

The Economics of Mobilizing Free-riders: Evidence from the Chinese Civil War 1945-1949

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Abstract

Land redistribution can be deliberately designed to trigger a civil war. How did the Chinese Communist Party (CCP) rally millions of farmers to win in 1949? The crucial step was to initiate land reform through class struggle, empowering farmers to violently take land from their landlords. Farmers desired land ownership but feared reprisals from landlords, who were backed by the Kuomintang (KMT) government. Therefore, farmers had to choose between joining the CCP's army to defend their land, and free-riding. Adopting a difference-in-difference design and examining the death records of 566,161 Communist soldiers, I find that, for counties within 81 kilometers of KMT forces, a greater share of land redistribution to farmers encouraged farmers to fight, leading to a rise in CCP soldier deaths after land reform. However, for counties that were farther than 81 kilometers from KMT forces, a greater share of land transfer to farmers discouraged them from fighting (free-riding), resulting in fewer soldier deaths after land reform. A model of class struggle for land ownership explains the two different patterns. This paper develops a novel theory of war mobilization and partially explains the emergence of communism in the twentieth century.

Keywords: Land Reform; Redistribution; War Mobilization; Communist Revolution; China.

JEL classification Numbers: D71, D74, D91, H56, I38, P32, N45.

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“Combat local tyrants and distribute their farmlands!”

——Mao Zedong

1 Introduction

Free rider problems may mitigate the potential for collective action, but prominent examples throughout history show that organized collective action can be highly effective. Collective action, for example, can foment revolutions and precipitate institutional change and new state formations (Tilly, 1990). As collective movements, wars are some of the most important events in human history; modern wars have involved millions of young men killing each other. How did a small group of political elites mobilize millions of commoners to fight? Existing literature has studied how the state convinces citizens to fight for their countries (Alesina, Reich, and Riboni, 2020a; Caprettini and Voth, 2023). These studies, however, focus on wars between states and overlook the dynamic reactions of forces involved in wars. This paper studies the Chinese Civil War of 1945–1949, examining how the Chinese Communist Party strategically planned a land reform through the class struggle between farmers and landlords to mobilize farmers to fight.

In the early 20th century, the Nationalist Kuomintang (KMT) and the Communists offered competing ideologies for the formation of a new Chinese government. In 1921, the CCP was founded with just 53 members. Growth in Communist membership was slow in the early decades and did not increase dramatically until after 1945. After Japan was defeated in WWII, the CCP captured several guerrilla bases in North China. The Nationalists had their power networks situated in the relatively wealthy southern provinces and coastal areas and drew on the support of landlords and the urban population. In addition, the United States backed the Nationalists with substantial sums of money to fight wars with Japan and the Communists; according to Elleman and Paine (2019), about 3.9 billion was ultimately spent supporting the Nationalists. Both the KMT and the CCP drew their troops from the rural population at a time when around 90% of the Chinese people lived as subsistence farmers. As the legitimate government, the KMT had the resources to sustain an army of millions of soldiers. In a word, it seems that the CCP had no advantages prior to the

Chinese Civil War; however, in 1949, upon defeating the Nationalists, the CCP took control over all of China, establishing the People’s Republic of China.

When the CCP drove Chiang Kai-shek’s Kuomintang regime off the Chinese mainland in 1949, the question of “Who lost China?” immediately sparked political vitriol and academic debate in the West ([Department of State, 1949](#)). Politicians and academic scholars have provided many explanations over the years, including the deterioration of the Nationalist rule ([Eastman, 1984](#)), yet this question remains unanswered, outside of a few unclear explanations, such as citing ideology as the key cause.

At the outbreak of WWII, the Nationalist military of some 2.5 million soldiers substantially outnumbered the 300,000 under the control of the Communists. Figure 1 compares the number of Communist and KMT troops, showing a steep rise in enlistments in the Communist army after the land reforms were passed in 1946, at approximately the same time that support for the KMT decreased. In addition, the CCP soldier count is closely correlated with the overall CCP membership numbers. The timing of the land reform suggests it was a turning point in the Civil War. This study on land inequality and war records examines the hypothesis that land reform was a strategy that ultimately helped the CCP defeat the KMT in the Chinese Civil War of 1945-1949.

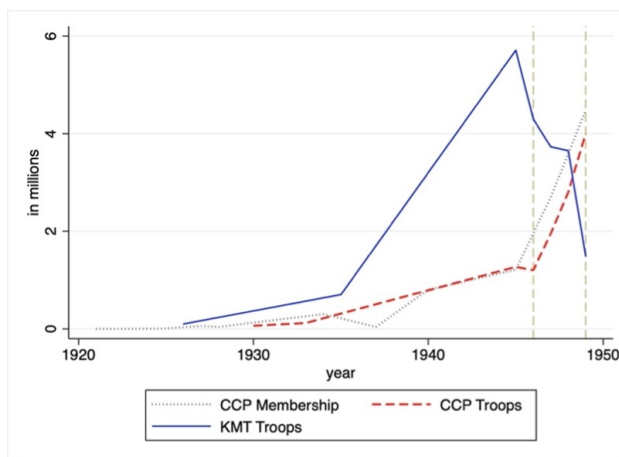


Figure 1: Number of Nationalists (KMT) military troops, the CCP military troops, and overall CCP membership

Notes: The time between two vertical lines refers to the period of land reform, 1946-1949. Source: Elleman and Paine 2019.

I construct a model to simulate farmers’ decisions based on their proximity to KMT forces,

which predicts the possibility of the control of a county being regained by the KMT. The CCP's land reform empowered farmers to seize land from landowners and severely punish the landlords. Farmers, on the other hand, coveted land but worried about retaliation from landowners if the KMT returned. The dominant strategy for farmers living close to KMT strongholds was to join the CCP's army and fight the KMT to safeguard their newly acquired property, fearful that their families would suffer retaliation if the CCP failed militarily. Conversely, such a danger was relatively modest for farmers from counties far away from KMT forces; they knew they ran the risk of dying if joined up, so many chose not to fight.

I evaluate the proposition by collecting data from the monthly death records of CCP soldiers during the Chinese Civil War, pre-reform land ownership records at the county level, and the monthly shifting distances from the KMT's armed troops to counties. The death number is to measure the military effort by farmers turned soldiers. Pre-reform land ownership serves as a proxy for farmers' land gains during the land reform. Given that the reform's stated objective was to equalize property distribution across social classes, a higher pre-reform Gini coefficient indicates that farmers acquired a greater portion of land under the land reform. The data corroborates this assumption. As stated previously, the shifting distances between KMT strongholds and soldiers' home counties indicate the potential that the KMT may retake a particular county, thereby allowing landlords to seek vengeance. I use a difference-in-difference framework, set the treatment timing as the month in which land reform began, and use two treatment-level measures: pre-reform Gini in land ownership, and the shifting distance to KMT forces.

I find that for counties within 81 km of KMT forces, a higher pre-reform Gini in land ownership explains the higher numbers of Communist soldiers dying after land reform; for counties farther than 81 km from KMT forces, a higher pre-reform Gini in land ownership is associated with a lower level of soldier deaths after the land reform. The results corroborate the model-derived theory. Land transfer via class struggle was effective for mobilizing farmers only if they realized that a cost-benefit estimate would resolve in their favor. The evidence presented in the mechanism section backs up the claim that landlords' retaliation against farmers was the most severe in counties that were close to KMT forces.

Studies on land reform are usually focused on issues of property rights and agricultural productivity. For example, during Britain’s industrialization, parliamentary actions allowed the accommodation of flexible rights on the property, which in turn helped to increase investments (Bogart and Richardson, 2009, 2011); and land reallocation during the French Revolution led to greater efficiency in 19th-century agricultural outcomes (Grantham, 1997) compared to a regime in which elites retained control over land. Although land reform can raise equity and efficiency in agricultural production, rich landlords often belong to the political elite and wield the political power to block reforms and public investment (Galor, Moav, and Vollrath, 2009). When landlords are compensated generously, however, the effective benefits of redistribution are reduced (Banerjee, 1999). Thus, the benefits of land reform depend on whether it can be accomplished, in the first place, and the conditions in which it takes place. This article emphasizes the political benefits of land redistribution for the designer, in this case, the Chinese Communist Party, situating the debate over land reform within the framework of political economy.

This study contributes to a small but growing body of knowledge on war mobilization. According to Caprettini and Voth (2023), the New Deal increased American patriotism throughout WWII. My article investigates whether redistribution or welfare is effective for military mobilization. Other works focus on how elites formed their networks in order to foment warfare (Rogall, 2021; Bai, Jia, and Yang, 2023). A few studies examine the impact of communication technology such as newspapers and radio on military mobilization (Yanagizawa-Drott, 2014; Adena, Enikolopov, Petrova, Santarosa, and Zhuravskaya, 2015; Enikolopov, Makarin, and Petrova, 2020; Dippel and Heblich, 2021) while coercion is mentioned in other studies (Lyall and Zhukov, 2021; Rozenas, Talibova, and Zhukov, 2022).

This paper contributes to the literature on the emergence of communism in the 20th century. Dell and Querubin (2018) concluded that US military intervention sparked the Communist insurgency’s military and political activities. Fontana et al. (2018) and Chen and Kung (2020) both suggested that the Nazi occupation of Italy and Japan’s conquest of China both aided the establishment of communism in their respective nations. These findings reaffirm the importance of foreign involvement in accelerating the rise of communism following WWII. However, communism, as a philosophy committed to extensive universal social welfare, has received little attention for its own

role in successful member development. This article bridges the theoretical and empirical divide.

This paper also helps us to better understand communism. Although communism largely died out at the end of the Cold War, persistent and growing inequality on a worldwide scale reintroduced communism and socialism to intellectuals ([Piketty, 2021](#)). [Alesina et al. \(2020b\)](#) found that, while the Chinese communist revolution eliminated inequality in wealth and education, human capital was passed down through families, and inequality persisted. My paper confirms once again that inequality results in social conflict; nevertheless, I emphasize the possibility of redistribution acting as a catalyst for conflicts.

2 Historical Background

Land, the most important asset in rural communities, has been a recurring theme throughout Chinese history. Hundreds of peasant uprisings, notably the late Ming peasant rebellions and the Taiping Rebellion, stemmed from the struggle for land ownership, as was the Communist revolution in the middle of the 20th century.

2.1 Land Reform in China 1946-1949

Land reforms in China took place from 1946 to 1949 under the direction of the Chinese Communist Party (CCP), beginning in the northern areas that were under direct Communist control. On May 4th, 1946, the CCP initiated a fierce conflict in which all property belonging to landlords was to be confiscated and redistributed to poor peasants. Land reform in different counties began at different times. Figure 2 shows the progress of land reform in counties controlled by the CCP.

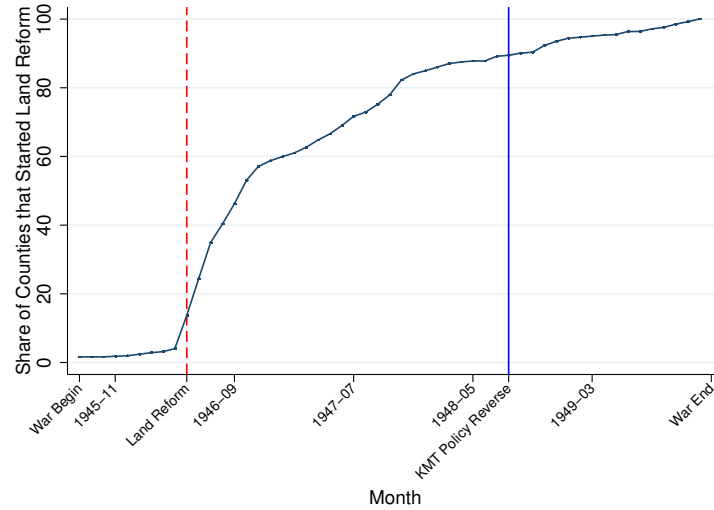


Figure 2: Progress of Land Reform

Source: County Gazetteers.

The darkened northeastern region in Figure 3 depicts the area under Communist control prior to 1949, in an area that was roughly equivalent to France and West Germany combined. Land reform was completed in the remaining unshaded territories of mainland China between 1950 and 1953, following the 1949 foundation of the People's Republic of China.

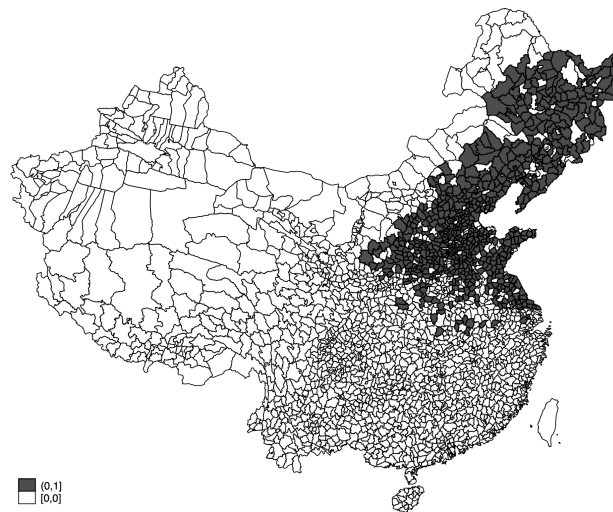


Figure 3: Counties exposed to the land reform from 1946 to 1949

Notes: 1= land reform was implemented, whereas 0 indicates that it was not. The analyze below only employs counties that enforced land reform before the end of 1949.

Source: Guo and Wang 1993.

China's land revolution of the mid-20th century was one of the most remarkable examples of land reform in the world. The government not only chose to not compensate landlords for their losses but many were publicly executed, sometimes along with the members of their households. By June 1949, Chinese farmers, under the leadership of the CCP, had collectively redistributed 25 million hectares of land from landlords to peasants; this represented more than half of the total rural land, and the 125 million persons affected equated to around one-third of the total rural population (Noellert, 2020). Estimates suggest that the average change in landholding per capita was 240% for poor farmers, 1000% for landless farmers, 23% for middle-income farmers, -41% for rich farmers, and -80% for landlords; in other words, landlords lost 80% of their land and rich farmers lost 41%, while poor farmers' land holdings roughly doubled. Estimates also suggest that between 1949 and 1953, about 3.5 million people died because of the violence organized as part of the Communists' land reform programs. In addition, an estimated 4 million people were transported to "reform through work" camps, where many perished in harsh conditions.

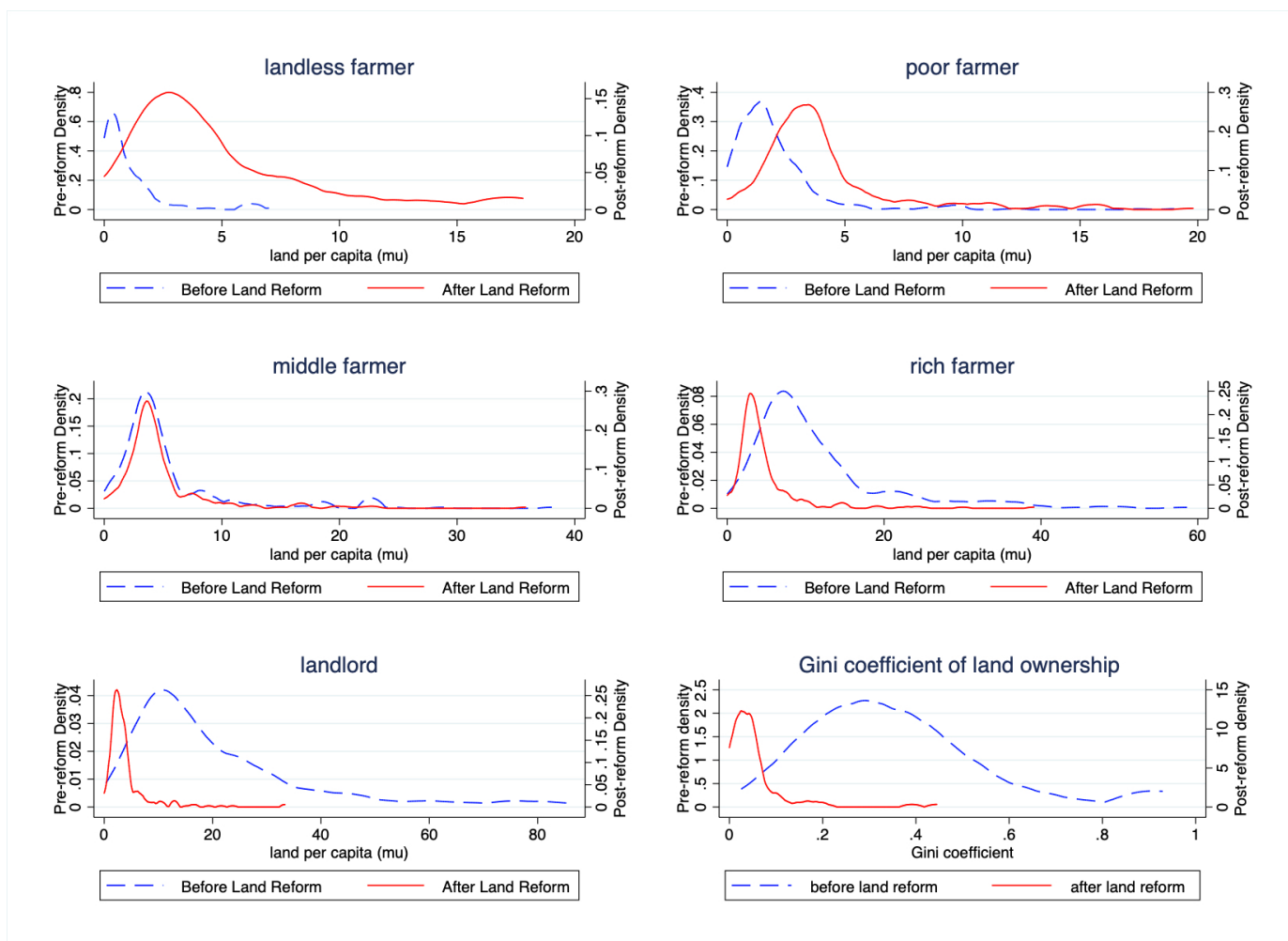


Figure 4: Land Ownership Before and After Land Reform

Source: County Gazetteers.

Second, although land redistribution was carried out relatively quickly and with a significant outlay of resources after the Communist Party emerged victorious (in 1949) in the civil war against the Nationalist (KMT) Party, Mao Zedong reversed the promise of private land ownership that was extended during land reform. Within a decade, all the land given to the peasantry during the land reform of 1946 to 1953 was retracted back by the state, and private ownership was abolished.

Third, while one might expect violence to be the consequence of high levels of inequality, in fact, landholdings were not particularly unequal prior to reform, at least by global standards; some 5% of landlords held 30% of the land, and the average landholding was a relatively modest 5.77 acres

per landlord family. By comparison, 3% of landlords held more than 90% of the land in Mexico and Bolivia, and plot sizes averaged some 1,895 acres (Flores, 1963). According to Elvin (1970), rural China in the early twentieth century consisted of “a multitude of smallholders whose relative fortunes were constantly rising and falling; a society in which the typical landlord owned only a few acres more than his poorest neighbours”.¹

On the basis of all this evidence, it is difficult to conclude that the CCP’s land reform efforts were only aimed at increasing agricultural productivity or achieving equality, as the CCP claimed (Liu, June 30th 1950) or as land reform literature saw it (Banerjee, 1999). Rather, it appears that the land reform from 1946 to 1949 was a short-term plan for the CCP to recruit tenant farmers, imprisoned in poor living conditions, into its military. As Mao pointed out in May 1946, “Only if we resolutely implement land reform and give the peasants land, will we be more powerful.” Put another way, if changes in age-old property rights are beneficial in winning the war, then prevailing in battle may have been the real reason why land reform was carried out, rather than equity or efficiency.

Importantly, land reform was not accomplished simply through top-down coercion. What made land reform possible is that Mao was able to tap into an effective means to mobilize widespread collective action. Contemporaries of the revolution described how Chinese land reform was used for the mobilization of rural support, within a strategy that pitted landowners against tenants and wage laborers (Crook and Crook, 1961; Hinton, 1966), and historians such as Levine (1987) have linked land reforms with Mao’s strategy to gain the support of farming families, who in turn provided the political and military means for Communist success in the civil war against the Nationalists. Although the arguments are compelling, they have not been closely scrutinized empirically.

2.2 Class Struggle as a Way of War Mobilization

The way in which land reform was implemented highlights the fact that different societies have different capacities for collective movements. Mao’s 1933 document, “How to Analyze Classes in

¹For more details, please check the literature review about the inequality in land ownership in the early-20th-century China in Appendix A.

the Chinese Countryside”, forms the basis of the CCP’s efforts to mobilize mass political action (Mao, 1933). The CCP would dispatch a task force to a community to organize impoverished farmers, making some of them local group leaders. With the protection of the CCP’s military, the association of farmers held gatherings in which landlords were placed on “trial”. The CCP tried to persuade all farmers to attend these gatherings, and many did. Farmers were allowed to do “whatever forms of struggle the masses want”. In approximately 10% of the cases, the landlord was executed (Dikötter, 2015; Noellert, 2020). Afterward, the alliance of farmers would seize the land and other properties of the landlords, and divide it up among themselves, with poor farmers receiving a larger share (Li, 2018; Noellert, 2020). Property of all kinds, including land, draft animals, farm tools, food, houses, and, in some cases, wives and concubines were redistributed to farmers (Li, 2018).

Although the land reform movement in China was organized by the CCP leaders, it relied on the cooperation of farmers. At times, farmers and party members executed not only landowners, but also their families, and accounts from the period describe how landlords sometimes died in circumstances that resemble mob beatings and stonings (Hinton, 1966). Facing the risk of losing all their property, and even their lives, landlords organized themselves to fight back against the CCP and the farmers, forming the Homecoming Legion (Huanxiang Tuan), with the support of the KMT, to force the return of their redistributed land and property from peasants and CCP guerrillas. Once the refugee landlords regained control of the county, they exacted severe revenge on farmers who took their property and actively participated in land reform. In Cangshan county, Shandong Province, the Homecoming Legion killed 1,595 farmers, of whom 197 were buried alive on June 9, 1947.

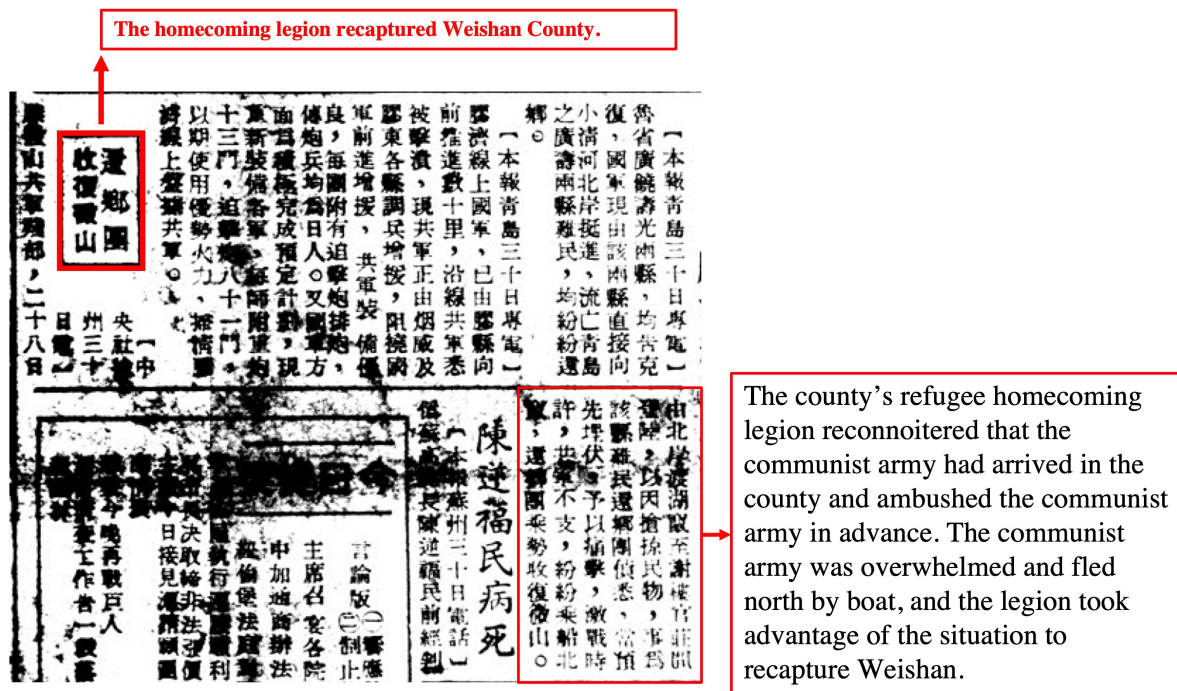


Figure 5: The Homecoming Legion

Source: Xinwenbao, October 1, 1946.

Note: Although the newspaper report did not detail how the returned refugee landowners exacted vengeance on farmers and Communist members, other historical records provided evidence of mass killing.

Anecdotal evidence indicates that once land was transferred to poor farmers, a sizable portion of them refused to accept ownership (Zhou, 1948), and some farmers even returned the land to their landlord in secret. Farmers feared that if the KMT won the war and returned, those who acquired confiscated land and property would face vengeance from the Homecoming Legion, which aided the KMT troops. This shows that farmers made strategic decisions about their participation in the CCP-led land reform. The benefits of joining the land reform are evident, as it allows for the acquisition of land and other properties; nevertheless, the price may have been considerable if the KMT had won. If farmers aggressively participated in land reform, seizing land from landlords and murdering them, when the Homecoming Legion returned with the KMT army, farmers and their families could be executed in retribution.

2.3 Pre-examine: Did the Redistribution Work for War Mobilization?

Figure 6 below illustrates the average number of soldiers who died in the months leading up to the land reform. Obviously, the number of deaths increased in each county shortly after the reform was initiated, demonstrating that the reform was effective in terms of war mobilization.



Figure 6: Soldier Deaths and the Land Reform

Notes: The horizontal axis indicates months to the land reform, and the vertical axis is the mean of counties' soldier deaths.

If redistribution was used to mobilize troops for war, we would predict that farmers who received more land would be more likely to join, resulting in a larger death toll. Figure 7 illustrates the relationship between soldier deaths and two other metrics of redistribution. The first measure is the Gini coefficient in land ownership before the reform, and the second is the proportion of land transferred to farmers as a percentage of the total land. These two variables are closely connected since the reform's stated objective was to equalize property distribution across social members; hence, a higher Gini suggests a greater attempt at redistribution.

It appears there's no relation between the number of deaths and level of redistribution, and the left-hand scatter plot even indicates a negative association. The plot in the appendix, which

uses death rates, shows a similar pattern. While many confounding variables remain unknown, the trend here raises the question of whether redistribution was effective for military mobilization. While it was reasonable for farmers to acquire additional land, they risked death if they join the CCP's army. As a result, redistribution may not have been a decisive factor in determining whether to fight for the CCP.

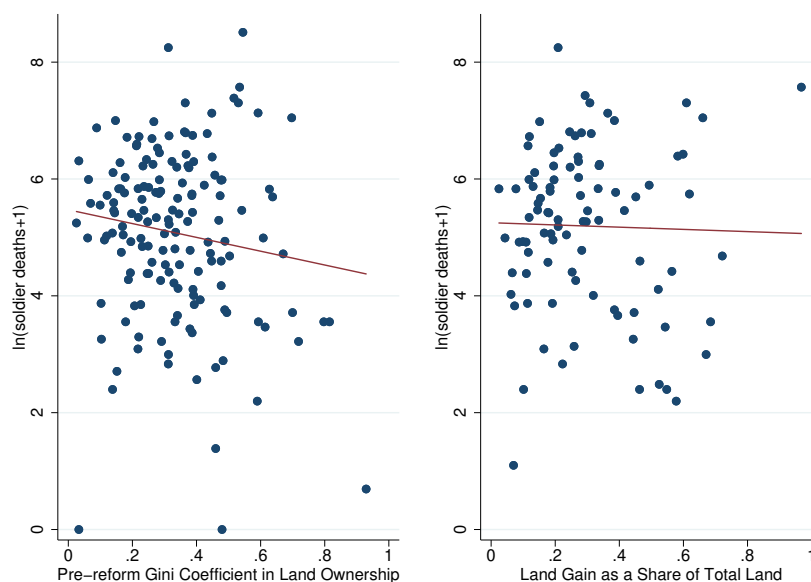


Figure 7: The Correlation between Land Gain and Soldier Deaths

Notes: Graphs are bin-scatters of log soldier deaths and pre-reform Gini Coefficient (left), and log soldier deaths and land gain for farmers (right); red lines are linear fits.

Figure 8 illustrates the relationship between soldier deaths and distance to KMT troops during a four-month period. County borders with KMT forces appear to have always resulted in a higher death toll. The appendix figure, which includes death rates, shows a similar pattern. Why is there a negative association between military deaths and the distance between them and the KMT forces? One apparent explanation is that it is more cost-effective for the CCP to recruit soldiers in close proximity to combat zones, thereby saving on transportation costs. However, armies marched regularly, and hence the CCP did not need to intensify its efforts in counties close to the front. An alternative reason is that counties adjacent to KMT troops faced a greater possibility of recapture by KMT forces and the Homecoming Legion, in which case farmers who took land from landlords would suffer harsh retaliation. Though CCP troops may flee, their families will face retribution.

As a result, troops must fight valiantly to avert the KMT recapture of their village and to save their families lives.

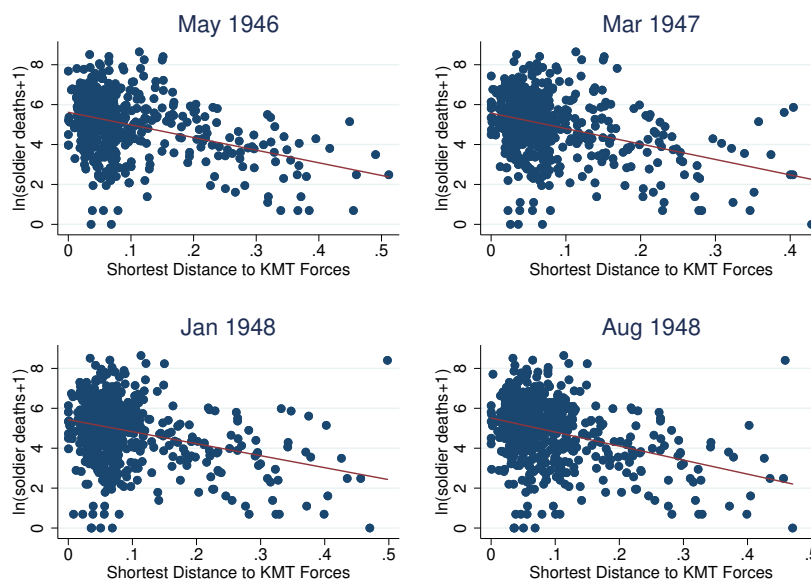


Figure 8: The Correlation between Shortest Distance to KMT Forces and Soldier Deaths

Notes: Graphs are bin-scatters of log soldier deaths and distance to KMT forces; red lines are linear fits.

3 Model

3.1 Model Set-up

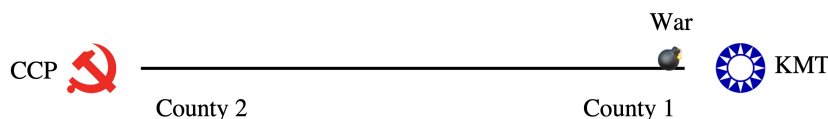


Figure 9

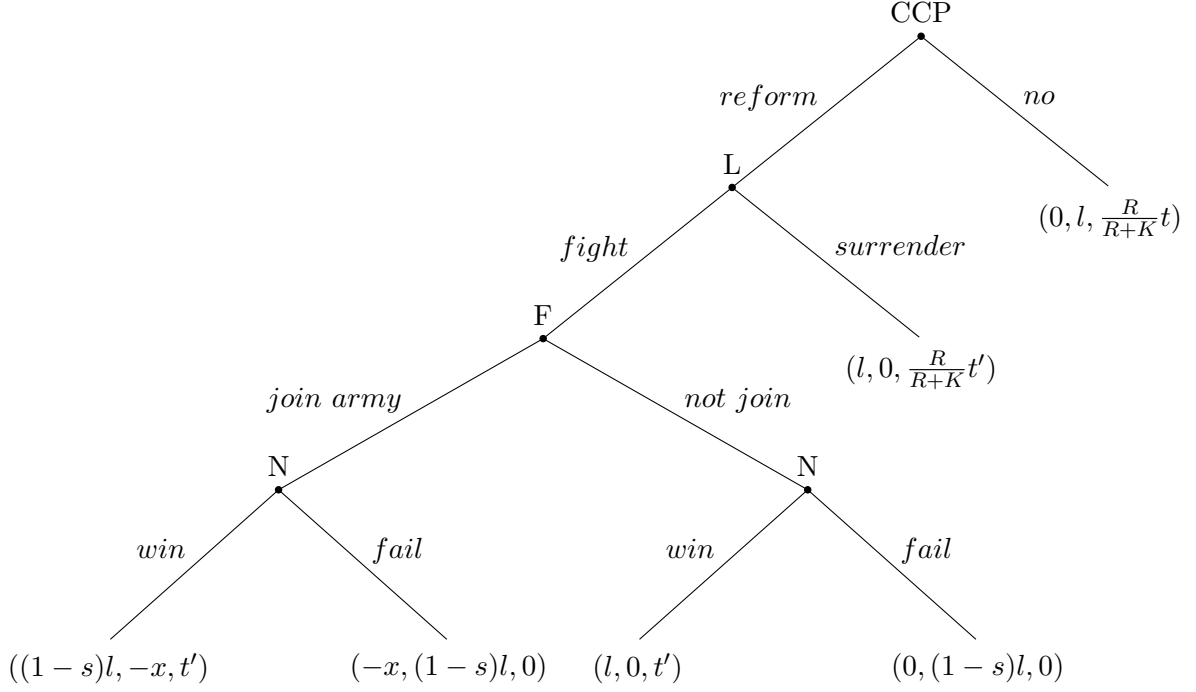
To simplify the conceptual framework, let's assume that the CCP controls two counties, county 1 and county 2. In both counties, the ruler is CCP with the initial level of army, R , and it seeks to defeat the KMT, whose military force is measured by K . The endowment (like tax revenue) of CCP is t . In line with the literature on conflict (Dixit, 1987; Hirshleifer, 1995; Chen, 2021), I use the

contest success function to model CCP's probability of winning the war against the KMT, $\frac{R}{R+K}$.

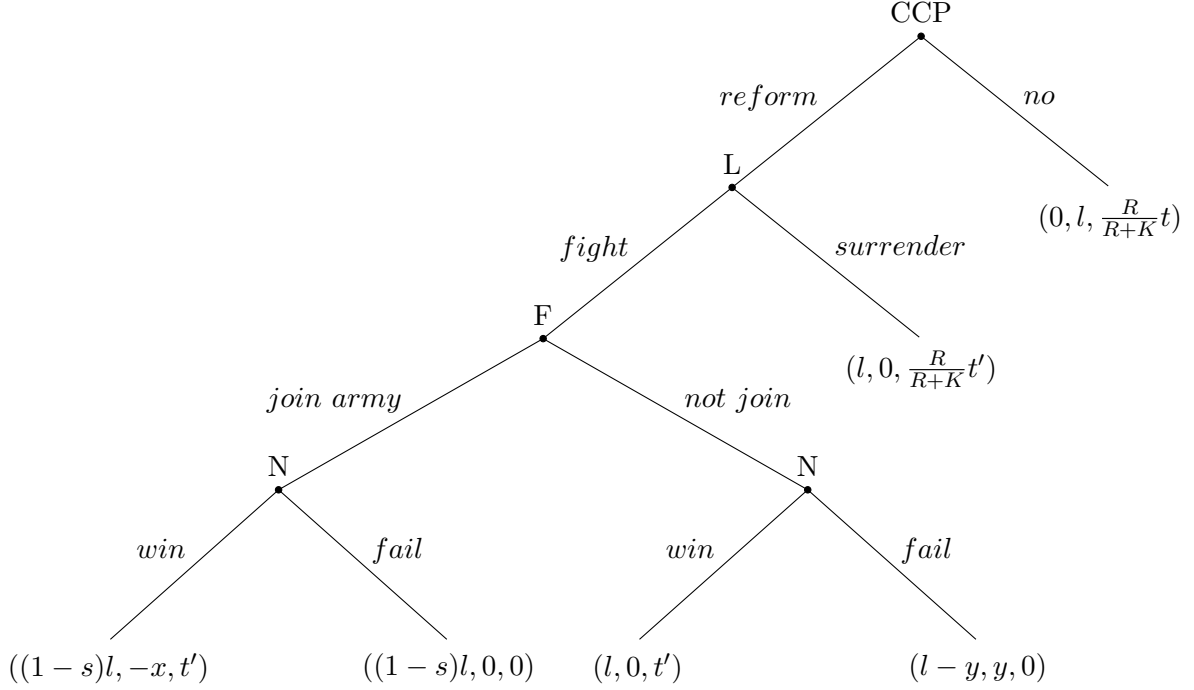
In both counties, the agricultural land size is l , which is owned by landlords (L). Farmers (F) hold no land, working for landlords to survive. The CCP-led land reform has made farmers confiscate land l from the hands of landlords. County 1 is near the KMT forces, which means that if CCP fails in a battle, the refugee landlords who are organized as the homecoming legion can return immediately and retaliate against farmers. County 2 is far away from the KMT forces. As a result, even if CCP fails in a battle, the homecoming legion as well as the KMT forces cannot immediately arrive.

The figure below presents three players' choices and corresponding payoffs (farmers, landlords, and CCP). First, the CCP choose whether to launch a land reform, persuading or forcing farmers to grab land from landlords. If no, the status quo remains. Second, if the land reform confiscates land from landlords. Landlords will choose whether to join the homecoming legion to fight. If landlords surrender, farmers get land without cost and have no incentive to side with CCP. Third, if landlords seek to recapture their land, farmers have a risk of losing land and being revenged and will choose whether to join the CCP's army. Finally, war happens, and the outcome of the war determines each player's payoff.

For farmers from county 1, which is near the KMT forces, if they join the CCP's army to fight, they have a risk of dying in the war (represented as s) even if the CCP wins; if CCP fails, they will lose the newly-gained land and their families will be harshly punished by landlords (punishment: x). If they prefer acting as free riders, for example, receive land but do not join the CCP's army, they will survive and keep the land if CCP wins; but if CCP fails, they will lose land without being punished because they do not join the CCP's army.



For farmers from county 2, which is far away from the KMT forces, if they join the CCP's army, they may die in a war at the rate of s ; if CCP wins, farmers in county 2 can still punish landlords (punishment: x), while they dare not to punish landlords if CCP fails. They can still keep the land and punish farmers if they resist since the homecoming legion cannot arrive in county 2. Suppose farmers act as free riders (grab land but not join the army), if CCP wins, farmers keep land; but if CCP fails, they may give some part of the land back to local landlords since they fear punishment in the future. Evidence of such kind of opportunistic behavior can be found in the background discussion.



I endogenize the probability of winning by CCP. If farmers do not join CCP's army, the probability of winning for CCP is $Pr(win) = \frac{R}{K+R}$ (same as status quo); and if farmers join CCP's army, the probability of winning increases to $Pr(win) = \frac{R+F}{K+R+F}$. To simplify the model, I do not introduce the situation when landlords join the KMT's army. Given only 5% of households in a county were labeled as landlords, it will not affect the outcome of the war.

3.2 Farmer's Choice

Let's use backward induction to derive each player's choice. Farmers from county 1 will join the CCP's army if and only if

$$\frac{R+F}{K+R+F}(1-s)l - \frac{K}{K+R+F}x > \frac{R}{K+R}l \quad (1)$$

i.e., the gain from fighting is larger than the expected gain as free riders:

$$\frac{x}{l} < (1-s)F - s\frac{R}{K}(K+R+F) \quad (2)$$

Farmers from county 2 will join the CCP's army if

$$(1 - s)l > l - \frac{R}{K+R}y \quad (3)$$

i.e.:

$$\frac{y}{l} > \frac{s(R+K)}{R} \quad (4)$$

Proposition 1. *1. For farmers from County 1, if $(1 - s)F > s\frac{R}{K}(K + R + F)$, condition (2) is more likely to be satisfied when l is larger. In another word, to transfer more land from landlords to farmers will encourage farmers to fight.*

2. For farmers from County 1, a brutal punishment (higher x) promised by landlords will discourage farmers to fight.

3. For farmers from County 2, condition (4) is more likely to be satisfied when l is smaller. To transfer more land from landlords to farmers will discourage farmers to fight.

The statement above makes an interesting observation on the effect of land redistribution on the CCP's army's war mobilization. For areas bordered by KMT troops, a larger l suggests more pre-reform inequality in land ownership and also indicates that farmers will benefit more from property-equalized reform, which will stimulate enlistment in the CCP's army. However, in places remote from KMT troops, a greater l discourages war mobilization due to the high opportunity cost of combat.

3.3 Landlord's Choice

For County 1, given that farmers choose to join the CCP's army, landlords they will choose to fight if,

$$\frac{R+F}{K+R+F}(-x) - \frac{K}{K+R+F}(1 - s)l > 0 \quad (5)$$

i.e,

$$\frac{l}{x} > \frac{F+R}{K(1-s)} \quad (6)$$

While if farmers act as free riders, the dominant strategy of landlords is to fight ($\frac{R}{R+K}l > 0$).

For landlords from County 2, given that farmers choose to join the CCP's army, the dominant strategy is to surrender because they cannot take land back without military support from KMT forces, while to fight will bring punishment from farmers ($\frac{-x(R+F)}{K+R+F}$). While if farmers act as free riders, the dominant strategy of landlords is to fight ($\frac{R}{R+K}y > 0$).

Proposition 2. *1. In county 1, if l is larger, landlords will seek to recapture land by fight.*

2. In county 1, a brutal punishment (higher x) promised by farmers will discourage landlords to fight.

3. In county 2, landlords choose to fight if farmers do not fight, while they choose to surrender if farmers choose to fight.

The discussion about punishment or vengeance in Proposition 1.1 and Proposition 2.1 is not trivial. A harsh penalty promised by landlords or farmers will dissuade the other from joining the war, hence increasing one's chances of retaining land. In other words, after the CCP redistributes land from landlords to farmers, violent class struggle between farmers and landlords becomes a rational choice for both sides, resulting in a vicious cycle that continues until the war declares a winner.

3.4 CCP's decision

CCP's payoffs do not differ in County 1 and County 2. If it does not launch the land reform, the CCP can levy tax t , with a probability $\frac{R}{R+K}$ to keep it (win the war). If land reform is successfully finished while landlords surrender, the CCP can extract a higher tax revenue t' ($t' > t$). The study by [Hao et al. \(2021\)](#) supports this assumption that the CCP extracted more tax after land reform.

And the war happens, if CCP wins, it can gain tax t' ; while if CCP fails, its payoff will be zero. In both counties, after the land reform, the CCP expects to get $\frac{R+F}{R+F+K}t'$ if farmers side with it, get $\frac{R}{R+F}t'$ if farmers act as free riders or landlords surrender. In any case, the unexpected payoff of the CCP after land reform is higher than the initial level.

Proposition 3. *1. In any case, it is a dominant strategy for the CCP to launch the land reform.*
2. A higher F enlarges CCP's probability of win and its expected payoff.

There is no hard and fast rule about the number of persons who should be designated as landlords or rich farmers and subjected to repression. However, typically, 5% of households in a county were classified as landlords, whereas 5% were classified as rich farmers. Proposition 3.2 explains why the CCP picked such a low proportion for the landlord quota, stating that 90% rural people (a high F) would share benefits from the redistribution and favor the CCP.²

4 Data

4.1 Death Number of Communist Soldiers

The death records were collected from an official website (Chinamartyr.gov.cn), which has a list of 566,162 Communist soldiers who died between 1945 and 1949 during the Chinese Civil War. Their names, gender, hometowns, birth years, divisions, and military ranks are included, as are the dates and places of their deaths. I compute the death toll for each month and county based on the soldiers' hometowns and dates of death.

4.2 Land Ownership and Land Redistribution

To quantify land inequality prior to land reform, I manually gathered data on land distribution by class from 349 county gazetteers, which represents almost half of the study area's 746 counties.

²Later, the "5 Percent Quota" becomes a norm for the CCP to unite the majority and confront any potential adversary in its all movements, from the Three-anti and Five-anti Campaigns in 1951-1952 to the Anti-Rightist Campaign in 1957, which were designed to repress entrepreneurs and intellectuals respectively.

County gazetteers were created by each county in the 1990s to document significant events. County gazetteers provide the earliest data set on land asset disparity in China’s history, documenting land ownership by different classes prior to the land reform of 1946 to 1953.

The method for calculating the gini coefficient of land ownership is identical to that used in (Alesina et al. 2020).

$$Gini = \frac{maxCDF - CDF(land)}{maxCDF - minCDF}$$

$$CDF(land) = \sum_{class} pop_{class} * CumulativeLand_{class}$$

Where *maxCDF* is the maximum value of CDF (i.e., extreme equality) under a discrete distribution of population subgroups, where everyone owns the same share of land in the society, and *minCDF* is the minimum value of CDF (i.e., extreme inequality) under a discrete distribution, where all land is owned by landlords. For counties that the land ownership data is missing, I replace it by prefecture averages and provincial averages.³

The ideal measure of benefits to farmers (including middle farmers, poor farmers and landless farmers) during the land reform is the ratio of land gain as a share of total agricultural land, however, only 95 counties’ gazetteers could produce this variable. Instead, I adopt pre-reform Gini coefficient in land ownership as the proxy of land gain by farmers in the land reform, which has 182 observations. Since the aim of the land reform was to equalize assets among social classes, higher value of pre-reform Gini coefficient in land ownership mean that a higher share of land would be redistributed from Landlord (also rich farmers) to other farmers. Figure beow shows the correlation between land gain and pre-reform Gini in land ownership, and the fitted line is nearly coincident with the 45 degree line, indicating a strong positive correlation (the correlation coefficient is 0.72).

³I use prefectures and provinces in 1990s since land ownership data was collected based on administrative divisions in 1990s.

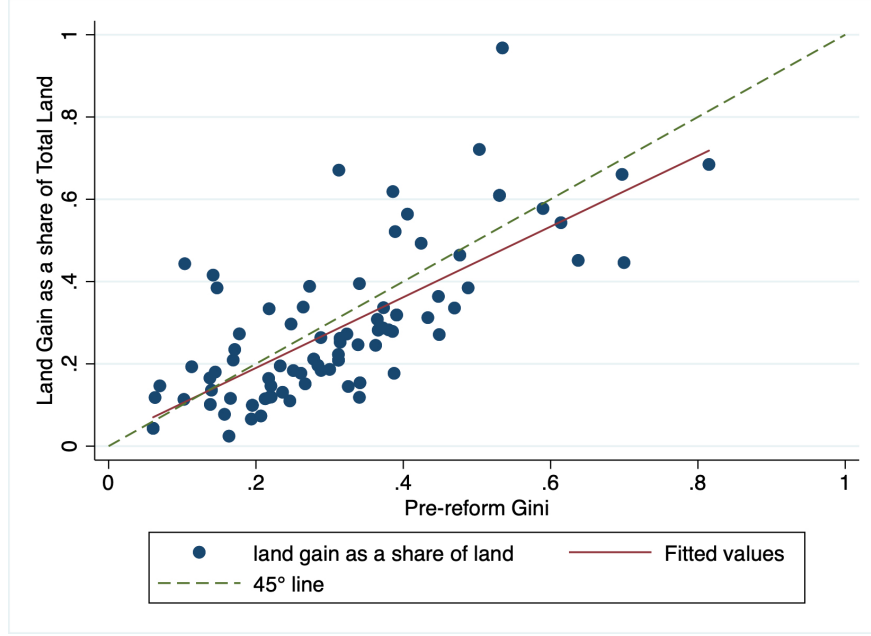


Figure 10: The Correlation between Land Gain of Farmers and Pre-reform Gini in Land Ownership

Source: County gazetteers.

4.3 Distance to KMT Forces

The book, *The 158 Armies in the History of the Kuomintang* (Zhang and Liu, 2007), collects information on all KMT's army forces. I collect the military bases of the KMT forces and trace their changing locations each month from the book. And then I calculate the minimum distance of each county to the changing KMT's military bases. This variable, distance to KMT's army forces, measures the threat and possible punishment to farmers who received land during the land reform.

The figure below shows the kernel density of 627 counties' shortest distances to KMT forces. The war began in August 1945. From the start of land reform in May 1946 until the reverse of KMT policy in August 1948, the distribution remained constant since the two parties were evenly balanced and the winner was undecided. After January 1949, the CCP's army crushed all KMT troops in North China, and shortly thereafter, in April 1949, the CCP army crossed the Yangtze River and defeated the KMT forces on the mainland.

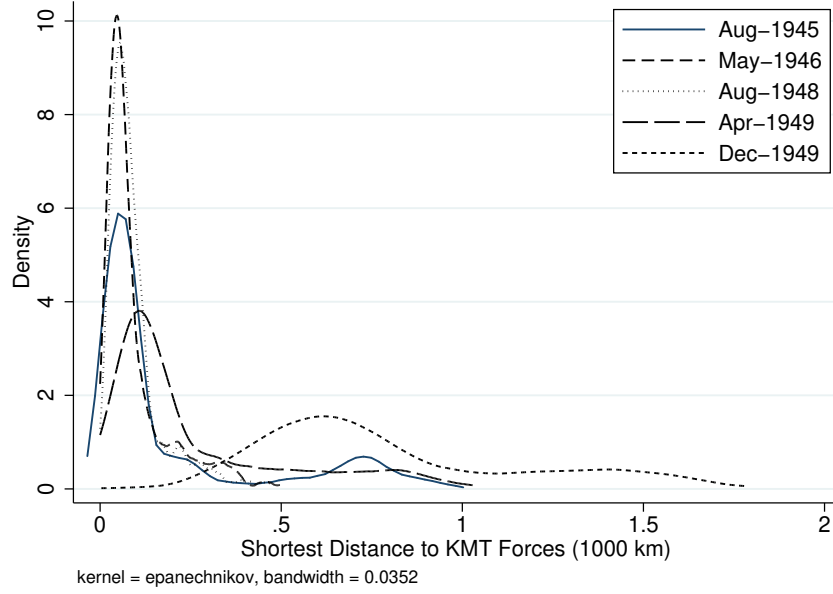


Figure 11: Distribution of Shortest Distance to KMT Forces by Month

Source: Zhang and Liu 1997.

4.4 Control Variables

The control variables include basic demographic and geographic characteristics such as population size in 1947, area, and distance to rivers. Importance in politics and business is measured by whether a county is the capital of the prefecture and trade center. The development of the modern industry is measured by the number of modern firms. Human capital and propaganda variables include newspapers, and primary school students in the 1920s. During the land reform, CCP employed intellectuals to sell its idea about communism to illiterate farmers, and print media also played a key role.

Next, I control the power of two parties in each county. KMT's control over a county is measured by the number of KMT senior officials in its central government. Since the development of the KMT party was largely based on private networks, this measure captures how close a county was connected to the KMT central government. To measure the CCP's influence in a county, I collect the information on CCP's guerilla bases. The first series of guerilla bases established by the CCP was from 1927 to 1937, and most of the bases were located in south China. In the second period

during the Sino-Japanese War (1937-1945), the CCP established guerilla bases in the northern region to fight against the Japanese invaders. In the occupied areas, Japanese control was mainly limited to railroads and major cities ("points and lines"). They did not have a major military or administrative presence in the vast Chinese countryside, where Chinese guerrillas roamed freely.

Third, I also control other political agents' influence. Foreign influence includes treaty ports, and distance to countries controlled by the Soviet Union (including North Korea, and Mongolia). Most treaty ports had been canceled by 1945, while foreign-owned businesses might still hold economic benefits there. In the Chinese Civil War, the Soviet Union provided huge financial and military support to the CCP ([Yang, 2010](#)). Additionally, the power of clans is measured by the editions of genealogical books. Local clans might intervene in land reforms as well as war mobilization and thus became the target to be repressed by the CCP in the land reform.

Forth, variables about agriculture will also be controlled, which include weather conditions each year, and crop (Wheat and Rice) suitability index. Table 1 shows the summary statistics.

Table 1: Summary Statistics

Variable	Obs	Mean	S.D	Min	Max	Data Source
ln (Soldier Deaths+1)	19313	1.295	1.168	0	6.144	A
Dist to KMT (1000 km)	19313	0.092	0.101	0.000	0.967	B
Pre-reform Gini	624	0.375	0.194	0.025	0.929	C
Dist to KMT, May 1946	627	88.538	91.569	0.007	511.693	B
ln Pop	608	-1.792	0.938	-6.568	0.433	D
ln Area	596	0.515	1.001	-4.101	4.195	D
Dist to Rivers (km)	627	31.853	31.721	0.124	203.514	E
Capital County	627	0.080	0.271	0	1	F
Trade Center	627	0.215	0.411	0	1	G
ln (Firms+1)	627	0.281	0.613	0	4.644	H
ln (Newspaper+1)	627	0.205	0.550	0	4.454	I
ln (Students+1)	627	0.053	0.120	0	1.269	J
ln (KMT Officials+1)	627	0.480	0.605	0	2.944	K
Guerrilla Base I	627	0.027	0.163	0	1	F
Guerrilla Base II	627	0.571	0.495	0	1	F
Treaty Port	612	0.029	0.169	0	1	L
Dist to Soviet (km)	627	355.212	180.798	0.319	1306.703	E
ln (Clans+1)	627	0.537	0.832	0	5.011	I
ln Weather, 1944	627	1.083	0.480	0	1.609	N
ln Weather	627	1.129	0.276	0	1.609	N
ln Rice	627	1.952	0.152	0.693	2.079	O
ln Wheat	627	1.219	0.443	0	2.079	O
land per capita	567	4.701	4.154	0.256	35.562	P
land value per capita (high)	345	171.165	176.168	2.037	1869.455	P
land value per capita (low)	345	84.204	92.309	1.282	934.727	P

A. Chinamartyr.gov.cn; B. Zhang and Liu 2007; C. County Gazetteers; D. Neizhengbu 1947; E. China Data Online; F. Fu and Liu 2017; G. Skinner, Yue and Henderson 2008; H. Du 1991; I. Shanghai Lib; J. Stauffer 1922; K. Liu 1995; L. Keller and Shiue 2021; N. State Meteorological Society 1981; O. FAO 2021; P. Kong 1944.

4.5 Sample Selection and Pre-Trend Analysis

Only after a county was taken over by the CCP could land reform and conscription begin. As a result, the unbalanced panel consists of 627 counties and the time varies from a county being sized by the CCP to August 1948, when the KMT reversed its policy regarding CCP's land reform.

War usually involves vast strategic choices made by all parties, therefore, sample selection may be unavoidable. To ensure widespread support from farmers, the CCP might purposefully choose counties with significant disparity in land ownership to occupy and implement land reform. If this is the case, the risk of overestimation will rise.

To test if there's a sample selection problem, I adopt an Ordered Probit model to examine if the order of being occupied by the CCP, and the order of land reform is correlated with the two treatment variables, Pre-reform Gini coefficient in land ownership and Distance to KMT forces in May 1946, as well as other county-level characteristics. In Column (1), it shows that the CCP took over a county earlier if the county is far from the KMT's military forces. This is understandable because whether the CCP could take over a county depends on who had stronger military forces and to far away from KMT forces implies weaker power of the KMT. Additionally, the order of being occupied by the CCP is correlated with several characteristics. To address the sample selection question, I incorporate a robustness check that utilizes a balanced panel covering all 2,200 counties from August 1945 to December 1949.

For the order of land reform, in Column (2), it is highly correlated with the order of being occupied by the CCP since the land reform could be implemented only if the CCP controlled this county. The order of land reform was not related to the first treatment variable, pre-reform Gini coefficient, but was negatively correlated with distance to KMT forces in May 1946. The result implies that the CCP might strategically chose counties which were far away from KMT forces to implement land reform. Since the second treatment variable, distance to KMT forces changes along with time, the correlation may not be a main problem.

Columns (3) and (4) examine the pre-treatment characteristics. The first treatment measure, pre-reform Gini coefficient in land ownership, is positively correlated with area size and newspaper, and negatively correlated with population size and guerilla bases during the Sino-Japanese War. In Column (4), Distance to KMT forces in May 1946, is correlated with population size, area size, distance to rivers, and distance to countries controlled by the Soviet Union. The second treatment measure varies in county-month. In column (5), I regress the change in distance to KMT military forces on pre-existing characteristics. The result shows that changes in distance to KMT is only

correlated with population and distance to countries controlled by the Soviet Union, which reflects the dynamic interaction between two parties in the war. I will include all the characteristics as controls in the subsequent analysis.

Table 2: Balance Checks

Model	Ordered Probit	Ordered Probit	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)
VARIABLES	Occupation Rank	Land Reform Rank	Pre-reform Gini	Distance to KMT May, 1946	Change in Distance to KMT
<i>Occupation Rank</i>		0.002*** (0.000)			
<i>Gini</i>	-0.479 (0.541)	0.460 (0.570)			
<i>Dist to KMT</i>	-0.007*** (0.002)	-0.005** (0.002)			
<i>ln Pop</i>	-0.159 (0.132)	-0.294** (0.141)	-0.021** (0.010)	-16.644*** (2.557)	-0.00066** (0.00027)
<i>ln Area</i>	-0.058 (0.098)	0.063 (0.101)	0.031*** (0.008)	9.664*** (1.965)	0.00027 (0.00021)
<i>Dist to Rivers</i>	-0.003 (0.003)	0.000 (0.003)	0.000 (0.000)	0.268*** (0.056)	-0.00000 (0.00001)
<i>Capital County</i>	0.895*** (0.293)	0.256 (0.276)	-0.022 (0.022)	-3.893 (5.683)	0.00001 (0.00064)
<i>Trade Center</i>	0.263 (0.197)	0.042 (0.182)	-0.010 (0.014)	2.601 (3.719)	-0.00014 (0.00041)
<i>ln(Firms + 1)</i>	0.168 (0.151)	-0.233 (0.160)	-0.005 (0.012)	-1.194 (3.170)	-0.00027 (0.00034)
<i>ln (Newspapers + 1)</i>	0.073 (0.184)	0.095 (0.184)	0.026* (0.014)	3.885 (3.581)	0.00033 (0.00041)
<i>ln (Studedents + 1)</i>	0.602 (0.691)	0.401 (0.682)	0.044 (0.057)	0.125 (14.613)	-0.00093 (0.00155)
<i>ln (KMT Officials + 1)</i>	0.034 (0.144)	0.059 (0.146)	-0.010 (0.011)	1.021 (2.951)	0.00002 (0.00032)
<i>Guerilla Base I</i>	2.511*** (0.769)	0.091 (0.761)	0.049 (0.047)	3.130 (12.112)	0.00048 (0.00143)
<i>Guerilla Base II</i>	-1.739*** (0.284)	-1.487*** (0.281)	-0.109*** (0.020)	-1.941 (5.132)	0.00085 (0.00061)
<i>TreatyPort</i>	-0.485 (0.467)	0.267 (0.555)	-0.004 (0.039)	-0.382 (10.058)	0.00091 (0.00104)
<i>Dist to Soviet</i>	0.002*** (0.001)	-0.000 (0.001)	-0.000 (0.000)	0.045*** (0.015)	0.00000** (0.00000)
<i>ln (Clans + 1)</i>	0.264*** (0.102)	-0.104 (0.101)	-0.002 (0.008)	3.537* (2.049)	-0.00007 (0.00023)
<i>ln Weather, 1944</i>	-0.194 (0.231)	-0.321 (0.213)	0.008 (0.017)	-6.405 (4.338)	
<i>ln Weather</i>					0.00008 (0.00044)
<i>ln Rice</i>	0.476 (0.651)	0.200 (0.622)	-0.016 (0.050)	6.537 (12.928)	-0.00044 (0.00141)
<i>ln Wheat</i>	0.149 (0.239)	-0.438* (0.256)	0.022 (0.019)	7.481 (4.942)	0.00032 (0.00052)
Province FE	Y	Y	Y	Y	Y
Month FE	N	N	N	N	Y
Observations	593	593	593	596	17,771
R-squared			0.447	0.863	0.181

5 Empirical Strategy and Results

5.1 Specification I

The difference-in-difference design is as follows,

$$\ln Soldier Death_{ct} = \alpha L_{ct} + \beta_1 L_{ct} \times Gini_c + \beta_2 L_{ct} \times dis_KMT_{ct} + \Gamma X_c \times \eta_t + Prov_p \times \eta_t + \zeta_c + \eta_t + \epsilon_{ct} \quad (7)$$

Where *Soldier Death_{ct}* refers to the number of CCP's soldiers who were from county *c* and died in month *t*. $\ln(Soldier\ Death_{ct} + 1)$ is used as the dependent variable. L_{ct} is a dummy variable equal to 1 following the start of the land reform in county *c*. $Gini_c$ is the prior-reform Gini coefficient in land ownership in county *c*. dis_KMT_{ct} denotes the shortest distance between county *c* and KMT military bases in month *t*. X_c consists of a series of control variables. ζ_c and η_t refer to county and month fixed effects. $Prov_p \times \eta_t$ are province-month fixed effects. Standard Errors are clustered at the county level.

Table 3 gives the regression result of equation 7. Columns 1 and 2 test the coefficients α and β_1 . In Column 1, I only control for month-fixed effect and county-fixed effect. In column (2), I add the interactions between control variables and month-fixed effects. Then in column (3) the province-month fixed effect is added. The coefficient β_1 is insignificantly negative. In column (9) when the distance interaction is added, the result remains the same.

5.2 Specification II

Then I bring the triple interaction in the specification,

$$\ln Soldier Death_{ct} = \alpha L_{ct} + \beta_1 L_{ct} \times Gini_c + \beta_2 L_{ct} \times dis_KMT_{ct} + \beta_3 L_{ct} \times Gini_c \times dis_KMT_{ct} + \Gamma X_c \times \eta_t + Prov_p \times \eta_t + \zeta_c + \eta_t + \epsilon_{ct} \quad (8)$$

Table 3: Main Result I

VARIABLES	$\ln(\text{SoldierDeath}_{ct} + 1)$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
L	0.140*** (0.0485)	0.158*** (0.0512)	0.0719 (0.0508)	0.165*** (0.0350)	0.138*** (0.0356)	0.0574 (0.0369)	0.175*** (0.0480)	0.178*** (0.0512)	0.0689 (0.0512)
$L \times Gini (\beta_1)$	-0.102 (0.0973)	-0.244** (0.106)	-0.0462 (0.107)				-0.0508 (0.117)	-0.142 (0.115)	-0.0556 (0.116)
$L \times dis_KMT (\beta_2)$				-0.755*** (0.249)	-0.854*** (0.225)	0.0317 (0.237)	-0.686** (0.293)	-0.721*** (0.241)	0.0981 (0.262)
County FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
dis_KMT	N	N	N	Y	Y	Y	Y	Y	Y
$Controls \times Month FE$	N	Y	Y	N	Y	Y	N	Y	Y
$Prov FE \times Month FE$	N	N	Y	N	N	Y	N	N	Y
Observations	19,829	18,850	18,850	19,940	18,961	18,961	19,829	18,850	18,850
R-squared	0.170	0.263	0.329	0.174	0.264	0.331	0.173	0.264	0.329
Number of id	624	593	593	627	596	596	624	593	593

Table 4 gives the new results using equation 8. In column 3, β_1 is 0.333 and β_3 is -4.093. The opposite directions of the two coefficients imply that the impact of land reform on soldier deaths is not linear. For example, if the distance to KMT forces is small enough, like 0.04 (40 km), the effect of land reform $\beta_1 + \beta_3 \times dis_KMT$ will be $0.333 + (-4.093 \times 0.04) = 0.169$. But if the distance to KMT forces is long, like 0.1 (100 km), the effect will be $0.333 + (-4.093 \times 0.1) = -0.076$. The results show that only if counties were close enough (within 81 km) to the KMT forces, could land reform positively contribute to soldier deaths; otherwise, for counties far away from KMT forces (larger than 81 km), land reform could contribute less to soldier deaths.

How should we understand the results from Table 4? Based on column (9), the result of β_1 and β_3 means that if pre-reform land inequality is higher in a county, correspondingly farmers would receive a higher proportion of land in the land reform, and land redistribution contributes to explain soldier deaths; however, the effect of land redistribution on soldier deaths is decreasing in distance to KMT forces and could reverse to a negative effect. Specifically, for counties within 81 km to KMT forces, a higher pre-reform Gini in land ownership explains higher values in soldier deaths after land reform; but for counties far than 81 km from KMT forces, a higher pre-reform Gini in land ownership is associated with lower level of soldier deaths after the land reform.

Table 4: Main Result II

VARIABLES	$\ln(\text{SoldierDeath}_{ct} + 1)$		
	(1)	(2)	(3)
L	-0.0580 (0.0684)	0.00446 (0.0689)	-0.0840 (0.0682)
$L \times Gini$ (β_1)	0.559*** (0.169)	0.306* (0.164)	0.333** (0.167)
$L \times dis_KMT$ (β_2)	2.078*** (0.610)	1.370** (0.561)	2.107*** (0.570)
$L \times Gini \times dis_KMT$ (β_3)	-5.745*** (1.110)	-4.365*** (1.082)	-4.093*** (1.055)
County FE	Y	Y	Y
Month FE	Y	Y	Y
dis_KMT	Y	Y	Y
$Controls \times Month\ FE$	N	Y	Y
$Prov\ FE \times Month\ FE$	N	N	Y
Observations	19,829	18,850	18,850
R-squared	0.176	0.266	0.330
Number of id	624	593	593

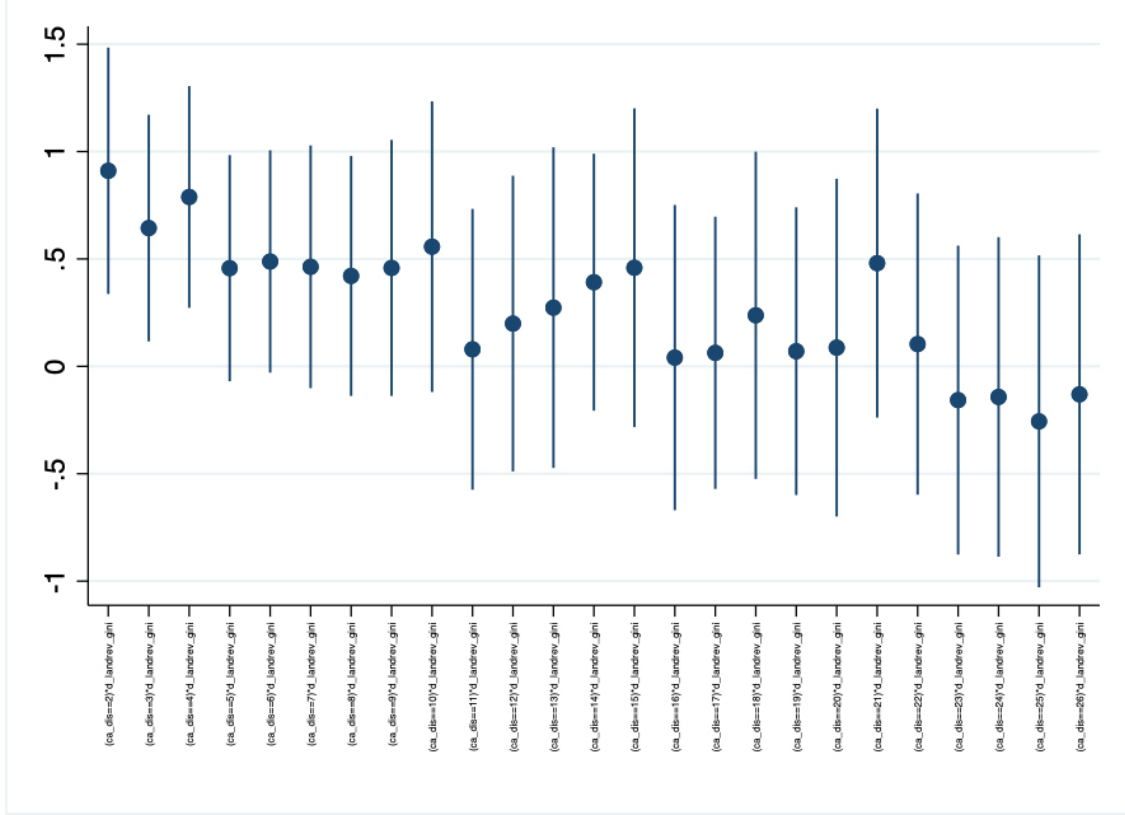
5.3 Specification III

To shed more light on the distance-based decreasing effect of the land reform, I extend the specification as,

$$\begin{aligned}
\ln \text{SoldierDeath}_{ct} = & \alpha L_{ct} + \beta_1 L_{ct} \times Gini_c + \beta_2 L_{ct} \times dis_KMT_{ct} + \\
& \sum_{i=10km}^{1000km} \beta_{3i} L_{ct} \times Gini_c \times 1_{ct}\{i-1 < dis_KMT_{ct} < i\} \\
& + \Gamma X_c \times \eta_t + Prov_p \times \eta_t + \zeta_c + \eta_t + \epsilon_{ct}
\end{aligned} \tag{9}$$

The graph presented below illustrates the findings. Notably, the coefficients for the triple interaction between the land reform dummy, pre-reform Gini, and distance dummies exhibit significant positivity when the distance measure falls within 100 km. However, these coefficients lose significance beyond the 100 km threshold, indicating the emergence of free-rider problems.

The specific distances of 81 km and 100 km may hold particular significance, possibly reflecting



the logistical capacity of both parties during the 1940s. It's worth noting that anecdotal evidence suggests that the Communist army was capable of traveling up to 75 km within a single day and night.

5.4 Robustness Check: the Reverse of KMT's Landlord Policy

By 1948, the KMT camp realized that “the livelihood of ignorant and unwashed peasants was in some fundamental way related to the debility of their own government and the dynamism of the Communists” (Eastman, 1984). In August 1948, the president of KMT, Chiang Kai-shek, declared that for areas that had been controlled by the CCP, if the KMT troops took them back, the KMT government would recognize the CCP-led land reform and no longer supported landlords' claim for land. Without military support by KMT, the homecoming legions can not capture a county and retaliate against farmers. Besides, the CCP had put efforts to eradicate the homecoming legions.

The Figure in the appendix show each player's decisions following the KMT's announcement.

Using backward induction, it appears as though farmers' property rights over land were permanent, but fighting resulted in death in battle, implying that the dominant strategy for farmers was to refrain from fighting. And the landlords' dominant strategy was to submit. Now distance and pre-reform inequality in land ownership (l in the model) would not affect farmers' decisions.

Table 5: Robustness Check: the Reverse of KMT's Landlord Policy

VARIABLES	$\ln(SoldierDeath_{ct} + 1)$					
	<i>Aug 1948 – Apr 1949</i>			<i>Aug 1948 – Dec 1949</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
L	-0.133 (0.222)	0.240 (0.357)	0.113 (0.283)	0.136 (0.145)	-0.0317 (0.169)	-0.0119 (0.186)
$L \times Gini$	0.909 (0.569)	-0.320 (1.010)	0.00741 (0.689)	0.242 (0.362)	0.507 (0.490)	0.701 (0.523)
$L \times dis_KMT$	-3.644*** (1.054)	-2.964** (1.169)	-2.590** (1.039)	-1.026** (0.515)	-0.599 (0.444)	-0.746 (0.469)
$L \times Gini \times dis_KMT$	1.826*** (0.524)	1.113** (0.557)	0.523 (0.715)	0.941*** (0.194)	0.501** (0.228)	0.381 (0.249)
County FE	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y
dis_KMT	Y	Y	Y	Y	Y	Y
$Controls \times Month\ FE$	N	Y	Y	N	Y	Y
$Prov\ FE \times Month\ FE$	N	N	Y	N	N	Y
Observations	5,142	4,894	4,894	10,416	9,920	9,920
R-squared	0.309	0.411	0.493	0.286	0.396	0.485
Number of id	655	624	624	661	630	630

Table 4 shows the result of equation (7) following the reversal of the KMT landlord policy. Columns (1) to (3) extend from the policy reversal until April 1949, when the CCP crossed the Yangtze River, signaling the CCP's intention to take over the whole mainland of China. Columns (4) to (6) extend the time span to December 1949, the end of the war. When all controls and fixed effects are included, the coefficients of the triple interaction $L \times Gini \times disKMT$, as well as the coefficients for $L \times Gini$, remain insignificant. The results indicate that land transfer to farmers no longer accounts for troop deaths, which is consistent with the model's prediction.

6 Mechanism

6.1 Class Struggle

Section 3 provides the theoretical framework for why land reform was effective in war mobilization only if counties were near KMT forces. The key point is that the class struggle between farmers and landlords was intense mainly in these places, because landlord retaliation must be backed up by KMT troops.

The results are shown in the table below after the outcome variable is replaced with a dummy variable indicating if local landlords organized homecoming legions to attack this county. The coefficients of two interactions and the triple interaction were all significant in column 3 and followed the same pattern as in Table 3. The findings suggest that if land inequality was larger before the reform and then fell after the reform, landlords were more inclined to pursue vengeance. Furthermore, where counties were close to the KMT forces, the influence of pre-reform land inequality on landlord retaliation was greater. This stands to reason because higher pre-reform inequality meant that landlords lost a larger share of their land, and if they won a battle, they could reclaim it. Landlords were more likely to organize the homecoming legions because KMT forces provided military assistance to them.

Table 6: Mechanism: Class Struggle

VARIABLES	Attack by the homecoming legions		
	(1)	(2)	(3)
L	-0.0179 (0.0140)	-0.0426*** (0.0155)	-0.0599*** (0.0170)
$L \times Gini$	0.107*** (0.0320)	0.153*** (0.0352)	0.170*** (0.0375)
$L \times dis_KMT$	0.0190 (0.113)	0.144 (0.115)	0.304** (0.148)
$L \times Gini \times dis_KMT$	-0.379* (0.204)	-0.652*** (0.216)	-0.821*** (0.264)
County FE	Y	Y	Y
Month FE	Y	Y	Y
dis_KMT	Y	Y	Y
$Controls \times Month\ FE$	N	Y	Y
$Prov\ FE \times Month\ FE$	N	N	Y
Observations	19,829	18,850	18,850
R-squared	0.014	0.054	0.086
Number of id	624	593	593

6.2 Alternative Explanations Unsupported by Evidence: Opportunity Cost of Fighting

One alternative hypothesis is that counties next to KMT troops are not associated with increased chances of class conflict, but rather with a decreased opportunity cost of fighting. For instance, if counties bordering KMT troops have a lower land-to-population ratio, they will receive small-scale farms during land reform. Thus, the opportunity cost of fighting would be low relative to the benefit of remaining in the community and cultivating one's own farm. However, if counties remote from the KMT troops have a high land endowment, farmers would receive large-scale farms following the land reform, increasing the opportunity cost of fighting. The idea of opportunity cost casts doubt on the mechanism of class struggle.

The link between land per capita and distance to KMT troops is seen in the graph below, and it is positive. Given that agriculture in China at the time lacked modern equipment and fertilizer,

land ownership per capita may have been a proxy for yield per capita. Additionally, I examine the relationship between distance and land value per capita. The value of land is determined by multiplying the area by the land price. In 1944, the KMT government conducted a survey that documented agricultural land and land prices in each county. Land value per capita appears to be adversely associated with the distance measure. This is unsurprising given the KMT's dominance of economic hubs, which resulted in a significantly higher property price in counties adjacent to major cities (also KMT military bases).

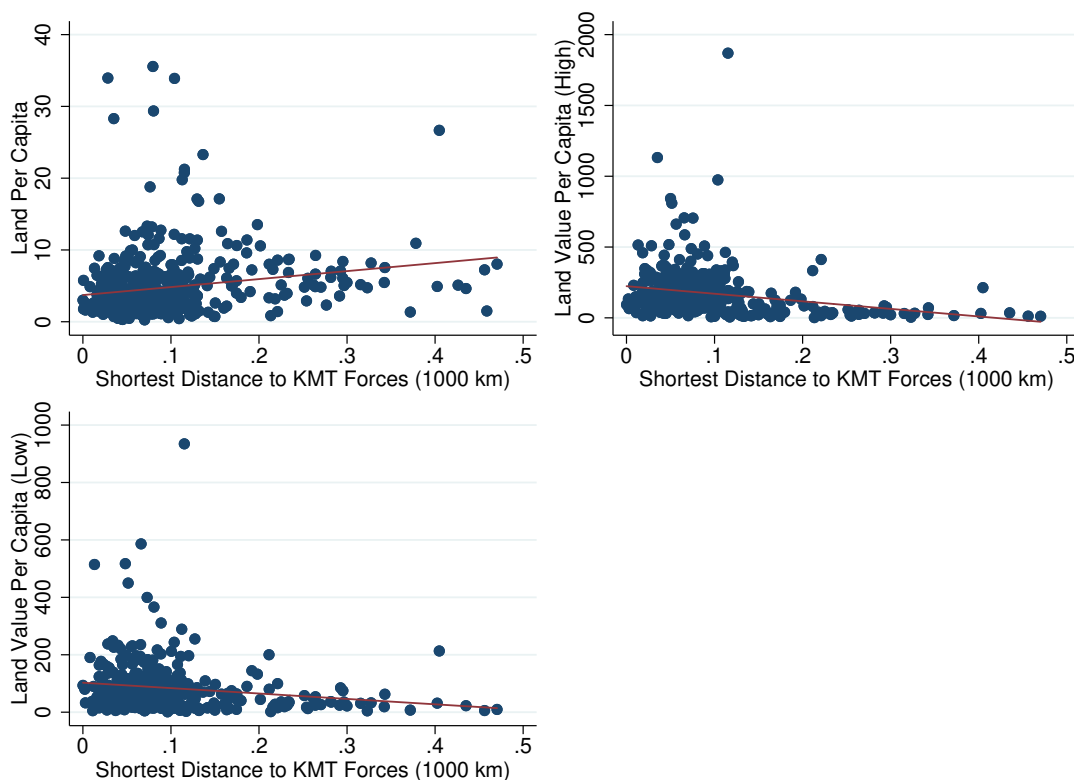


Figure 12: The Correlation between Land Per Capita and Distance to KMT Forces (July 1948)

To determine if the opportunity cost hypothesis adequately explains the findings, I substitute the distance measure in the regression with land per capita in interaction terms. I use land per capita for the first two columns, land value per capita with the highest estimation for the third and fourth columns, and land value per capita with the lowest estimation for the last two columns. It appears that counties with far more land per capita contributed less to soldier deaths following land

reform, confirming the argument that a large opportunity cost discourages fighting; nevertheless, the coefficient of the interaction term $L \times \text{land per capita}$ is significant only in column (4). Once again, the triple interaction term is negligible in all specifications. The table below confirms that the opportunity cost of fighting cannot account for the pattern of soldier deaths observed in the main results.

Table 7: Mechanism: Opportunity Cost

VARIABLES	$\ln(\text{Soldier Death}_{ct} + 1)$					
	land		land value (high)		land value (low)	
	(1)	(2)	(3)	(4)	(5)	(6)
L	0.055 (0.055)	-0.010 (0.231)	0.100 (0.073)	0.170** (0.078)	0.081 (0.074)	0.158** (0.078)
$L \times Gini$	0.0161 (0.124)	0.484 (0.751)	-0.150 (0.142)	-0.362** (0.168)	-0.138 (0.143)	-0.366** (0.178)
$L \times \text{land per capita}$	-0.0001 (0.006)	-0.019 (0.014)	-7.53e-05 (0.0001)	-0.0006* (0.0003)	-7.53e-05 (0.0002)	-0.0006* (0.0006)
$L \times Gini \times \text{land per capita}$		0.056 (0.046)		0.0016* (0.001)		0.003 (0.002)
County FE	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y
dis_KMT	Y	Y	Y	Y	Y	Y
$Controls \times Month FE$	Y	Y	Y	Y	Y	Y
$Prov FE \times Month FE$	Y	Y	Y	Y	Y	Y
Observations	17,780	9,350	11,009	11,009	11,009	11,009
R-squared	0.333	0.487	0.345	0.345	0.345	0.345
Number of id	563	592	344	344	344	344

6.3 Alternative Explanations Unsupported by Evidence: coercion

Another alternative hypothesis is that the CCP might put more effort into counties near KMT troops. There's evidence showing that the CCP forced farmers to join the war (see Figure B.3). If so, soldiers from counties near to the KMT troops must fight because of coercion which thus resulted in higher death numbers. I collect the number of CCP members from county gazetteers and use CCP members and their growth rate to measure the strength of coercion across different counties. Table 8 shows the results. Only in Column 4, I find that counties with greater CCP

members' growth during the period 1945-1949 exhibit higher death numbers following the land reform; however, the triple interaction term remains insignificant. The results suggest that coercion was not a strong mechanism to explain the pattern we found.

Table 8: Mechanism: coercion

VARIABLES	$\ln(\text{Soldier Death}_{ct} + 1)$					
	ccp members		ccp growth (yearly)		ccp growth (average)	
	(1)	(2)	(3)	(4)	(5)	(6)
L	0.229 (0.199)	-0.725 (0.963)	0.216 (0.162)	-0.277 (0.287)	0.0553 (0.0578)	-0.0661 (0.312)
$L \times Gini$	-0.167 (0.210)	1.445 (2.328)	-0.289 (0.366)	0.168 (0.928)	-0.143 (0.127)	0.113 (0.917)
$L \times ccp$	-0.0145 (0.0232)	0.110 (0.128)	0.0165 (0.012)	0.148* (0.083)	-0.0009 (0.009)	-0.127 (0.379)
$L \times Gini \times ccp$		-0.183 (0.283)		-0.285 (0.174)		0.506 (0.906)
County FE	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y
dis_KMT	Y	Y	Y	Y	Y	Y
$Controls \times Month\ FE$	Y	Y	Y	Y	Y	Y
$Prov\ FE \times Month\ FE$	Y	Y	Y	Y	Y	Y
Observations	6,091	6,987	2,714	2,585	13,198	6,646
R-squared	0.406	0.437	0.444	0.511	0.347	0.509
Number of id	404	554	144	193	401	422

7 Conclusion

Land reform studies in the past have tended to focus on property rights and agricultural output, with few emphasizing the political economy of land reform (Galor, Moav, and Vollrath, 2009). China's land reform began before the Communist Party assumed power in the country, and its goal was not to enhance efficiency or equality. Rather, it was a short-term plan for the CCP to recruit tenant farmers into its army. I look at how land redistribution affected war mobilization. I don't find that providing more land was beneficial in recruiting farmers throughout the war. Only when counties were close to KMT forces did the mobilization become successful. However, since the rise of the free rider problem, land reform discouraged farmers from battling in distant locations. The

pattern resulted from class struggles between farmers and landlords. Landlords, who lost nearly all of their lands as a result of the reform, seek vengeance by forming the homecoming legions. In regions close to KMT forces, the homecoming legions unleashed a barrage of retaliation.

Civil wars have long been disregarded in most studies, which focus on inter-state conflicts. The theoretical model and empirical findings both contribute to a novel understanding of war mobilization in civil war situations. The paper also explains why the Communist Party was able to entice millions of farmers to battle and conquer China in 1949. Despite the fact that I am studying the Chinese Civil War, the conclusion of this paper might be applied to other situations. In the case of Vietnam, the same story applies.

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Appendix

A Land distribution in early twentieth-century China

Land inequality in early twentieth-century China has remained a controversial topic. Given the CCP's emphasis on class struggle, the bulk of land ownership statistics were classified according to social classes based on land holdings: landlord, rich farmer, middle farmer, poor farmer, and landless farmer. For propaganda purposes, the CCP claimed that the landlords and the rich farmers, who accounted for 10% of the population, held 70% to 80% of China's land (Mao 1947; Liu 1950). This official assertion had become standard in Chinese Communist publications and was cited elsewhere (Hinton 1966), while the original source remained unknown.⁴ According to the 1949–1952 Land Census, landlords and rich farmers accounted for 9.4 percent of the population while controlling 51.9 percent of land prior to the land reform (Chinese Academy of Social Sciences 1991). However, studies by historians demonstrated that the CCP exaggerated the concentration in land ownership. Long and He (2018) determined, based on land census data from each province, that the proportion of land held by landlords and rich farmers was 30% in southern provinces but substantially lower in northern regions.

Eralier in 1930s, massive land surveys had been conducted by scholars and the KMT government (Buck 1937; for more, see the review by Esherick (1981)). All of the statistics for the 1930s divide farmers into owner-cultivators, tenants, and owner-tenants (tenants who also own and cultivate some land of their own). Of these surveys, Buck's was independent conducted and thus faithful. According to Buck's survey, the share of owner-cultivator, tenant households and owner-tenant was 44%, 33% and 23%, implying that at least 67% farmers had their own land.⁵ Land surveys conducted by the KMT government and other scholars between 1918 and 1937 show similar percentages (Perkins 1969; Esherick 1981).

Additionally, historians discover that there was no tendency toward concentration in terms of land ownership. Mayers (1970) examined land distribution in villages in Hebei and Shandong from 1880 to 1937 and discovered that land distribution either stayed relatively steady or became more equal. Li (1933) conducted a survey in Dingxian county, Hebei province, which matches up the pattern of dispersion.

In a word, most studies support that rural China in early twentieth century consisted of "a multitude of smallholders whose relative fortunes were constantly rising and falling; a society in which the typical landlord owned only a few acres more than his poorest neighbours" (Elvin, 1973).

⁴The numbers could be traced back to estimates made by the Land Commission of the 1927 Wuhan Nationalist (KMT) Government, in which Mao Zedong was the leader.

⁵The data derives from his agriculture survey. Based on his farm survey, the three shares were 54%, 17%, and 29%, implying that 83% farmers had their own land. Buck's data had a bias in the direction of wealthier households since the survey was conducted by his students in their hometowns, who were from a small sample of rich households in China.

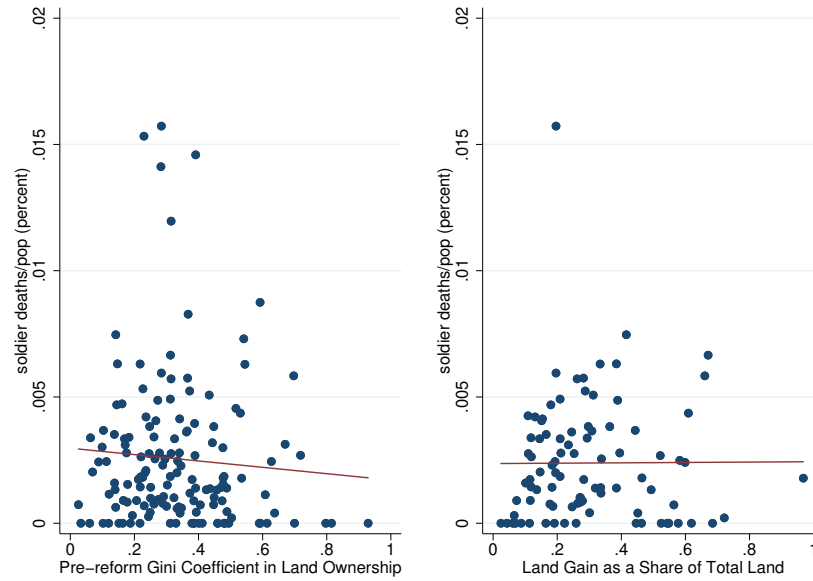


Figure A.13: The Correlation between Land Gain and Soldier Death Rates

Notes: Graphs are bin-scatters of soldier death rates and pre-reform Gini Coefficient (left), and log soldier deaths and land gain for farmers (right); red lines are linear fits.

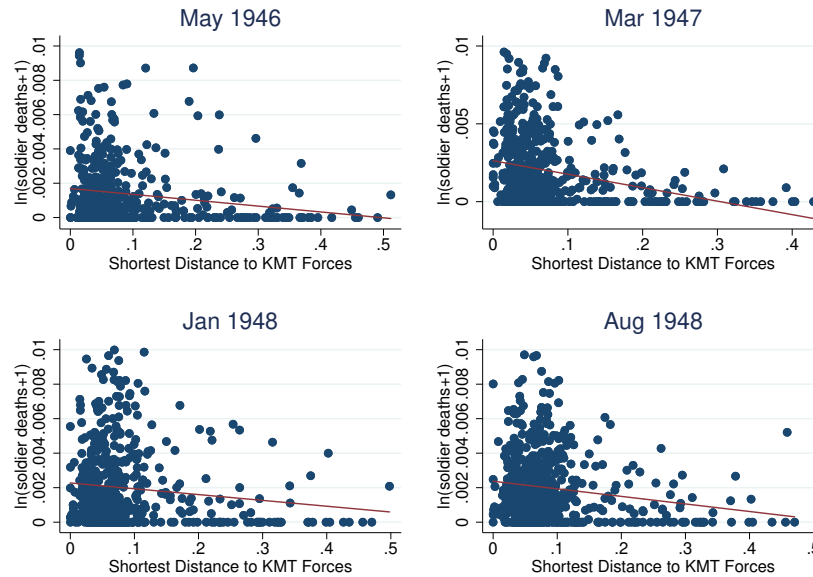


Figure A.14: The Correlation between Shortest Distance to KMT Forces and Soldier Deaths

Notes: Graphs are bin-scatters of soldier death rates and distance to KMT forces; red lines are linear fits.

B Locations of KMT Military Forces

The map below illustrates the shifting positions of the KMT's armed troops. Zhang and Liu (2007) collected the locations of the KMT's one hundred corps (Jun). When Japan proclaimed its surrender in August 1945, the KMT forces were concentrated in the southwest. The US lent its ships and planes to assist the KMT in transporting its soldiers to North China and Manchuria. The distribution of the KMT's forces remained relatively stable until January 1949, when the CCP's army crushed all forces in the North. By the end of 1949, the KMT's mainland forces had been eliminated or expelled to Taiwan and Myanmar.

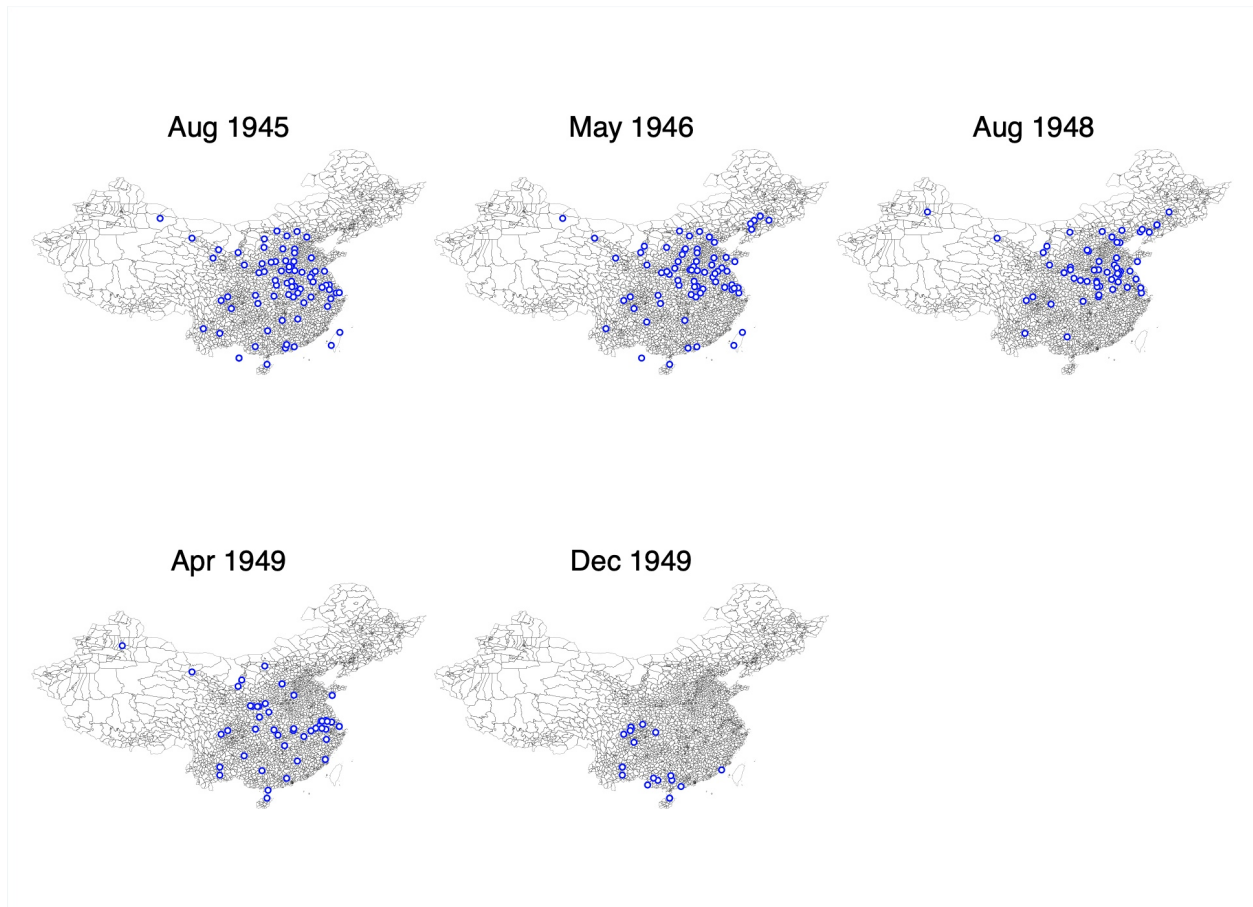


Figure B.1: Distribution of KMT Military Forces

Source: Zhang and Liu 2007.

The march of four KMT corps is depicted on the map below. For example, the New 6th Corps was stationed in Nanjing in August 1945 and moved to Shenyang in February 1946. Finally, it was destroyed in Heishan County in October 1948, at the end of the Liaoshen campaign.

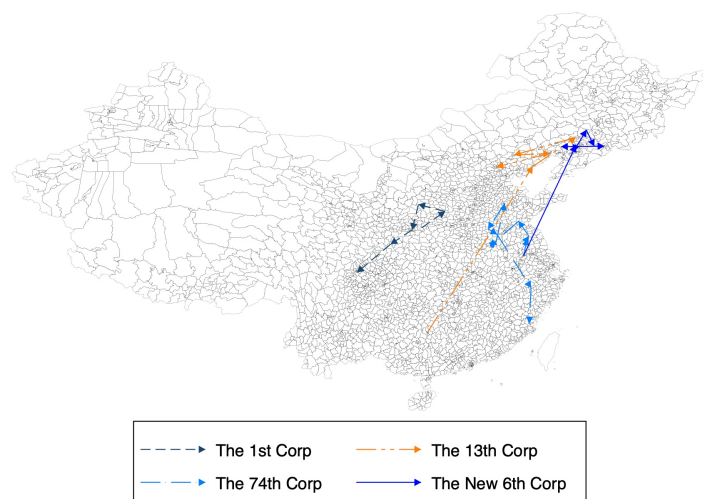


Figure B.2: March of Four KMT Corps

Source: Zhang and Liu 2007.

Table B1: Main Result, all 2200 counties, balanced panel

VARIABLES	$\ln(\text{Soldier Death}_{ct} + 1)$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
L	0.514*** (0.0371)	0.252*** (0.0334)	0.468*** (0.0245)	0.261*** (0.0228)	0.502*** (0.0367)	0.252*** (0.0333)	0.377*** (0.0539)	0.178*** (0.0456)	0.137*** (0.0487)
$L \times Gini$	-0.341*** (0.0748)	-0.135** (0.0670)			-0.112 (0.0988)	0.0303 (0.0827)	0.154 (0.129)	0.197* (0.108)	0.072 (0.114)
$L \times dis_KMT$			-1.202*** (0.142)	-0.688*** (0.128)	-1.075*** (0.199)	-0.716*** (0.162)	0.360 (0.507)	0.118 (0.402)	0.553 (0.353)
$L \times Gini \times dis_KMT$							-2.384*** (0.743)	-1.465** (0.637)	-1.559*** (0.552)
$\ln(\text{Soldier Death}_{c,t-1} + 1)$		0.270*** (0.010)		0.269*** (0.010)		0.269*** (0.010)		0.268*** (0.010)	0.242*** (0.010)
dis_KMT			-0.235*** (0.046)	0.0664 (0.041)	-0.238*** (0.045)	0.0673 (0.041)	-0.247*** (0.045)	0.0600 (0.041)	-0.152** (0.059)
County FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
$\text{Controls} \times \text{Month FE}$	N	Y	N	Y	N	Y	N	Y	Y
$\text{Prov} \times \text{Month FE}$	N	Y	N	Y	N	Y	N	Y	Y
Observations	81,363	72,684	81,363	72,684	81,363	72,684	81,363	72,684	72,684
R-squared	0.099	0.211	0.103	0.212	0.103	0.212	0.104	0.212	0.270
Number of counties	2,199	2,019	2,199	2,019	2,199	2,019	2,199	2,019	2,019

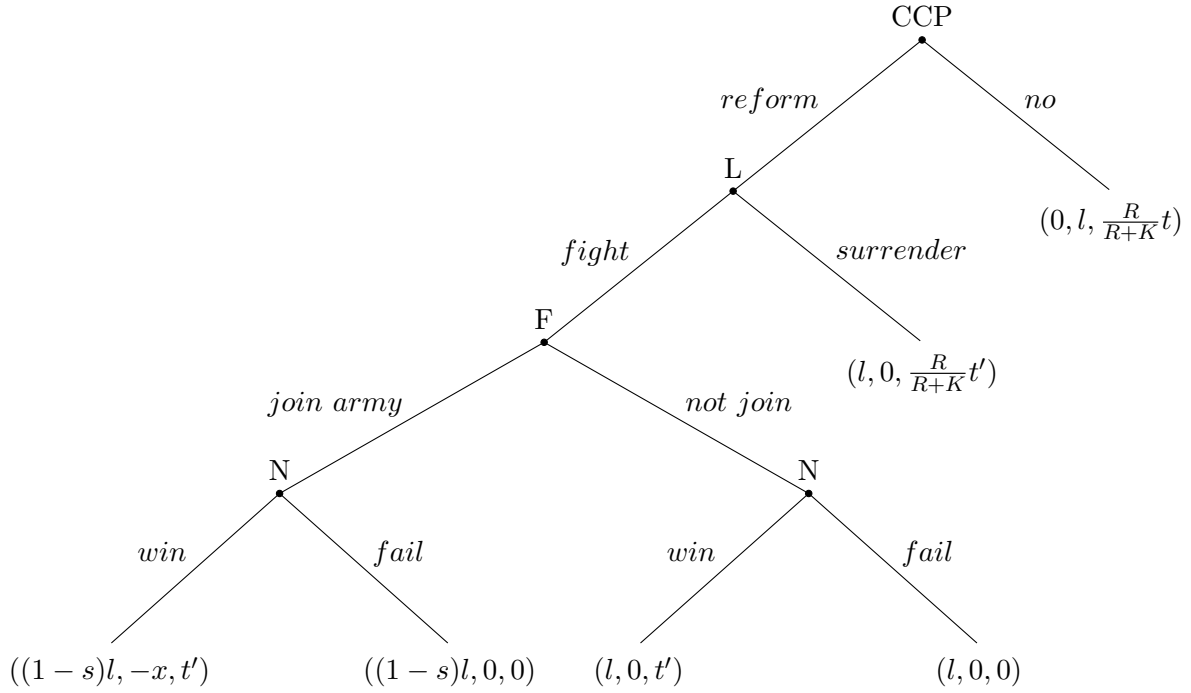
淮海战役在1948年冬天打响以后,接上级指示,张申负责组织尉氏、长葛和扶沟等三个县的地方党组织,发动群众组成运输队和担架队,支援前线部队作战。他们共组织了600副担架,4个人抬一个。这支2000多人的民工队伍以党团员为骨干,包括很多先进分子和积极分子,浩浩荡荡开往前线。“走到太康一带,谣传说前面有蒋介石的飞机在轰炸,一些民工就吓得脱离队伍逃跑了。”张申顿了顿说,“焦裕禄听说后非常生气,领着一些精干党员追赶,很快就把这些逃跑的民工抓了回来,狠狠地训了一顿。”

Figure B.3: coercion

Source: Zhang 2014.

C KMT's Policy Reverse

The figure below illustrates each player's decisions following the KMT's announcement that it would no longer assist landlords in reclaiming their land. In any case, landlords cannot get land, but fighting may result in severe punishment for themselves or their families. Using backward induction, it appears as though farmers' property rights over land were permanent, but fighting may result in death in battle, implying that the dominant strategy for farmers is to refrain from fighting. And the landlords' dominant strategy is to submit.



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