Christian population established the Naga Hills Baptist Church Council in 1937, ten years before independence from the British. In other words, we observe over a long run a kind of two-way causal relationship, first, from institutions (state structures) to culture (identity) and then back to new, locally constructed institutions built around this new identity. This would've further strengthened identity as time went on.[15] Survey results sixty years after independence suggests that indeed a sense of commonness did emerge and persists to recent times.

More concretely, one may ask why looser kinship ties would facilitate growth? A growing body of work supports the idea that non-relational ties are superior for tacit knowledge transmission over those based on kin networks. For example De la Croix et al. (2018) show how the correlated nature of kin-based learning diminishes the growth of knowledge. Apprenticeship-based learning, on the other hand, allows for learning from a much wider pool of teachers. To develop along the lines of the latter, however, societies need to build impersonal institutions to overcome moral hazard problems that don't come up when everyone in the small village knows everyone else. The predictions of the model—that societies making such a transition will simultaneously build new institutions—seem to hold true in this paper's setting.

Lastly, in Bisin and Verdier (2017) and Tabellini (2008), the relationship between institutions and culture can be either that of strategic substitutes: enforcement institutions (eg., the police) can crowd out culture if society delegates cooperative norms to the state. The study by Lowes et al. (2017) on the expansion of the Kuba kingdom seem to suggest such a substitution at play (state

[14]Taken from the Morung Express, Daniel Shiu.

[15]Chophy (2021) gives a local-based account of the state and missions cooperating (and also disagreeing) in the socialization process of the native population.

formation leads to less cooperation). There is another path, however, that a society can take—that of a complementarity between institutions and culture. For example, Heldring (2021) hypothesizes that state formation in Rwanda created a culture of obedience to the state. My study suggests in-group expansion as another path of complementarity between institutions and culture.

1.4 Data and outcome variables

For the colonial boundary I georeference Robert Reid's map of Assam province (Reid (1944)). Reid was the then governor of undivided Assam. In 1944, as governor, he published an essay of the territory he was put in charge of. The survey (including the map) eventually found its place in The Geographic Journal.[16]

To study the long-term persistence of British rule I use DHS data from 2015. My main outcomes of interest are literacy rates, years of schooling, and wealth. Literacy is coded in 3 categories: "cannot read at all", "able to read only parts of sentence", and "able to read whole sentence". I treat the first two as capturing being illiterate and recode them to 0 and recode 'able to read whole sentences' as 1. Wealth is an index that takes five values, from 0, poorest, to 5, richest.

In addition I make use of census data going back to 1971. This allows me to study trends in literacy rates as well labor force composition. The 1971 and 1981 census were scraped from scanned copies while the latter census years (1991-2011) were obtained from the Socioeconomic High-resolution Rural-Urban Geographic Platform for India (SHRUG) compiled by Asher et al. (2021). Using another source (`data.gov.in`) I obtain census data (2011) that has information on various public goods/services availability at the village level.

To study identity-related questions I use data from the Center for the Study of Developing Societies (CSDS-Lokniti). The NGO conducts election-related surveys in every state in India during the assembly elections. I obtain data for Nagaland for the year 2008. The outcome variables from this dataset capture an individual's support for the administrative unification of fellow Naga people

[16] See *The Excluded Areas of Assam* by Robert Reid (1944), The Geographical Journal, Jan.-Feb., 1944, Vol. 103, No. 1/2, pp. 18-29.

living in neighboring states.

1.5 Identification Strategy

The nature of my setting allows for a regression discontinuity at the colonial border as an identification strategy. The idea is that villages close to the border will have similar characteristics, including unobservables, and thus comparing villages just inside with those just outside the historical border will capture the effect of colonial rule. In the spirit of Dell et al. (2018) I use the following semi-parametric regression specification-

$$y_{iv} = \alpha + \beta \times \text{British}_v + \delta X_i + f(\text{geographic location}_v) + \epsilon_{iv} \tag{1}$$

where y_{iv} is the outcome of interest of individual i living in village v, $British_v$ is a dummy variable that takes the value 1 if village v was a former colony, X_i is a set of individual specific controls that include age, age squared, gender, and $f(\text{geographic location}_\text{v})$ is the RD polynomial that controls for smooth geographical variation for village v. β is our main coefficient of interest. It measures the effect of being just inside the colonial boundary on our outcome of interest. For my main tables I use a linear polynomial in distance to the colonial boundary as my functional form and pick two bandwidths: 10 kms and 20 kms.

To study time-varying effects of colonial administration I also estimate the following equation-

$$y_{vt} = \alpha + \sum_{t \in T} \beta_t \times \text{British}_{v,t} + \gamma_t + f(\text{geographic location}_v) + \epsilon_{vt} \tag{2}$$

where $T = \{1971, 1981, 1991, 2001, 2011\}$, $\text{British}_{v,t} = 1$ if at time t village v was an administered village and 0 otherwise, and γ_t is a time fixed effect.

Lastly, to study village level differences in modern times I run the following regression-

$$y_v = \alpha + \beta \times \text{British}_v + f(\text{geographic location}_v) + \epsilon_v \tag{3}$$

where y_v is average outcome of village 'v'.

In Figure 1.4, I focus on the red highlighted part of the colonial border. This is because the southermost region witnessed heavy bombing during the Second World War, and previous studies caution us that such military fighting can have persistent, negative effects (Dell and Querubin (2018)). My concern is the displacement caused by the war since people relocated to the capital city (Ltu (2019)). Lastly, the DHS jitters geocode locations to protect the identity of respondents. I address the concerns around this in section 1.8.

1.6 Results

I begin by looking at the evolution of human capital over time. Figure 1.5 depicts binned scatter plots of literacy rates of villages from 1971 to 2011. Gaps remain very persistent through the decades. Literacy rates in the formerly-administered villages are, on average, 14 percentage points higher. Not surprisingly, we see spillovers over time as the formerly non-administered villages benefit from proximity to the border. In fact, after independence it was the more educated ones from the former colony villages who introduced those in the east with their new institutions and educational system, as well as new religion, beginning first with those at a more geographically convenient location and gradually moving further east over the decades.[17] Table 1.1 gives the regression output of specification 2 using a linear polynomial in distance to the border and the outcome variable as village literacy rate. We see that the gaps in literacy rates have remained persistent over the decades, well into modern times, with no hints of convergence.[18]

Table 1.2 reports the estimates of β from equation (1) for years of schooling, literacy, and wealth respectively, with odd (even) numbered columns representing a bandwidth of 10 (20) kilometres within the border.[19] The unit of observation is an individual from the DHS 2015 data. The polynomial function used for the estimates in Table 1.2 is a linear function in distance to the

[17] See Chophy (2021) for more details about identity and proselytizing among the eastern region by the western villages.

[18] Starting in 1991 literacy rates were counted only for those 6 years of age and above.

[19] For each regression using the DHS data I cluster standard errors at the village level. For other results for which available data is aggregated at the village level clustering occurs at the sub-district level.

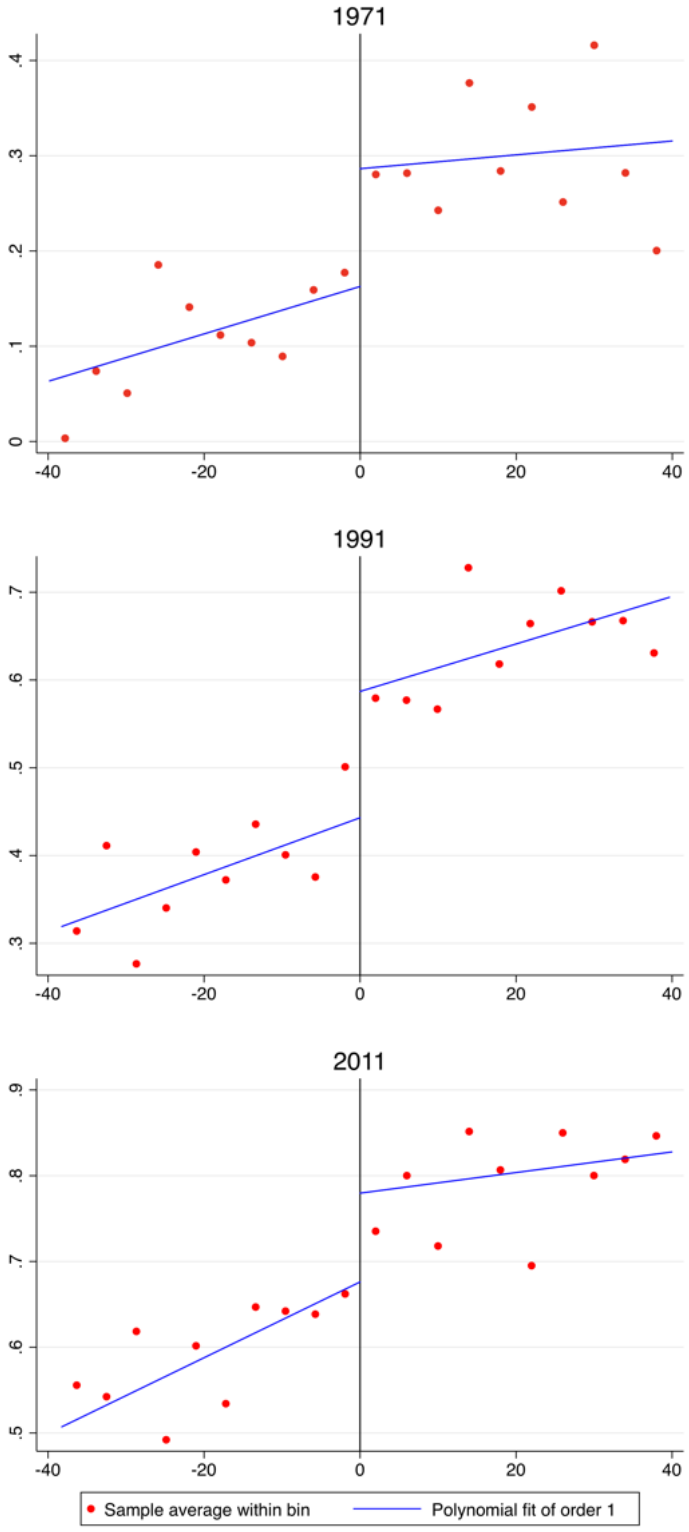


Figure 1.5: Binned scatter plots for literacy rates across time. Each dot represents average village literacy rates using 4 kilometer bins.

Table 1.1: RD results using Census Data (1971-2011)

Dependent variable	Literacy Rate	
Bandwidth	10 km	20 km
	(1)	(2)
$British_{1971}$	0.121***	0.157***
	(0.026)	(0.019)
$British_{1981}$	0.098***	0.174***
	(0.034)	(0.030)
$British_{1991}$	0.174***	0.201***
	(0.033)	(0.027)
$British_{2001}$	0.189***	0.229***
	(0.027)	(0.025)
$British_{2011}$	0.155***	0.184***
	(0.029)	(0.023)
Observations	1,312	2,099
R-squared	0.526	0.560
Mean $literacy_{1971}$	0.222	0.215
Mean $literacy_{1981}$	0.357	0.354
Mean $literacy_{1991}$	0.514	0.516
Mean $literacy_{2001}$	0.587	0.574
Mean $literacy_{2011}$	0.737	0.728

Notes: Robust standard errors (in parentheses) are clustered at the sub-district level. The unit of observation is a village. Each regression uses a linear polynomial in distance to the border. *** p<0.01, ** p<0.05, * p<0.1

border.

Looking at column 1 of Table 1.2 we see that those living in villages formerly administered by the British have about 1.3 more years of schooling. A similar pattern follows for literacy and wealth, with those living in the formerly administered villages being more literate (15 percentage points difference) and having about 25% more wealth.

One worries if this is a simple river-effect. To look into this, I consider the *Doyang* river on the administered side. It is the largest river in the state, and certainly the best known. More

Table 1.2: Main RD results, DHS 2015 (linear polynomial in distance to the border)

Dependent variable	Schooling Years		Literacy Rate		Wealth Index	
Bandwidth	10 km	20 km	10 km	20 km	10 km	20 km
	(1)	(2)	(3)	(4)	(5)	(6)
British administered	1.367***	1.764***	0.134***	0.184***	0.474***	0.640***
	(0.340)	(0.303)	(0.033)	(0.029)	(0.140)	(0.110)
Observations	1,751	2,965	1,746	2,956	1,751	2,965
R-squared	0.131	0.128	0.106	0.114	0.056	0.092
Mean dep. var	6.890	6.540	0.716	0.675	2.995	2.915

Notes: Robust standard errors are clustered at the village level. The unit of observation is an individual. The sample includes women and men between 15 and 49 years. Literacy rate lies between 0-100%, years of schooling between 0 and 15, and wealth between 1 (poorest) and 5 (richest). *** p<0.01, ** p<0.05, * p<0.1

Table 1.3: Placebo check using the Doyang river

Dependent variable	Schooling Years		Literacy Rate		Wealth Index	
Bandwidth	10 km	20 km	10 km	20 km	10 km	20 km
	(1)	(2)	(3)	(4)	(5)	(6)
West side	0.149	0.272	0.011	0.016	-0.040	0.278
	(0.540)	(0.388)	(0.055)	(0.037)	(0.294)	(0.198)
Observations	486	850	483	847	486	850
R-squared	0.124	0.113	0.070	0.079	0.041	0.020
Mean dep. var	7.405	7.429	0.788	0.776	3.232	3.231

Notes: Robust standard errors are clustered at the village level. Data is from the DHS. I create a dummy variable 'West side' that takes value 1 if an individual is from a village west of the Doyang river and 0 otherwise. Each regression controls for age, age squared, gender, and a linear polynomial in distance to the river. Figure A.3 in the appendix shows a bridge constructed by the British in the 19th century across the Doyang. *** p<0.01, ** p<0.05, * p<0.1

importantly, this was the initially intended border at the early stages of annexation. However, the British marched eastward implying that villages immediately to the east and west of the Doyang were under colonial administration. Table 1.3 reports results using a 20 kilometer bandwidth and a linear ordered polynomial in distance to the river. We can confirm that those on either side of the Doyang river do not systematically differ on my main outcomes (literacy, schooling years, wealth). Table A.4 in the appendix considers higher ordered polynomials.

Figure 1.6 plots coefficients alongwith 95% confidence intervals for labor share in services. We see that for women gaps start opening in the 1990s as those formerly administered gravitate towards services and away from agriculture. For example, in 2011, formerly-administered villages have 8 percentage points higher share of their labor force employed in services. For men the gaps are not significant. Table A.1 in the Appendix reports the regression results.

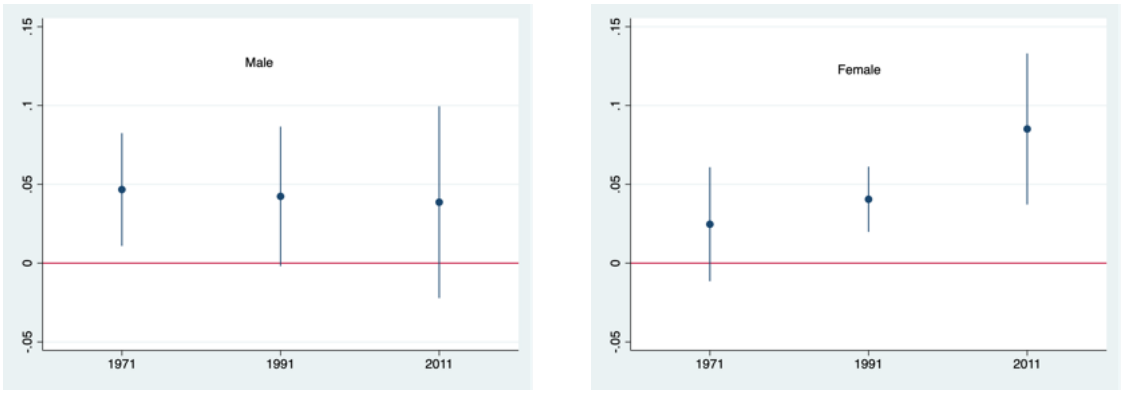


Figure 1.6: Point estimates with 95% CI from Table A.1. These estimates are based on specification 3, and use a linear polynomial in distance to the colonial border. The dependent variable is share of village in services. The left graph is for men and the right for women.

1.7 Potential Mechanisms

To understand the potential mechanisms driving our main results I use the 2011 Census, the latest year for which data is publicly available. The data is collected at the village level and includes information on various village amenities and services. I geocode the villages so as to run spatial RD regressions. In all specifications I report results based on a linear polynomial in distance to the colonial border withing a 20 kilometer bandwidth. The data codes a public good/service as 1 if it's available in a village, and 2 if not. I recode the latter to 0 so as to run linear probability regressions.

1.7.1 Roads and public schools

The Census data 2011 provides details of public goods/services provision. Panel A of Table 1.4 reports the results for road connectivity. The coefficients on the colonial dummy is significant for 'other district roads' and 'national highways.' However, in Panel B of Table 1.4 we don't see differences in public school status for the villages on either side of the border.

Table 1.4: Data Source: Census 2011

	Panel A: Road Connnectivity			
Dependent variable	Major district roads	Other district roads	National highway	State Highway
	(1)	(2)	(3)	(4)
British	0.060	0.283**	0.114*	0.032
	(0.075)	(0.109)	(0.062)	(0.057)
Observations	426	426	426	426
R-squared	0.027	0.056	0.044	0.044
Mean dep. var	0.324	0.448	0.066	0.134
	Panel B: Public Schools			
Dependent variable	Primary	Middle	Secondary	Senior
	(1)	(2)	(3)	(4)
British	0.065*	-0.052	0.046	0.017
	(0.033)	(0.094)	(0.049)	(0.012)
Observations	426	426	425	426
R-squared	0.013	0.003	0.015	0.004
Mean dep. var	0.932	0.357	0.114	0.006

Notes: Robust standard errors (in parentheses) are clustered at the sub-district level. The unit of observation is a village. Each regression uses a 20 kilometer bandwidth and a linear polynomial in distance to the border. The dependent variables are binary taking value 1 if a village has the public good/service, and 0 otherwise. *** p<0.01, ** p<0.05, * p<0.1

1.7.2 Identity Creation as a key mechanism?

So far I have presented a few mechanisms that appear to be driving my key outcomes. Here I want to point to deeper cultural forces at play, namely the formation of a larger sense of identity, one that extends the in-group beyond the primordial village identity to a pan-ethnic one. By the 1920s a sense of oneness emerged among the administered villages, the sense that they should unify as a common Naga people. Interestingly, to the area south of the British Naga Hills District is a vast region inhabited by a people that the British also classified as Naga (Hodson (1911)). However this region was administered indirectly under the princely state of Manipur. In the decades following independence a movement demanding the creation of Greater Nagaland emerged. This was conceptualized as the administrative unification of all Naga inhabited regions spread out across

4 states in India and one administrative zone in Burma (Myanmar).[20] I analyse people's views on this demand via survey responses.

1.7.2.1 Survey responses

The Center for the Study of Developing Societies (CSDS-Lokniti) conducts election-related surveys in every state in India during the assembly elections. For Nagaland state I was able to obtain their data for the year 2008. One of the questions asks if an individual respondent has *heard of the demand of 'Greater Nagaland'*, taking the value 1 if yes, and 0 otherwise. I run a simple OLS regression of the survey answers on the colonial dummy, controlling for age and gender only. Column 1 of Table 1.5 reports the coefficient on the colonial dummy for the above mentioned question. Those in the administered region are 34% more likely to be aware of the movement (only half of those in the non-administered region had heard of it). The outcome variable in column 2 is a binary variable asking if the respondent has an opinion of the movement. Column 3's outcome variable is a 5-point Likert scale based on the question *To what extent do you think the demand of Greater Nagaland is justified?* and takes values as follows: 1, fully unjustified; 2, somewhat unjustified; 3, no opinion; 4, somewhat justified; 5, fully unjustified. From Table 1.5 we observe much stronger support for the movement among the historically treated group.

An interesting aspect of this question is that it captures a desire for new institutions (formal state administration) built around the Naga identity. Thus, the results of this section capture, perhaps, an equilibrium outcome of the joint evolution of identity and institutions.

1.7.2.2 Networks

If, as illustrated in the previous subsection, a sense of larger belonging did emerge—in particular, with non-kin folk—one must see it reflected in some measure of behavior. To see this I consider the pool of candidates who ran for the 2023 State Assembly Election (166 total) and observe their

[20] The states in India include Nagaland, Manipur, Assam, and Arunachal Pradesh. In Burma the concerned location is the Naga-Self Administered Zone in Sagaing Division.

Table 1.5: Opinion survey on identity

VARIABLES	(1) Heard about movement	(2) Have an opinion	(3) Movement justified
Panel A: Full rural sample			
British	0.300***	0.412***	0.539***
	(0.077)	(0.089)	(0.087)
Mean dep. var	0.836	0.604	3.473
Observations	649	649	649
R-squared	0.104	0.111	0.042
Panel B: Within 30 kms of the border			
British	0.263**	0.374***	0.221**
	(0.097)	(0.103)	(0.088)
Mean dep. var	0.760	0.515	3.178
Observations	376	376	376
R-squared	0.123	0.128	0.014

Notes: Standard errors are clustered at the polling station level. The non-administered regions make up 15% of the survey sample in Panel A and 24% in Panel B. All regressions control for age and gender only. Columns 1 and 2 use a linear probability model. Column 1 takes value 1 if respondent has heard about the ethnic movement and 0 otherwise. Column 2 takes value 1 if respondent has an opinion about the movement and 0 otherwise. Column 3 measures the degree of support for the movement and takes values as follows: 1 if fully unjustified, 2 if somewhat unjustified, 3 if indifferent, 4 if somewhat justified, 5 if fully justified. *** p<0.01, ** p<0.05, * p<0.1

presence on twitter.[21] What is neat about this measure is that unlike other social media platforms like Facebook or Instagram, Twitter is used primarily to interact with strangers and not with family or relatives. The results in Table 1.6 report OLS results for the probability that a candidate has a twitter account: much higher for the formerly administered region. There are many interpretations to this. First, the fact that candidates from the formerly administered regions are more likely

[21]The data is as of April 2023, a month after the most recent state assembly elections.

Table 1.6: Twitter Presence

Dependent variable	Twitter	Twitter
	(1)	(2)
British	0.249***	0.250***
	(0.077)	(0.071)
Specification	LPM	Logit (margins)
Mean dep. var	0.439	0.439
Observations	166	166
R-squared	0.056	0.042

Notes: Robust standard errors (in parentheses) are clustered at the constituency level. *** p<0.01, ** p<0.05, * p<0.1. The unit of observation is a political candidate running for the state assembly elections, 2023. The dependent variable "twitter" is binary and takes value 1 if a candidate is on twitter and 0 otherwise. I exclude the constituencies of the capital city of Kohima and the commercial city of Dimapur.

to have a twitter account could potentially reflect a stronger desire to reach out to strangers. Alternatively it could be a behavioral response to the fact that they contest in regions that have more voters on twitter.

1.7.3 Concerns about migration

One concern is that people might migrate across the border leading to biased estimates. The customary rules regarding village identity reassures us against this. The way villages are organized is as follows: each village is made up of a number of clans (phatries). Clans live in their respective *khels* (localities) within the village. Most importantly, each clan traces ancestry to a common ancestor. One cannot simply enter another village and expect to be absorbed if they do not pass down from the same lineage. An analogous case is the caste identity in most other parts of India whereby one simply cannot switch castes as they please. These identities are remarkably sticky.

Figures A.1 and A.2 in the appendix plot the densities of villages across the border. One does not see a one-sided clustering that might invalidate the RD assumption for identification if villages

relocated themselves at the border in a strategic manner.

1.8 Robustness checks

1.8.1 Alternate specifications of the RD polynomial

Tables A.2 and A.3 in the appendix present results for alternate specifications of the RD polynomial, f(geographic location), and for higher order powers. These include linear, quadratic, and cubic polynomials in distance to the commercial capital (Dimapur city) and a two-dimensional function of latitude-longitude. Results appear very robust for our various specifications. The exception is the linear polynomial in latitude and longitude for which the coefficients for human capital are not statistically significant at conventional levels.

1.8.2 Concerns about geocode displacement in the DHS sample

The DHS displaces geocode locations by upto 5 kilometres for 99% of rural areas. This is likely to lead to a downward bias in my estimates as those formerly administered are coded as non-administered, and vice versa. To address this I use a donut regression by dropping observations within 5 kilometers of the border and using only those located between 5 and 20 kilometers. Table A.5 in the appendix show that the coefficients, if anything, do get larger.

1.9 Conclusion

This study looks at the transition a society makes from anarchy to state structures, a process most societies in the world have gone through at some point in their past. It does so by exploiting a natural experiment during the European colonial era. Among the natives, those brought under British administration are faring better today economically. I begin by showing that the nature of the colonial border drawing was done in a haphazard way. I then show how the formerly administered regions score much better on outcomes like literacy rates, schooling years, and wealth. I also find gaps in the labor force as the administered villages move towards services.

I then point to another key contribution this paper makes to the literature by giving structure to the mechanisms involved in such a complex process. In particular I argue that identity-creation is a strategy society adopts as it tries to scale up from tribal structures to more impersonal relationships. This is likely a pattern that occurred in vast parts of the world as societies moved away from identifying with their tribe and instead seeing themselves as part of larger more impersonal groups, aided primarily by states. The exogenous nature of my setting gives us a clean way of causally identifying a state-effect. Results from a survey make a case that the formerly administered are more likely to identify with non-kin members and also display a desire to form larger institutions beyond kinship. This study also tests predictions of very recent theoretical models. Compared to previous theories that posit that either culture causes institutions or vice versa, this new strand views historical economics as a two-way interaction between culture and institutions. The results I find suggest that such a interaction is most likely at play.

Chapter 2

CONSEQUENCES OF FORCED URBANIZATION VIA VILLAGE GROUPINGS IN MIZORAM

2.1 Introduction

An important question in urban and spatial economics concerns the role of agglomeration in promoting economic growth and structural transformation (Lagakos, 2020; Bryan et al., 2020). Studies on this topic, often centered on industrialized (or industrializing) countries, show that urban agglomeration can foster economic transitions by shifting labor from agriculture to more productive sectors like manufacturing and services (Michaels et al., 2012). However, the extent to which these findings apply to developing regions, especially those with weaker state capacities, remains under-explored.

Furthermore, a growing body of work in development has shown how the impact of policy on economic outcomes can vary substantially depending on the existing institutional and economic environment. For instance, Alfaro et al. (2010) demonstrate that the success of foreign direct investment (FDI) in fostering growth depends heavily on the maturity of local financial markets. Similarly, Henderson and Kriticos (2018) suggest that the development of city systems and agglomeration economies in sub-Saharan Africa is hindered by limited state capacity and infrastructure. By contrast, studies in industrialized nations, such as those examining post-war Germany, have found significant positive effects of forced migration on economic growth due to existing manufacturing bases and robust institutions capable of absorbing labor into higher-productivity sectors (Peters, 2022). The question arises: can similar urbanization policies yield comparable benefits in less developed, weak state contexts? This study contributes to this growing literature by examining the effects of a forced urbanization policy on the economic structure of Mizoram, a tribal state in

northeast India.

In the late early 1960s a secessionist uprising erupted in Mizoram state. The local population felt the government had not responded sufficiently to an impending famine that hits the state every 50 years or so (Chadha, 2009). In response to the unrest, the Indian government engaged in a forced urbanization policy wherein, with the aid of Indian military, about 168,000 people were forcibly relocated from about 516 villages into one of 103 designated "Grouping Centers" (GCs), with the stated goal of better monitoring the people as well as increasing economic development (Nunthara, 1989). About 110 villages, concentrated primarily in the southern region, remained unaffected. The number of villages enumerated in the 1971 census (at the height of the intervention) stood at 238 as opposed to 743 villages in the 1961 census. This episode, therefore, creates variation in treatment status within the same state, a natural experiment that this paper leverages.

Theoretically, forced population agglomeration could drive structural transformation by having the manufacturing sector absorb the additional labor. For example, in the model proposed by Leukhina and Turnovsky, 2016, if the elasticity of substitution between factor inputs is low in the agricultural sector, then population growth shifts people towards manufacturing. Other theories predict that the concentration of people could increase the exchange of ideas and networks that then allow for productivity increases, as shown in many canonical models of growth (Romer, 1990). This, in turn, could directly people towards non-agricultural activities.[1]

Using a difference-in-differences (DiD) approach, this paper estimates the effects of forced relocation on the economic structure of treated villages versus the non-affected villages. First the policy had immediate large effects on the size of the GCs. Between 1961 and 1971 (when the policy was in effect) the GCs saw their populations surge by 100% more than the control villages. However by 1991, the population differences reduced to about 35%, though still statistically significant. A reason for this is that there was partial compliance to the policy. Qualitative evidence show that about half the refugees returned to reestablish their home villages while half remained in the

[1]Other models from cultural evolutionary theory also predict scale effects on innovation even in low-literacy societies (eg., Henrich, 2004).

GCs (Nunthara, 1989). In fact, by 1981, as the policy was winding down, the number of villages enumerated in the census returned to the pre-intervention period. Figure 2.1 shows the number of villages enumerated in each census decade. From about 743 villages in 1961 being listed, this number drops to 238 in 1971, and then returns to 736 in 1981. Therefore the diff-in-diff results reflect an Intent-to-treat effect.

Looking at the effects of the policy on structural transformation I find a decline in the share of agricultural employment in GC villages relative to ungrouped villages. More specifically the GCs, on average, saw their agricultural share of the labor force decline by about 6 percentage points even twenty years after the policy ended. Furthermore the GCs also saw their labor force participation rate rise by 9 percentage points.

I further estimate a parameter of interest in urban economics—the semi-elasticity of population growth on structural change (Peters, 2022; Leukhina and Turnovsky, 2016). To estimate this, I employ an instrumental variable (IV) approach using GC assignment as an instrument. I find a strong first stage and consequently a statistically significant effect on structural change. Specifically, a doubling in population between 1961 and 1991 led to an approximate 5.5 percentage point decrease in agricultural employment.[2]

Going beyond this push factor that drives structural change, I further examine potential institutional factors associated with the success of population absorption in the Grouping Centers (GCs). A large body of work emphasizes pull factors in attracting people to towns/cities (Glaeser, 2012). Using data on amenities from the 1961 census I find suggestive evidence that the availability of infrastructure at this baseline year—taken five years before intervention—strengthens the policy's effect over the long run. Taken together this illustrates the importance of institutional characteristics in interacting with population growth and fostering structural change. This finding aligns with the studies on forced urbanization in low-capacity settings, where limited industrial infrastructure inhibits labor reallocation to non-agricultural sectors (Henderson and Kriticos, 2018).

[2]This stands in contrast to a previous study by Peters, 2022 who looks at refugee inflows in post-war Germany and documents a semi-elasticity almost five-fold larger.

This paper contributes, firstly, to the literature on structural transformation by addressing the conditions under which population agglomeration can drive economic reallocation from agriculture to higher productivity sectors. Structural transformation, often characterized by shifts in labor from agriculture to manufacturing and services, is central to economic development (Lewis, 1954; Rodrik, 2016). Within the wide range of reasons used to explain such changes, a recurring one relates to scale and population growth. Increased population density and larger market sizes can facilitate productivity gains and structural change by enabling economies of scale, labor specialization, and efficient resource allocation (Krugman, 1991; Henderson, 2003; Ciccone, 2002; Acemoglu and Robinson, 2014). However, the literature remains fraught with endogeneity problems, considering the difficulty in randomizing large population movements. A few studies that use individual panel data show how productivity differences between urban and rural dwellers are reduced substantially once individual fixed effects are included (Hamory et al., 2021; Alvarez, 2020). However, Lagakos (2020) cautions that these findings might underscore factors such as migration costs that prevent those who might have greatly benefited from actually moving.

Secondly, this study contributes to the literature on forced displacement in low-income countries by focusing on long-term structural transformations, an area less explored in existing research, which often emphasizes shorter-term impacts and immediate socioeconomic outcomes. Recent findings in this area highlight a range of forced migration cases. Studies in African contexts, such as those by Maystadt and Duranton (2019) and Ruiz and Vargas-Silva (2015a), found that refugee inflows in northwest Tanzania led to increased competition for agricultural labor, benefiting local producers. Other research, like that of Islam et al. (2024), examines the psychological and developmental challenges faced by Rohingya refugee children, highlighting the mental health impact of forced displacement on young refugees. While these studies offer valuable insights, they tend to emphasize immediate economic impacts or short-term social mobility. In contrast, this paper aims to examine the deeper, more prolonged structural shifts in economic activity prompted by forced displacement, particularly in Mizoram's largely agrarian economy, thereby addressing a gap in understanding the

enduring economic consequences of forced migration policies in low-capacity settings.

Thirdly, the paper speaks to a broader policy debate in development economics concerning policy heterogeneity and local contexts. While the literature largely focuses on the interactions of policy and culture, few have explored the dynamics of policy and infrastructure with respect to population inflows. Policymakers have often advocated urbanization as a means of promoting growth in developing countries, suggesting that concentrated populations can improve access to services and markets (Duranton, 2015a). However, this study underscores the need for cautious consideration of regional context, capacity, and infrastructure when implementing such policies. The Mizoram case suggests that in regions without foundational economic infrastructure or institutional support, forced urbanization may lead to overcrowding, resource strain, and social disruption rather than substantial economic development (Henderson et al., 2021). By contributing to the discourse on the efficacy of urbanization as a tool for development, this research cautions against the blanket application of agglomeration-based policies in regions lacking the structural conditions needed to support them.

The remainder of the paper is organized as follows. Section 2 provides historical context for the forced relocation policy in Mizoram, including the socio-political conditions leading up to the intervention. Section 3 describes the data sources and construction of key variables. Section 4 presents the empirical strategy and results, with a focus on identifying the causal effects of the forced urbanization policy on economic outcomes. Section 5 concludes by discussing the policy's implications for similar interventions in other developing regions.

2.2 Historical Setting

The period between 1966 and the early-1980s is remembered in the state of Mizoram as the Rambuai era, or "land in turmoil" (Khiangte, 2022). This era was marked by socio-political upheaval, forced displacement, and a strong assertion of Mizo identity, which was driven in part by historical

grievances against perceived neglect from the Indian government.[3]

The roots of the Rambuai period can be traced back to the devastating Mautam famine that struck Mizoram, then part of Assam state, in the late 1950s. This famine was triggered by the cyclical flowering of bamboo, which, as observed in botanical studies, occurs approximately every 48 years (Nibedon, 2013). The flowering event led to a population surge among rats, which fed on the bamboo flowers and seeds, ultimately causing widespread crop destruction. This agricultural devastation led to food shortages and suffering among the Mizo people, and the Assam government's delayed response soon fostered a sense of marginalization and neglect among the Mizos (Hazarika, 1995).

In response, the Mizo National Famine Front was established in 1959 as a grassroots organization aiming to manage the crisis and mobilize relief resources (Baruah, 1999). However, as dissatisfaction with the government's handling of the famine grew, the Front evolved into a broader political movement, eventually becoming the Mizo National Front (MNF) in 1961. Under the leadership of Laldenga, the MNF sought self-determination, contending that the Mizo people's distinct culture, language, and identity were not adequately recognized by the Indian government. By 1966, the MNF had escalated its demands to include independence for Mizoram, leading to a declaration of independence and the beginning of an insurgency.

Armed Insurgency and the Indian Government's Response: On March 1, 1966, the MNF launched a coordinated uprising against the Indian government's infrastructure in Mizoram, targeting police stations, communication lines, and government offices. This series of attacks, known as the Mizo National Front Uprising, marked the start of a prolonged insurgency. In response, the Indian government declared Mizoram a "disturbed area" and deployed the Indian Army under the Armed Forces (Special Powers) Act (AFSPA), which granted the military extensive powers to arrest, search, and open fire on civilians (Mahapatra and Zote, 2008).

A particularly controversial strategy employed by the Indian Army during this period was the

[3]See Pachuau and Van Schendel, 2015 for a pictorial account of the years surrounding the event.

"Village Grouping" policy.[4] Under this policy, rural Mizo villages were forcefully relocated into one of 103 existing villages to facilitate surveillance and control.

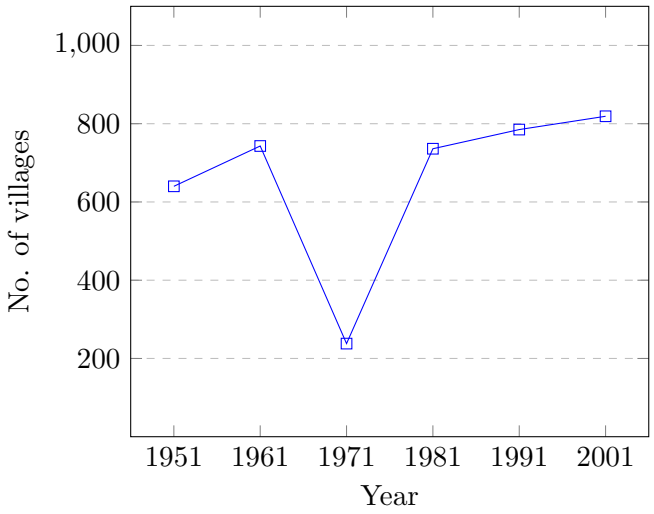


Figure 2.1: Time series of the number of villages enumerated in the deccenial census from 1951 to 2001.

Scale of the Grouping Policy: Approximately 103 villages were designated as Grouping Centers. Meanwhile, around 110 villages, primarily in southern Mizoram, remained ungrouped but were still subject to strict surveillance. An estimated 50,000 households—about 200,000 people in total—were forced into the Grouping Centers, resulting in overcrowded conditions and resource scarcity (Nunthara, 1989). In total, over 516 villages, accounting for more than 85% of Mizoram's population at the time, were affected by the Grouping policy. Figure 2.1 plots the time series of the number of villages enumerated in each deccenial census between 1951 and 2001. A striking fact is how only 230 villages were listed in 1971, suggesting more than 500 villages missing. By 1981 the pre-intervention levels were restored.

The histograms in Figure 2.2 show the difference in population growth between the GCs and

[4]Forced relocations by states are not new and can be traced to medieval China and Thailand of other places. More recently the British colonial empire engaged in a massive resettlement of ethnic Chinese in Malaysia under what was called the Briggs Plan so as to curb a rising leftist insurgency. This policy served as a motive for the Indian state in controlling the rebels in Mizoram.

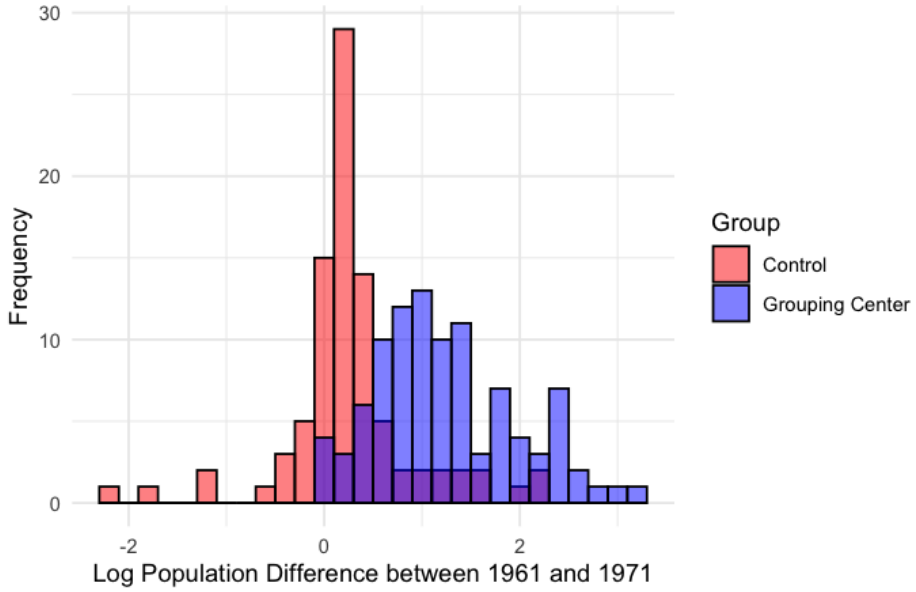


Figure 2.2: Distribution of treatment intensity between grouping centers (blue) and non-affected villages (red).

the control villages. The differences are stark and unsurprising since the GCs on average saw their populations increase over a 140% more than the control villages did between 1961 and 1971. Figure 2.3 shows that within the GCs the allocation of refugees was fairly arbitrary. In the subsequent sections I analyze the effects this historical episode had on the state's economy.

2.3 Data and Summary Statistics

The primary data source for this analysis is the deccenial census data for the years 1951 through 2001. The SHRUG database (Asher et al., 2021) provides Census abstracts at the village level starting from 1991. This dataset provides comprehensive village-level information, allowing me to track key variables over time, including population size and the share of employment in agriculture. The census data offers reliable and standardized coverage across multiple years, making it well-suited for a difference-in-differences analysis and other time-series methods to evaluate the long-term effects of the Grouping Center (GC) intervention.

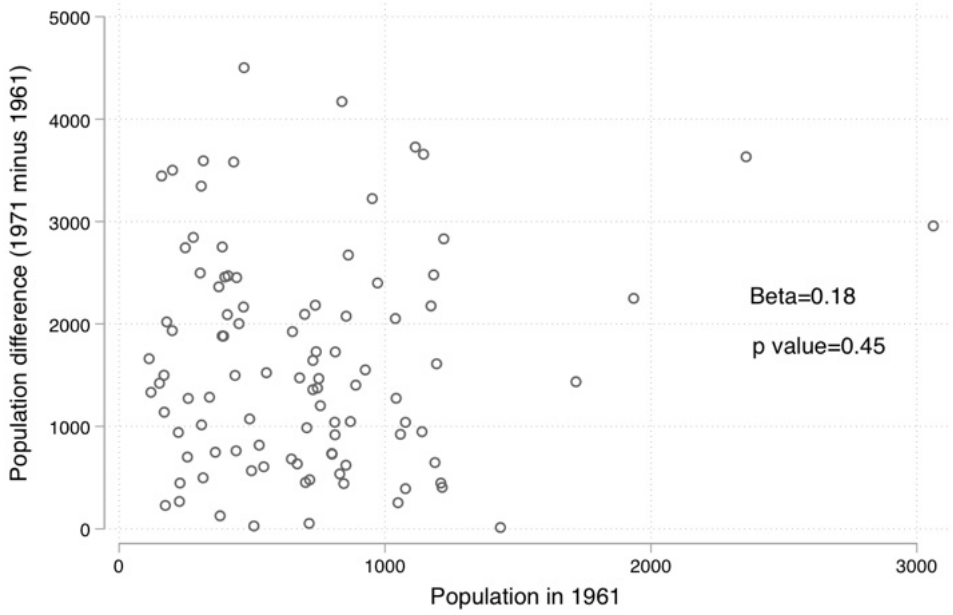


Figure 2.3: Scatter plot of population change post-intervention against 1961 population for the GCs.

To identify the specific villages designated as GCs, I rely on the work of Nunthara, 1981 and Nunthara, 1989, who provides a detailed historical account of the forced relocations and village classifications during the intervention period. In particular, he provides a list of all GCs only (see Figure B.2). Using the fact that the 1971 Census included the GCs and non-affected villages I can then extract the village list of the latter group. I then use these two sets to identify GCs and control villages in the subsequent census years.

2.3.1 Data Limitations

Since the SHRUG data only starts in 1991, for the earlier years (1951, 1961, 1971), I manually impute them using scanned copies of census abstracts available online (www.censusindia.gov). These reports contain spelling errors as well as missing data. For example in 1951, only 640 villages were enumerated as opposed to the usual 700 plus in the subsequent years. Figure B.3 in the

appendix gives the balancedness of the panel with respect to the 1991 census. For over two-thirds of the villages enumerated in the 1991 census we have a balanced panel with all previous census years. Therefore a key assumption for identification is that these discrepancies are random and not systematically related to our analysis.

2.3.2 Summary Statistics

Table 2.1: Baseline Summary Statistics for GC and Control Villages

	Control		GC	
Variable	Mean	SD	Mean	SD
Panel A: 1951				
Population	274	215	503	307
Agricultural Share (employment)	0.94	0.12	0.93	0.08
N	73		92	
Panel B: 1961				
Population	318	247	707	472
Agricultural Share (employment)	0.90	0.16	0.88	0.15
Labor Force Participation Rate	0.51	0.09	0.45	0.06
Literacy	0.34	0.20	0.46	0.13
N	89		102	

Table 2.1 provides a summary of baseline characteristics for both GC and control villages, showing differences in key variables such as population size and agricultural share of employment across two periods: 1951 and 1961. In Panel A, we observe that GC villages had a higher mean population (503) compared to control villages (274) in 1951, with a slightly lower standard deviation,

suggesting less variability in population size among GCs. Both groups had similar agricultural employment shares, with GCs having a mean of 0.93 and control villages at 0.94. Panel B shows the data for 1961, where population sizes have increased in both GC and control villages, with GCs maintaining a larger mean population (707) than control villages (318). The agricultural share of employment remained high for both groups, though slightly lower than in 1951. The GCs were also more literate and had lower labor force participation rates. With the exception of agriculture (for which the gaps between 1951 and 1961 were not significant at conventional levels), the t-test for the other variables are significant at the 1% level.

2.4 Results

For the analyses to follow I exclude the 2011 census year since starting in 2006 the Indian government introduced a large-sclae, nationwide rural employment generation program called the MGNREGA that targeted villages only. By then a large number of of the GCs had been classified as townships owing to their larger size and therefore were differentially impacted by the program. Studies on the program show significant labor market effects (Imbert and Papp, 2015).

2.4.1 Difference-in-Differences

To estimate the effect of treatment over time, I specify a difference-in-differences (DiD) model that includes both unit and time fixed effects. This model allows us to capture the differential impact of treatment across multiple decades, controlling for unobserved heterogeneity at the village level and common time trends. The equation for this model is given as follows:

$$y_{vt} = \alpha_v + \gamma_t + \sum_{t=1951}^{2001} \beta_t \times (\text{GC}_v \times \text{Decade}_t) + \epsilon_{vt} \tag{2.1}$$

In this specification, y_{vt} represents the outcome variable for village i in time period t. The term α_v captures village fixed effects, while γ_t denotes time fixed effects common to all villages.

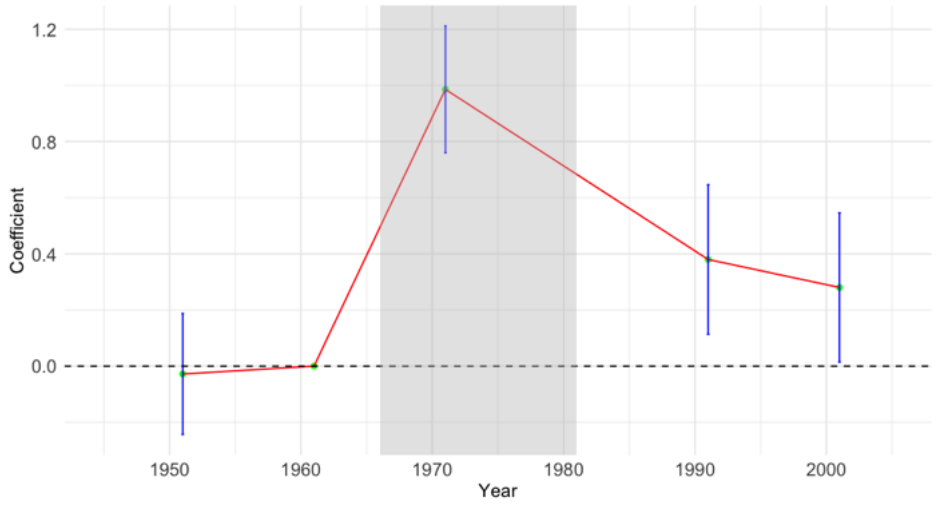


Figure 2.4: Coefficient plot of the treatment indicator interacted with year (DiD estimator). The shaded region corresponds to the policy duration, about 15 years starting in 1966. The reference year is set to 1961, the census year right before intervention. Blue lines indicate 95% confidence intervals. For 1981, the census reports are available for only one district and so is not included in the analysis. Standard errors are clustered at the village level.

The interaction $\beta_t \times (\text{GC}_v \times \text{Decade}_t)$ represents the decade-specific treatment effect for treated villages. The error term ϵ_{vt} captures idiosyncratic shocks. This framework allows us to observe how treatment effects evolve over time, identifying both immediate and cumulative impacts on the outcome variable across decades. For all results I use 1961 as the baseline, the year right before intervention.

Table 2.2 (Figure 2.4) presents the difference-in-differences (DiD) results for the effect of the Grouping Center (GC) intervention on population growth. The table reports coefficients for the interaction between the GC treatment and indicator variables for each census year from 1951 to 2001, with 1961 as the base year. Each coefficient reflects the impact of the GC policy on the log of the population relative to 1961, capturing the differential growth for villages designated as GCs compared to non-GC villages over time.

The results show a significant increase in the population for GC villages immediately following the intervention, with the interaction term for 1971 yielding a coefficient of 0.986 ($p < 0.01$). This

Table 2.2: Diff-in-diff results for population

VARIABLES	(1) Log Population
GC × $\mathbb{1}_{1951}$	-0.029
	(0.112)
GC × $\mathbb{1}_{1971}$	0.985***
	(0.117)
GC × $\mathbb{1}_{1991}$	0.371***
	(0.139)
GC × $\mathbb{1}_{2001}$	0.276**
	(0.139)
Observations	967
R-squared	0.829
Mean dep. var (1951)	5.69
Mean dep. var (1961)	5.96
Mean dep. var (1971)	6.60
Mean dep. var (1991)	6.61
Mean dep. var (2001)	6.84

Notes: The base year is 1961 and GC stands for Grouping Center. The 1981 Census did not enumerate a significant part of the state. Standard errors in parenthesis are clustered at the village level. *** p<0.01, ** p<0.05, * p<0.1

suggests that, by 1971, GC villages experienced a nearly 99% increase in population relative to their pre-intervention trends, reflecting the direct effect of the forced relocations during the intervention period. However, the effect diminishes in later years, with the coefficients gradually decreasing over time.

By 1991, the coefficient for the GC interaction remains positive and statistically significant, though reduced in magnitude (0.380, $p < 0.01$), indicating that the initial population increase partially persists two decades after the intervention.

Table 2.3: Diff-in-diff results for economic variables (base year=1961)

VARIABLES	(1) Agricultural Share Employment	(2) LFPR	(3) Literacy Rate
GC × $\mathbb{1}_{1951}$	0.003		
	(0.023)		
GC × $\mathbb{1}_{1971}$	-0.019	0.091***	
	(0.023)	(0.020)	
GC × $\mathbb{1}_{1991}$	-0.066***	0.061***	-0.025
	(0.025)	(0.020)	(0.036)
GC × $\mathbb{1}_{2001}$	-0.054*	0.099***	0.006
	(0.029)	(0.024)	(0.034)
Observations	965	803	592
R-squared	0.602	0.520	0.858
Mean dep. var (1951)	0.93		
Mean dep. var (1961)	0.89	0.48	0.41
Mean dep. var (1971)	0.92	0.45	
Mean dep. var (1991)	0.82	0.51	0.61
Mean dep. var (2001)	0.81	0.56	0.66

Notes: The base year is 1961 and GC stands for Grouping Center. The 1981 Census did not enumerate a significant part of the state. LFPR stands for labor force participation rate and is the ratio of total workers to total population. Literacy rate is measured as the crude rate (includes children under 6 years of age). Standard errors in parenthesis are clustered at the village level. *** p<0.01, ** p<0.05, * p<0.1

2.4.1.1 Structural Change

Building on the analysis of population effects, Table 2.3 presents the difference-in-differences results for the agricultural employment share, examining how the Grouping Center (GC) intervention impacted structural change. This table reports coefficients for the interaction between the GC designation and each census year from 1951 to 2001, with 1961 as the reference year.

Initially, the interaction terms for 1971 is close to zero and statistically insignificant suggesting that the GC policy did not immediately alter the share of agricultural employment in GC villages compared to non-GC villages. However, by 1991, a statistically significant decline in agricultural

employment share emerges for GC villages, with the coefficient reaching -0.066 ($p < 0.01$). This 6.6 percentage point decrease suggests a fairly small shift away from agriculture in GC areas, given that the the GCs absorbed on average a migrant size equal to their own population.

The downward trend persists into 2001, with a slightly smaller but still significant coefficient of -0.050 ($p < 0.1$), indicating that the policy's effects on agricultural employment extended into later decades. This suggests that the GC designation may have led to a sustained shift in economic structure, even as the initial population surge tapered off.

However, this coefficient is to be interpreted as an Intent-to-treat since compliance was partial. As mentioned earlier a sizable share of migrants returned after the policy.

2.4.2 Two-Stage Approach

Given that we have partial compliance, the analysis in the previous section measures an Intent-to-Treat effect. This effect reflects the average impact of the intervention among all eligible participants, regardless of whether they complied with their assigned treatment status. To estimate the effect more precisely for those who were directly affected by the population shift, I employ an instrumental variables approach. Specifically, this method allows us to address non-compliance by isolating the causal effect of population shifts on structural change for the subgroup that responded to the exogenous shift. Here, the instrumental variables provide a framework to separate the effect of the intervention from other potential confounding influences.

A first choice is to use the GC assignment as an instrument. The GC assignment, or Grouping Center assignment, offers a credible source of exogenous variation for estimating the causal impact of population changes. By instrumenting population growth with GC assignment, we account for the influence of population dynamics induced by the program rather than factors endogenous to village characteristics. This approach provides a Local Average Treatment Effect (LATE) specific to those villages that complied with the treatment.

The analysis uses as the main explanatory variable the log difference in population between the

post-treatment years and the immediate pre-intervention year, 1961, denoted as (Log Pop_t - Log Pop_{1961}). However, given that population growth itself could be endogenous to other unobserved village characteristics that may also affect the agricultural share, I instrument population growth between each of the years 1991 and 2001 with population growth during the intervention period (Log Pop_{1971} - Log Pop_{1961}), the period in which population growth was forced. This approach leverages the initial population increase due to the forced relocation as an exogenous source of variation in later population growth, under the assumption that the 1961–1971 growth rate captures the initial impact of refugee inflow rather than endogenous factors driving later growth.

The equation to be estimated takes the familiar form-

$$(\text{Agri share}_{\text{v,t}} - \text{Agri share}_{\text{v,1961}}) = \alpha + \beta\ (\text{Ln Pop}_{\text{v,t}} - \text{Ln Pop}_{\text{v,1961}}) + \delta X_v + \gamma_t + \epsilon_{v,t} \tag{2.2}$$

where, in the left-hand side term, $(\text{Agri share}_{\text{v,t}} - \text{Agri share}_{\text{v,1961}})$, represents the change in the agricultural share of employment from 1961 to a later time period t in village v. This captures how much the agricultural employment share has shifted over time, which can indicate structural changes in the local economy. The main independent variable of interest is $(\text{Ln Pop}_{\text{v,t}} - \text{Ln Pop}_{\text{v,1961}})$, which measures the growth in population in logarithmic terms between 1961 and year t in village v. This log difference allows us to capture proportional changes in population, which are expected to influence economic structure and labor distribution.

The term X_v includes baseline control variables for log population. The time fixed effects γ_t control for any period-specific factors that might influence all villages uniformly. The coefficient β is of primary interest, as it reflects the impact of population growth on the change in agricultural share, holding other factors constant.

Column 1 of Table 2.4 reports a strong first stage, with a coefficient of 0.672 that is highly significant, indicating that the GCs grew about 50% more than the control villages in the post-treatment years. This strong first stage along with Figure 2.3 suggests that the intervention-induced population shift is a valid instrument for subsequent population growth.

Table 2.4: IV Estimation

VARIABLES	(1) Ln Pop_t−Ln Pop_{61} (First Stage)	(2) $Agri_t$−$Agri_{61}$ (2SLS)	(3) $LFPR_t$−$LFPR_{61}$ (2SLS)
GC_v	0.673***		
	(0.128)		
Ln Pop_t− Ln Pop_{61}		-0.081**	0.085**
		(0.035)	(0.036)
Controls	Yes	Yes	Yes
Observations	333	332	333

Notes: Standard errors in parenthesis are clustered at the village level. *** p<0.01, ** p<0.05, * p<0.1

Columns 2 and 3 present the Instrumental Variables (IV) estimates of the impact of population growth on the agricultural employment share. The estimate in Column 3 shows a statistically significant negative relationship between population growth and agricultural employment share, with a coefficient of -0.081 ($p < 0.01$). This suggests that higher population growth is associated with a reduction in the agricultural share of employment. The estimate in Columns 3 yields a similar coefficient of 0.085 ($p < 0.01$) for labor force participation rate. These results indicate that a doubling of population between 1961 and the post years (1991 and 2001) led to a fall in the agricultural employment share by 4 percentage points and a rise in the LFPR by about 4 percentage points.

2.4.3 Comparison with Other Settings

However, this semi-elasticity is fairly small when contrasted with those found, for example, in Germany by Peters, 2022. For every 10% increase in migrants he finds a 2.5 percentage point fall in agricultural employment. Given that migrants accounted for only a third of the receiving population their effects on structural change are quite large. A possible explanation for this difference could

be the already existing manufacturing base in Germany led by a centralized state that was able to absorb the growth in population and transition the society away from agriculture. In fact he finds no change to services employment share and instead an increase in manufacturing employment similar in magnitude to the drop in agricultural employment share. The fact that my study region was made up of a tribal society without manufacturing potential it seems less surprising that the receiving locations were not able to make a rapid transition away from agriculture.

Nonetheless, the fact that population increases can also lead to structural changes in low-income settings is striking, given that the context of my study region is of a society that was largely agrarian to start with.

2.5 Analyzing Characteristics of Compliance

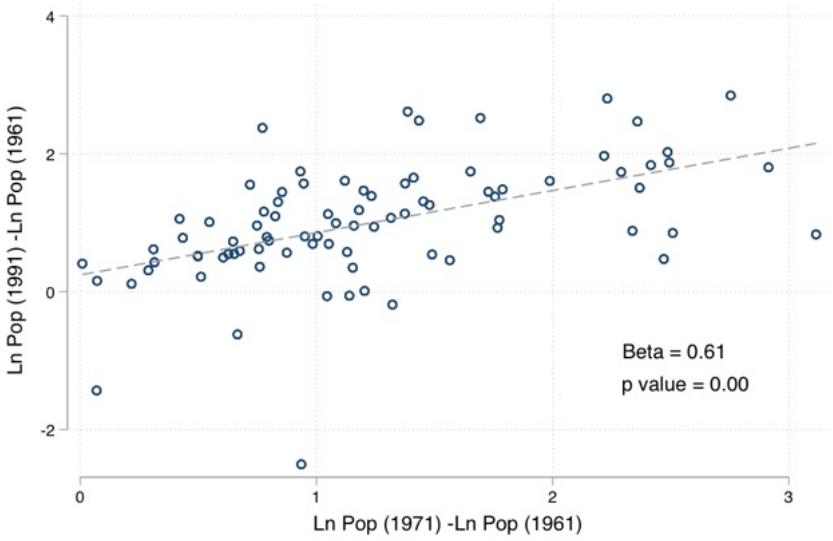


Figure 2.5: Scatter plot of population growth: 1961 to 1991 versus 1961 to 1971. Sample includes only GCs.

Next I ask what potentially predicts non-compliance. First Figure 2.5 plots the log difference in population between 1961 (immediate pre-treatment year) and 1971 (the height of the forced

intervention) on the y-axis against the log difference in population between 1961 and 1991. This reflects the strength of compliance to treatment. The regression coefficient is 0.6 (< 1) indicating partial compliance. However one does not see systematic difference across the distribution.

Table 2.5: Notations used in the 1961 Census to identify amenities

Category	**Item**	**Notation**
Transport and Postal Facilities	Bridle Path	R
	Metalled Road	R
	Tarred Road	R
	Railway	Rly
	Branch Post Office	BO
	Sub-Post Office	SO
	Extra Departmental Branch Office	Edbo
	Extra Departmental Sub-Office	Edso
	Central Sub-Office	CSO
Educational Institutions	Primary, Basic, Tol, Maktab, Night, Nursery School	P
	Middle School (M.E. & M.V.)	M
	High School or Higher Secondary	H
	Higher Institutions including Colleges	C
	Technical Institutions	T
Drinking Water Supply	Tanks or Beels	Tk
	Kachha well	Kw
	Pipes and Tube wells or Ring wells	S
	Pucca well	Pw
	River, Running Stream, or Springs	Riv
Bazar Day and Medical Facilities	Weekly Bazar	WB
	Daily Bazar	Db
	Dispensaries	D
	Hospitals	Hos
Veterinary Facilities and Community Development	Government Veterinary, Private Veterinary, Other Methods	V
	Community Development	Cd
	National Extension Service	Nes

Next, and in a suggestive though more rigorous manner, I look at suggestive evidence that the share of people who left the GCs does seem to depend on baseline public amenities. For this I use the 1961 Census to identify public amenities. A column named amenities lists alphabets separated by commas, with each indicating some type of amenity. I create a variable 'amenities' that is the sum of these indicators.

There are theoretically 24 different amenities a village can have (see Table 2.5). Within my sample, however, the minimum (maximum) value for amenities is 2 (9) with a mean of 5.68 (see Figure B.4 for the distribution of amenities). To analyze compliance heterogeneity to GC status I

Table 2.6: Population growth persistence by amenities at baseline

VARIABLES	(1) Ln Pop_t−Ln Pop_{61}	(2) Ln Pop_t−Ln Pop_{61}
GC	0.673***	-0.235
	(0.128)	(0.467)
GC × Public good score		0.156**
		(0.076)
Intercept	2.611***	2.664***
	(0.445)	(0.441)
Observations	333	319
R-squared	0.178	0.198

Notes: I focus on the two post-intervention time periods (1991 and 2001). Standard errors in parentheses are clustered at the village level. Public goods score is the sum of public goods available in 1961 (0 to 24) with a sample mean of 5.68. *** p<0.01, ** p<0.05, * p<0.1

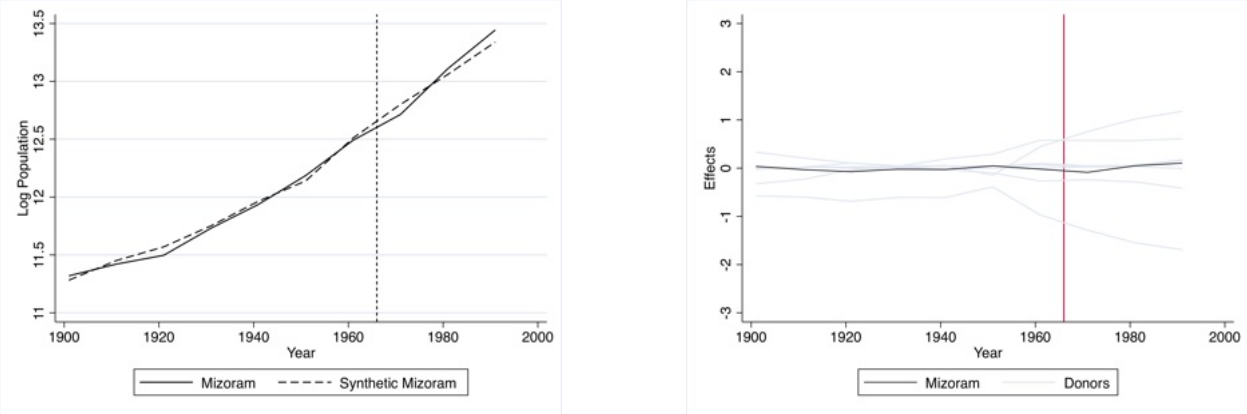
run the following regression:

$$\begin{aligned}(\text{Ln Pop}_{\text{v,t}} - \text{Ln Pop}_{\text{v,1961}}) = \alpha + \beta \ \times GC_v \\ +\gamma\big[GC_v \times \text{Amenities score}_{\text{v}}\big] + \delta X_{_v} + \Gamma_t + \epsilon_{v,t}\end{aligned} \tag{2.3}$$

The coefficient of interest, γ, which captures treatment status interacted with baseline amenities and it captures how baseline amenities strengthen the degree of population persistence. Column 2 of Table 2.6 finds a positive and statistically significant value for this estimate. In particular, treated villages that score higher on 1961 amenities see a stronger correlation between the treatment period population growth and longer-run population growths. This is suggestive of the higher amenity score GCs being better able to retain their populations in the post-intervention periods. Furthermore in column 2 the coefficient on GC_v, though not statistically significant, is negative, implying the GCs with an amenity score of 0 grew even less than the control villages between 1961 and the post years (1991 and 2001).

2.5.1 Aggregate Effects

As an additional result I look at the possibility of the policy having changed the state's demographics at the aggregate. Given the large internal changes that persist into the long run, it is possible that the state as a whole might have had its demographics shift relative to other states.



(a) Synthetic control plot

(b) Inference (p-value=0.86).

Figure 2.6: The donor pool comprises states with less than 2 million people in 1961 (7 in total).

Since the treatment state is an aggregate unit, I employ the synthetic control method to analyze long term trends. For the donor pool I use states and union territories that had a population of less than 2 million in the 1961 census, and use pre-treatment values of log population as the predictors. This restricts the pool to the following states: Andaman & Nicobar, Goa, Lakshadweep, Manipur, Meghalaya, Puducherry, and Tripura.[5]

Figure 2.6 (a) plots the time series of log population for Mizoram (solid) and synthetic Mizoram (dashed).[6] Though there appears to be an increase in population growth for Mizoram relative to its synthetic control, the differences are slight. Furthermore, upon conducting inference tests, I

[5]I drop the state of Nagaland since it underwent boudary re-drawings in the 1950s and 1960s that incorporated new regions thereby mechanically changing its demographics.

[6]The population data is the only one available that stretches back in time. The synthetic control method requires a large number of pre-treatment periods to be meaningful (Abadie, 2021).

obtain a p-value of 0.86, indicating the deviations are not statistically different from 0. Figure 2.6 (b) plots the RMPSE for Mizoram (solid) as well as for the donor states (lighter-colored plots). Clearly, Mizoram does not appear to be an outlier, with its post-RMPSE staying close to 0, similar to its pre-RMPSE.

2.6 Conclusion

This paper examines the economic impacts of a forced urbanization policy implemented in Mizoram during the 1960s, which relocated residents from over 500 villages into designated Grouping Centers (GCs) while leaving about 110 villages ungrouped. Using a difference-in-differences approach comparing the treated and ungrouped villages, the analysis reveals that population growth in GCs led to reductions in agricultural employment and increases in the labor force participation rate, suggesting a structural shift in the local economy. Furthermore, a strong correlate of the policy's success is the availability of amenities in the treated villages.

These findings contribute to the literature on urbanization, highlighting the possibility of, though limited, economic benefits of forced population concentration in low state-capacity, agrarian contexts. This study also underscores the importance of supportive institutions and infrastructure to achieve the growth objectives often associated with urbanization. While the literature on long-term structural transformation has focused primarily on the industrialized countries, this paper brings this topic in the context of a low-income, weak state setting.

Future research could build on these findings by examining similar policies in other regions and investigating the long-term social impacts on displaced populations.

Chapter 3

CHIEFS, CUSTOMS, AND COLONIES

3.1 Introduction

Existing work on the causes and consequences of agglomeration approach their questions primarily through a neo-classical lens (Krugman (1999); Henderson (2010); Desmet et al. (2018)). A question this raises is whether there can be cultural explanations for such topics, considering the growing evidence that traditional practices are remarkably persistent in shaping present-day outcomes, particularly in poorer societies (Atkin (2016); Jayachandran and Pande (2017); Ashraf et al. (2020); Corno et al. (2020); Moscona et al. (2020); Lowes (2021); Le Rossignol et al. (2022)).[1] This paper tests the hypothesis that traditional practices shape spatial growth. It does so by leveraging ethnic differences in tribal customary laws governing land inheritance. Furthermore it shows the consequences these traditional differences have on local infrastructure.

In the northeastern Indian state of Manipur reside two sets of tribes, the Kuki-Zo and the Naga. These two groups, who primarily occupy the hilly areas of the state, make up the main ethnic minorities, the majority being the Meitei people living at the valley core that also includes the capital city of Imphal.[2] One sharp point of difference between them, however, is their ancestral mode of village organization. While the Kuki-Zo practice governance under hereditary chiefs with secular powers, the Nagas organize within less hierarchical structures (Hunter (1876); Shakespear (1909); Gangte et al. (2014); Haokip (2017); Hodson (1911)). Land ownership among the former is

[1] Another area of research focuses on the origins of cultural practices (Nunn and Wantchekon (2011); Alesina et al. (2013); BenYishay et al. (2017); Schulz et al. (2019)). This paper instead takes culture as given, and then looks at its influence on a variety of outcomes.

[2] The Kuki-Zo and Naga are pan-ethnic groups, each comprising multiple tribes and sub-tribes. As section 3.2.2 highlights, however, is the commonness of traits and institutions 'within' the two categorizations. While the Meitei majority make up two-thirds of the state's population the remaining third is equally distributed between the two minority groups.

exclusively in the hands of the chief while among the Nagas, communities or individuals own land without chiefly control (Hodson (1911)). Furthermore, the two sets of tribes are not bounded by formal land laws that otherwise apply to the Meitei majority group, and each operates under its own customs.

Consequently, among the Kuki-Zo group, sons of chiefs who do not inherit land from their fathers are incentivized to leave and establish villages of their own (see Section 3.2.2 for more details). As a result of such cleavages, the Kuki-Zo villages tend to be small in size, relatively speaking. The consequence of this fragmentation shows up in the form of lower public amenities (schools and roads).

The first strategy I use to establish these claims is a simple OLS regression of my outcome variables on a dummy indicating which of the two ethnic groups a village belongs to. I find that compared to the Naga villages, the Kuki-Zo ones are about 8 kilometer square smaller. This is substantial considering the average Naga village is over 16 km sq. in area. The estimates are robust to controlling for elevation, ruggedness, and distance to the capital city.

However, one concern of the above method is that we are not accounting for omitted variables that might then bias the estimates. To strengthen causality claims, therefore, this paper uses a second approach along the lines of recent work that exploit variation at ethnic borders (Michalopoulos and Papaioannou (2013), Lowes (2017), Moscona et al. (2020), and Lowes (2021)). The reasoning behind such specifications is that, by focusing on a sub-sample right around the ethnic border, many unobservables determined outside ethnic ones—geography, ecology, historical experiences, incentives—are likely to be similar. So one can, with a certain degree of confidence, attribute jumps at these borders to differences in cultural forces. Looking at my study region, within a 0.05 degree ($\sim$ 5.5 km) buffer around the ethnic border, I find results very similar in magnitude to the OLS estimates. Then, as an alternate measure of village size, I place 0.01 x 0.01 degree grids over the study region. I then assign a value 1 to each grid that is fully contained within a village's boundary in the shapefile, and 0 otherwise. A positive association between this indicator variable and

ethnicity implies larger village size. Repeating the same specifications as above I find the Kuki-Zo grids are 22% less likely to be fully contained inside an existing village (against an average of 58% for the Naga grids).

It is plausible, nevertheless, that the village size differences have nothing to do with chiefly institutions, and that the Kuki-Zo villages have always been smaller for reasons other than fragmentation over time. Figure 3.1 shows the normalized growth rates of the number of villages of the two groups disaggregated at the district level. While the number of Naga villages has remained fairly stable between 1971 and 2023, the number of Kuki-Zo villages has, on average, increased more than two-fold.[3] To cement this idea, I create a dummy that equals 1 if a village enumerated in 2011 (the latest census) was also enumerated in the 1971 census (the oldest one that is publicly available), and 0 otherwise. I find a negative and statistically significant coefficient of this variable on the Kuki-Zo ethnic dummy, thus indicating their villages were established at some time between the two census years.

To further examine the impact of village fragmentation on public amenities, I analyze differences in infrastructure across villages. Specifically, I explore whether the process of fragmentation and the establishment of new villages among the Kuki-Zo have resulted in lower levels of public goods, such as schools and roads, compared to the older villages. Fragmented villages often need to build amenities from scratch, which could explain disparities in access to public infrastructure. Using cross-sectional data from the 2011 census, I estimate a regression to determine the likelihood of villages possessing these public goods, conditional on their ethnicity and whether they were established after 1991. The results indicate that Kuki-Zo villages, particularly those established more recently, have significantly lower levels of public amenities. This finding supports the hypothesis that fragmentation—driven by customary land inheritance practices—can hinder infrastructure development, thus reinforcing disparities in public amenities across ethnic lines.

[3]There exist two other mixed-ethnicity districts, namely, Tengnoupal and Chandel, that are dropped for the analyses throughout the paper so as to avoid mis-measurement of the key regressor. For the remaining districts used for the study, however, their borders coincide with the Kuki-Zo–Naga border.

The paper's findings contribute, firstly, to our understanding of culture's effect on space. As opposed to existing theories that use purely economic motives like agglomeration effects (Baldwin and Okubo (2006)), skill complementarities (Eeckhout et al. (2014)), or exogenous factors like terrain (Nagy (2023)), this paper shows how traditions can be another cause for spatial divergence.

Secondly, this paper speaks to the origins of modern institutional divergence. In his comparative study of the Latin and Muslim world in the Medieval era, Greif (1994) brought a new theoretical understanding of the link between informal cultural norms and their evolution to more formal systems. He argued that when societies are confronted with new political or economic environments, depending on their underlying traits and mental modes, they may diverge in their adaptation process. Other qualitative works on the cultural roots of divergence include Fischer (1989) and his study of different immigrant groups setting up different legal systems in the United States, and that of Putnam (1994) explaining the economic divergence between Northern and Southern Italy as arising from historical experiences with self-governing cities. Likewise, Greif and Tabellini (2010, 2017) and Henrich (2020), in trying to explain the economic divergence between Europe and China, point to differences in their traditional family structures. My study provides an empirical link along the lines of Greif (1994) by showing how the roots of institutional divergence can be traced to differences arising from different initial conditions of pre-existing norms; it thus provides an empirical study of the codification of customs to formal demarcations.

Thirdly, this paper speaks to the growing literature on the consequences of culture Nunn, 2022. Though the studies so far focus primarily on behavior and preferences (Alesina and Giuliano (2011a); Lowes (2017); Ashraf et al. (2020)), little remains know on the effects of culture on public amenities and infrastructure.

Lastly, this paper adds to the political economy of this region in India. Arguably the most volatile state in the country, Manipur, and the rest of Northeast India, remains under-researched.[4]

[4]During the 2023-24 ethnic conflict that erupted in the state, many news pundits linked the incidents to religious differences, while others took to conspiracy theories of mass illegal immigration. These ideas were pursued despite any substantial supporting evidence.

Disentangling the mechanisms driving political and economic instability should be at the heart of research, moving forward.

The rest of the paper is organized as follows: Section 3.2 gives a background of the research setting, Section 3.3 outlines the data sources, and Section 3.4 explains the methods and results.

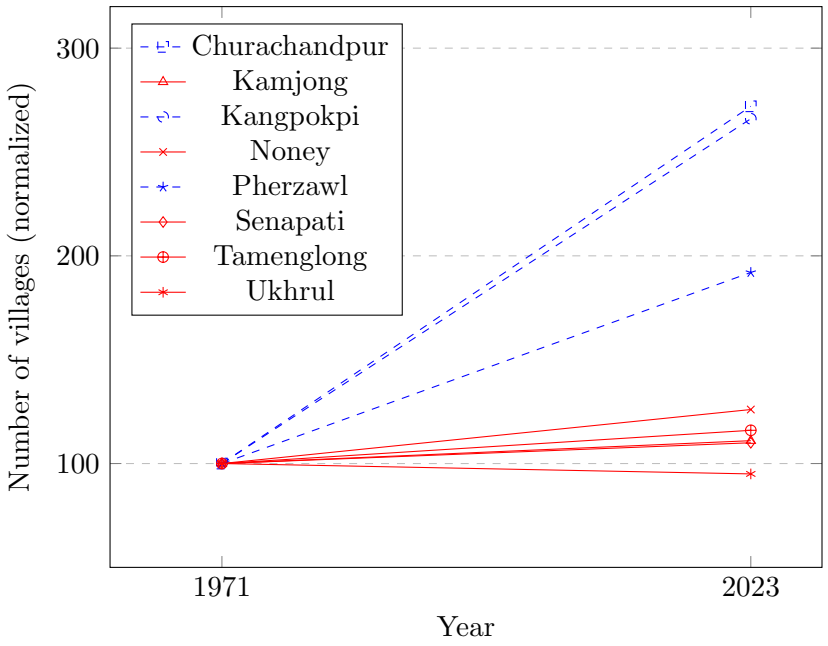


Figure 3.1: Growth in the number of villages between 1971 and 2023 for the eight districts inhabited by the Kuki-Zo (blue dashed) and Naga (red solid) tribes. The y-axis is normalized to equal 100 in 1969. I do not include districts with mixed-ethnicities. (Source: Census 1971, Ministry of Gram Panchayat 2023.)[5]

3.2 Background

In this section I give a brief outline of the state's history in general, and the two studied groups in particular.

[5]The most recent census for which data is available was conducted in 2011. To get an updated list for the figure, I look at data from another government ministry, the Ministry of Gram Panchayat 2023.

3.2.1 The Ethnic Composition of Manipur

The three main ethnic groups in Manipur are the Meiteis, the Nagas, and the Kuki-Zos. The Meiteis reside at the valley core of the state, and historically, they belonged to the Kingdom of Manipur. Known to have a written history and ruled by kings, the Meiteis display influences from both Indic as well as Burmese civilizations (Parratt (2005)). In the peripheral mountain regions that make up 90% of the state's area, on the other hand, reside the other two minority groups who historically were organized as small scale tribes. Often clubbed together as a general rule, they have had various terms applied to distinguish them: the Hill people, the Tribal areas, etc. The Meitei in the valley core, however, are constitutionally categorized as a more advanced ethnic group (general category), owing to their historical experience of being a centralized kingdom. Population-wise the Meiteis make up two-thirds of the population, the remaining third being made up in equal numbers between the two minorities.

However, on closer inspection one notices distinct social systems within the Hill tribes. Section 3.2.2 gives more details of these bifurcations that form the core of this paper's argument.

3.2.2 Ancestral Practices

One key distinction between the Kuki-Zo and Naga tribes is in their respective structures of village organization. This fact was first noted by British colonial officers trying to make sense of the ethnic mosaic of the region.[6] To start with, consider this observation by McCulloch (1859), Political Agent for the Manipur Kingdom:

> "The [Naga] tribes I have hitherto noticed have exhibited chiefs hereditary; but without any power. Amongst the [Kukis] this is not the case; their hereditary chiefs....having a very considerable degree of power and receiving a revenue in kind, and in service from their subjects." *(page 58)*

[6]The dearth of local records in the past means having to resort primarily to British sources. To ensure the credibility of the claims in these sources, I include citations from multiple authors at different points in time who travelled to multiple locations.

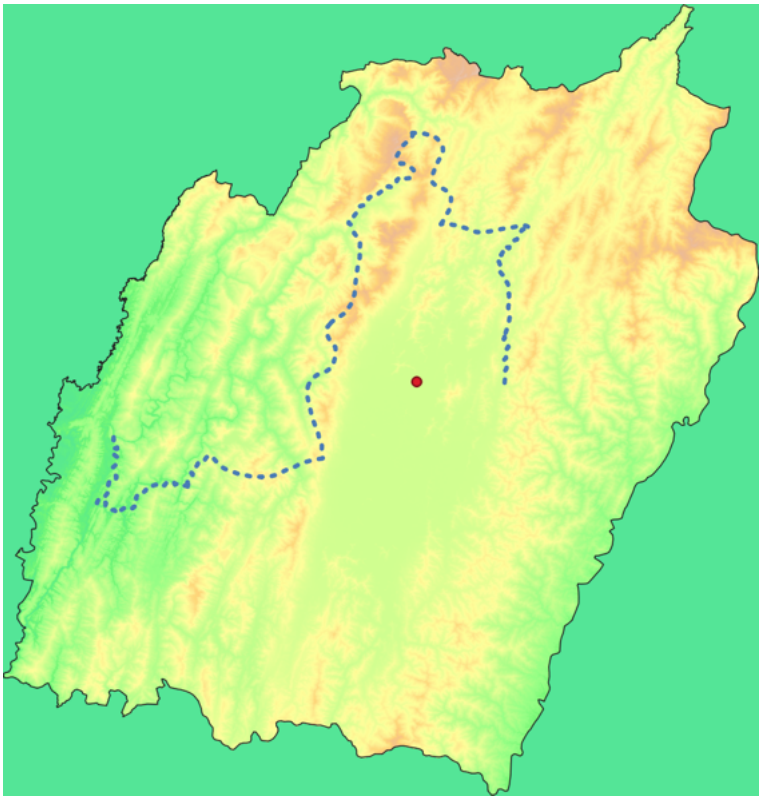


Figure 3.2: Topographic map of Manipur state. The blue dashed line indicates the ethnic border. The Kuki-Zo tribes inhabit areas south of the border while the north is inhabited by Naga tribes. The red dot indicates the center of the capital city of Imphal.

Hunter (1876), writing about the Kuki-Zo, says,

> "A chief's son, on attaining manhood, does not generally remain with his father, but sets up a village of his own. The men of one chief are able to transfer their allegiance to another at will... The chiefs all come from a certain clan... Only the son of a chief can set up a village for himself." *(page 60)*

Hodson (1911), in a comparative statement, notes,

> "We are sometimes able to distinguish a Kuki from a Naga clan by the development of the chieftain in the former instance into a secular leader who takes only a ceremonial part in the tribal rites, and in the latter case by the diminution of the secular authority of the gennabura

> [chief], who remains the religious head of his village." *(page 21)*[7]

Similarly, Shakespear (1909) writes,

> "The general rule is for the youngest son to inherit, but occasionally the eldest also claims a share. With chiefs it is usual for each son, as he comes to a marriageable age, to be given a certain number of households and allowed to set up a village of his own, but the youngest generally remains with his father, and inherits his village and his property.... The peculiar vagabond strand...of the Kuki-Lushai race...leads to villages splitting into hamlets and hamlets sub-dividing... This could never happen among tribes belonging to the Naga group, with whom intense love for the ancestral village site is a leading characteristic." *(page 21)*

A recurring theme in these excerpts is the distinction in chiefly powers and functions between the two groups. Furthermore, they make qualitative causal links between traditional systems and spatial growth. The subsequent sections attempt to empirically test these claims and see how persistent they are.

3.2.3 Village Creation Process

Two facts working simultaneously cause the proliferation of new villages. First, as recorded by early colonial officers, only those from the chiefly clan can own land.[8] Second, inheritance of existing land goes from father to youngest son (though, sometimes the oldest). These two rules incentivize the other sons to set up villages of their own, since only then can they too posses land. Sometimes this involves settling in unclaimed territory, but often it involves annexation (Chongloi (2018)).

Qualitative evidence note that to establish a new village a chief's son gathers a few members from the parent village (Chongloi (2022)). Unfortunately there are no precise numbers available for verification. Once established, new members choosing to join must get approvals from both the parent village chief and the receiving village chief. New villages being formed with as few as

[7] Hodson (1910) also noted the isolated nature of Naga villages as follows, "As a general rule it may be said that each village forms an independent, self-contained group." Many other authors make similar observations that members of the group seldom leave their village and join a new allegiance.

[8] Others like Chongloi (2018) contend that even commoners with good standing can set up villages.

20 families are common. More recent local media reports also support the idea that "in the Kuki areas, all of the village land is owned by the chief and the villagers are his tenants living under his patronage, who are given temporary rights for tilling the land on the condition that a portion of the produce should be given to the chief, the landowner. It is simply because of this factor that new villages keep cropping up in Kuki-dominated areas as the brothers of the Chief want a slice of the pie."[9]

3.3 Data

3.3.1 Determining Ethnic Borders

The state of Manipur is divided into sixteen districts. Of these, ten are inhabited by the two ethnic minorities, and furthermore, eight have their borders coinciding with ethnicity; namely, Churachandpur, Kamjong, Kangpokpi, Noney, Pherzawl, Senapati, Tamenglong, and Ukhrul. I therefore use these eight district boundaries as the point of discontinuity for my analyses.

3.3.2 Main Outcome Variable

To get information on village location and size I use data from the Socioeconomic High-resolution Rural-Urban Geographic or SHRUG (Asher et al. (2019)). It includes a shapefile of village boundaries for those that were enumerated in the 2011 Census of India. An important point to emphasize in the context of my study region is that these village boundaries include, in addition to settlements, farmlands and forests. While farmlands sustain the agricultural societies, forests also provide other needs such as firewood and hunting grounds.

The village demarcations provided in the dataset allow for a granular analysis of village surface areas, including the calculation of polygon averages of geographic variables for controls. A limitation is that we have information for only the 2011 villages. But as I show below, there are ways to extend this geographic data back in time.

[9] Link to article quoted.

3.3.3 Controls

For geographic controls I use NASA's Shuttle Radar Topography Mission (SRTM) available at a 30 metre resolution. This allows me to calculate both the elevation and terrain ruggedness of each village. To estimate the effect of cultural practices on my outcomes of interest, I further pick a sub-sample along a 0.05 degree (about 5.5 kms) buffer of the ethnic borders as shown in Figure-3. This controls for other unobserved spatial characteristics that might confound the study if unaccounted for.

3.3.4 Summary Statistics

Table 3.1: Summary Statistics

	All villages			Villages within a 0.5 degree buffer		
Variable	Naga	Kuki-Zo	p-value	Naga	Kuki-Zo	p-value
Area (km sq.)	16.706	5.65	0.00	15.525	5.221	0.00
	(14.38)	(9.16)		(12.93)	(7.69)	
Elevation (metres)	1113	1074	0.04	1091	1160	0.08
	(391)	(367)		(368)	(405)	
Ruggedness	31.53	27.07	0.00	30.98	28.81	0.01
	(6.08)	(10.12)		(6.63)	(9.26)	
Distance to capital (kms)	53.74	46.78	0.00	46.80	36.13	0.00
	(16.90)	(21.99)		(16.23)	(16.09)	
Absolute Latitude	24.97	24.65	0.00	24.97	24.92	0.04
	(0.32)	(0.35)		(0.28)	(0.23)	
Observations	542	1147		130	379	

Notes: The unit of observation is the village. Standard deviations in parenthesis. Ruggedness is an index formally called Terrain Ruggedness Index (TRI) is calculated by taking the mean of the absolute differences between the elevation of a central grid cell and the elevations of its eight neighboring cells in a raster. Mathematically, for each cell, TRI is given by:

$$\text{TRI} = \frac{1}{8}\sum_{i=1}^{8} |z_0 - z_i|$$

where z_0 is the elevation of the central cell and z_i are the elevations of the neighboring cells. This measure captures the average deviation in elevation (in metres), indicating the roughness of the terrain. The elevation raster file is granulated at a 30m$\times$ 30m level.

Table 3.1 reports summary statistics for a few relevant geographic variables. Looking at the full sample of Kuki-Zo and Naga villages one does find statistically different differences for a number of variables. This seems true even within a 0.5 degree buffer of the ethnic border. However, the size of the differences are very small. For example, the Kuki-Zo villages are 6.3% higher in elevation. The only exception is the distance to the capital city for which the Kuki-Zo villages are about 9 kilometres closer, against an average of 46 kms for the Naga group. Nonetheless I include all these variables as covariates in my regressions.

3.4 Results

3.4.1 OLS Estimates

I begin by running the following specification-

$$y_i = \alpha + \beta \times \text{Kuki Zo}_i + \Gamma \mathbf{X}_i + \epsilon_i \tag{3.1}$$

where y_i is outcome of village i. Kuki Zo_i is a dummy variable that equals 1 if village i belongs to the Kuki-Zo group and 0 otherwise. X_i are village level controls that include elevation, terrain ruggedness. Given the fact that the Kuki-Zo villages are closer to the capital city by about 9 kms, I include as a covariate distance to the state capital city.

I first report OLS estimates (Table 3.2) that includes all villages inhabited by the two groups. From column 1 we see a jump in village size across the ethnic borders. Against an average village area of 15.52 sq.km for the Naga villages, the Kuki-Zo villages are about 8 sq.kms smaller. These results are robust to controlling for elevation, ruggedness, and distance to the capital city center (column 2).

3.4.2 Buffered region

One concern is that we might not be accounting for omitted spatial variables that could possibly be driving these results. To overcomes this I create a 0.05 degree (5.5 km) buffer around the border

Table 3.2: Village size (all villages)

	Dependent variable is village area in km sq.	
	(1)	(2)
Kuki-Zo	-11.051***	-8.556***
	(2.686)	(2.534)
Elevation		-0.005**
		(0.002)
Ruggedness		0.308***
		(0.070)
Distance to capital		0.190***
		(0.061)
Observations	1,689	1,689
R-squared	0.178	0.362
Controls	No	Yes
Mean dep. var	9.202	9.202

Notes: Standard errors in parentheses are clustered at the sub-district level. The dependent variable is the area of a village (including farmland and forests) in square kilometres. Kuki-Zo is a binary variable that equals 1 if a village belongs to a Kuki-Zo tribe and 0 if it belongs to a Naga tribe. Controls include distance to the state capital center core, elevation in metres, and a measure of terrain ruggedness. *** p<0.01, ** p<0.05, * p<0.1

so as to control for unobservables that are likely similar within the buffer. Furthermore I divide the border into 5 segments and include them as fixed effects (Dell (2010)). This is analogous to a regression discontinuity design except that here I am leveraging variation in cultural practices at the border. This leads us to a specification of the form-

$$y_{is} = \alpha + \beta \times \text{Kuki Zo}_i + \Gamma \mathbf{X}_i + \Delta_s + \epsilon_{is} \tag{3.2}$$

where y_{is} is outcome of village i along line segment s of the ethnic border. Kuki Zo_i is a dummy variable that equals 1 if village i belongs to the Kuki-Zo group and 0 otherwise. X_i are village level controls that include elevation, terrain ruggedness, and distance to the state capital city. By dividing the border into segments and including them as a fixed effect (Δ_s) I further control for

wider spatial unobservables.

Also note that by including distance to the capital city center I am controlling for smooth geographic variation across the border since areas close to each other will have similar values of this variable. Thus a statistically significant difference in β from eq. 2 captures jumps at the border. The results from this specification are reported in Table 3.3 while Figure 3.3 gives a visual representation of the results. The coefficients maintain their size and significance levels. Tables C.1 and C.2 in the appendix use alternate smoothing variables as robustness checks.

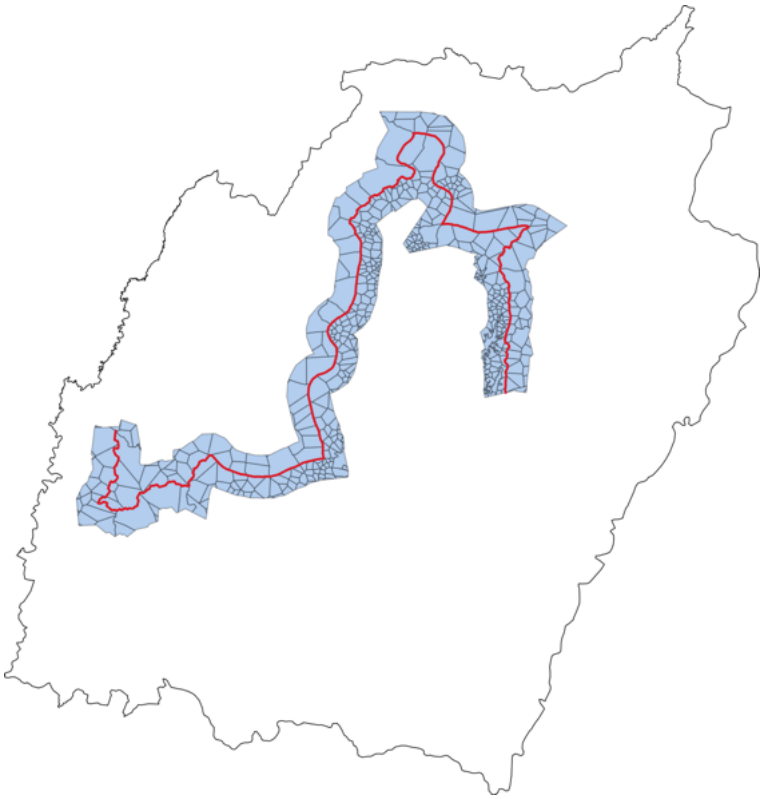


Figure 3.3: Polygons of villages within a 0.05 degree (5.5 km) buffer of the ethnic border. Visually we can observe that Kuki-Zo villages, lying south of the border, are much smaller in size.

Table 3.3: Village size across ethnic borders but within a 0.05 degree buffer

	Dependent variable is village area in km sq.			
	(1)	(2)	(3)	(4)
Kuki-Zo	-10.303***	-9.073***	-8.117***	-7.968***
	(2.061)	(1.965)	(1.957)	(2.192)
Observations	509	509	509	509
R-squared	0.189	0.278	0.303	0.312
Controls	No	No	Yes	Yes
Segment Fixed Effect	No	Yes	No	Yes
Mean dep. var	7.853	7.853	7.853	7.853

Notes: Standard errors in parentheses are clustered at the sub-district level. The dependent variable is the area of a village (including farmland and forests) in square kilometres. Kuki-Zo is a binary variable that equals 1 if a village belongs to a Kuki-Zo tribe and 0 if it belongs to a Naga tribe. Controls include distance to the state capital center core, elevation in metres, and a measure of terrain ruggedness. The border is divided into 5 equal segments that are used as fixed effects so that I am comparing groups along these segments. *** p<0.01, ** p<0.05, * p<0.1

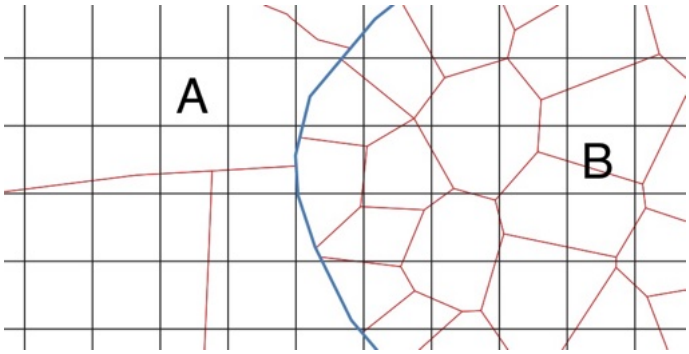


Figure 3.4: A section of my study region at the ethnic border (blue line). Red lines indicate a village's polygon border. Each grid (black square) is 0.01 x 0.01 degrees in size. Villages on the right side belong to the Kuki-Zo group.

3.4.3 Grids

In this subsection I introduce an alternate way of measuring village size. First I create a set of grids in the buffer area, each of size 0.01 x 0.01 degrees. Then for each grid I assign a value of 1 if it is fully contained within a village boundary, and 0 otherwise. In Figure 3.4, for example, Grid A is completely contained within a village's red boundary and is assigned a value 1. Grid B, on

Table 3.4: Grids across ethnic borders

	Dependent variable equals 1 if grid is contained entirely within a village			
	(1)	(2)	(3)	(4)
Kuki-Zo	-0.224***	-0.236***	-0.208***	-0.214***
	(0.073)	(0.067)	(0.054)	(0.059)
Observations	2,585	2,585	2,585	2,585
R-squared	0.050	0.077	0.086	0.088
Controls	No	No	Yes	Yes
Segment Fixed Effect	No	Yes	No	Yes
Mean dep. var	0.474	0.474	0.474	0.474

Notes: Standard errors in parentheses are clustered at the sub-district level. The dependent variable equals 1 if a grid is fully contained within a village boundary (each grid is 0.01 x 0.01 degrees in size). Kuki-Zo is a binary variable that equals 1 if a village belongs to a Kuki-Zo tribe and 0 if it belongs to a Naga tribe. Controls include distance to the state capital center core, elevation in metres, and a measure of terrain ruggedness. The border is divided into 5 equal segments that are used as fixed effects so that I am comparing groups along these segments. *** p<0.01, ** p<0.05, * p<0.1

the other hand, overlaps with two villages and is therefore coded as 0. Intuitively it captures the probability that a random grid dropped on a region is fully contained within an existing village's boundary. Hence a negative coefficient on the Kuki-Zo dummy for this indicator variable would indicate smaller villages. This is confirmed from the columns of Table 3.4.

3.4.4 Dynamics (growth of villages)

Next, as a validation of the paper's central claim that the Kuki-Zo villages are more likely to cleave over time I create a dummy variable that equals 1 if a village enumerated in the 2011 census (most recent one) was also enumerated in the 1971 census (earliest census for which data is available), and 0 otherwise. A negative and significant coefficient of ethnicity on this variable captures the fact that the Kuki-Zo villages were established at some time after 1971. Table-5 repeats the exercise from Table 3.5 but with this newly created dummy as the dependent variable. As expected, the Kuki-villages are relatively new.

Table 3.5: Whether village was established before 1971

	Dependent variable indicates if a village in the 2011 census existed before 1971			
	(1)	(2)	(3)	(4)
Kuki-Zo	-0.083**	-0.103***	-0.110***	-0.112***
	(0.037)	(0.034)	(0.032)	(0.037)
Observations	509	509	509	509
R-squared	0.014	0.031	0.034	0.038
Controls	No	No	Yes	Yes
Segment Fixed Effect	No	Yes	No	Yes
Mean dep. var	0.899	0.899	0.899	0.899

Notes: Standard errors in parentheses are clustered at the sub-district level. The dependent variable is a dummy variable that equals 1 if a village enumerated in 2011 already existed before 1971. Kuki-Zo is a binary variable that equals 1 if a village belongs to a Kuki-Zo tribe and 0 if it belongs to a Naga tribe. Controls include distance to the state capital center core, elevation in metres, and a measure of terrain ruggedness. The border is divided into 5 equal segments that are used as fixed effects so that I am comparing groups along these segments. *** p<0.01, ** p<0.05, * p<0.1

3.4.5 Public goods

Next I look at differences in public amenities. One cost to village fragmentation is having to build infrastructure from scratch when a new village is established. To test this I estimate a simple regression of the following form and look at cross sectional differences from the 2011 census-

$$y_i = \alpha + \beta \times \text{Kuki Zo}_i + \gamma \left(\text{Kuki Zo}_i \times \mathbb{1}_{\text{New Village}_i}\right) + \epsilon_i \tag{3.3}$$

where $\mathbb{1}_{\text{New Village}_i}$ is a dummy variable that indicates if a village was established after 1991. A negative value of both β and γ will suggest that the Kuki-Zo villages have lower access to public amenities and that this effect is stronger for the newer villages, thus adding credibility to the idea that village fragmentation lowers infrastructure development among the Kuki-Zo. For my analysis

I consider the following public goods: government primary and middle school availability, major district roads, and black-topped roads.

Table 3.6: Public amenities availability

VARIABLES	(1) Primary school	(2) Primary school	(3) Middle school	(4) Middle school	(5) Major district road	(6) Major district road	(7) Black-topped road	(8) Black-topped road
Kuki-Zo	-0.362***	-0.334***	-0.113***	-0.122***	-0.236***	-0.244***	-0.108***	-0.093***
	(0.025)	(0.024)	(0.025)	(0.028)	(0.034)	(0.033)	(0.023)	(0.029)
Kuki-Zo × $\mathbb{1}_{\text{New Village}_i}$		-0.226***		-0.070**		-0.064***		-0.066**
		(0.042)		(0.028)		(0.025)		(0.026)
Observations	1,359	1,359	1,359	1,359	1,359	1,359	1,359	1,359
R-squared	0.109	0.133	0.015	0.018	0.061	0.063	0.014	0.017

Notes: Robust standard errors in parentheses. $\mathbb{1}_{\text{New Village}}$ is a dummy variable that equals 1 if the village enumerated in the 2011 Census did not exist in 1991. *** p<0.01, ** p<0.05, * p<0.1

In columns 1 and 2 of Table 3.6, we focus on primary school and secondary school availability in Kuki-Zo villages. The coefficient on the Kuki-Zo variable is negative and statistically significant, indicating that Kuki-Zo villages are less likely to have primary and secondary schools compared to non-Kuki-Zo villages. This suggests an educational infrastructure gap in these communities. Furthermore, the interaction term between Kuki-Zo ethnicity and the indicator for villages established after 1991 ($\mathbb{1}_{\text{New Village}}$) is also negative and significant implying that recently established Kuki-Zo villages experience an additional disadvantage, being even less likely to have primary schools, which underscores the challenges of infrastructure development in newly fragmented communities.

For the remaining columns, which examine middle school availability, major district roads, and other district roads, we observe a similar pattern. The coefficients on the Kuki-Zo variable are consistently negative and statistically significant, indicating lower availability of these public amenities in Kuki-Zo villages. Additionally, the interaction terms for new village formation are negative, further confirming that newly formed Kuki-Zo villages face an added disadvantage in accessing public infrastructure. This pattern across various types of public goods supports the hypothesis that village fragmentation, particularly within Kuki-Zo communities, is associated with lower levels of public amenities.

However, one should note that the coefficient on *gamma* is likely an underestimate of the true effect of fragmentation since those that were established before 1991 might themselves be new villages from the point of view of, say, 1971. This further does not account for the cost to the old villages losing members to a new village.

3.5 Conclusion

This paper investigates the significant yet often overlooked role of cultural and customary land practices in influencing spatial growth and public infrastructure within ethnic communities. By comparing two prominent tribal groups in Manipur, India, the Kuki-Zo and the Naga, I demonstrate how differences in land inheritance customs have led to varying village sizes and, consequently, disparities in access to public amenities. The findings underscore that, for the Kuki-Zo group, the fragmentation of villages due to customary practices results in smaller settlements with fewer public resources, such as schools and roads. This contributes to the broader understanding of how historical and cultural institutions continue to impact development outcomes, particularly in regions with limited state capacity.

The study contributes to the literature on the political economy of rural development by emphasizing the unique challenges that traditional inheritance systems pose for infrastructure and economic consolidation in rural areas. These findings suggest that development policies must consider cultural and institutional factors unique to regions when attempting to foster growth and infrastructure expansion. Future research could build upon these findings by exploring similar dynamics in other tribal or rural contexts, potentially yielding a more comprehensive understanding of how cultural and historical institutions impact development across diverse geographic areas.

Chapter 4

IS GEOGRAPHY EXOGENOUS? CULTURE AND MIGRATION IN SOUTHEAST ASIA

4.1 Introduction

When posing questions on the long-run interactions between geography and institutions, economists largely suppose the direction of causality as going from the former to the latter. Geographical characteristics, as argued by economists, are difficult to alter drastically, more so in the pre-industrial era. This reasoning seems widely accepted as suggested by the voluminous literature that has as its key independent variable a geographical or ecological variable (Michalopoulos, 2012; Jimenez-Ayora and Ulubaşoğlu, 2015; Galor and Özak, 2016; BenYishay et al., 2017; Henderson et al., 2018). In similar ways, other papers instead use them as instruments (Alesina et al., 2013; Fenske, 2014; Mayshar et al., 2022). The outcome variables in these studies fill a spectrum of cultural traits and institutions, from gender attitudes to state formation, kinship structures to time preference.

However, a topic less explored in the historical economics literature is the possibility of geography being treated as a left-hand-side variable. Do societies choose where to migrate over long time horizons? And what determines this? Furthermore, what implications does this potentially have for econometric analyses?

This paper tests the hypothesis that groups can and do migrate to geographical areas that best suit their pre-existing practices. In particular, I look at the historical migratory patterns of ethnic groups from two language families (*Kra-Dai* and *Hmong-Mien*) and their gradual peopling of Southeast Asia over centuries. Widely studied by anthropologists and historians, the various peoples of the Kra-Dai language family, whose origins are in Southwest China, have been recorded since early times to have been practicing wet-rice cultivation in the valleys between mountains

(Chamberlain, 1975; Baker, 2002; Li et al., 2016). On the other hand, the Hmong-Mien language groups, another set of tribes with origins in Southwest China, locate themselves on mountain tops owing to their practice of shifting cultivation on hill slopes (Quincy, 1995; Schein, 2000; Wen et al., 2005).[1]

Furthermore, the Kra-Dai people were also relatively hierarchical and known to have a feudal like chiefdom system having been influenced by contact with Chinese civilization (Holm, 2004; Leach, 2021). The Hmong-Mien, on the other hand, were organized at a smaller scale without political centralization beyond the village (Lee and Tapp, 2010).

As the Han Chinese expanded southward in search of new land between the second century B.C and well into the European colonial era, they pushed these two sets of peoples further south and westward into the provinces of Yunnan, Sichuan, and Guizhou, as well as large areas that constitute modern-day Vietnam, Laos, Thailand, Myanmar, and Northeast India (Dodd, 1923; Michaud and Culas, 2000; Scott, 2010). This area of the world, named *Zomia* by Van Schendel, 2005, is a vast expanse the size of Europe with a population of over 100 million and cutting across nine, modern-day nation-states.

A natural question one can ask is what the patterns of their respective migrations were. Were these re-locations random, and that the new geographies the people came to inhabit dictated new practices? Or did their pre-existing locations and agricultural practices lead to selective movements? This age-old chicken-egg question about whether culture is the cause or effect of geography is one that has absorbed the interests of economic historians in recent decades (Bazzi et al., 2020; Obolensky et al., 2024). And while the literature largely supports the idea of environments shaping outcomes, this paper provides evidence for the reverse case and approaches the question from a long-run historical point of view.

In line with my hypothesis of endogenous migration, I do find selective settlements of groups based on pre-existing agricultural practices. The Kra-Dai people settle in less-rugged terrain, since

[1] West, 2010 gives a detailed account of many individual groups, including origins and agricultural practices.

flatter areas are much more suitable for wet-rice cultivation. The Hmong-Mien, on the other hand, settle at steeper slopes. Two reasons support the assumptions underlying these claims. First, the migration of the two groups share a common cause and a common point of origin. Second, since language is not easily manipulable, especially at the group level, it seems more plausible to think of the direction of causality as going from language-group-specific agricultural practice to settlement terrain via migration. This argument finds strength in the definition of a language family as "a group of genetically related languages, that is, languages which share a linguistic kinship by virtue of having developed from a common ancestor."[2]

But endogenous settlement also means that the migrants should carry with them a bundle of institutions (formal and informal) to these new locations. The village-based form of organization of the Hmong-Mien, as mentioned above, shows up in the form of smaller geographical areas occupied by their sub-groups that migrated as compared to the larger ones of the Kra-Dai sub-groups. Furthermore the Kra-Dai settlements are more clustered while the Hmong-Mien settlements are more fragmented and dispersed. Additional results using the epidemiological method show lower rates of inter-ethnic marriages among those belonging to the historically tight-knit Hmong-Mien group (Fernández, 2011).

One should note here that the thesis of this paper is not a critique of geography as an exogenous variable in all settings. Rather its purpose is simply to highlight cases that might deviate from this supposition, a possibility that is understudied in historical contexts. Neither is this paper about language families. Rather its use comes from the convenient historical setting that happens to produce variation at the language family level among the two studied ones. In other regions of the world such cultural variations across families may be less or more pronounced.

Early works on endogenous migration go back to Steckel, 1983, 1989. Looking at the east-west nature of US internal migration, Steckel proposed the idea of climatic similarity along latitudes as an explanation for such patterns. More recently, Obolensky et al., 2024, in a large sample of US

[2]Taken from Campbell, 2013, Historical Linguistics, pg.173.

migrants, show how immigrants pick locations in the United States that are closest in climate to their home country's. My paper builds on a similar theme while explicitly linking migrations to history and pre-existing institutions and practices.

This paper also contributes to the literature on persistence studies that generally treat geography as being exogenous. This has generated a large body of work that attempts to explain the origins of institutions to geography (BenYishay et al., 2017; Talhelm et al., 2014). While those that use large geographic differences like those of Diamond and Ordunio, 1999 might be reasonable, in smaller sub-regions, one worries how much of the exclusion restriction might be valid since people can migrate.

Lastly, this paper also contributes to our understanding of agriculture's role in the emergence of hierarchy. Mayshar et al., 2022 test James Scott's influential idea (Scott, 2010, 2017) that cereal crop appropriability caused the emergence of states. To resolve endogeneity concerns they instrument for crop selection with geographic and ecological variables that capture cereal suitability. My study, however, emphasizes a key distinction between primary and secondary state formation. While geography certainly played a big role in the endogenous formation of primary states, it might have had a much dampened effect on secondary state formation.[3] My analysis shows instead that states travel, and that they might pick places that best sustain their populations. Thus I raise a key distinction in definition between endogenous state formation and state expansion/proliferation.

The rest of the paper is organized as follows: Section 4.2 gives a brief historical background of the setting, section 4.3 outlines a theoretical framework, and section 4.4 onwards elaborates the data and results.

[3]This distinction matters since cases of primary state formation are the exception. In fact we know of only about 8 or 9 such cases (Sandeford, 2018). The rule for the majority of the world is state formation by emulation, interactions, and conquests from or by other states.

4.2 Background

The Kra-Dai and Hmong-Mien languages families are two of five families that make up the societies in Southeast Asia, the others being Sino-Tibetan, Austro-Asiatic, and Austronesian. The earliest recorded societies of these two families go back to before the formation of the first Chinese Qin Dynasty in 221 B.C. Scholars by-and-large agree that the point of origin of the two groups is somewhere in Southern China in the Guangxi/Guizhou province (Blench, 2008; Chamberlain, 1975).

Over the centuries, as the Han Chinese expanded, they pushed these two groups outward in a southerly direction (Schafer, 1967). Thereafter, the groups further travelled even in the absence of Chinese contact. Figure 4.1 shows the present-day boundaries of the various ethnic groups belonging to the Kra-Dai (sub-figure a) and the Hmong-Mien (sub-figure b) families as recorded by the Ethnologue. The arrows in each sub-figure were created separately by a number of authors, and are meant to indicate the likeliest direction of migration over time (Baker, 2002).

(a) (b)

Figure 4.1: Polygons of the ethnic boundaries of the (a) Kra-Dai and the (b) Hmong-Mien language families. The arrows indicate migration directions as suggested by Baker (2002) and Chamberlain (2013) for the Kra-Dai, and as suggested by traditional folklore and transcribed by van Herzeele (2013) for the the Hmong-Mien. *Note:* The arrows do not indicate actual migration 'routes' but are meant to indicate the likeliest 'direction' of migration.

However, two reasons jointly suggest the endogenous nature of their respective re-settling. Firstly, starting at Southern China, early chronicles report a sharp distinction between their agricultural practice and choice of settlement. The Hmong-Mien were known to live in rugged, higher elevated areas while sustaining on shifting cultivation.[4] This stood in contrast to the Kra-Dai who were know for their reliance on intensive wet-rice cultivation in river valleys (Scott, 2010). A popular saying in China goes,

> *"The Miao (the Hmong-Mien) live at the head of the mountain, the Zhuang (a Kra-Dai people) at the head of the river, and the Han at the head of the street"* (Kaup, 2000).[5]

Secondly, the Kra-Dai folk stories and chronicles speak of their statelets/kingdoms being set up by disgruntled princes sojourning elsewhere in search of new locations. A well-known one is the establishment of the Tai-Ahom kingdom in the Bhramaputra river valley in Northeast India (Baura, 1930). In 1215 A.D. a young Kra-Dai prince named Sukaphaa left the kingdom of Mong Mao located along the Longjiang river valley in Yunnan, China. He took with him "three queens, two sons and a daughter; chiefs from five other dependent Mongs; members of the priestly class and soldiers—a total contingent of 9,000,... 300 horses fitted with saddles and bridles and two elephants"(Phukan, 1992). The journey took thirteen years and almost a thousand kilometers, and required bypassing several mountainous territories until they found an appropriate location to cultivate wet-rice. Thus we observe a few facts of their migration pattern: first, they moved from one river valley to another. Second, they brought with them old institutions (eg., priests) and practices (wet-rice) to the new location. But more consequentially, they already possessed a knowledge of statecraft.[6]

Likewise, in the Lao People's Democratic Republic the people categorize themselves into three distinct groups based on geographic location: the lowland Lao or *Lao-Loum* made up of the Kra-Dai

[4]Other synonyms for shifting cultivation in the region include swidden agriculture, jhum cultivation, slash-and-burn agriculture.

[5]An important point to note is that the two agricultural practices are not exclusive within a group and that a combination of both intensive and shifting cultivation can be found occasionally within a group. However, what this paper relies on is the fact that one of the two is the predominant mode of agriculture.

[6]See Figure-A.3 in the appendix for the path of their migration.

peoples; the midland Lao or *Lao-Theung* comprising the Austro-Asiatic groups; and the upland Lao or *Lao-Sung* made up of Hmong-Mien speaking peoples (Baumann and Gingrich, 2004).[7]

Section 4.3 provides a framework that builds on this historical context and highlights the concerns arising in the use of geographic variables in such settings.

4.3 Conceptual Framework and Hypothesis

Within Guangxi province in Southwestern China, the proposed point of origin for the two groups, there are notable differences in the geographic characteristics of the Hmong-Mien and Kra-Dai, particularly in the Terrain Ruggedness Index (TRI) and elevation of their respective settlements (see Figure 4.2). The former are perched on more rugged higher elevation areas as compared to the Kra-Dai. As these groups migrated, a key question arises: do these foundational geographic features persist in influencing their new settlement choices? If these geographic attributes continue to characterize the migration destinations, it suggests a consistent preference or need for certain topographical conditions.

But if geographic choices persist are there other characteristics we might also expect to persist? For example, a large literature on cultural persistence shows how migrants carry with them values and practices to their new locations (eg., Fernández and Fogli, 2009). This continuity introduces important considerations for, say, instrumental variable (IV) estimation.[8] If settlement choices are group-specific, and that these groups also carry with them certain group-specific institutions, then these geographic features will be correlated with various outcomes we measure. Consequently, using TRI or elevation as instruments may risk introducing spurious correlations into the estimation. Specifically, the outcomes we observe today could appear correlated with geographic features not because of a causal relationship but due to shared historical or cultural influences brought about by

[7] Another Hmong-Mien proverb goes as follows, "*If you don't fear hunger, stay in the mountains. If you don't fear death, go to the plains*" (as stated in a documentary by Terra Films TV, video link, minute 4:17).

[8] An influential theory on state formation is by Wittfogel, 1959 who suggested irrigation for intensive agriculture as the precursor to states. His mechanism operates via the emergence of an autocratic state to manage water resources. Bentzen et al., 2017 test this theory using irrigation potential as an instrument.

migration. This would violate the exclusion restriction, where the instrument should only influence the outcome through the treatment variable and not through alternative pathways, such as the persistence of cultural traits.

The remaining sections provide some evidence for these claims.

4.4 Data

I begin by geo-referencing maps of the language groups as outlined in the Ethnologue (Campbell and Grondona, 2008). A naive approach to conduct my analysis would be to use these language borders to calculate the desired statistics and run a comparison between the two groups. The disadvantage of this method, however, is that we would be including non-inhabited regions like forests and wastelands. Given the research question is specifically about actual human settlement and not about claimed territory, this approach would not be meaningful. Furthermore, a common reference made to Southeast Asia's population is how sparse it is.

To get around this issue I make use of data from the World Settlements Footprint (Marconcini et al., 2020). Using machine learning techniques on NASA's Landsat imagery, the WSF dataset provides a raster file of every possible human settlement in the year 2019. I polygonize the raster which allows me to superimpose the settlement data with the ethno-linguistic borders from the Ethnologue to get a precise idea of where groups locate themselves within their respective borders. A point to note is that the conversion of the settlement raster to polygons results in some adjacent raster pixels of settlements to be merged into a single polygon feature. This just happens to be how the 'polygonize' function in QGIS or ArcGIS executes the command. Therefore one should not interpret a polygon feature as necessarily a unit settlement but occasionally a cluster of settlements. Figure-A.2 in the appendix shows the settlements of the Tai-Khamti ethnic group superimposed over their ethnic boundary.

For the elevation data I use NASA's Shuttle Radar Topography Mission (SRTM) measured in meters and granulated at a 30m×30m level (Mission, 2013). This dataset allows me to further

calculate a Terrain Ruggedness Index (TRI) using the default settings in QGIS. For each cell in the SRTM raster file, the TRI is calculated by taking the mean of the absolute differences between the elevation of a central grid cell and the elevations of its eight neighboring cells in a raster. Mathematically, for each cell, TRI is given by:

$$\text{TRI} = \frac{1}{8}\sum_{i=1}^{8} |z_0 - z_i|$$

where z_0 is the elevation of the central cell and z_i are the elevations of the neighboring cells. This measure captures the average deviation in elevation (in meters), indicating the roughness of the terrain.

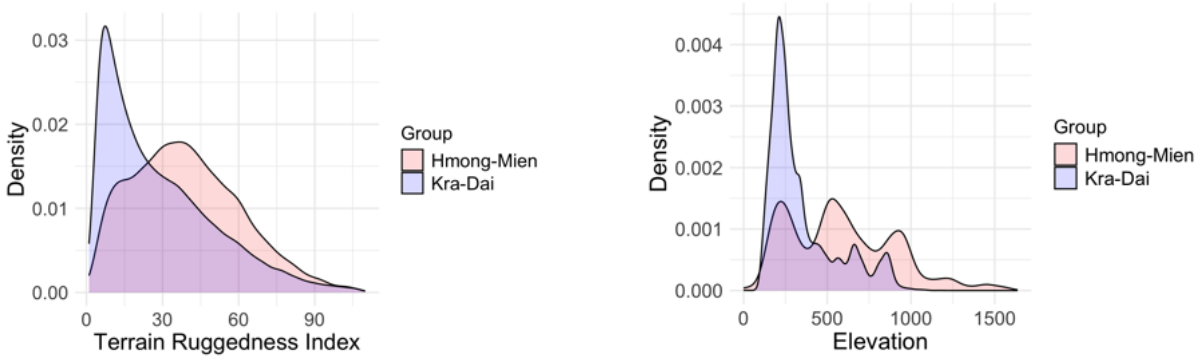
4.5 Results

In section 4.5.1, I first show difference between the two groups in Guangxi province. In section 4.5.2, I show differences in the distributions of settlements between the two groups for all locations across Zomia. Sections 4.5.3 and 4.5.4 highlight the challenges we might face in interpreting other results under these scenarios. Lastly Section 4.5.5 then asks what an instrument would pick up were we to ignore selective migration.

4.5.1 Differences in Settlements in Guangxi Province, China

The geographic differences between the Kra-Dai and Hmong-Mien groups in Guangxi Province offer a compelling starting point for understanding how pre-existing practices influence settlement patterns. Guangxi province, the proposed point of origin for both groups, provides a natural setting for comparing their geographic preferences because it contains diverse terrain types, from rugged mountainous regions to flatter lowlands. Within this setting, distinct differences emerge between the two groups in their choice of settlement location, as depicted in Figure 4.2.

The Hmong-Mien, historically known for their practice of slash-and-burn or shifting cultivation, are predominantly found in rugged, high-elevation areas. These regions offer the steep slopes



(a) (b)

Figure 4.2: Density plots of (a) the Terrain Ruggedness Index and (b) Elevation of the *Kra-Dai* (blue) and *Hmong-Mien* (red) language groups in Guangxi Province, China.

necessary for their traditional agricultural methods, which involve clearing small patches of forested land and rotating crops to maintain soil fertility. In contrast, the Kra-Dai groups, with a long history of wet-rice cultivation, are more concentrated in flatter, less rugged areas. These regions are better suited to building the intricate irrigation systems required for wet-rice agriculture, which depends on controlled water flow.

The question that follows from this result is if there is persistence in their topographic choices as they migrated southward and westward over time. The next section analyzes empirically the nature of their movements into the various regions of Southeast Asia.

4.5.2 Endogenous Settlements

Expanding the analysis beyond Guangxi, the geographic preferences of the Kra-Dai and Hmong-Mien aare just as pronounced when considering their settlements across the entire Zomia region. The density plots in Figure 4.3 show consistent differences in Terrain Ruggedness Index (TRI) and elevation between the two groups, reinforcing the hypothesis that their migration and settlement patterns are endogenous rather than exhibiting random geographic movements.

The Kra-Dai's preference for lower, less rugged terrain is evident in both individual settlement-

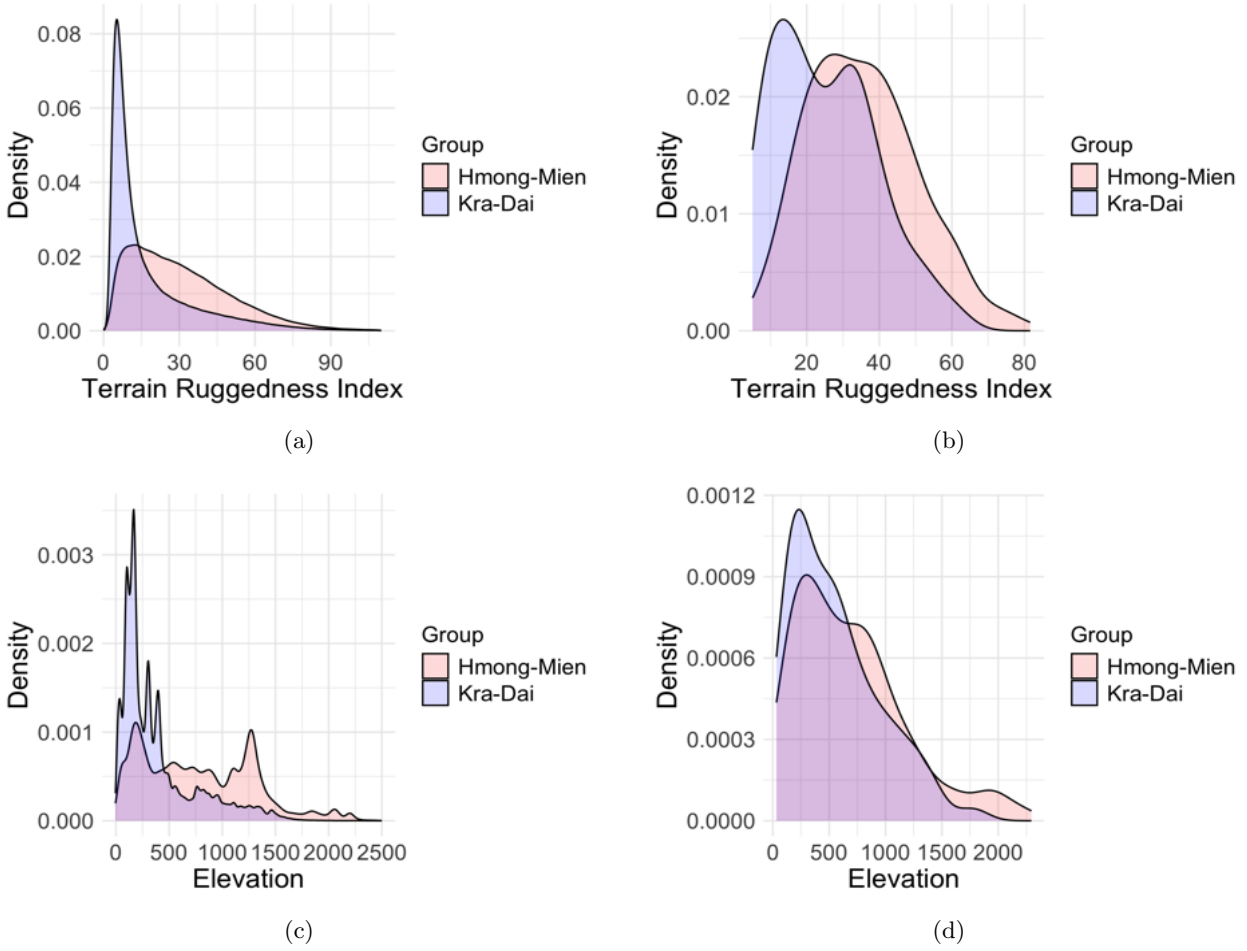


Figure 4.3: Density plots of the Terrain Ruggedness Index of (a) individual settlements and (b) aggregated settlements (using figure-1 borders) of the *Kra-Dai* (blue) and *Hmong-Mien* (red) language groups in Southeast Asia. Sub-graphs (c) and (d) are the analogous plots for Elevation in meters.

level data (Figure 4.3a and 4.3c) and aggregated polygon-level data (Figure 4.3b and 4.3d). This pattern reflects their reliance on wet-rice cultivation, which demands flat, fertile land and access to consistent water sources. By settling in such areas, the Kra-Dai were able to sustain their agricultural practices. The Hmong-Mien, by contrast, show a clear preference for more rugged, higher-elevation areas. These locations align with their traditional reliance on shifting cultivation, which thrives in isolated, forested regions.

The statistical differences in terrain preferences between the two groups are significant, as confirmed by Kolmogorov-Smirnov tests. For individual settlements, the p-values for TRI and elevation are both 0.000, indicating highly significant differences in the empirical distributions of these variables between the Kra-Dai and Hmong-Mien. Even when data is aggregated at the polygon level, the differences remain statistically significant, with p-values of 0.000 for TRI and 0.016 for elevation. These results highlight the robustness of the observed patterns, suggesting that the geographic preferences of the two groups are not random but are instead deeply rooted in their cultural and agricultural practices.

4.5.3 Other Characteristics that Migrate with People

Next, I allude to the possibility of spurious correlations we would observe if we took geography as exogenous.[9] Geographic characteristics such as terrain ruggedness or elevation are often assumed to directly shape economic and social outcomes. However, this assumption may overlook the role of group-specific historical and institutional factors that influence migration and settlement patterns. For instance, if a group's historical agricultural practices or social institutions shaped their decision to settle in certain types of terrain, geographic variables would no longer be independent determinants of observed outcomes. Instead, they would serve as proxies for underlying cultural or institutional characteristics that co-migrate with the group, introducing potential bias into econometric models that treat geography as exogenous.

A notable example of this phenomenon comes from the work of Putterman and Weil, 2010, who examine population flows and their implications for institutional development. Their analysis reveals that adjusting a country's population for the historical backgrounds of its migrants significantly alters the observed relationship between institutions and economic outcomes. This finding underscores the importance of accounting for the historical and cultural characteristics of migrating groups when interpreting the role of geography in development.

[9] Michalopoulos and Papaioannou, 2018, in a review of spatial studies, point to the geographic clustering of development in Zomia. My paper suggests that one can view such topics from the lens of group-level migration.

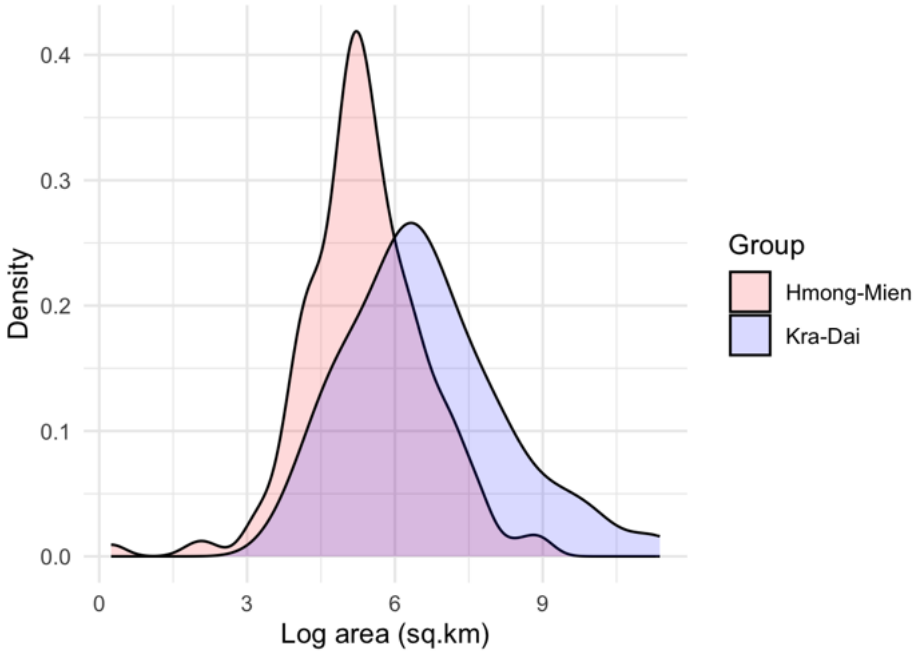


Figure 4.4: Density plot of log area in square kilometers of the *Kra-Dai* (blue) and *Hmong-Mien* (red) language group polygons in Southeast Asia.

The migration patterns of the Kra-Dai and Hmong-Mien offer a clear illustration of this complexity. As mentioned in Section 4.2, the Kra-Dai migrations were often led by princes and other hierarchical leaders who conquered and controlled new territories. This centralized form of societal organization would have enabled the Kra-Dai to establish expansive territorial claims, reflecting their ability to coordinate large-scale settlement and political consolidation. In contrast, the Hmong-Mien lacked centralized military leadership and remained more reliant on small-scale, village-based autonomy. These institutional differences likely shaped their settlement patterns and the relative sizes of their territories.

As Figure 4.4 demonstrates, the Kra-Dai polygons are significantly larger in area compared to those of the Hmong-Mien (significant at the 1% level). This difference aligns with the hypothesis that pre-existing institutions, such as hierarchical leadership among the Kra-Dai, facilitated territorial expansion. Importantly, the causality here appears to flow from these centralized institutions to

territorial outcomes, rather than from geographic conditions to institutions to territorial expansion. For example, Kra-Dai leaders likely sought out flatter, more fertile regions to support their wet-rice agriculture and larger populations, reinforcing their hierarchical structure. Conversely, the Hmong-Mien's preference for rugged, mountainous terrain was more consistent with their decentralized and subsistence-based organization.

This example underscores the risk of spurious correlations when geography is treated as exogenous. If the observed differences in settlement sizes and locations are driven by historical institutional factors rather than geographic determinism, then models relying on geographic variables as independent determinants may misattribute causality. The next subsection takes another approach to further support the idea that practices and traits can and do travel with migrants.

However, one could argue that it was geography that allowed the Kra-Dai to expand, and were they to have resided in less hospitable terrain they would have been limited in their reach. Likewise other practices too might have been influenced by their spatial environments. To get around this, in the sense of isolating geography's effect, I employ the well-known epidemiological method in the next section.

4.5.4 The Epidemiological Approach

To further strengthen the idea that cultural traits migrate with groups, I employ the well-known epidemiological strategy that allows us to empirically analyze historical differences while holding environmental variables constant (Fernández, 2011). The idea here is to look at people living in the same geographical unit and compare their cultural differences. In doing so we control for various geographical confounders that could bias our estimates. These might include policies, politics, geography, formal institutions, etc, that might vary across space.

This is to simply provide evidence that traits and practices can be transported by groups. It does not, however, disprove the fact that the Kra-Dai, by settling in valleys endogenously developed states, and that these states in turn shaped beliefs and values. What it does show, nonetheless, is

that beliefs and values can travel with people, and that this could include knowledge of statecraft traveling across space and time with people. And though the absence of cultural differences from this approach does not disprove that culture does not travel, detecting differences places confidence in their persistence.

Table 4.1: Cultural differences holding geography constant

	(1)	(2)	(3)	(4)
VARIABLES	Mixed marriage	Mixed marriage	Mixed marriage	Mixed marriage
Hmong-Mien	-0.094***	-0.101***	-0.090***	-0.112**
	(0.013)	(0.014)	(0.016)	(0.047)
Birth Year		0.002***	0.002***	-0.003
		(0.000)	(0.000)	(0.003)
Years of Schooling		0.001*	0.001*	0.001
		(0.001)	(0.001)	(0.004)
Controls		✓	✓	✓
New migrant	✓	✓		
Recently married				✓
Observations	11,515	11,490	10,857	980
R-squared	0.069	0.074	0.073	0.173
District FE	✓	✓	✓	✓
Mean dep. var	0.093	0.093	0.093	0.093

Notes: The sample is restricted to males residing in urban areas. Standard errors in parenthesis are two-way clustered at the birth year and district levels. Each regression includes district and occupation fixed effects. The dependent variable is a dummy variable indicating if the individual is married to someone of a different ethnicity. Hmong-Mien is an indicator variable equal to 1 if an individual belongs to the Hmong-Mien group and 0 if he belongs to the Kra-Dai group. Columns 3 and 4 include only those who have been residing in the province for the last 5 years. Column 4 further restricts this sample to those who were married in the last 5 years since enumeration. The Hmong-Mien make up about 10% of the sample. *** p<0.01, ** p<0.05, * p<0.1

I hypothesize that one should observe tighter cultural traits among the Hmong-Mien owing to their small-scale kin-based structures, and that these values get transported even after they migrate to the cities (Gelfand et al., 2011; Tabellini, 2008). To measure this I use inter-ethnic marriage as a proxy for limited trust, the idea being that in historically less tight-knit societies one should observe more willingness to intermarry with more distant groups (Alesina and La Ferrara, 2002).

For this analysis I use the Vietnam 2019 Census, which provides individual-level data on ethnic-

ity, marital status, and location, and focus on married individuals living in urban areas of the Kinh majority homelands (the Vietnamese majority group who make up 90% of the country), restricting the sample to households with exactly two married members to isolate couples. The outcome variable I am interested in is the probability that a married man has a spouse of a different ethnicity. I identify whether a couple is of mixed ethnicity, defining this as belonging to different ethnic groups. To analyze patterns, I create a treatment group of male individuals from Hmong-Mien ethnic groups and a control group of male individuals from Kra-Dai ethnic groups. Finally, I estimate the effect of belonging to the treatment group on mixed ethnicity marriages, using district and occupational fixed effects while also controlling for age and education levels. By comparing those in the same district (that, on average, is 470 sq. kilometers in area) within urban areas, I am able to account for various geographical factors that one could possibly attribute to the differences in outcomes we study, as is certainly possible in the previous section.

Employing the epidemiological approach, I examine patterns of intermarriage between Kra-Dai and Hmong-Mien individuals in shared districts to highlight cultural persistence. Table 4.2 reveals significant differences in intermarriage behavior, even within the same geographic regions. Specifically, Hmong-Mien individuals are 9.4 percentage points less likely to marry outside their group compared to Kra-Dai individuals, even after controlling for birth year, education, and district-level fixed effects (column 1). This finding suggests a strong cultural preference for endogamy among the Hmong-Mien, reflecting their village-based autonomy and greater social isolation historically.

These results suggest the enduring impact of cultural practices on social outcomes, even when geographic environments are held constant. This persistence of cultural traits complicates the interpretation of geographic variables as exogenous in econometric analyses. If cultural norms, such as marriage practices, influence settlement patterns and social interactions, then geography may reflect endogenous group decisions rather than acting as an independent determinant of economic or institutional outcomes. The results provide empirical evidence that cultural traits not only migrate with groups but also persist across generations, influencing key behaviors like marriage even within

shared geographic settings.

A caveat of this exploratory analysis, nonetheless, is that I am unable to distinguish first generation migrants from those who have lived in their new towns/cities for longer. Finding quick convergence among second generation migrants, for example, will support the idea that environments shape beliefs and that culture is not as persistent.

4.5.5 What would a Geographical Instrument Predict?

I now test what a geographic instrument would pick up were we to run a naive regression that does not take into account selective migration. To do this I first divide my study area into grids of size 0.5×0.5 degrees at the equator (55 kms), and focus on grids that include settlements from at least one of the two groups (see Figure-A.1 in the appendix).[10] Then for each grid I calculate the difference in the log number of Kra-Dai settlements versus Hmong-Mien settlements per square kilometer. Thus a lower value of this variable indicates 'relatively' more Hmong-Mien settlements. I regress this variable on the grid average elevation and TRI values-

$$\text{Log Settlement Difference}_i = \alpha + \beta \times \text{Geography}_i + \mathbf{\Gamma X_i} + \epsilon_i \tag{4.1}$$

where 'Log Settlement Difference$_i$' is the difference in the log number of settlements per sq.km between the Kra-Dai and the Hmong-Mien in grid i, and Geography$_i$ is the grid cell average of the geographic variables (Terrain Ruggedness or Elevation). I control for distance to the center of Guangxi province, the proposed point of outward migration of the two groups.

As Table 4.2 shows, the geographic variables strongly predict relative differences in settlements. For instance, based on column 2 and when expressed in non-logarithmic form, for every 100 meters increase in a grid's average elevation, the relative number of Kra-Dai settlements falls by 3 units per square kilometer. This is against an average of 22.40 settlement difference per sq.km per grid.

[10]The 0.5×0.5 degree size has been used for studies focused on sub-global regions (eg., McGuirk and Nunn, 2024 studying Africa). For global studies authors tend to use 1×1 degree cell sizes (eg., Mayshar et al., 2022).

Table 4.2: First stage predictions using ruggedness and elevation as instruments.

VARIABLES	(1) Difference	(2) Difference	(3) Difference	(4) Difference
Terrain Ruggedness	-0.024***		-0.018***	
	(0.003)		(0.004)	
Elevation		-0.001***		-0.001***
		(0.000)		(0.000)
Controls			✓	✓
Mean (dep. var)	0.384	0.384	0.384	0.384
Observations	520	520	520	520
R-squared	0.071	0.075	0.097	0.132

Notes: Robust standard errors in parenthesis. The unit of observation is a grid cell of size 0.5 x 0.5 degrees (55 kms) at the equator. The dependent variable in each column is the difference in the log number of settlements per square kilometer between the Kra-Dai and the Hmong-Mien in each grid. The average settlement is a building as captured from satellite data by the World Settlement Footprint. Ruggedness is measured as the squared deviation of each cell's elevation from its neighboring eight cells. Each cell is 90m×90m in dimension and is measured in meters. Elevation is measured in meters ASL. The average number of settlements per sq.km per grid are 28.71 and 6.67 for the Kra-Dai and Hmong-Mien respectively. *** p<0.01, ** p<0.05, * p<0.1

Figure 4.5 displays a binned scatter plot of the relationship. Likewise, columns 1 and 3 suggest a strong predictive power of TRI on the difference variable. Thus, if Settlement-Difference$_i$ is a good proxy for intensive agriculture, as we argued earlier, and assumed no selective migration, we would be convinced of a strong first-stage.

4.6 Conclusion

In summary, this paper is a first to test long-run endogenous movements of groups across space. It uses historical natural experiments in Southeast Asia to make the case for endogenous migration. Pre-existing practices, the paper argues, cause groups to migrate to locations best suited to them. This potentially poses threats to the exclusion restriction, or reverse causality issues in long-run analyses that leverage geographic variables as right-hand-side variables.

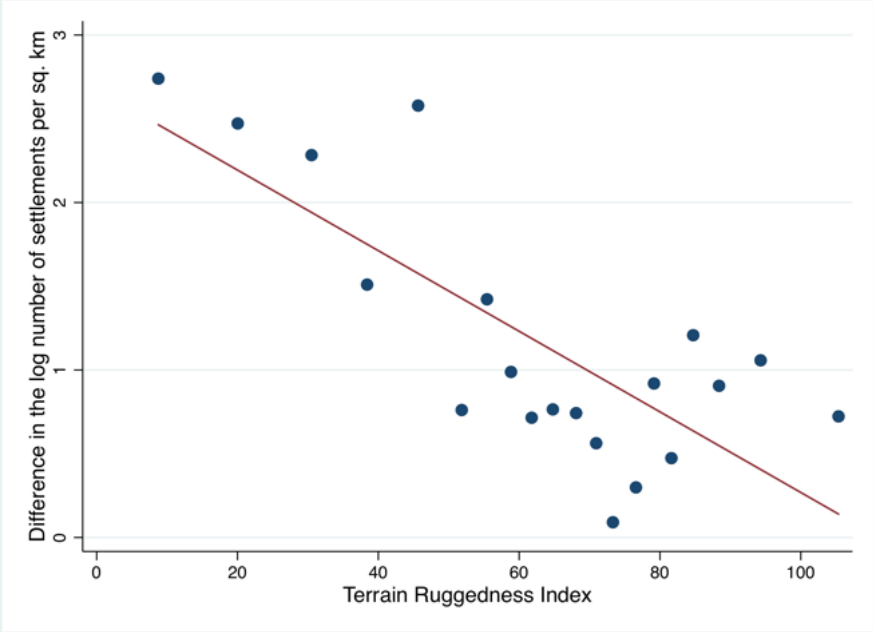


Figure 4.5: Binned scatter plot of log settlement difference against TRI at the grid level. The graph represents regression results from column 1 of Table 1.

BIBLIOGRAPHY

Abadie, A. (2021). Using synthetic controls: Feasibility, data requirements, and methodological aspects. *Journal of economic literature 59*(2), 391–425.

Acemoglu, D., T. Reed, and J. A. Robinson (2014). Chiefs: Economic development and elite control of civil society in sierra leone. *Journal of Political Economy 122*(2), 319–368.

Acemoglu, D. and J. A. Robinson (2014). *The Rise and Decline of Nations: Economic Growth, Stagflation, and Social Rigidities*. MIT Press.

Acemoglu, D. and J. A. Robinson (2020). *The narrow corridor: States, societies, and the fate of liberty*. Penguin.

Adams, W. M. (1996). *Development and social change: A global perspective*. Routledge.

Agte, P. and A. Bernhardt (2023). The economics of caste norms: Purity, status, and women's work in india. *Job Market Paper*.

Akbulut-Yuksel, M. and M. Yuksel (2015a). The legacy of forced migration in wwii: Jewish expulsion from civil service in germany. *European Economic Review 80*, 78–97.

Akbulut-Yuksel, M. and M. Yuksel (2015b). The long-term direct and external effects of jewish expulsions in nazi germany. *American Economic Journal: Economic Policy 7*(3), 58–85.

Akerlof, G. A. and R. E. Kranton (2000). Economics and identity. *The quarterly journal of economics 115*(3), 715–753.

Alesina, A. and P. Giuliano (2011a). Family ties and political participation. *Journal of the European Economic Association 9*(5), 817–839.

Alesina, A. and P. Giuliano (2011b). Preferences for redistribution. In *Handbook of Social Economics*, Volume 1, pp. 93–131. Elsevier.

Alesina, A., P. Giuliano, and N. Nunn (2013). On the origins of gender roles: Women and the plough. *The Quarterly Journal of Economics 128*(2), 469–530.

Alesina, A. and E. La Ferrara (2002). Who trusts others? *Journal of public economics 85*(2), 207–234.

Alesina, A., G. Tabellini, and F. Trebbi (2017). Is europe an optimal political area? Technical report, National Bureau of Economic Research.

Alfaro, L., A. Chanda, S. Kalemli-Ozcan, and S. Sayek (2010). Does Foreign Direct Investment Promote Growth? Exploring the Role of Financial Markets on Linkages. *Journal of Development Economics 91*(2), 242–256.

Ali, M., O.-H. Fjeldstad, B. Jiang, and A. B. Shifa (2019). Colonial legacy, state-building and the salience of ethnicity in sub-saharan africa. *The Economic Journal 129*(619), 1048–1081.

Ali, M., O.-H. Fjeldstad, B. Jiang, A. B. Shifa, et al. (2015). Colonial legacy, state-building and the salience of ethnicity in sub-saharan africa. *The Economic Journal 129*, 1–34.

Allen, B. C. (2010). *Gazetteer of Naga Hills and Manipur*. Mittal Publications.

Alvarez, J. A. (2020). The agricultural wage gap: Evidence from brazilian micro-data. *American Economic Journal: Macroeconomics 12*(1), 153–173.

Asher, S., T. Lunt, R. Matsuura, and P. Novosad (2019). The socioeconomic high-resolution rural-urban geographic dataset on india (shrug). *URL: https://doi. org/10.7910/DVN/DPESAK*.

Asher, S., T. Lunt, R. Matsuura, and P. Novosad (2021). Development Research at High Geographic Resolution: An Analysis of Night Lights, Firms, and Poverty in India using the SHRUG Open Data Platform. *The World Bank Economic Review*.

Ashraf, N., N. Bau, N. Nunn, and A. Voena (2020). Bride price and female education. *Journal of Political Economy 128*(2), 591–641.

Atkin, D. (2016). The caloric costs of culture: Evidence from indian migrants. *American Economic Review 106*(4), 1144–1181.

Bahrami-Rad, D., J. Beauchamp, J. Henrich, and J. Schulz (2022). Kin-based institutions and economic development. *Available at SSRN*.

Baker, C. (2002). From yue to tai. *Journal of the Siam Society 90*(1-2), 1–26.

Baldwin, R. E. and T. Okubo (2006). Heterogeneous firms, agglomeration and economic geography: spatial selection and sorting. *Journal of economic geography 6*(3), 323–346.

Banerjee, A. and L. Iyer (2005). History, institutions, and economic performance: The legacy of colonial land tenure systems in india. *American economic review 95*(4), 1190–1213.

Baruah, S. (1999). *India Against Itself: Assam and the Politics of Nationality*. University of Pennsylvania Press.

Bau, N. (2021). Can policy change culture? government pension plans and traditional kinship practices. *American Economic Review 111*(6), 1880–1917.

Baumann, G. and A. Gingrich (2004). *Grammars of identity/alterity: A structural approach*, Volume 3. Berghahn Books.

Baura, G. C. (1930). Ahom-buranji from the earliest time to the end of ahom rule. Technical report, Calcutta, Authority of the Assam Administration.

Bazzi, S., M. Fiszbein, and M. Gebresilasse (2020). Frontier culture: The roots and persistence of "rugged individualism" in the united states. *Econometrica 88*(6), 2329–2368.

Bazzi, S., A. Gaduh, A. D. Rothenberg, and M. Wong (2016). Skill transferability, migration, and development: Evidence from population resettlement in indonesia. *American Economic Review 106*(9), 2658–2698.

Becker, S. O., K. Boeckh, C. Hainz, and L. Woessmann (2016). The empire is dead, long live the empire! long-run persistence of trust and corruption in the bureaucracy. *The Economic Journal 126*(590), 40–74.

Becker, S. O. and L. Woessmann (2009). Was weber wrong? a human capital theory of protestant economic history. *The quarterly journal of economics 124*(2), 531–596.

Bénabou, R. and J. Tirole (2006). Incentives and prosocial behavior. *American economic review 96*(5), 1652–1678.

Bentzen, J. S., N. Kaarsen, and A. M. Wingender (2017). Irrigation and autocracy. *Journal of the European Economic Association 15*(1), 1–53.

BenYishay, A., P. Grosjean, and J. Vecci (2017). The fish is the friend of matriliny: Reef density and matrilineal inheritance. *Journal of Development Economics 127*, 234–249.

Bergeron, A. (2019). Religion and the scope of morality: Evidence from exposure to missions in the drc. Technical report, Technical report. https://www. augustinbergeron. com/research.

Berkowitz, D., K. Pistor, and J.-F. Richard (2003). Economic development, legality, and the transplant effect. *European economic review 47*(1), 165–195.

Besley, T. (2020). State capacity, reciprocity, and the social contract. *Econometrica 88*(4), 1307–1335.

Bisin, A. and T. Verdier (2001). The economics of cultural transmission and the dynamics of preferences. *Journal of Economic theory 97*(2), 298–319.

Bisin, A. and T. Verdier (2017). On the joint evolution of culture and institutions. Technical report, National Bureau of Economic Research.

Blench, R. (2008). Stratification in the peopling of china: How far does the linguistic evidence match genetics and archaeology? In *Past Human Migrations in East Asia*, pp. 137–164. Routledge.

Bockstette, V., A. Chanda, and L. Putterman (2002). States and markets: The advantage of an early start. *Journal of Economic growth 7*, 347–369.

Borcan, O., O. Olsson, and L. Putterman (2018). State history and economic development: evidence from six millennia. *Journal of Economic Growth 23*, 1–40.

Borjas, G. J. (1999). *The Economics of Immigration*. University of Chicago Press.

Boserup, E. (2014). *The conditions of agricultural growth: The economics of agrarian change under population pressure*. Routledge.

Bryan, G., E. Glaeser, and N. Tsivanidis (2020). Cities in the Developing World. *Annual Review of Economics 12*(1), 273–297.

Campbell, L. (2013). *Historical linguistics*. Edinburgh University Press.

Campbell, L. and V. Grondona (2008). Ethnologue: Languages of the world. *Language 84*(3), 636–641.

Castelló-Climent, A., L. Chaudhary, and A. Mukhopadhyay (2018). Higher education and prosperity: From catholic missionaries to luminosity in india. *The Economic Journal 128*(616), 3039–3075.

Cattaneo, M. D., N. Idrobo, and R. Titiunik (2019). *A practical introduction to regression discontinuity designs: Foundations*. Cambridge University Press.

Cernea, M. M. (1997). The risks and reconstruction model for resettling displaced populations. *World Development 25*(10), 1569–1587.

Chadha, V. (2009). India's counterinsurgency campaign in mizoram. In *India and Counterinsurgency*, pp. 44–60. Routledge.

Chamberlain, J. R. (1975). A new look at the history and classification of the tai languages. *Studies in Tai linguistics in honor of William J. Gedney*, 49–66.

Chandramouli, C. and R. General (2011). Census of india 2011. *Provisional Population Totals. New Delhi: Government of India*, 409–413.

Chaussende, D. (2015). Liang shu. *Early Medieval Chinese Texts. A bibliographic Guide*, 167–170.

Chhangte, L. (2001). *The Mizo Insurgency*. Calcutta University Press.

Chongloi, H. (2018). Reinterpreting kuki chieftainship of northeast india in relation to colonial historiography: Media theory perspectives. *Media Watch 9*(3), 486–500.

Chongloi, H. (2022). The three schools of thought on kuki chieftainship: A theoretical approach. *Studies of Tribes and Tribals 20*.

Chophy, G. K. (2021). *Christianity and politics in tribal India: Baptist missionaries and Naga nationalism*. State University of New York Press.

Christensen, D., M. Nguyen, and R. Sexton (2019). Strategic violence during democratization: Evidence from myanmar. *World Politics 71*(2), 332–366.

Ciccone, A. (2002). Agglomeration effects in europe. *European Economic Review 46*(2), 213–227.

Clark, M. E. (1978). *A corner in India*. Christian Literature Centre.

Corno, L., N. Hildebrandt, and A. Voena (2020). Age of marriage, weather shocks, and the direction of marriage payments. *Econometrica 88*(3), 879–915.

Dasgupta, P. (2000). *Economics of Social Sector and Environment*. Springer.

De la Croix, D., M. Doepke, and J. Mokyr (2018). Clans, guilds, and markets: Apprenticeship institutions and growth in the preindustrial economy. *The Quarterly Journal of Economics 133*(1), 1–70.

Dell, M. (2010). The persistent effects of peru's mining mita. *Econometrica 78*(6), 1863–1903.

Dell, M., N. Lane, and P. Querubin (2018). The historical state, local collective action, and economic development in vietnam. *Econometrica 86*(6), 2083–2121.

Dell, M. and B. A. Olken (2020). The development effects of the extractive colonial economy: The dutch cultivation system in java. *The Review of Economic Studies 87*(1), 164–203.

Dell, M. and P. Querubin (2018). Nation building through foreign intervention: Evidence from discontinuities in military strategies. *The Quarterly Journal of Economics 133*(2), 701–764.

Depetris-Chauvin, E. and Ö. Özak (2020). Borderline disorder:(de facto) historical ethnic borders and contemporary conflict in africa. *Available at SSRN 3541025*.

Desmet, K. and J. V. Henderson (2017). The geography of development. *Journal of Economic Geography 17*(2), 395–431.

Desmet, K., D. K. Nagy, and E. Rossi-Hansberg (2018). The geography of development. *Journal of Political Economy 126*(3), 903–983.

Diamond, J. M. (1998). *Guns, germs and steel: a short history of everybody for the last 13,000 years*. Random House.

Diamond, J. M. and D. Ordunio (1999). *Guns, germs, and steel*, Volume 521. Books on Tape New York.

Dimiceli, C., M. Carroll, R. Sohlberg, D. Kim, M. Kelly, and J. Townshend (2015). Mod44b modis/terra vegetation continuous fields yearly l3 global 250 m sin grid v006 [data set]. *NASA EOSDIS Land Process*.

Dodd, W. C. (1923). *The Tai Race, Elder Brother of the Chinese: Results of Experience, Exploration and Research of William Clifton Dodd*. Torch.

Donaldson, D. (2018). Railroads of the raj: Estimating the impact of transportation infrastructure. *American Economic Review 108*(4-5), 899–934.

Durante, R., N. Mastrorocco, L. Minale, and J. Snyder Jr (2021). Unpacking social capital. *Work. Pap., Trinity Coll. Dublin, Dublin, Irel*.

Duranton, G. (2015a). Growing through cities in developing countries. *The World Bank Research Observer 30*(1), 39–73.

Duranton, G. (2015b). Urbanization and development. *Handbook of Regional and Urban Economics 5*, 543–594.

Dzuvichu, L. (2013). Roads and the raj: The politics of road building in colonial naga hills, 1860s–1910s. *The Indian Economic & Social History Review 50*(4), 473–494.

Eaton, R. M. (1984). Conversion to christianity among the nagas, 1876-1971. *The Indian Economic & Social History Review 21*(1), 1–44.

Ebrey, P. B. and P. J. Smith (2016). *State Power in China, 900-1325*. University of Washington Press.

Eeckhout, J., R. Pinheiro, and K. Schmidheiny (2014). Spatial sorting. *Journal of Political Economy 122*(3), 554–620.

Ellis, F. and A. Bigsten (2015). *Economic Development*. Routledge.

Esteban, J., L. Mayoral, and D. Ray (2012). Ethnicity and conflict: An empirical study. *American Economic Review 102*(4), 1310–1342.

Fearon, J. D. and D. D. Laitin (2003). Ethnicity, insurgency, and civil war. *American political science review 97*(1), 75–90.

Fenske, J. (2014). Ecology, trade, and states in pre-colonial africa. *Journal of the European Economic Association 12*(3), 612–640.

Fernández, R. (2011). Does culture matter? *Handbook of social economics 1*, 481–510.

Fernández, R. and A. Fogli (2009). Culture: An empirical investigation of beliefs, work, and fertility. *American economic journal: Macroeconomics 1*(1), 146–177.

Fernández-Villaverde, J., M. Koyama, Y. Lin, and T.-H. Sng (2020). The fractured-land hypothesis. Technical report, National Bureau of Economic Research.

Fischer, D. H. (1989). *Albion's seed: Four British folkways in America*, Volume 1. America: A Cultural History.

Furer-Haimendorf, C. v. (1976). *Return to the Naked Nagas: An Anthropologist's View of Nagaland 1936-1970*. New Delhi: Vikas Publishing House.

Gallagher, J. and R. Robinson (1953). The imperialism of free trade. *The Economic History Review 6*(1), 1–15.

Gallup, J. L., J. D. Sachs, and A. D. Mellinger (1999). Geography and economic development. *International Regional Science Review 22*(2), 179–232.

Galor, O. (2011). *Unified growth theory*. Princeton University Press.

Galor, O. and Ö. Özak (2016). The agricultural origins of time preference. *American Economic Review 106*(10), 3064–3103.

Galor, O. and D. N. Weil (2000). Population, technology, and growth: From malthusian stagnation to the demographic transition and beyond. *American economic review 90*(4), 806–828.

Gangte, K., M. Touthang, and E. Kanagaraj (2014). Kuki traditional institutions and development: Role of village chiefs in manipur. *Soc Work J 5*, 46–65.

Gelfand, M. J., J. L. Raver, L. Nishii, L. M. Leslie, J. Lun, B. C. Lim, L. Duan, A. Almaliach, S. Ang, J. Arnadottir, et al. (2011). Differences between tight and loose cultures: A 33-nation study. *science 332*(6033), 1100–1104.

Ghosh, A., S. I. M. Hwang, and M. Squires (2023). Economic consequences of kinship: Evidence from us bans on cousin marriage. *The Quarterly Journal of Economics*, qjad018.

Glaeser, E. (2012). *Triumph of the city: How our greatest invention makes us richer, smarter, greener, healthier, and happier*. Penguin.

Glaeser, E. L. (2014). Urbanization and its discontents. *National Bureau of Economic Research*, Working Paper.

Goody, J. (1983). *The development of the family and marriage in Europe*. Cambridge University Press.

Greif, A. (1993). Contract enforceability and economic institutions in early trade: The maghribi traders' coalition. *The American economic review*, 525–548.

Greif, A. (1994). Cultural beliefs and the organization of society: A historical and theoretical reflection on collectivist and individualist societies. *Journal of political economy 102*(5), 912–950.

Greif, A. and G. Tabellini (2010). Cultural and institutional bifurcation: China and europe compared. *American economic review 100*(2), 135–140.

Greif, A. and G. Tabellini (2017). The clan and the corporation: Sustaining cooperation in china and europe. *Journal of Comparative Economics 45*(1), 1–35.

Grossman, G. M. and E. Helpman (1993). *Innovation and growth in the global economy*. MIT press.

Hamory, J., M. Kleemans, N. Y. Li, and E. Miguel (2021). Reevaluating agricultural productivity

gaps with longitudinal microdata. *Journal of the European Economic Association 19*(3), 1522–1555.

Haokip, G. T. (2017). Kuki chieftainship in democratic india. *Economic and Political Weekly 52*(34), 21–22.

Haukka, J., J. Suvisaari, M. Sarvimäki, and P. Martikainen (2017). The impact of forced migration on mortality: a cohort study of 242,075 finns from 1939–2010. *Epidemiology 28*(4), 587–593.

Hauzel, P. (2008). *Conflict and Resolution: The Mizoram Experience*. Northeast India Publications.

Hazarika, S. (1995). *Strangers of the mist: Tales of war and peace from India's northeast*. Penguin Books India.

Heldring, L. (2021). The origins of violence in rwanda. *The Review of economic studies 88*(2), 730–763.

Henderson, J. V. (2003). Urbanization and economic development. *Annals of Economics and Finance 4*(2), 327–357.

Henderson, J. V. (2010). Cities and development. *Journal of Regional Science 50*(1), 515–540.

Henderson, J. V. and S. Kriticos (2018). The development of the african system of cities. *Annual Review of Economics 10*(1), 287–314.

Henderson, J. V., T. Regan, and A. J. Venables (2021). Building the city: from slums to a modern metropolis. *The Review of Economic Studies 88*(3), 1157–1192.

Henderson, J. V., T. Squires, A. Storeygard, and D. Weil (2018). The global distribution of economic activity: nature, history, and the role of trade. *The Quarterly Journal of Economics 133*(1), 357–406.

Henrich, J. (2004). Demography and cultural evolution: how adaptive cultural processes can produce maladaptive losses—the tasmanian case. *American antiquity 69*(2), 197–214.

Henrich, J. (2020). *The WEIRDest people in the world: How the West became psychologically peculiar and particularly prosperous*. Penguin UK.

Hodson, T. (1910). Some naga customs and superstitions. *Folklore 21*(3), 296–312.

Hodson, T. C. (1911). *The Nāga Tribes of Manipur*. Macmillan and Company, limited.

Holm, D. (2004). Recalling lost souls: The baeu rodo scriptures, tai cosmogonic texts from guangxi in southern china. *(White Lotus)*.

Htin Aung, M. (1967). *A History of Burma*. Columbia University Press, New York and London.

Humphreys, M. (2005). Natural resources, conflict, and conflict resolution: Uncovering the mechanisms. *Journal of conflict resolution 49*(4), 508–537.

Hunter, W. W. (1876). *A Statistical Account of Bengal*, Volume 6. Trübner & Company.

Huntington, S. P. (2020). The clash of civilizations? In *The new social theory reader*, pp. 305–313. Routledge.

Hutton, J. H. (1928). The ao nagas. *Folklore 39*(1), 93–95.

Hutton, J. H. (1965). The mixed culture of the naga tribes. *The Journal of the Royal Anthropological Institute of Great Britain and Ireland 95*(1), 16–43.

Hutton, J. H. et al. (1933). Census of india, 1931. vol. i: India. part i: Report.

Imbens, G. W. (2007). *What's New in Econometrics? Instrumental Variables Methods*. National Bureau of Economic Research.

Imbert, C. and J. Papp (2015). Labor market effects of social programs: Evidence from india's employment guarantee. *American Economic Journal: Applied Economics 7*(2), 233–263.

Islam, A., T. A. Mozumder, T. Rahman, T. Shatil, and A. Siddique (2024). *Forced Displacement, Mental Health, and Child Development: Evidence from the Rohingya Refugees*. IZA-Institute of Labor Economics.

Iyer, L. (2010). Direct versus indirect colonial rule in india: Long-term consequences. *The Review of Economics and Statistics 92*(4), 693–713.

Jain, S. (1976). Bamboo flowering and famine. *Indian Botanical Studies*.

Jayachandran, S. and A. Lleras-Muney (2009). Life expectancy and human capital investments: Evidence from maternal mortality declines. *The Quarterly Journal of Economics 124*(1), 349–397.

Jayachandran, S. and R. Pande (2017). Why are indian children so short? the role of birth order and son preference. *American Economic Review 107*(9), 2600–2629.

Jensenius, F. R. and G. Verniers (2017). Studying indian politics with large-scale data: Indian election data 1961–today. *Studies in Indian Politics*.

Jimenez-Ayora, P. and M. A. Ulubaşoğlu (2015). What underlies weak states? the role of terrain ruggedness. *European Journal of Political Economy 39*, 167–183.

Kaup, K. P. (2000). *Creating the Zhuang: ethnic politics in China*. Lynne Rienner Publishers.

Khiangte, Z. (2022). An identity born out of shared grief: The account of rambuai in the contemporary mizo literary texts. *Rupkatha Journal on Interdisciplinary Studies in Humanities 14*(2).

Kipgen, N. (2013). Politics of ethnic conflict in manipur. *South Asia Research 33*(1), 21–38.

Kremer, M. (1993). Population growth and technological change: One million bc to 1990. *The quarterly journal of economics 108*(3), 681–716.

Krugman, P. (1991). *Increasing returns and economic geography*. MIT Press.

Krugman, P. (1999). The role of geography in development. *International Regional Science Review 22*(2), 142–161.

La Ferrara, E. and A. Milazzo (2017). Customary Norms, Inheritance, and Human Capital: Evidence from a Reform of the Matrilineal System in Ghana. *American Economic Journal: Applied Economics 9*(4), 166–185.

Lagakos, D. (2020). Urban-Rural Gaps in the Developing World: Does Internal Migration Offer Opportunities? *Journal of Economic Perspectives 34*(3), 174–192.

Lal, D. (1987). *Tribal Societies and Economic Development*. Oxford University Press.

Lalbiakthanga, Z. (2009). *Mizoram: A Historical Account*. Mizoram Publications.

Lalrimawia, K. (1995). *The Mizo National Front and the Quest for Independence*. Northeast Historical Review.

Lalrintluanga, V. (2014). Peace and reconciliation: The mizoram accord of 1986. *Mizoram Studies Journal*.

Lê, V. H., P. T. Phan, and S. L. Ngô (2001). *Đi Vit s kỳ toàn th*. Khoa hc xã hi Hà Ni.

Le Rossignol, E., S. Lowes, and E. Montero (2024). Fallow lengths and the structure of property rights. Technical report, National Bureau of Economic Research.

Le Rossignol, E., S. Lowes, and N. Nunn (2022). Traditional supernatural beliefs and prosocial behavior.

Leach, E. R. (2021). *Political systems of highland Burma: a study of Kachin social structure*. Routledge.

Lecce, G., L. Ogliari, and T. Orlando (2022). State formation, social unrest and cultural distance: Brigandage in post-unification italy. *Journal of Economic Growth 27*(3), 453–483.

Lee, G. Y. and N. Tapp (2010). *Culture and Customs of the Hmong*. Bloomsbury Publishing USA.

Leukhina, O. M. and S. J. Turnovsky (2016). Population size effects in the structural development of england. *American Economic Journal: Macroeconomics 8*(3), 195–229.

Lewis, W. A. (1954). Economic development with unlimited supplies of labour. *The Manchester School 22*(2), 139–191.

Li, Y.-C., W. Huang, J.-Y. Tian, X.-Q. Chen, and Q.-P. Kong (2016). Exploring the maternal history of the tai people. *Journal of human genetics 61*(8), 721–729.

Liu, X., D. Mattariganond, and B. Narasaj (2019). Migration of Yunnan People into Myanmar from Ancient Times to the 19th Century. *Journal of Mekong Societies 15*(1), 18–39.

Lowes, S. (2017). Matrilineal kinship and spousal cooperation: Evidence from the matrilineal belt. *Unpublished manuscript. URL: https://scholar. harvard. edu/files/slowes/files/lowes_matrilineal. pdf*.

Lowes, S. (2021). Kinship structure, stress, and the gender gap in competition. *Journal of Economic Behavior & Organization 192*, 36–57.

Lowes, S. and E. Montero (2021). Concessions, violence, and indirect rule: Evidence from the congo free state. *The Quarterly Journal of Economics 136*(4), 2047–2091.

Lowes, S., N. Nunn, J. A. Robinson, and J. L. Weigel (2017). The evolution of culture and institutions: Evidence from the kuba kingdom. *Econometrica 85*(4), 1065–1091.

Ltu, K. (2019). *World War II in Northeast India: A Study of Imphal and Kohima Battles*. Barkweaver Publications.

Macfarlane, A. (1978). *The origins of English individualism: the family property and social transition*. Wiley-Blackwell.

Mahapatra, L. (2007). *The Armed Forces and Special Powers Act in North-East India*. New Delhi Press.

Mahapatra, P. and L. Zote (2008). Political development in mizoram: Focus on the post-accord scenario. *The Indian Journal of Political Science*, 643–660.

Marconcini, M., A. Metz-Marconcini, S. Üreyen, D. Palacios-Lopez, W. Hanke, F. Bachofer, J. Zeidler, T. Esch, N. Gorelick, A. Kakarla, et al. (2020). Outlining where humans live, the world settlement footprint 2015. *Scientific Data 7*(1), 242.

Mayshar, J., O. Moav, and L. Pascali (2022). The origin of the state: Land productivity or appropriability? *Journal of Political Economy 130*(4), 1091–1144.

Maystadt, J.-F. and G. Duranton (2019). The development push of refugees: Evidence from tanzania. *Journal of Economic Geography 19*(2), 299–334.

Maystadt, J.-F. and P. Verwimp (2014). Winners and losers among a refugee-hosting population. *Economic Development and Cultural Change 62*(4), 769–809.

McCulloch, W. (1859). *Account of the Valley of Munnipore and of the Hill Tribes: With a Comparative Vocabulary of the Munnipore and Other Languages*. Number 27. Bengal Printing Company.

McCullough, E. B. (2017). Labor productivity and employment gaps in sub-saharan africa. *Food Policy 67*, 133–152.

McGuirk, E. F. and N. Nunn (2024). Transhumant pastoralism, climate change, and conflict in africa. *Review of Economic Studies*, rdae027.

Michaels, G., F. Rauch, and S. J. Redding (2012). Urbanization and structural transformation. *The Quarterly Journal of Economics 127*(2), 535–586.

Michalopoulos, S. (2012). The origins of ethnolinguistic diversity. *American Economic Review 102*(4), 1508–1539.

Michalopoulos, S. and E. Papaioannou (2013). Pre-colonial ethnic institutions and contemporary african development. *Econometrica 81*(1), 113–152.

Michalopoulos, S. and E. Papaioannou (2014). National institutions and subnational development in africa. *The Quarterly journal of economics 129*(1), 151–213.

Michalopoulos, S. and E. Papaioannou (2016). The long-run effects of the scramble for africa. *American Economic Review 106*(7), 1802–1848.

Michalopoulos, S. and E. Papaioannou (2018). Spatial patterns of development: A meso approach. *Annual Review of Economics 10*(1), 383–410.

Michalopoulos, S. and E. Papaioannou (2020). Historical legacies and african development. *Journal of Economic Literature 58*(1), 53–128.

Michaud, J. and C. Culas (2000). The hmong of the southeast asia massif: Their recent history of migration. In *Where China Meets Southeast Asia: Social & Cultural Change in the Border Regions*, pp. 98–121. Springer.

Mills, J. P. (1922). *The Lhota Nagas*. Ams PressInc.

Mission, N. S. R. T. (2013). Shuttle radar topography mission (srtm) global. distributed by opentopography. *Distributed by Opentopography,[online] Available: https://www. fdsn. org/networks/detail/GH*.

Moscona, J., N. Nunn, and J. A. Robinson (2020). Segmentary lineage organization and conflict in sub-saharan africa. *Econometrica 88*(5), 1999–2036.

Nagy, D. K. (2023). Hinterlands, city formation and growth: Evidence from the us westward expansion. *Review of Economic Studies 90*(6), 3238–3281.

Nelson, R. R. and E. S. Phelps (1966). Investment in humans, technological diffusion, and economic growth. *The American economic review 56*(1/2), 69–75.

Nibedon, N. (2013). *Mizoram The Dagger Brigade*. Lancer Publishers LLC.

Nunn, N. (2007). Historical legacies: A model linking africa's past to its current underdevelopment. *Journal of development economics 83*(1), 157–175.

Nunn, N. (2014). *Gender and Missionary Influence in Colonial Africa*, pp. 489–512. New York: Cambridge University Press.

Nunn, N. (2022). On the causes and consequences of cross-cultural differences. *Handbook of Advances in Culture and Psychology 9*, 125.

Nunn, N. and D. Puga (2012). Ruggedness: The Blessing of Bad Geography in Africa. *Review of Economics and Statistics 94*(1), 20–36.

Nunn, N. and L. Wantchekon (2011). The slave trade and the origins of mistrust in africa. *American Economic Review 101*(7), 3221–3252.

Nunthara, C. (1981). Grouping of villages in mizoram: Its social and economic impact. *Economic and Political Weekly*, 1237–1240.

Nunthara, C. (1989). Impact of the introduction of grouping of villages in mizoram. *(No Title)*.

Obolensky, M., M. Tabellini, and C. Taylor (2024). Homeward bound: How migrants seek out familiar climates. Technical report, National Bureau of Economic Research.

O'HARROW, S. (1979). From co-loa to the trung sisters' revolt: Viet-nam as the chinese found it. *Asian Perspectives 22*(2), 140–164.

Pachuau, J. L. and W. Van Schendel (2015). *The camera as witness*. Cambridge University Press.

Parkinson, W. A. and M. L. Galaty (2007). Secondary states in perspective: An integrated approach to state formation in the prehistoric aegean. *American Anthropologist 109*(1), 113–129.

Parratt, S. N. A. (2005). *The Court Chronicle of the Kings of Manipur-Cheitharon Kumpapa: Original Text, Translation and Notes Vol. 1. 33-1763 CE*. Routledge.

Peters, M. (2022). Market Size and Spatial Growth—Evidence from Germany's Post-War Population Expulsions. *Econometrica 90*(5), 2357–2396.

Phukan, J. (1992). The tai-ahom power in assam. *The Comparative History of Assam 2*, 56–57.

Platteau, J.-P. (2015). *Institutions, social norms and economic development*. Routledge.

Porter, G. (2008). *Urbanization, migration, and development*. Taylor & Francis.

Prakash, N., M. Rockmore, and Y. Uppal (2019). Do criminally accused politicians affect economic outcomes? evidence from india. *Journal of Development Economics*.

Puri, B. (2002). Counter-insurgency in mizoram. *Journal of Indian Military History*.

Putnam, R. D. (1994). Making democracy work: Civic traditions in modern italy.

Putterman, L. and D. N. Weil (2010). Post-1500 population flows and the long-run determinants of economic growth and inequality. *The Quarterly journal of economics 125*(4), 1627–1682.

Quincy, K. (1995). Hmong: History of a people. *Eastern Washington University*.

Reed, R. (1942). History of the frontier areas bordering on assam.

Reid, R. (1944). The excluded areas of assam. *The Geographical Journal 103*(1/2), 18–29.

Rodrik, D. (2016). Premature deindustrialization. *Journal of Economic Growth 21*(1), 1–33.

Rodrik, D., A. Subramanian, and F. Trebbi (2004). Institutions rule: the primacy of institutions over geography and integration in economic development. *Journal of Economic Growth 9*, 131–165.

Romer, P. M. (1990). Endogenous technological change. *Journal of political Economy 98*(5, Part 2), S71–S102.

Rosenbaum, P. R. (2010). *Design of Observational Studies*. Springer Science & Business Media.

Rosenzweig, M. R. and K. I. Wolpin (1994). Are there increasing returns to the intergenerational production of human capital? maternal schooling and child intellectual achievement. *Journal of Human Resources*, 670–693.

Ruiz, I. and C. Vargas-Silva (2015a). The labor market impacts of forced migration. *American Economic Review 105*(5), 581–586.

Ruiz, I. and C. Vargas-Silva (2015b). The labor market impacts of forced migration in northwest tanzania. *Journal of Refugee Studies 28*(4), 511–535.

Sachs, J. D. (2003). Institutions don't rule: direct effects of geography on per capita income.

Samuel, H. (1993). The clash of civilizations. *Foreign Affairs 72*(3), 22–49.

Sandeford, D. S. (2018). Organizational complexity and demographic scale in primary states. *Royal Society open science 5*(5), 171137.

Sarvimäki, M., R. Uusitalo, and M. Jäntti (2018). The long-term effects of forced migration in finland's wartime context. *Journal of Economic History 78*(2), 322–361.

Schafer, E. H. (1967). *The Vermilion Bird*. Univ of California Press.

Schein, L. (2000). *Minority rules: The Miao and the feminine in China's cultural politics*. Duke University Press.

Schulz, J. F. (2022). Kin networks and institutional development. *The Economic Journal 132*(647), 2578–2613.

Schulz, J. F., D. Bahrami-Rad, J. P. Beauchamp, and J. Henrich (2019). The church, intensive kinship, and global psychological variation. *Science 366*(6466), eaau5141.

Scott, J. C. (2009). *The art of not being governed*. Yale University Press.

Scott, J. C. (2010). *The Art of Not Being Governed: An Anarchist History of Upland Southeast Asia*. Nus Press.

Scott, J. C. (2017). *Against the grain: A deep history of the earliest states*. Yale University Press.

Sema, P. (1985). The institution of'dobashi system'in colonial naga hills. In *Proceedings of the Indian History Congress*, Volume 46, pp. 470–475. JSTOR.

Shakespear, J. (1909). The kuki-lushai clans. *The Journal of the Royal Anthropological Institute of Great Britain and Ireland 39*, 371–385.

Sheehan, O., J. Watts, R. D. Gray, and Q. D. Atkinson (2018). Coevolution of landesque capital intensive agriculture and sociopolitical hierarchy. *Proceedings of the National Academy of Sciences 115*(14), 3628–3633.

Shrestha, M. P. (2017). Selective migration and self-selection of migrants during conflict: Evidence from nepal. *Journal of Development Economics 125*, 84–96.

Singh, N. (2006). *Famine and Survival in the North-East*. Northeast India University Press.

Spolaore, E. (2022). The economic approach to political borders. Technical report, National Bureau of Economic Research.

Steckel, R. H. (1983). The economic foundations of east-west migration during the nineteenth century. *Explorations In Economic History 20*, 14–36.

Steckel, R. H. (1989). Household migration and rural settlement in the united states, 1850–1860. *Explorations in Economic History 26*(2), 190–218.

Storper, M. and A. J. Scott (2009). Rethinking human capital, creativity and urban growth. *Journal of Economic Geography 9*(2), 147–167.

Subba, T. B. and J. J. Wouters (2013). North-east india: ethnography and politics of identity. In *the Modern Anthropology of India*, pp. 207–221. Routledge.

Tabellini, G. (2008). The scope of cooperation: Values and incentives. *The Quarterly Journal of Economics 123*(3), 905–950.

Tajfel, H. (2010). *Social identity and intergroup relations*, Volume 7. Cambridge University Press.

Talhelm, T., X. Zhang, S. Oishi, C. Shimin, D. Duan, X. Lan, and S. Kitayama (2014). Large-scale psychological differences within china explained by rice versus wheat agriculture. *Science 344*(6184), 603–608.

Valencia Caicedo, F. (2019). The mission: Human capital transmission, economic persistence, and culture in south america. *The Quarterly Journal of Economics 134*(1), 507–556.

van Driem, G. (2011). 16 rice and the austroasiatic and hmong-mien homelands. *Dynamics of Human Diversity*, 361.

Van Schendel, W. (2005). Geographies of knowing, geographies of ignorance: jumping scale in southeast asia. In *Locating Southeast Asia*, pp. 275–307. Brill.

Venables, A. J. (2018). Urbanization in developing economies: Building better cities. *Annual Review of Economics 10*, 255–275.

Waldinger, M. (2017). The long-run effects of missionary orders in mexico. *Journal of Development Economics 127*, 355–378.

Wantchekon, L., M. Klašnja, and N. Novta (2015). Education and human capital externalities: evidence from colonial benin. *The Quarterly Journal of Economics 130*(2), 703–757.

Watts, J., O. Sheehan, S. J. Greenhill, S. Gomes-Ng, Q. D. Atkinson, J. Bulbulia, and R. D. Gray (2015). Pulotu: Database of austronesian supernatural beliefs and practices. *PloS one 10*(9), e0136783.

Weber, M. (2004). *The vocation lectures*. Hackett Publishing.

Wen, B., H. Li, S. Gao, X. Mao, Y. Gao, F. Li, F. Zhang, Y. He, Y. Dong, Y. Zhang, et al. (2005). Genetic structure of hmong-mien speaking populations in east asia as revealed by mtdna lineages. *Molecular biology and evolution 22*(3), 725–734.

West, B. A. (2010). *Encyclopedia of the Peoples of Asia and Oceania*. Infobase Publishing.

Wittfogel, K. A. (1959). Oriental despotism: A comparative study of total power. *Science and Society 23*(1).

Wouters, J. J. (2017). Who is a naga village? the naga'village republic'through the ages. *The South Asianist Journal 5*(1).

Wyatt, D. K. (1963). Siam and Laos, 1767–1827. *Journal of Southeast Asian History 4*(2), 19–47.

Zoramthanga, S. (1984). *Memoirs of the Mizoram Conflict*. Northeast Perspective Publishers.

Appendix A

CHAPTER 1

Table A.1: RD results using Census Data (1971-2011)

	Labor share in services	
	(1)	(2)
VARIABLES	Men	Women
$British_{1971}$	0.047**	0.025
	(0.018)	(0.018)
$British_{1991}$	0.042*	0.041***
	(0.022)	(0.010)
$British_{2011}$	0.039	0.085***
	(0.031)	(0.024)
Observations	1,382	1,374
R-squared	0.092	0.118
Mean $share_{1971}$	0.122	0.038
Mean $share_{1991}$	0.160	0.040
Mean $share_{2011}$	0.266	0.130

Robust standard errors (in parentheses)
are clustered at the sub-district level.
*** p<0.01, ** p<0.05, * p<0.1

Robustness to other polynomials functions

Table A.2: Polynomial in distance to the commercial city of Dimapur (20 kilometer bandwidth)

	(1)	(2)	(3)
VARIABLES	Literacy rate	Schooling years	Wealth Index
		Linear	
British	0.162***	1.497***	0.547***
	(0.031)	(0.306)	(0.116)
Observations	2,956	2,965	2,965
R-squared	0.107	0.126	0.101
		Quadratic	
British	0.213***	1.975***	0.682***
	(0.029)	(0.287)	(0.125)
Observations	2,956	2,965	2,965
R-squared	0.125	0.148	0.125
		Cubic	
British	0.227***	2.152***	0.743***
	(0.027)	(0.270)	(0.119)
Observations	2,956	2,965	2,965
R-squared	0.129	0.159	0.145

Robust standard errors are clustered at the village level.
*** p<0.01, ** p<0.05, * p<0.1

Table A.3: Polynomial in latitude and longitude (20 kilometer bandwidth)

VARIABLES	(1) Literacy rate	(2) Schooling years	(3) Wealth Index
		Linear	
British	0.049	0.644	0.396**
	(0.040)	(0.394)	(0.152)
Observations	2,956	2,965	2,965
R-squared	0.125	0.141	0.107
		Quadratic	
British	0.109**	1.365***	0.582***
	(0.044)	(0.439)	(0.184)
Observations	2,956	2,965	2,965
R-squared	0.065	0.075	0.121
		Cubic	
British	0.106**	1.331***	0.574***
	(0.044)	(0.444)	(0.185)
Observations	2,956	2,965	2,965
R-squared	0.066	0.077	0.122

Robust standard errors are clustered at the village level.
*** p<0.01, ** p<0.05, * p<0.1

Table A.4: Placebo check using the Doyang river (20 kilometer bandwidth)

VARIABLES	(1) Literacy rate	(2) Schooling years	(3) Wealth Index
		Linear	
West side	0.039	0.495	0.210
	(0.035)	(0.341)	(0.176)
Observations	847	850	850
R-squared	0.076	0.109	0.015
		Quadratic	
West side	0.041	0.520	0.220
	(0.033)	(0.327)	(0.174)
Observations	847	850	850
R-squared	0.083	0.118	0.031
		Cubic	
West side	0.043	0.528	0.224
	(0.032)	(0.326)	(0.174)
Observations	847	850	850
R-squared	0.085	0.119	0.033

Robust standard errors are clustered at the village level. Data is from the DHS. I create a dummy variable 'West side' that takes value 1 if an individual is from a village west of the Doyang river and 0 otherwise. Each regression controls for age, age squared, gender, and a linear polynomial in distance to the river. Figure A.3 below shows a bridge constructed by the British in the 19th century across the Doyang. *** p<0.01, ** p<0.05, * p<0.1

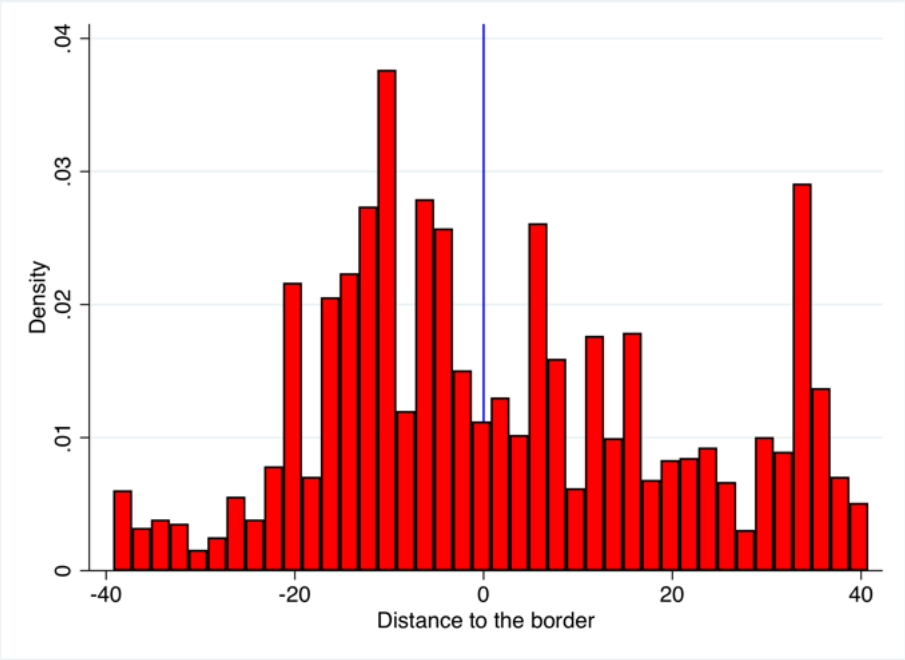


Figure A.1: A histogram showing the distribution of DHS villages. The blue vertical line indicates the colonial border. The x-axis plots distance to the border in kilometers; positive (negative) values denote villages within (outside) the colonial border.

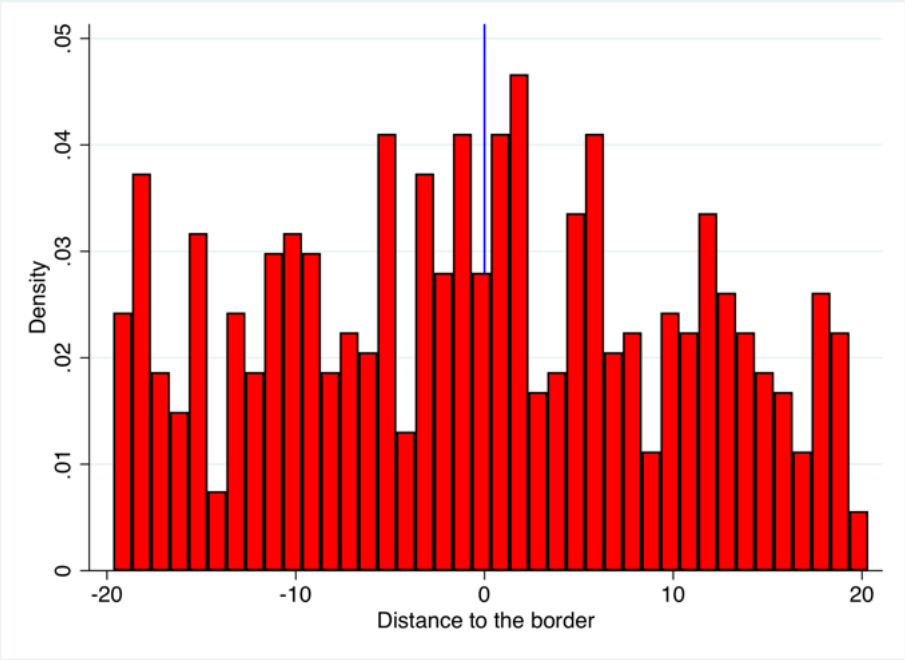


Figure A.2: A histogram showing the distribution of the 1971 census villages. The blue vertical line indicates the colonial border. The x-axis plots distance to the border in kilometers; positive (negative) values denote villages within (outside) the colonial border.

Table A.5: Donut regression (5-20 kilometer bandwidth)

	(1)	(2)	(3)
Dependent variable	Literacy rate	Schooling years	Wealth Index
East side	0.214***	2.095***	0.792***
	(0.035)	(0.364)	(0.129)
Observations	2,213	2,217	2,217
R-squared	0.118	0.140	0.129

Notes: Robust standard errors are clustered at the village level. The unit of observation is an individual. The sample includes women and men between 15 and 49 years. Literacy rate lies between 0-100%, years of schooling between 0 and 15, and wealth between 1 (poorest) and 5 (richest). *** p<0.01, ** p<0.05, * p<0.1

Figure A.3: British-constructed bridge across the Doyang river taken by Connie Shakespear, 1900-1902.

Outposts held by the Naga Hills military police battalion.

Name.	Distance from Headquarters.	Strength.	
		Officers.	Men.
Tamlu	126 miles	1	50
Mokokchung	53 „	1	100
Henima	76 „	1	25
Khonoma	11 „	1	25
Tessima	7 „	...	3

TABLE XII.

Kohima Subsidiary Jail.

		1891	1901
Average daily population	Male	17	20
	Female	...	...
Rate of jail mortality per 1,000 ...		...	...
		Rs.	Rs.
Expenditure on jail maintenance ...		2,693	1,013
Cost per prisoner* (excluding civil prisoners)		66	22
Profits on jail manufacture ...		...	1,343
Earnings per prisoner† ...		...	71

* On rations and clothing only.
† Calculated on the average number sentenced to labour.

(a) Details on jails and outposts in the district

TABLE XV.

Medical.

Particulars.	Kohima Subdivision.			Mokokchung Subdivision.		Total District.		
	1881.	1891.	1901.	1891.	1901.	1881.	1891.	1901.
Number of dispensaries	1	3	2	1	1	1	4	3
Daily average number of in-door patients	16 18	7 34	13 60	...	...	16 18	7 34	13 60
„ „ „ out-door „ „	30 36	15 20	26 67	5 76	23 18	30 36	20 96	60 05
Cases treated	1,081	4,275	10,651	1,274	7,859	1,081	5,549	18,510
Operations performed	11	121	119	27	42	11	148	161
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Total income	3,024	4,256	4,009	304	699	3,024	4,560	4,708
Income from Government	2,910	3,724	3,556	304	699	2,910	4,028	4,255
Subscriptions	...	434	249	...	...	...	434	249
Total expenditure	3,024	4,201	3,987	304	699	3,024	4,505	4,686
Expenditure on Establishment ...	1,368	2,004	1,776	...	334	1,368	2,004	2,110
Ratio per mille of persons successfully vaccinated.		Not available				(a) #	19	128
Cost per case		Do.				...	Rs. A. P. 0 3 11	Rs. A. P. 0 1 2

(a) Figure for 1881-82.

(b) Medical Expenditures

Particulars.	1900-01	1901-02	1902-03	1903-04
Kohima Subdivision.	Rs.	Rs.	Rs	Rs
House tax	40,889	41,243	42,112	33,893
Total revenue	41,610	42,039	42,112	34,837
Mokokchung Subdivision.				
House tax ...	18,096	19,520	17,832	23,820
Total revenue ...	18,098	18,520	17,832	29,813
Total District.				
House tax	58,984	59,963	59,944	57,713
Other heads	724	595		7,937*
Total revenue	59,708	60,559	59,944	64,650

(c) Land revenue, 1901-1904

Particulars	No. of institutions.	Expenditure on institutions maintained or aided by public funds in 1900-01 from				Expenditure per scholar.
		Provincial Revenues.	Fees	Other sources.	Total.	
		Rs.	Rs.	Rs.	Rs.	Rs. As. P.
Training and Special School	1	28	...	957	985	25 4 1
Middle English Schools ...	1	1,649	207	...	1,856	23 11 4
Lower Primary School ..	16	1,620	...	...	1,620	8 2 3
Total	18	3,297	207	957	4,461	14 1 10

(d) Education expenditure

Figure A.4: Scans from the Gazetteer of Naga Hills and Manipur by B.C. Allen, 1905 (Allen (2010)).

Appendix B

CHAPTER 2

B.0.1 Density plots of population growth

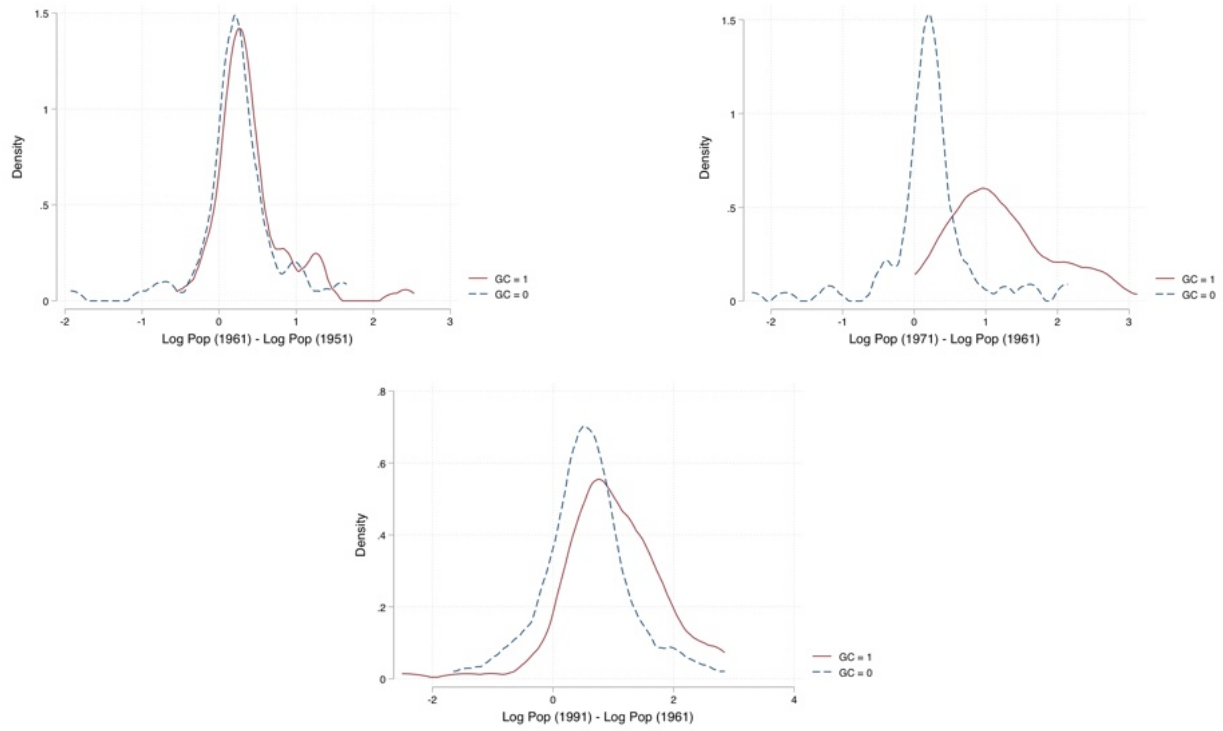
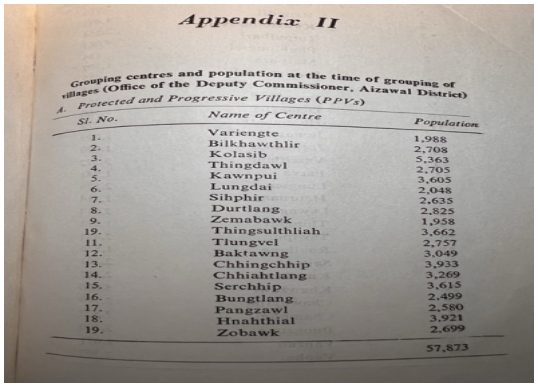


Figure B.1: Population growth between 1951 and 1961 (top), 1971 and 1961 (middle), 1991 and 1961 (bottom). Red (solid) indicates GCs and dashed (blue) indicates control villages.

B.0.2 List of GCs taken from Nunthara, 1981



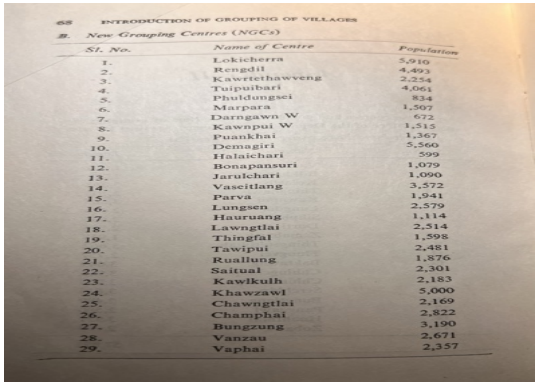
Appendix II

Grouping centres and population at the time of grouping of villages (Office of the Deputy Commissioner, Aizawal District)

A. *Protected and Progressive Villages (PPVs)*

Sl. No.	Name of Centre	Population
1.	Variengte	1,988
2.	Bilkhawthlir	2,708
3.	Kolasib	5,363
4.	Thingdawl	2,705
5.	Kawnpui	3,605
6.	Lungdai	2,048
7.	Sihphir	2,635
8.	Durtlang	2,825
9.	Zemabawk	1,958
19.	Thingsulthliah	3,662
11.	Tlungvel	2,757
12.	Baktawng	3,049
13.	Chhingchhip	3,933
14.	Chhiahtlang	3,269
15.	Serchhip	3,615
16.	Bungtlang	2,499
17.	Pangzawl	2,580
18.	Hnahthial	3,921
19.	Zobawk	2,699
		57,873

(a)

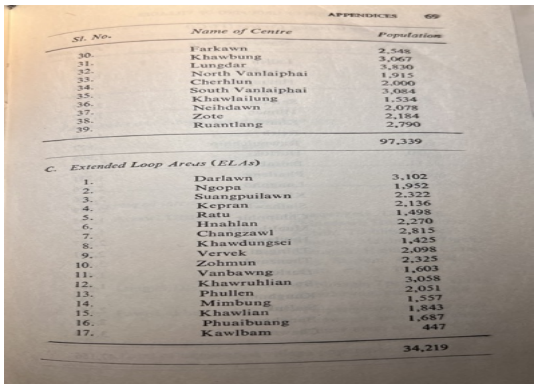


68 INTRODUCTION OF GROUPING OF VILLAGES

B. *New Grouping Centres (NGCs)*

Sl. No.	Name of Centre	Population
1.	Lokicherra	5,910
2.	Rengdil	4,493
3.	Kawrethawveng	2,254
4.	Tuipuibari	4,061
5.	Phuldungsei	834
6.	Marpara	1,507
7.	Darngawn W	672
8.	Kawnpui W	1,515
9.	Puankhai	1,367
10.	Demagiri	5,560
11.	Halaichari	599
12.	Bonapansori	1,079
13.	Jarulchari	1,090
14.	Vascitlang	3,572
15.	Parva	1,941
16.	Lungsen	2,579
17.	Hauruang	1,114
18.	Lawngtlai	2,514
19.	Thingfal	1,598
20.	Tawipui	2,481
21.	Ruallung	1,876
22.	Saitual	2,301
23.	Kawlkulh	2,183
24.	Khawzawl	5,000
25.	Chawngtlai	2,169
26.	Champhai	2,822
27.	Bungzung	3,190
28.	Vanzau	2,671
29.	Vaphai	2,357

(b)



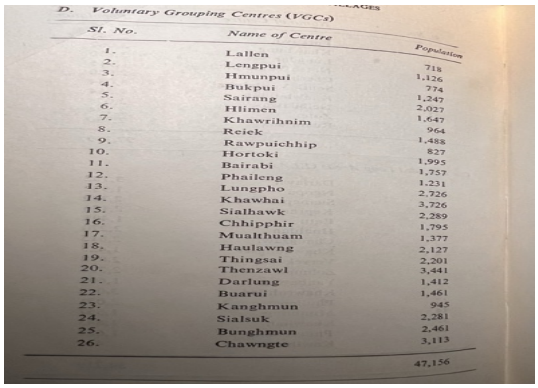
APPENDICES 69

Sl. No.	Name of Centre	Population
	Farkawn	2,548
30.	Khawbung	3,067
31.	Lungdar	3,830
32.	North Vanlaiphai	1,915
33.	Cherhlun	2,000
34.	South Vanlaiphai	3,084
35.	Khawlailung	1,534
36.	Neihdawn	2,078
37.	Zote	2,184
38.	Ruantlang	2,790
		97,339

C. *Extended Loop Areas (ELAs)*

1.	Darlawn	3,102
2.	Ngopa	1,952
3.	Suangpuilawn	2,322
4.	Kepran	2,136
5.	Ratu	1,498
6.	Hnahlan	2,270
7.	Changzawl	2,815
8.	Khawdungsei	1,425
9.	Vervek	2,098
10.	Zohmun	2,325
11.	Vanbawng	1,603
12.	Khawruhlian	3,058
13.	Phullen	2,051
14.	Mimbung	1,557
15.	Khawlian	1,843
16.	Phuaibuang	1,687
17.	Kawlbam	447
		34,219

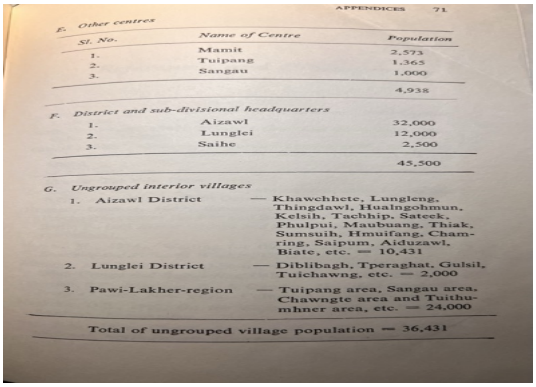
(c)



D. *Voluntary Grouping Centres (VGCs)*

Sl. No.	Name of Centre	Population
1.	Lallen	718
2.	Lengpui	1,126
3.	Hmunpui	774
4.	Bukpui	1,247
5.	Sairang	2,027
6.	Hlimen	1,647
7.	Khawrihnim	964
8.	Reiek	1,488
9.	Rawpuichhip	827
10.	Hortoki	1,995
11.	Bairabi	1,757
12.	Phaileng	1,231
13.	Lungpho	2,726
14.	Khawhai	3,726
15.	Sialhawk	2,289
16.	Chhipphir	1,795
17.	Mualthuam	1,377
18.	Haulawng	2,127
19.	Thingsai	2,201
20.	Thenzawl	3,441
21.	Darlung	1,412
22.	Buarui	1,461
23.	Kanghmun	945
24.	Sialsuk	2,281
25.	Bunghmun	2,461
26.	Chawngte	3,113
		47,156

(d)



APPENDICES 71

E. *Other centres*

Sl. No.	Name of Centre	Population
1.	Mamit	2,573
2.	Tuipang	1,365
3.	Sangau	1,000
		4,938

F. *District and sub-divisional headquarters*

1.	Aizawl	32,000
2.	Lunglei	12,000
3.	Saihe	2,500
		45,500

G. *Ungrouped interior villages*

1. Aizawl District	—	Khawchhete, Lungleng, Thingdawl, Hualngohmun, Kelsih, Tachhip, Sateek, Phulpui, Maubuang, Thiak, Sumsuih, Hmuifang, Chamring, Saipum, Aiduzawl, Biate, etc. — 10,431
2. Lunglei District	—	Diblibagh, Tperaghat, Gulsil, Tuichawng, etc. — 2,000
3. Pawi-Lakher-region	—	Tuipang area, Sangau area, Chawngte area and Tuithumhner area, etc. — 24,000

Total of ungrouped village population — 36,431

(e)

Figure B.2: List of GCs and their populations during the early years of the intervention period.

B.0.3 Match with older census abstracts

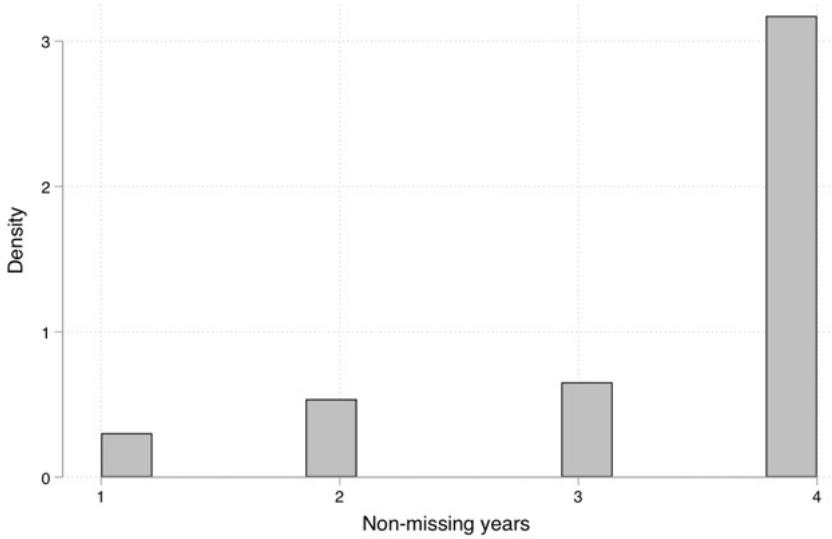


Figure B.3: A histogram of village name matches of 1951, 1961, and 1971 with the 1991 census. A value of 1 indicates a village enumerated in 1991 was not identified in any of the preceding census years, while 4 indicates balance in all years (1951 to 1991).

B.0.4 Distribution of amenities of GCs in 1961

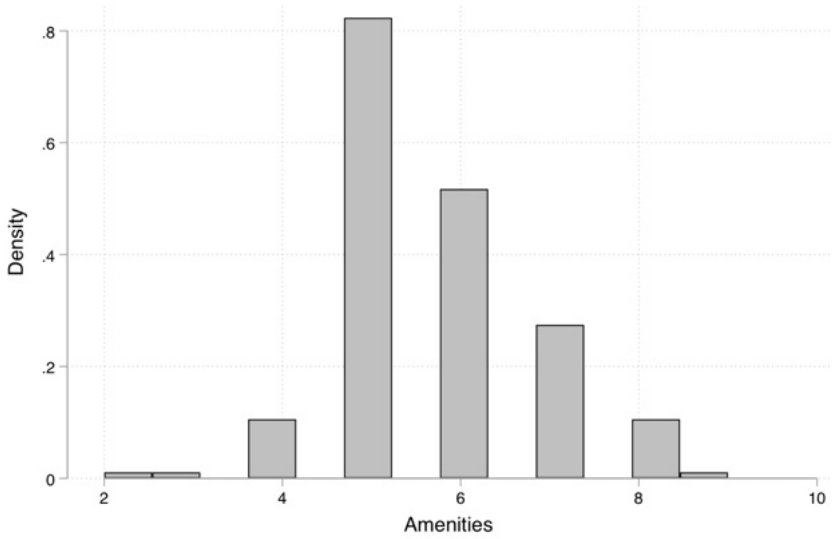


Figure B.4: A histogram of the number of amenities as listed in the 1961 census (GCs only).

Appendix C

CHAPTER 3

C.0.1 Additional smoothing variables using latitude and longitude (dependent variable is village size)

Table C.1: Village size across ethnic borders but within a 0.05 degree buffer

	Dependent variable is village area in km sq.			
	(1)	(2)	(3)	(4)
Kuki-Zo	-10.691***	-9.423***	-8.749***	-8.727***
	(1.796)	(1.983)	(2.301)	(2.360)
Latitude	2.621	11.565**	-0.828	7.875
	(2.842)	(4.423)	(6.596)	(8.174)
Longitude	-12.873***	-28.349***	-3.795	-21.951
	(4.005)	(8.984)	(6.224)	(13.322)
Observations	509	509	509	509
R-squared	0.278	0.316	0.309	0.326
Other Controls	No	No	Yes	Yes
Segment Fixed Effect	No	Yes	No	Yes
Mean dep. var	7.853	7.853	7.853	7.853

Notes: Standard errors in parentheses are clustered at the sub-district level. The dependent variable is the area of a village (including farmland and forests) in square kilometres. Kuki-Zo is a binary variable that equals 1 if a village belongs to a Kuki-Zo tribe and 0 if it belongs to a Naga tribe. Controls include distance to the state capital center core, elevation in metres, and a measure of terrain ruggedness. The border is divided into 5 equal segments that are used as fixed effects so that I am comparing groups along these segments. *** p<0.01, ** p<0.05, * p<0.1

C.0.2 Additional smoothing variables using latitude and longitude (dependent variable indicates if a grid is contained within a village)

Table C.2: Grids across ethnic borders

	Dependent variable equals 1 if grid is contained entirely within a village			
	(1)	(2)	(3)	(4)
Kuki-Zo	-0.232***	-0.225***	-0.217***	-0.216***
	(0.057)	(0.051)	(0.053)	(0.050)
Latitude	0.313**	0.375**	0.224	0.430*
	(0.126)	(0.164)	(0.170)	(0.210)
Longitude	-0.476***	-0.836***	-0.304*	-0.933**
	(0.106)	(0.223)	(0.166)	(0.335)
Observations	2,585	2,585	2,585	2,585
R-squared	0.086	0.095	0.092	0.100
Controls	No	No	Yes	Yes
Segment Fixed Effect	No	Yes	No	Yes
Mean dep. var	0.474	0.474	0.474	0.474

Notes: Standard errors in parentheses are clustered at the sub-district level. The dependent variable equals 1 if a grid is fully contained within a village boundary (each grid is 0.01 x 0.01 degrees in size). Kuki-Zo is a binary variable that equals 1 if a village belongs to a Kuki-Zo tribe and 0 if it belongs to a Naga tribe. Controls include distance to the state capital center core, elevation in metres, and a measure of terrain ruggedness. The border is divided into 5 equal segments that are used as fixed effects so that I am comparing groups along these segments. *** p<0.01, ** p<0.05, * p<0.1

Appendix D

CHAPTER 4

D.0.1 Study Region for the First-stage Regression from Equation 1 (Table 1)

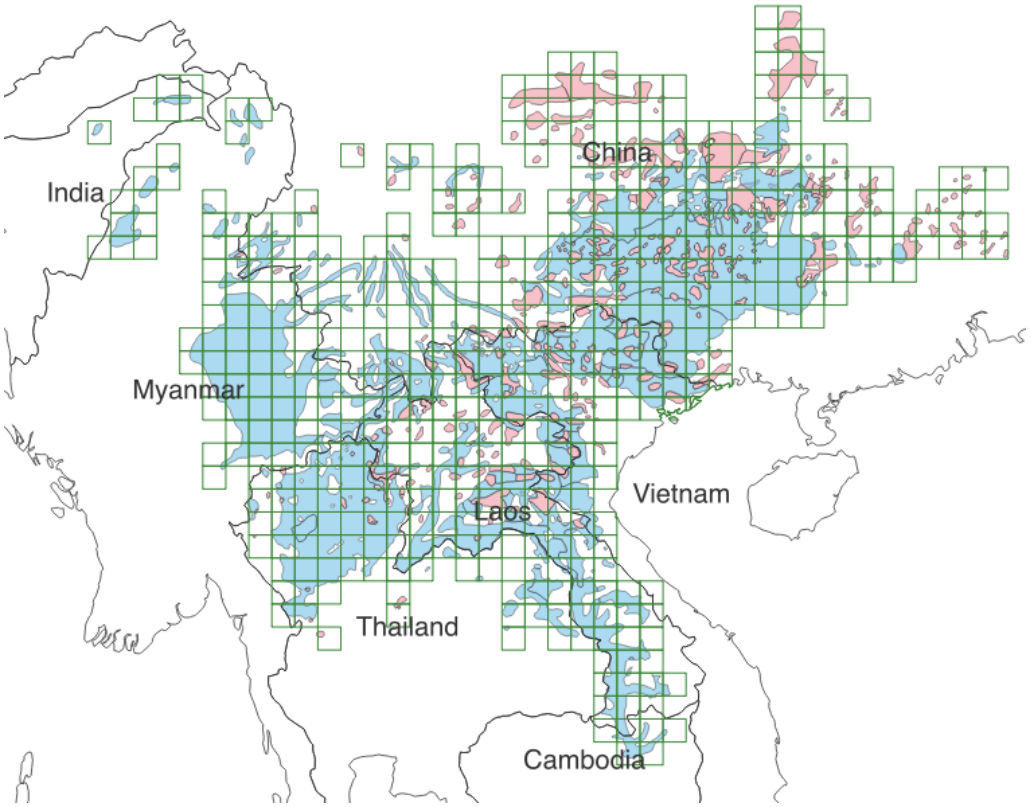


Figure D.1: Study region as indicated by the grids.

D.0.2 Merging Settlements with Ethnic Boundary

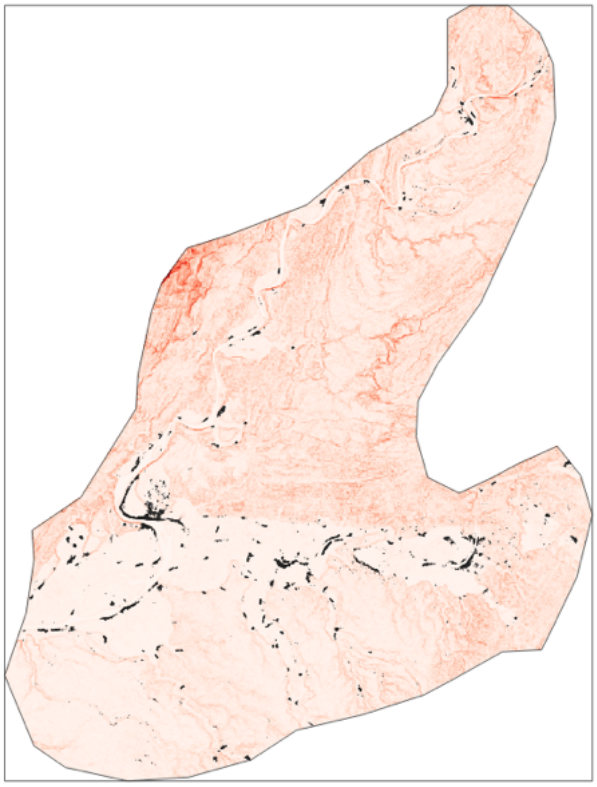


Figure D.2: Settlements (black spots) of the Tai Khamti sub-group superimposed on a map of Terrain Ruggedness (darker red colors indicate more rugged terrain).

D.0.3 The migration path of the Tai-Ahom of the Kra-Dai group

Figure D.3: The journey began in Ruili in Yunnan (labeled as 1), and concluded in Chareideo (labeled as 6). Along the way the passed through Namkhan (2), Myitkyina (3), Mongkawng (4), and The Lake of No Return (5). Notes: Locations created by the author based on the Ahom Chonicles (Baura, 1930).

D.0.4 Endogenous settlements

To understand how the groups locate themselves, I run a simple regression of the form-

$$\text{Geographic Location}_{ij} = \alpha + \beta \times \text{Kra-Dai}_j + \epsilon_{ij} \tag{D.1}$$

where $\text{Geographic Location}_{ij}$ is the geographic characteristic at which settlement i of group j locates itself in, and Kra-Dai_j is an indicator that takes value 1 if a settlement belongs to the Kra-Dai group, and 0 if to the Hmong-Mien group. A statistically significant β would indicate selective migration in the two groups.

As shown in the first two columns of Table- D.1 the coefficients on the indicator variable are significant for both TRI and elevation. The Kra-Dai, who pratice wet-rice cultivation, locate in lower elevation and less rugged terrain as opposed to the Hong-Mien who practice shifting cultivation on mountain slopes. Columns 3 and 4 run a similar exercise, except that the data is aggregated to the polygon level as outlined in Figure-1. To get a visual sense of these differences, Figure-3 displays the corresponding density plots.

Table D.1: Ruggedness and elevation differences in the settlements of the two language families.

VARIABLES	(1) Ruggedness	(2) Elevation	(3) Ruggedness	(4) Elevation
Kra-Dai	-13.41***	-396.6***	-10.36***	-141.1***
	(2.672)	(81.57)	(1.479)	(44.48)
Mean (dep. variable)	20.10	459	32.06	647
Observations	2,827,698	2,827,698	422	422
R-squared	0.077	0.136	0.099	0.020

Notes: Robust standard errors in parenthesis. For columns 1 and 2 standard errors are clustered at the polygon level as depicted in Figure 1. The unit of observation in the first two columns is an individual settlement as described by the World Settlement Footprint database, and for the last two columns settlements are aggregated to the polygon level. Ruggedness is measured as the squared deviation of each cell's elevation from its neighboring eight cells. Each cell is 30m×30m in dimension and is measured in meters. Elevation is measured in meters ASL. *** p<0.01, ** p<0.05, * p<0.1

VITA

Resem Makan is an Economics PhD candidate at the University of Washington.

He welcomes your comments to `resmakan@uw.edu`.