Reshaping Partition into Partnership:
Forced Diversity and Development in Rural China[*]

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Abstract

What is the impact of ethnic diversity on cooperation and development? This paper provides micro-level evidence from Communist China's rural forced integration campaign during the 1950s-1980s, which brought together farmers from diverse ethnic backgrounds to live and work collectively in agriculture and public goods projects. Using a regression discontinuity design, the findings reveal that institutional context shapes the effects of ethnic diversity on cooperation and development. During the campaign, forced ethnic diversity had a negative impact on interethnic marriage rates and GDP per capita. However, after the campaign ended, these effects shifted to positive. In the long run, the experience of ethnic diversity due to the forced integration campaign led to increased voluntary participation in interethnic farmer cooperatives, which grew larger and more efficient in production. The positive effects are attributed to strengthened interethnic networks and reduced inequality in human capital accumulation. Marketization, as a key institutional change, played a crucial role in transforming the impact of ethnic diversity from negative to positive. This paper highlights the importance of institutions in shaping the effects of ethnic diversity.

1 Introduction

Diversity has long been recognized as a crucial subject in economics (Easterly and Levine, 1997; Alesina et al., 1999, 2003). In particular, ethnic diversity is an important phenomenon around the world that has received lots of attention (Collier, 2001; Alesina and La Ferrara, 2005; Desmet et al., 2017). How does diversity influence cooperation and development? The answer to this question remains ambiguous in theory. On the one hand, ethnic diversity may lead to divergent preferences, hostility between groups, and inter-group conflict, which can hinder cooperation (Alesina et al., 1999; Ray and Esteban, 2017). On the other hand, ethnic diversity may positively affect cooperation due to the complementarities in production among different groups and the diversity of skills, experiences, and ideas that foster innovation (Ashraf and Galor, 2013). The empirical evidence on this theoretical debate also shows conflicting results[1]. Therefore, a unified framework is needed to reconcile these conflicting findings. Notably, the existing literature seldom captures how these effects evolve over time or examines their variation across different contexts. A particularly important yet often overlooked factor is institutions, which have been identified in the economics literature as critical in shaping incentives, behaviors, and economic outcomes (North, 1991; Acemoglu et al., 2014; Acemoglu and Johnson, 2005). The impact of ethnic diversity may differ significantly across varying institutional settings.

This paper examines how ethnic diversity influences cooperation and development under different institutional contexts by studying Communist China's forced integration campaign from the 1950s to the 1980s that enhanced rural ethnic diversity by forcing integration among different ethnic groups. After taking power in 1949, the Chinese Communist Party (CCP) established new rural administrative units called "*administrative villages*" (which were also named "*brigades*" later) to control rural residents directly. This system compelled people of different identities - particularly those of different ethnicities - to integrate by resettling to live closely and working collectively in administrative villages under the leadership of CCP cadres for agricultural production and public goods construction. The system aimed to discard traditional identities of ethnicity, lineage, and clan, and establish administrative and ideological integration of

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[1]See Alesina et al. (2016) for a review.

people. By doing so, the party wished to promote efficiency in agriculture and boost rural development. The system lasted for around 30 years, which finally ended in 1984 when China abandoned the system and granted people some individual freedom of economic activities. Although the campaign has often been blamed for causing conflicts and leading to no efficiency gain, few have provided rigorous evidence on its effect on interethnic cooperation and development, in particular in the long run (She and Chen, 2000; Su, 2011). We also know little about how the effect changes over time under different institutional contexts. In this paper, I examine how the ethnic diversity caused by the forced integration campaign influences interethnic cooperation and economic development over the long term.

To identify the causal relationship, I make use of an arbitrary rule in the design of the forced integration campaign which provides an exogenous variation of local ethnic diversity to set up a regression discontinuity design (RDD). During the execution of the campaign, the Chinese central government defined two types of regions. A county was defined as a "*Mountainous County*" if over 80% of its terrain is mountainous; otherwise, it was defined as a "*Plain County*". The campaign allowed each administrative village to contain a smaller number of naturally formed communities (usually called "*natural villages*") in the Mountainous Counties than in the Plain Counties. As a result, the Mountainous Counties tended to experience a weaker policy shock: within each administrative village, the diversity of farmers' traditional identities would be smaller. Therefore, I am able to identify the causal impact of the campaign by comparing the counties with a mountainous ratio (MR) just below 80% (stronger forced integration, and thus higher ethnic diversity) and those with a MR just above 80% (weaker forced integration, and lower ethnic diversity).

I digitized and hand-collected archival data on the ethnic components within around 10,000 administrative villages located in counties with MR close to the 80% cutoff during the forced integration campaign (around the early 1970s). Using this novel data, I show that the RDD setting is valid. A larger number of natural villages and higher ethnic diversity are witnessed within administrative villages located in counties with MR just below 80% than those located in counties with MR just above 80%. In addition, there is no sorting issue around the cut-off point because of the lack of significant change in sample density. Relevant geographical and social characteristics at the baseline change

smoothly at the cut-off point.

To obtain precise micro-level measurements of voluntary interethnic cooperation and local development, I focus on interethnic cooperation within voluntarily formed farmer cooperatives (hereafter referred to as co-ops) in China and assess their efficiency outcomes. Co-ops represent a key form of cooperation essential for agricultural development and promoting equality (Montero, 2022; Macchiavello, 2022; Lal, 2023). Meanwhile, the rapid growth of co-ops in China has become a remarkable phenomenon, significantly impacting rural development (Fock and Zachernuk, 2006; Eum, 2017). Drawing on administrative data from a government publicity system, I constructed a comprehensive dataset covering around 800,000 co-ops established in China since 1984. Key co-op-level data includes location, year of establishment, capital, inputs, outputs, and member lists. This dataset enables me to observe the ethnic composition of each co-op's membership, providing a direct measure of voluntary interethnic cooperation. It also allows me to assess the efficiency outcomes associated with ethnic diversity by analyzing each co-op's output per capita and total factor productivity (TFP).

In the baseline analysis, I find that greater ethnic diversity within administrative villages during the forced integration campaign leads to increased ethnic diversity within co-ops in the long run (1984-2019), suggesting that farmers were more willing to voluntarily engage in interethnic cooperation after the end of the forced integration campaign. The effect is not only statistically significant but also economically meaningful: a one-standard-deviation increase in ethnic diversity within administrative villages during the campaign results in a 1.56-standard-deviation increase in ethnic diversity within co-ops. Regarding the dynamics of the effect, I observe that its economic and statistical significance has grown since 1984, peaking during the period 2015-2019. Moreover, I also find gains in the economics of scale and efficiency. The results show that co-ops in counties with higher ethnic diversity within administrative villages during the campaign tend to be significantly larger in terms of both membership and capital. Ethnic diversity in co-ops is also associated with higher efficiency, since these co-ops also exhibit higher productivity, as measured by output per capita and TFP.

To demonstrate that the positive effects on interethnic cooperation and efficiency observed in co-ops have broader implications, I examine the campaign's impact on additional outcomes related to interethnic relations and local development. Using

individual-level census data and hand-digitized historical records, I construct two alternative measures: interethnic marriages from 1950 to 2010 reflecting interethnic relationships, and county-level GDP per capita from 1950 to 2019 reflecting local development. A key advantage of these outcomes is their extended time span, allowing me to observe the campaign's impact on interethnic relationships and local development both during and after its implementation. Interestingly, my findings reveal a reversed effect over time. During the campaign, the forced ethnic diversity had a negative impact on both interethnic marriage rates and GDP per capita. However, following the end of the campaign, these effects reversed, showing positive long-term outcomes. This long-term improvement aligns with the positive effects on cooperation and efficiency found in my baseline analysis of co-ops, supporting its reliability and representativeness. Additionally, the findings highlight that the effects of forced integration can evolve and even reverse over time, warranting further attention and explanation.

I next explore the mechanisms behind these findings. I start by showing that the extended interethnic networks and reduced interethnic inequality are the drivers of my results. Firstly, I find that the forced integration campaign increased the likelihood that farmers would trust individuals from outside of their own groups. This heightened trust in strangers facilitated cooperation between people of different ethnicities in economic activities, as evidenced by increased interactions in both the rural labor and land markets. Second, I find that the forced integration campaign significantly reduced interethnic educational inequality. This suggests that the campaign helped to equalize educational opportunities across ethnic groups, particularly for younger generations raised in more integrated environments. By narrowing the educational gap between ethnic groups, the campaign contributed to more efficient human capital allocation, enhancing the ability of individuals from different ethnicities to collaborate in co-ops and improving overall co-op efficiency in the long term.

A remaining puzzle is why the campaign initially had a negative effect but showed positive effects in the long run. I attribute these changes to a major institutional shift since 1979: Chinas transition from a centrally planned economy to a market-oriented one. My argument is that the positive changes in interethnic networks and equality only matter when the right institutions are in place. Marketization shifted the costs and benefits of ethnic diversity by enabling mutual economic incentives and recognizing skills

4

unique to different groups, previously undervalued in a centrally planned economy. To explore this, I utilize the staggered establishment of Special Economic Zones (SEZs) across counties in China. SEZs, characterized by liberalized regulations and preferential market-oriented policies, played a pivotal role in accelerating marketization within the regions they encompassed. Consequently, the establishment of SEZs introduces variations in the timing of marketization. The results indicate that the forced integration campaign's effects on co-ops' ethnic diversity, size, and efficiency were overall negative before SEZ establishment, but shifted to positive afterward, underscoring the critical role of institutional change in shaping the impact of ethnic diversity.

This project contributes to several branches of literature. First, this project contributes to the literature on the economic impact of diversity. Despite the cross-country analysis (Alesina et al., 2016), rigorous micro evidence on this question remains limited (Dippel, 2014; Marx et al., 2021; Lowe, 2021). Relying on experiments or firm context, most of the relevant studies that provide micro evidence focus on the short-run impact. The studies that pay attention to the long-run effect seldom provide evidence on how the effect changes over time. This paper adds to this literature by providing causal evidence that documents the change in the economic impact of ethnic diversity over time under different institutional contexts. I highlight the fact that institution is a key factor that shapes the economic impacts of ethnic diversity.

Second, this project contributes to the literature on programs aimed at nation-building. Understanding what fosters or hinders nation-building has generated significant discussion[2]. Recent studies explore the effects of public media (Blouin and Mukand, 2019), bureaucratic assignments (Okunogbe, 2018), schooling (Bandiera et al., 2019), shared religious experiences (Clingingsmith et al., 2009), external threats (Dell and Querubin, 2018), and forced migration (Bazzi et al., 2019; Carlitz et al., 2022) on intergroup tolerance and national identity. This project contributes to this literature by examining how a forced integration campaign impacts nation-building under different institutional contexts.

Third, this paper adds to the discussion on cooperative property or, more broadly, relational contract. Recent literature has shown the positive effect of cooperative property on efficiency and equity (Montero, 2022; Lal, 2023) It is therefore important to

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[2]See Paluck et al. (2019) for a review.

explore the drivers of participation in cooperative property or relational contract (Macchiavello, 2022). While some recent literature has emphasized the role of formal market institutions: e.g., enforcement, competition (Casaburi and Macchiavello, 2015, 2019), we know relatively little about the role of informal institutions, e.g., trust, intergroup relationship (Macchiavello, 2022). This project provides relevant empirical evidence by showing how a forced integration campaign can boost cooperative development by altering interethnic relationships.

Fourth, this paper also contributes to the discussion on the long-term effects of government planning programs. The debate over government planning versus free-market approaches has a long history in economics (Bardhan and Roemer, 1992, 1993; Shleifer and Vishny, 1994; Stiglitz, 1996), with much of the literature focusing on the disadvantages of government planning, such as limited incentives, weak property rights protection (Boettke, 2005; Megginson and Netter, 2001; Djankov and Murrell, 2002; Estrin et al., 2009), and inadequate local information (Hayek, 1945; Huang et al., 2017). This paper contributes by examining how government planning programs may impact economic development in the long term, even after they have concluded. Specifically, it highlights how government planning can enhance market efficiency by altering intergroup relationships.

Finally, this project is loosely related to the literature on the political economy of administrative divisions (Alesina and Spolaore, 1997; Bolton and Roland, 1997; Michalopoulos and Papaioannou, 2013; Ko et al., 2018). Most of these studies focus on national-level variation leaving within-nation analysis limited (Blanchard and Shleifer, 2001; Treisman, 2007). In the context of China, scholars have paid attention to the provincial boundary and capital settings (Guy, 2015; Sng et al., 2018; Bai and Jia, 2023). However, few have focused on a more local setting. By examining the administrative village system - the lowest administrative level in China and a critical component of the forced integration campaign - I provide relevant evidence to address this gap.

The rest of this paper is organized as follows. Section 2 introduces the historical background. Section 3 summarizes the data and the variables used in the empirical analysis. The empirical strategy and evidence of its validity are described in Section 4. Section 5 provides the main results of the effects on interethnic cooperation and local development. Section 6 presents evidence on the mechanisms, highlighting the

development of interethnic networks and equality, and illustrating the crucial role of institutional changes. Section 7 offers the conclusion.

2   Historical Background

This section provides the historical context. First, I offer an overview of the forced integration campaign in rural China. Next, I explain the specific policy assignment rules that shaped local ethnic diversity. Finally, I discuss historical narratives on how the campaign impacted interethnic cooperation and local development.

2.1   The Forced Integration Campaign

China, the world's most populous country with over 1.4 billion people, is home to remarkable ethnic diversity. Officially, China recognizes 56 distinct ethnic groups, with the Han Chinese forming the majority and 55 minority groups contributing to the nation's rich cultural mosaic[3] (Zang, 2015). As illustrated in Figure A.1, these ethnic groups are geographically dispersed across diverse terrains, with minorities primarily concentrated in border regions such as Xinjiang, Tibet, Inner Mongolia, and Guangxi, as well as the mountainous areas of southwestern provinces like Yunnan and Guizhou[4] (Poston Jr and Jing, 1992; Zang, 2015). The ethnic groups exhibit significant differences in culture, language, religion, and other social characteristics (Xu and Wang, 2007). Each group has its own distinct traditions, festivals, and lifestyles, shaped by unique historical and environmental factors.

Historically, ethnic groups in China were relatively isolated from one another, with limited interaction. Prior to the Chinese Communist Party (CCP)'s rise to power in 1949, rural China operated without direct central government control[5], and local com-

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[3]During the early 20th century, Chinese ethnologists and policymakers began categorizing various groups within the country's vast territory. After the founding of the Peoples Republic of China in 1949, a formal ethnic classification project was launched, combining field research, self-identification, and government verification. This process, completed in the early 1950s, established the current framework of recognized ethnic groups (Crossley, 1990; Harrell, 2012; Zang, 2015).

[4]Readers interested in the distribution of ethnic minorities in the People's Republic of China can explore the Interactive Map of Minorities in China, published by The New York Times on July 10, 2009. It is available at: https://archive.nytimes.com/www.nytimes.com/interactive/2009/07/10/world/20090711-xinjiang.html?_r0.

[5]Figure 2 illustrates that, throughout imperial China's long history prior to 1949, the county level represented the lowest administrative tier under the direct authority of the central government, with

munities were organized around "**natural villages**." These villages emerged organically, shaped by shared ethnicity, kinship, and familial ties, rather than by government planning (Brown and Johnson, 2015). Within natural villages, residents typically shared the same ethnicity, language, surname, and cultural traditions, fostering tightly knit communities. This living arrangement meant that most interactions took place within natural villages and, consequently, within the same ethnic group. Geographic barriers such as mountains, deserts, and rivers, along with distinct social traditions, economic practices, and limited political integration, further reduced inter-group interaction, leaving many ethnic groups relatively isolated (Harrell, 2012; Zang, 2015).

During the 1950s, the CCP launched a forced integration campaign in rural China, making substantial efforts to bring the state and its ideology into direct contact with villagers. Figure 1 outlines the timeline of these policy changes. As depicted in Figure 2, a new administrative structure, known as the "**Administrative Village System**" (AVS), was introduced as the lowest tier of administration. These "**administrative villages**"[6] were established to exert direct control over natural villages, with each administrative village typically encompassing one or more natural villages (Zhang, 1998). A primary objective of this system was to increase inter-group contact and integration. Within administrative villages, individuals from different ethnic groups were compelled to live and work closely together, fostering significantly increased interaction across group boundaries (Harrell, 2012; Brown and Johnson, 2015). Figure A.2 illustrates this transformation, highlighting how people from diverse ethnic backgrounds were organized to live in close proximity, farm collectively, and collaborate on constructing irrigation systems under the leadership of CCP cadres.

[Figure 1 and 2 should be here]

The communist government presented two primary motivations for the campaign. The first was efficiency. The government argued that by consolidating people, they could achieve economies of scale and increase productivity in rural areas[7] (Ma, 1959;

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rural areas remaining outside its direct control (Fairbank and Liu, 1980).

[6]During that period, these administrative villages were referred to as "*brigades*." For consistency, this paper uses the term "administrative villages" to describe these newly established units.

[7]Mao (1977) highlighted this point during a speech at a CCP Central Committee conference, stating: "*Factors such as a large population, limited land resources per capita, frequent natural disasters, and outdated management methods were contributing to the poverty of farmers in China. Unification was the only way for farmers to escape poverty, improve their living standards, and fight against natural disasters*".

8

Mao, 1977). The second motivation was the ideological integration of farmers. The government sought to eliminate traditional identities, with ethnicity being one of the most significant, and aimed to transform farmers into "new farmers under the leadership of the party" (Qu, 1959). As an illustration example, a government document further emphasized this goal: "*Why do people in this administrative village not unite? ... This administrative village contains three natural villages, and each natural village is a community formed by a traditional clan. For decades, our enemy has used traditional identities to prevent people from these three natural villages from cooperating... To crush our enemy's conspiracy, the party leaders of the administrative village criticized traditional identities severely... and disseminated propaganda stating that there are no traditional identities, only unification and cooperation under the leadership of the party. All people under the leadership of the party are one big family*" (Li et al., 1977).

Notably, villagers had little to no means of escaping this forced integration. Under the new system, they were prohibited from migrating freely and were required to comply with the directives of CCP cadres (Harrell, 2012; Brown and Johnson, 2015). These cadres in the administrative villages took control of agricultural planning, public goods construction, and other village affairs, further entrenching state authority in daily rural life. This system remained in place for approximately 30 years and formally ended in 1984 when China abolished it, granting villagers greater freedom to choose their way of life (Zhang, 1998). Individuals gained autonomy in decisions regarding labor allocation, and migration restrictions were gradually eased. Significantly, villagers regained the ability to voluntarily decide with whom they wished to interact.

2.2 Assignment of Local Ethnic Diversity

While the central government made the decision to introduce the integration campaign, The campaign was carried out and enforced by county governments immediately after the policy was announced. To ensure the policy met the local conditions and to guide the local execution, the central government allowed some regional variation in the policy. Two types of regions were defined by the central government (Mo, 1957). One is "*Mountainous County*", which means counties in the mountainous area; the other is "*Plain County*", which stands for counties on the plain. According to the rules announced by

9

the central government in 1953, it was allowed that each administrative village was allowed to contain a smaller number of natural villages in the Mountainous Counties than in the Plain Counties (Zhang, 1998). As a result, the Mountainous Counties tended to experience a weaker policy shock: Each administrative village was allowed to contain a smaller number of natural villages. As a result of this change, the ethnic diversity within administrative villages should also be smaller.

However, the two groups of counties are arbitrarily defined. The local terrain information was collected and reported by the central government long before the forced integration campaign (Li, 1939; Chinese Academy of Sciences, 1959; Li et al., 2013). Then the central government announced that a county was defined as a "*Mountainous County*" if over 80% of its terrain is mountainous (Li and Li, 2018). Otherwise, a county belonged to "*Plain Counties*". Figure 4 shows the geographic distribution of the two types of counties. For simplicity, I define the share of the mountainous area over the total area as "Mountainous Rate" (MR). The arbitrary definition of these two groups of counties provides exogenous variation around the 80% cutoff. Counties with MR that are marginally bigger and smaller than 80% should be ex-ante identical but will differ from each other later as counties with MR bigger than 80% will be defined as "Mountainous counties" and thus receive less intensified shock.

2.3 The Impacts of The Campaign

Chinese historians have extensively documented the negative impacts of ethnic diversity during the forced integration campaign. Although the government claimed that the administrative village system was effective in mobilizing resources, it proved ill-suited for arbitrarily combining people from different ethnic groups, as it overlooked the potential frictions this could cause (Su, 2011). The forced nature of the cooperation created dissatisfaction, with farmers having no choice but to adhere to the governments design, as migration or exiting the system was nearly impossible. Additionally, the distribution of cooperative benefits, such as public goods, among different natural villages within an administrative village often failed to meet expectations, resulting in conflicting interests. This intensified contact between different groups tended to reinforce ethnic identities and even sparked conflicts (She and Chen, 2000). As a result,

the efficiency gains from the forced integration were minimal, largely undermined by strained inter-group relations and farmers' implicit resistance. Thus, it is widely believed that the forced integration campaign not only strengthened group identities and fueled interethnic tensions but also led to only modest efficiency improvements.

However, on the other hand, historians have also documented a reversal of effects after the end of the campaign. Although the forced integration was traumatic and unhappy, the legacy of forced integration provided opportunities for forming connections among farmers from different ethnic groups. When cooperation became profitable after the abolishment of the forced system and the market system was retained, the formed connections facilitated inter-group cooperation (Gao, 2013). For example, She (1997) documented that "after the end of the program, the two groups which fought severely before developed a friendly relationship by marriage and economic links... Cooperation and economic connection went beyond a small identity group... This is an important root of the village's economic development."

A typical example illustrating the positive long-term impact can be seen in the development of voluntarily formed farmer cooperatives in China. Since the abolition of the People's Commune system in the early 1980s, China has seen a gradual resurgence of farmer cooperatives (Fock and Zachernuk, 2006; Eum, 2017; Zou and Wang, 2022). These co-ops have emerged as a way for smallholder farmers to pool resources, increase bargaining power, and improve market access in a rapidly changing economy (Fock and Zachernuk, 2006). They play a critical role in rural development by boosting agricultural productivity, fostering rural entrepreneurship, and enhancing farmers' incomes. However, the development of farmer cooperatives has faced several challenges, one of the most significant being the difficulty in promoting inclusivity and ensuring fair participation across diverse social and ethnic groups, often resulting in resource misallocation. In this context, the experience of forced ethnic diversity during China's rural integration campaign may help address these challenges (Fock and Zachernuk, 2006; Harrell, 2012). Farmers previously exposed to interethnic cooperation have developed broader social networks and higher levels of trust across ethnic lines, facilitating more inclusive and cooperative behaviors. For example, in regions where farmers were forced to collaborate with diverse ethnic groups during the integration campaign, they have shown a greater ability to manage conflicts and build trust in

multi-ethnic co-ops, leading to more successful outcomes in co-op governance and productivity. This shared experience of overcoming ethnic divisions helps reduce tensions and inequalities, making these co-ops more cohesive and effective in navigating the complexities of the market economy.

3 Data and Measurement

To empirically test the hypotheses, this project constructs several novel datasets that offer comprehensive information on local ethnic diversity, farmer cooperatives, interethnic relationships, as well as individual attitudes and decision-making.

3.1 Historical Data

The key independent variable in this analysis is the ethnic diversity within administrative villages. The data for this variable is sourced from multiple local gazetteers, which provide detailed information during the forced integration campaign at the administrative village level, including the village's name, location, a list of natural villages it contains, and the population of each ethnic group within the village. Figure A.3 offers an illustration of the gazetteers used and the specific types of information they contain. In total, I hand-collected data on over 10,000 administrative villages across approximately 250 counties. To measure ethnic diversity, I use this information and follow Bazzi et al. (2019) and Bazzi and Gudgeon (2021) to construct the index that measures ethnic diversity:

$$EthnicDiversity = \sum_{j=1}^{N} g_j(1 - g_j) \tag{1}$$

where N represents the total number of identity groups in an administrative village, and g_j is the population share of group j. The ethnic diversity index is a Herfindahl-Hirschman-style index, which can be interpreted as the probability that two randomly selected individuals within a given admin village belong to different groups. A larger ethnic diversity index indicates a more ethnically diverse administrative village.

12

3.2 Geographic Data

As discussed in Section 2.2, geographic data plays a crucial role in this analysis, as the communist government used geographic conditions, particularly the mountainous ratio, to determine the assignment of the forced integration policy. The mountainous ratio, a key variable in this study, reflects the extent to which a county is mountainous, which directly influences the intensity of the forced integration efforts in different regions. This variable is sourced from multiple archives of local county gazetteers, which are detailed records of counties across China. These gazetteers provide comprehensive information on various geographic features, including the total area of each county and the area classified as mountainous. Using this information, I calculate the mountainous ratio (MR) for each county, which is defined as the share of a county's area that is mountainous. To ensure the reliability of the historical data on mountainous ratios, I cross-validated the archival records with contemporary satellite-derived mountainous ratio data. This validation process is important because of the concerns about potential inaccuracies in the archival records. By leveraging modern geospatial technology, I calculated the mountainous ratio for each county using satellite maps and compared the results with the historical figures. The correlation is graphically illustrated in Figure A.6, where the values from both sources show a high degree of similarity. The analysis revealed a strong correlation between the two datasets, indicating that the archival records are consistent with contemporary measurements. This close alignment suggests that the historical data is reliable and can be confidently used in further analysis. In addition, I also gathered county-level information on a rich set of geographic characteristics from the Geographic Information System for use in balance checks, which will be discussed in detail in Section 4.4.

3.3 Outcome Data

The main outcomes of interest in this study focus on the development of farmer cooperatives in China, particularly using ethnic diversity within co-ops as a measure of farmers tendency toward interethnic cooperation. The primary source of data on co-ops is the National Enterprise Credit Information Publicity System, which provides detailed information such as co-op names, addresses, establishment dates, capital, member lists,

and scope of business. I focus exclusively on co-ops formed voluntarily by farmers, excluding those owned or organized by the government. The full dataset encompasses approximately 850,000 co-ops established between 1979 and 2019. To further assess performance efficiency, I also obtained operational data for around 20,000 co-ops from the National Tax Survey Database, covering the period from 2007 to 2016. This data includes key variables such as input (labor, capital), output, and profit. Figure A.5 provides an illustration of the spatial distribution of the co-ops in the two samples. Ethnic diversity within the co-ops is calculated based on member lists, using the same method described in Equation (1). Figure 3 provides an illustration of the spatial variation in ethnic diversity within the co-ops.

[Figure 3 should be here]

To further explore the underlying mechanism, I also gathered data on various additional outcomes from multiple sources:

Individual Attitude. The data comes from two nationwide household surveys: the China Family Panel Studies (CFPS) and the Chinese General Social Survey (CGSS). The two surveys contain information on a large number of questions related to individual attitudes towards families, government, strangers, etc. This allows a comprehensive examination of the effect of the AVS on individual attitudes, especially intergroup tolerance, national identity, and trust.

Individual Economic Activities. Making use of the National Fixed-Point Survey (NFS), a detailed annual village- and household-level economic survey in rural China, we are able to detect a set of important information on individual economic activities. This includes with whom farmers do land transactions, the time they spend on agricultural and non-agricultural production, incomes from the relevant activities, etc.

4   Empirical Setup

In this section, I discuss the empirical strategy employed in this paper to identify causality. I then present evidence supporting the validity of this approach.

4.1 Identification Strategy

To address the endogeneity problem and establish causality, this study employs a regression discontinuity (RD) approach, leveraging policy variation across different geographical regions as discussed in Section 2.2. The exogenous aspect of the RD design stems from the arbitrary definition of the two geographical regions: a county is classified as a "Mountainous County" if its Mountainous Ratio (MR) exceeds 80%, and a "Plain County" if its MR falls below 80%. As explained above, the central government collected and reported local terrain information long before the forced integration campaign, and the 80% threshold was chosen arbitrarily. Consequently, county governments had no opportunity to manipulate the Mountainous Ratios or influence the type of policy implemented during the campaign. Therefore, the 80% cutoff serves as a reliable threshold.

[Figure 4 should be here]

The key identifying assumption of this research design is that, due to the arbitrary classification, counties with Mountainous Ratios just above and below 80% should be ex-ante similar. However, after the policy was applied, those with Mountainous Ratios above 80% were designated as "Mountainous Counties" and experienced a less intense shock and lower ethnic diversity within administrative villages compared to those below the threshold. Figure 4 illustrates the two groups of counties around the 80% cutoff, using a bandwidth of 0.05. Thus, the RD design will utilize the Mountainous Ratio (MR) as the running variable. I will investigate whether counties with Mountainous Ratios slightly above 80% have a higher average number of natural villages per administrative village and greater ethnic diversity within administrative villages compared to those with ratios slightly below 80%. Next, I will examine whether there is a significant discontinuity in outcomes of interest at the 80% cutoff. The analysis will employ a local linear approach to RD estimation, using the following equation:

$$Y_{ic} = \beta_0 \mathbb{1}\{MR < 80\%\}_c + \beta_1 MR_c + \beta_2 MR_c \times \mathbb{1}\{MR < 80\%\}_c + \epsilon_{ic} \qquad (2)$$

$$s.t. -h \leq MR_c - 80\% \leq h$$

where c represents the county, and i denotes the unit of analysis, which is the admin-

istrative village in the first-stage analysis and the co-op in the reduced-form analysis of outcomes. Y_{ic} refers to the policy variables (i.e. ethnic diversity in administrative villages) and the outcomes of interest. MR_c represents the running variable Mountainous Rate, while $\mathbb{1}\{MR < 80\%\}_c$ is a dummy which equals to 1 if $MR_c > 80\%$, and 0 otherwise. h is the estimated MSE-optimal bandwidth determined using the method proposed by Calonico et al. (2018), which suggests a bandwidth of 0.05. This bandwidth is used in all baseline analyses, while alternative bandwidths are applied in robustness checks. This equation indicates a local linear polynomial in the outcome variables estimated separately on each side of the 80% MR cutoff. Standard errors are clustered at the county level to account for potential spatial correlation in the error term, as recommended by Cameron and Miller (2015).

One potential concern with the regression-discontinuity approach in Equation (2) is that it may not only capture the effect of ethnic diversity within administrative villages but also reflect the impact of economies of scale due to the increased size of administrative villages, which now include more natural villages and a larger population. To address this issue, I refine the approach by considering the initial geographic distribution of ethnic minority communities. As discussed in Section 2, some counties in China were home to ethnic minority communities before the Chinese Communist Party's rule and the forced integration campaign, while others were predominantly populated by the Han majority. The key idea is that the forced integration campaign would have increased ethnic diversity within administrative villages only in counties that originally had ethnic minority communities, while it merely expanded the size of administrative villages without affecting ethnic diversity in counties that were initially ethnically homogeneous. Using this distinction, I separate the counties into two groups - those with and without ethnic minority communities prior to the campaign - and develop a difference-in-discontinuity approach by comparing the effects between these two groups. The revised equation for this analysis is as follows:

$$Y_{ic} = \beta_0 \mathbb{1}\{MR < 80\%\}_c + \beta_1 \mathbb{1}\{MR < 80\%\}_c \times EthnicMinor_c$$

$$+\beta_2 MR_c + \beta_3 MR_c \times EthnicMinor_c + \beta_4 MR_c \times \mathbb{1}\{MR < 80\%\}_c \qquad (3)$$

$$+\beta_5 MR_c \times \mathbb{1}\{MR < 80\%\}_c \times EthnicMinor_c + \beta_6 EthnicMinor_c + \epsilon_{ic}$$

16

$$s.t. - h \leq MR_c - 80\% \leq h$$

where all notations are consistent with those in Equation (2), except that $EthnicMinor_c$ is a dummy variable that equals 1 if a county initially had ethnic minority communities, and 0 otherwise. The coefficient β_1 rules out the effect of the economics of scale and captures the causal effect of ethnic diversity in administrative villages during the campaign. I use this difference-in-discontinuity estimator for the following analysis.

4.2   Empirical Evidence on Enhanced Diversity

I start to test the validity of our RDD design by examining the relationship between mountainous ratios and ethnic diversity. I firstly examine whether administrative villages located in counties with MR just below 80% have stronger forced integration treatment than those located in counties with MR just above 80%. We should witness higher ethnic diversity in admin villages located in counties with MR just below 80% than those located in counties with MR just above 80%.

In Figure 5, I leverage the discontinuity by plotting the average number of natural villages in an administrative village against the deviation of MR from the 80% cutoff. To make the figure easier to interpret, I normalize MR relative to the 80% cutoff (i.e., normalized MR = -(MR - 80%)), where a positive normalized MR indicates that the countys MR is below 80%, classifying it as a Plain County with a higher level of integration intensity as designed by the campaign. Going forward, all RD plots will use this normalized MR instead of the original MR for consistency. As shown in the figure, the average number of natural villages contained in an admin village is significantly larger in those counties with MR slightly smaller than 80% than those counties with MR slightly bigger than 80%. This indicates the counties with MR around the two sides of the cut-off point indeed receive different levels of treatment. In terms of magnitude, the results shown Columns 1 and 2 of Table 1 indicate that an administrative village, on average, contains 4.5 more natural villages if we were able to change a county's MR from marginally bigger than 80% to marginally smaller than 80%. This result confirms a strong first stage in our RDD design.

[Figure 5 and Table 1 should be here]

Next, I show in Figure 6 the difference in ethnic diversity within administrative villages. Consistent with the argument in Section 4.1, I find that, only in counties with ethnic minority communities initially, the forced integration campaign increased ethnic diversity within administrative villages. An estimation based on Equation (3) is shown in Columns 7 and 8 of Table 1, which indicates a statistically higher ethnic diversity caused by the forced integration campaign.

[Figure 6 should be here]

Combining these findings, I conclude that our RDD design has a strong first stage, which indicates that randomization based on the MR rule provides a valid setting for examining the effect of the program.

4.3 No Evidence of Sorting

Our RDD framework relies on the assumption that there was no selective sorting around the 80% MR cutoff. This assumption would be violated if local governments, such as county administrations, were able to selectively alter their mountainous ratios at the time of the campaign to either impose or avoid stronger integration. To test for potential sorting around the cutoff, we apply the Cattaneo, Jansson, and Ma test (Cattaneo et al., 2018), which involves collapsing the data into mountainous ratio bins and analyzing the number of observations in each bin. Figure 7 shows no evidence of a discontinuous change in the number of observations across the 80% cutoff, suggesting that local governments were unable to manipulate their mountainous ratio to influence the level of forced integration. This finding is consistent with the historical details of the campaign, as mountainous ratios were calibrated and reported by the central government before the programs announcement. Local governments did not have the opportunity to alter these ratios after learning the specifics of the campaign.

[Figure 7 should be here]

4.4 Balance on Initial Characteristics

Another key assumption of the RD design is that all relevant factors, aside from the treatment, vary smoothly at the cutoff point. This assumption is crucial to ensure that

counties with an MR just above 80% serve as an appropriate counterfactual for those with an MR just below 80%. The assumption would be violated if, for instance, counties with an MR slightly below 80% systematically differed in characteristics (such as land suitability or geographic location) from counties with an MR slightly above 80%.

To assess the plausibility of this assumption, I examine whether initial characteristics are balanced across the 80% MR cutoff. Specifically, I check various geographic and historical characteristics based on the Equation 2 and present the estimated coefficients of interest for these variables in Figure 8. For geographic characteristics, I use the area, elevation, and ruggedness of a country to capture topographical conditions. Additionally, I assess natural conditions for economic activities, particularly agricultural production, using rainfall, temperature, and land quality for agriculture. I also examine the land suitability for some important crops, including tea, cotton, potato, rice, and wheat. To account for locations and transportation conditions, I also check a county's longitude, latitude, distance to the coastline, distance to major rivers, and distance to provincial capitals. Regarding historical characteristics, I first examine a county's initial total population and the population of ethnic minorities in 1953. The number of Chinese firms and banks in the 1920s serves as a proxy for the modern economy (Kung, 2022). Furthermore, I consider the number of mosques (1951) and missionaries in the 1920s to proxy for historical religiosity (Bai and Kung, 2015), and I assess initial human capital levels using the number of pupils in the 1920s (Bai and Kung, 2015), as well as the number of Shengyuan quota (those who took the Keju Imperial Examination) and Jinshi (those who passed the highest stage of the Keju) during the Qing Dynasty (Chen et al., 2020). The distance from the railway in 1949 is used to proxy for the development of modern transportation (Kung, 2022). For each of these initial characteristics, I find little evidence of a discontinuity at the cutoff point. This provides evidence that the assumption of smooth variation in relevant factors at the 80% MR cutoff is plausible.

[Figure 8 should be here]

5   Impact of Ethnic Diversity on Farmer Co-ops

In this section, I present the key empirical findings on the impact of ethnic diversity during the forced integration campaign on co-op development. I begin by outlin-

19

ing the average effect on ethnic diversity in co-ops, followed by an analysis of how marketization shaped this relationship.

5.1 Effect on Ethnic Diversity in Co-ops

I first visually present the findings on the effect of ethnic diversity during the forced integration campaign on ethnic diversity in co-ops. I show in Figure 9 that higher ethnic diversity during the forced integration campaign leads to higher ethnic diversity in co-ops in counties with initial ethnic minority communities; yet, this effect does not exist in counties without ethnic minority communities initially. To quantify this, I calculate the difference between the effects in counties with and without initial ethnic minority communities and estimate the difference-in-discontinuity effect based on Equation (3). The results are presented in Table 2. Column 1 demonstrates that the effect remains statistically significant regardless of the method used to calculate standard errors: robust standard errors clustered at the county level (presented in parentheses) or Conley standard errors adjusted for spatial correlation[8] (presented in brackets). To better understand the magnitude of the effect, Column 2 combines the reduced-form estimation from Column 1 with the first-stage estimation in Column 7 of Table 1. This two-stage-least squares (2SLS) estimate suggests that if the ethnic diversity level in administrative villages during the forced integration campaign increased from 0 to 1, ethnic diversity in co-ops would rise from 0 to 0.743. In other words, a one standard deviation increase in ethnic diversity during the campaign would lead to a 1.56 standard deviation increase in co-op diversity[9]. This indicates that the average effect is not only statistically significant but also economically substantial.

[Figure 9 and Table 2 should be here]

I now examine how the effect of ethnic diversity evolved over time between 1979 and 2019. I divided the sample into four periods: before 2005, 2005-2009, 2010-2014, and 2015-2019. Each period covers five years, with all years before 2005 aggregated into one period to ensure sufficient observations within the bandwidth. Figure 10

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[8]When calculating Conley standard errors adjusted for spatial correlation, I assume the observations of co-ops within 100 kilometers are correlated.

[9]$0.143 \times 0.743 / 0.0681 = 1.56$

20

shows how the effect changed over time, revealing that the baseline result I identified has grown in both economic and statistical significance. Before 2005, the effect was statistically insignificant and economically small. Starting from the 2005-2009 period, the effects became statistically significant, with magnitudes increasing steadily, peaking in 2015-2019. These findings suggest that the baseline results are not simply a legacy effect, which would have led to a gradual convergence between treated and control regions. This leads to the next subsection, where I examine the role of institutional changes in shaping the effect of ethnic diversity on cooperation.

[Figure 10 should be here]

5.2 Effects on Co-op Sizes and Efficiency

In addition the effect of ethnic diversity during the forced integration campaign on co-op diversity, I also explore its impact on other important characteristics of co-ops. One key aspect I focus on is the size of the co-ops, measured both by the number of members and total capital. The rationale behind this is that ethnic diversity could encourage larger co-ops, as the inclusion of individuals from different ethnic backgrounds may lead to broader collaboration and the pooling of more resources. If people are more willing to form interethnic co-ops, it is likely that they would seek to create larger, more robust organizations that leverage the strengths of diverse group members. Larger co-ops might also benefit from economies of scale, enhancing their productivity and resilience in local markets. The results shown in Figure 11 and Table A.1 indicate that co-ops in counties with higher ethnic diversity during the forced integration campaign indeed tend to be significantly larger in both membership and capital.

[Figure 11 should be here]

Next, I assess whether these larger, more ethnically diverse co-ops are also more efficient in production. This step is crucial, as larger co-ops or ethnically more diverse co-ops may not always translate into higher efficiency; without proper coordination, size or diversity could potentially lead to inefficiencies. To evaluate this, I measure efficiency using two metrics: output per capita and total factor productivity (TFP). Output per capita provides insight into how effectively the co-op generates value for

its members, while TFP reflects the overall efficiency of resource use in production. The results in Figure 11 and Table A.1 show a consistent pattern: co-ops formed in counties with higher ethnic diversity during the forced integration campaign not only tend to be larger but also exhibit higher levels of efficiency across both measurements. These findings suggest that ethnic diversity fostered during the forced integration campaign plays a significant role in improving the performance and productivity of the co-ops.

5.3 Robustness Checks

In this section, I outline the robustness checks for the baseline results on ethnic diversity in co-ops, as presented in Section 5.1. One potential concern is that the observed patterns may only hold under specific regression discontinuity specifications. To address this, I perform a series of robustness checks to ensure that the results remain consistent across alternative RD specification choices. First, instead of using a bandwidth of 0.05 as in the baseline analysis, I apply additional bandwidth options of 0.03, 0.07, and 0.1 to the RD results. Second, I re-estimate the main results using a quadratic function, rather than a linear function, which is estimated separately on each side of the threshold. The estimation results are shown in Figure 12. Overall, I find that the results discussed in Section 5.1 are robust to alternative RD specifications.

Another concern is that the MR cutoff of 0.8 used in the baseline analysis may be capturing other unobservable factors, making it seem unique. To address this, alongside the balance checks in Section 4.2, I conduct a falsification test by re-running the analysis with placebo MR cutoffs other than 0.8. Specifically, I use fake MR cutoffs at 0.75 and 0.85, comparing co-ops in counties that fall on the same side of the actual MR cutoff, thus belonging to the same category (either Mountain Counties or Plain Counties) in the forced integration campaign. Figure 12 presents the results, showing that the placebo tests yield insignificant coefficients, both economically and statistically. This indicates that the main regression is capturing an effect that only emerges when crossing the actual MR cutoff in the forced integration campaign, rather than being driven by random factors.

5.4 Alternative Development Outcomes

A major concern with the results observed in co-ops is their broader applicability. Firstly, it is unclear whether the patterns found in co-ops are representative in a general sense, raising questions about their relevance beyond these specific settings. Secondly, while the co-op results indicate a positive long-run effect following the end of the forced integration program, they do not provide insight into the program's impact during its active period. Therefore, it is essential to use alternative measurements that capture different dimensions of interethnic relations and local development. By examining additional outcomes that reflect interethnic relationships and economic development, I can better determine whether the observed benefits of the program extend beyond co-ops and into broader societal domains.

The first alternative outcome I construct is interethnic marriage, a commonly used measure in the literature that serves as a proxy for interethnic relationships and integration within communities (Bazzi et al., 2019; Bazzi and Gudgeon, 2021). I use individual-level census data from the Chinese National Population Census 2010 to determine whether individuals who married between 1950 and 2010 entered interethnic marriages. The second outcome is county-level GDP per capita, which reflects local economic development from 1950 to 2019. GDP data after 1990 is primarily sourced from the China County Statistical Yearbooks, while data from 1950 to 1990 was digitized and manually collected from county gazetteers. These data sources offer a substantial advantage due to their extended time span, enabling an analysis of the programs impact both during and after its implementation. Therefore, I can trace the trajectory of interethnic relationships and economic outcomes in response to the enforced ethnic diversity policy, capturing shifts that occurred over several decades.

I estimate the effects of the forced integration program on interethnic marriage and county-level GDP per capita using Equation (3), following the approach used in the baseline analysis. For interethnic marriage, I categorize individuals by the 5-year period in which they married beginning in 1950, and estimate the programs effects for each period. For GDP per capita, due to missing values and relatively large measurement errors, I evaluate the programs impact by decade, also starting from 1950. Figure 13 plots the dynamic of the estimated coefficients on interethnic marriage and GDP per

capita. The results reveal a dynamic pattern in the program's impact over time for both of the two outcomes. Initially, during the programs implementation, forced ethnic diversity had a negative effect, with both interethnic marriage rates and GDP declining. This suggests that while the policy aimed to foster integration and development, the immediate, coercive nature of the approach may have instead generated tensions and hindered local economic progress. However, following the end of the program, these negative effects reversed, demonstrating a positive, long-term impact on both interethnic relationships and local economic growth. The long-run positive effects after the program align with the earlier findings in co-op settings, reinforcing the reliability and broader applicability of these positive effects on co-ops. Importantly, these results suggest that the outcomes of forced integration policies can shift over time, from initially adverse impacts to beneficial long-term effects, highlighting the need to consider temporal dynamics in evaluating the success of such interventions.

[Figure 13 should be here]

6   Mechanism

In this section, I investigate how ethnic diversity during the forced integration campaign positively impacts cooperation and development in the long run. First, I present evidence of inter-group relationships by examining inter-group trust and participation in rural land and labor markets. Next, I demonstrate how the forced integration campaign reduced interethnic inequality. Most importantly, I discuss how institutional changes play a critical role in transforming the program's initially negative effects into positive outcomes over the long term.

6.1   Interethnic Network

To see why ethnic diversity during the forced integration campaign boosts cooperation in the long run, I first check people's willingness to interact with others from different identity groups. I examine this by testing the campaign's effect on people's trust levels. Trust is a key dimension of inter-individual relationships and has been founded as a fundamental factor that drives economic development (Nunn and Wantchekon, 2011).

Employing the CFPS survey dataset in 2012, I am able to have individual information on people's trust levels towards different groups. Column 1 of Table 3 shows that the history of stronger forced integration and higher ethnic diversity leads to a higher level of trust in strangers. As a placebo test, I check the program's effect on people's trust levels in close relatives. As shown in Column 2 of Table 3, I find no significant result. This finding is consistent with the details of the program's history, since the forced program did not change how close relatives contact and interact with each other and should not heavily influence the trust among close relatives. I argue that this evidence suggests that the market frictions due to inter-group mistrust are largely reduced by the history of the forced integration campaign. People are more likely to trust people with different backgrounds. This condition makes it possible for them to cooperate with people with different backgrounds in economic activities.

[Table 3 should be here]

I further provide additional evidence of inter-group relationships by showing the spatial variation in economic activities in the rural land market and the rural labor market. The NFS survey dataset provides information on rural residents' economic activities from the 1980s to the 2010s. This allows us to see if the factor markets work better in the regions with a history of stronger forced integration. I first look at the rural labor market and examine the inter-group labor hiring activities. Columns 3 and 4 of Table 3 summarize the findings. Column 3 shows that rural residents are more likely to work outside of their own villages in the regions with higher ethnic diversity due to the forced integration program. In addition, I also see a significant increase in the number of days per month they spend working in other villages (Column 4). The pattern is the same in the rural land market, as shown in Columns 5 and 6 in Table 3. I find that, in a village in the regions with stronger forced integration, the transacted area with people from outside of the villages increases significantly (Column 5). The pattern is the same if we look at the share of area transacted with other villages (Column 6).This evidence indicates that different villages tend to interact more in regions with stronger forced integration, both in the rural labor market and the rural land market. This supports the argument that the forced integration campaign helps extend inter-group links and remove some barriers that prevent people from cooperating with each other.

6.2 Interethnic Equality

One potential mechanism through which ethnic diversity during the forced integration campaign could have a long-run positive effect on co-op ethnic diversity and efficiency is the reduction of barriers to forming human capital, which previously caused talent misallocation. As highlighted by Hsieh et al. (2019), individuals often cannot pursue their comparative advantages due to a lack of access to occupation-specific human capital. In China, large disparities in school quality and opportunities for skill development existed among different ethnic groups, contributing to the misallocation of talent. However, during the forced integration period, these barriers began to erode, as different ethnic groups were required to work together to construct schools, and children from various ethnic backgrounds attended mixed-ethnicity schools. This exposure to a more integrated educational environment likely contributed to the development of human capital across ethnic lines, which in turn may have enhanced the capabilities and efficiency of co-ops.

To empirically investigate this mechanism, I examine the effect of forced ethnic diversity on interethnic education inequality. Using data from the 2010 population census micro dataset provided by the National Bureau of Statistics of China, which includes information on 4 million individuals, I am able to obtain individuals' locations, ethnicities, and education levels. Using the approach outlined by Bazzi et al. (2019), I calculate Between-Group Education Inequality (BGEI), which measures the disparity in education levels across ethnic groups in a certain county. For each county, the definition of BGEI is shown as below

$$BGEI_c = \frac{1}{2\bar{a}} \sum_i \sum_j n_i n_j \mid a_i a_j \mid \tag{4}$$

where n_i represents the relative population size of ethnic group i, a_i is the mean education level of ethnic group i, and $\bar{a}$ is the overall mean education level of all groups. To capture the campaign's effects on different cohorts, I differentiate between individuals born before the campaign (before 1950) and those born afterward (after 1950). I then calculate BGEI for each county, separately for both groups, to assess the impact on interethnic education inequality across generations.

The empirical results, presented in Table 4, provide strong evidence supporting

the hypothesis that the forced integration campaign reduced interethnic education inequality. The results in Columns 1 and 3 indicate that both the overall education level and interethnic education inequality were balanced prior to the forced integration campaign. However, as shown in Columns 2 and 4, while the campaign did not significantly increase the overall education level for individuals born after 1950, it did lead to a substantial reduction in interethnic education inequality among this group. This indicates that the campaign helped equalize educational opportunities across ethnic groups, particularly for younger generations who grew up in more integrated environments. By reducing the educational disparities between ethnic groups, the campaign likely contributed to better human capital allocation, enabling individuals from different ethnicities to collaborate more effectively in co-ops and increasing overall co-op efficiency in the long run.

[Table 4 should be here]

6.3   Importance of Institutional Changes

In Sections 5.1 and 5.4, I demonstrate that the outcomes of forced integration policies can evolve over time, shifting from initially adverse impacts to beneficial long-term effects. These findings may be somewhat surprising and puzzling, as they challenge the prevailing narrative surrounding the history of collectivization in China and contrast with widely reported long-term negative legacies of historical conflict found in the literature (Nunn and Wantchekon, 2011; Michalopoulos and Papaioannou, 2016). A unified framework is needed to explain this shift.

The central argument of this paper is that institutional changes can alter the effect of ethnic diversity on cooperation and development. Specifically, I examine China's shift from a centrally planned to a market-oriented economy after 1979 as a key explanation. This move toward marketization has been fundamental to China's rapid economic growth and social transformation. The rationale here is that marketization changed the relative benefits and costs associated with ethnic diversity. Under the centrally planned economy, particularly during the forced integration program, the imposed nature of ethnic diversity generated significant disamenities, raising the costs and hindering interethnic cooperation. Additionally, certain skills unique to specific ethnic groups,

27

such as trade networks and risk management, only gained value in a market economy. The centrally planned system also constrained the benefits of skill complementarities arising from ethnic diversity. Consequently, ethnic diversity initially had a negative impact. However, marketization introduced a framework where diverse groups could engage in cooperative ventures driven by mutual economic incentives. Expanded opportunities for individual and group mobility helped reduce disamenities, as people gained more freedom of choice. More importantly, in a market economy, interethnic cooperation could leverage skill complementarities, making it beneficial. As a result, the forced integration program's overall effect has shifted positively in the long run.

To provide empirical evidence, I leverage the timing variation in the marketization process by using the establishment of Special Economic Zones (SEZs) across different counties. Since 1978, China's marketization reform has been promoted through the establishment of SEZs (Wang, 2013). They are geographical zones with liberal regulations, reduced tariffs, and other preferential policies (Wang, 2013). In 1979, the first four SEZs (Shenzhen being the most famous one) were founded in Guangdong and Fujian to attract foreign investment and stimulate economic growth. Since then, the SEZ program has expanded gradually from the east coast to the entire country (Figure A.7). They act as catalysts for China's transition from a planned economy to a market economy (Farole et al., 2011; Wang, 2013; Lu et al., 2019, 2023). The establishment of an SEZ in a county signals an increase in the county's level of marketization.

I begin by dividing the baseline sample into two periods: the period before the establishment of a SEZ in each county and the period after. I then estimate the effects of the forced integration program on co-op outcomes separately for each period. The patterns are illustrated in Figure 14. The results show that before SEZ establishment, the programs effects on co-ops ethnic diversity, size, and efficiency are, on average, negative. However, following the SEZ establishment, these effects shift significantly to positive. This suggests that marketization, proxied by the SEZ establishment, plays a crucial role in shaping the impact of ethnic diversity.

[Figure 14 should be here]

To rigorously capture the effect of institutional changes, I further refine the empirical setup by incorporating variation in the timing of SEZ establishments across counties.

This approach combines the DDRD analysis from the baseline with a difference-in-differences (DID) method, where the identification assumption is that the timing of SEZ establishment in a county is uncorrelated with the ethnic diversity within administrative villages. The analytical framework is defined as follows:

$$Y_{ict} = \sum_{k=-5, k \neq -1}^{5} \beta_k \mathbb{1}\{MR < 80\%\}_c \times EthnicMinor_c \times SEZ_{ct}^k + \gamma_c + \lambda_p \times \theta_t + \epsilon_{ict} \quad (5)$$

$$s.t. -h \leq MR_i \leq h$$

where i stands for co-op, c stands for county, t stands for year, p stands for province. MR_i, $\mathbb{1}\{MR < 80\%\}_i$, and $EthnicMinor_i$ are consistent with the definitions provided in Equation (3). k denotes the gap between year t and s_c, the year when the first SEZ was established in county i. SEZ_{ct}^k is a dummy that equals 1 if $t - s_c = k$.[10] The dummy for k = 1 is omitted so that the effects in other periods are relative to the reference period immediately prior to the start of the SEZ establishment in a county c. γ_c denotes county fixed effects, while $\lambda_p \times \theta_t$ represents province $\times$ year fixed effects. The setup of bandwidths and the local linear polynomial in the outcome variable is consistent with that described in Equation (3). The coefficients β_k capture the impact of SEZ establishment on the effect of ethnic diversity during the forced integration campaign on ethnic diversity in co-ops in each period relative to the reference period.

Figure 15 depicts the coefficients of $\mathbb{1}\{MR < 80\%\}_c \times EthnicMinor_c \times SEZ_{ct}$ and their 95% confidence intervals. The insignificant coefficients in the pre-SEZ periods support the parallel trend assumption for causal identification. Following the introduction of SEZs, ethnic diversity in co-ops increased significantly. Consistent with this, Table 5 demonstrates that the effects of the forced integration program on co-ops ethnic diversity, size, and efficiency all experienced relative increases after SEZ establishment. With the exception of the total number of co-op members, all other changes are statistically significant. These results underscore the crucial role of marketization, as an institutional change, in shaping the impact of ethnic diversity.

[Figure 15 and Table 5 should be here]

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[10]$SEZ_{ct}^{-5} = 1$, if $ts_c \leq 5$, and 0 otherwise; $SEZ_{ct}^5 = 1$, if $ts_c \geq 5$, and 0 otherwise.

7 Conclusion

What is the impact of ethnic diversity on cooperation and development? This paper provides micro-level evidence from Communist China's rural forced integration campaign during the 1950s1980s, which compelled farmers from diverse ethnic backgrounds to live and work together in agricultural and public goods projects. Using a regression discontinuity design, the findings demonstrate that the long-term policy consequences of boosting diversity can differ from short-term ones, and the institutional context plays a pivotal role in shaping the effects of ethnic diversity on cooperation and development. During the campaign, forced ethnic diversity negatively impacted interethnic marriage rates and GDP per capita. However, after the campaign's end, these effects reversed, turning positive. Long-term exposure to ethnic diversity fostered greater voluntary participation in interethnic farmer cooperatives, which have grown larger and more efficient in production over time. These positive outcomes are attributed to strengthened interethnic networks and reduced inequality in human capital accumulation. Marketization, a key institutional shift, played a transformative role in changing the impact of ethnic diversity from negative to positive. This paper underscores the critical influence of institutions in mediating the effects of ethnic diversity.

This paper not only contributes to several branches of academic literature but also helps policymakers optimally design relevant integrative policies. Using the policy change in China, this project provides a concrete setting for identifying the causal effect and showing how the effects change in different institutional contexts. The findings highlight that the effect of enhancing diversity through integrative programs is shaped by institutional contexts. This may provide the insight that policymakers need to distinguish the effects of an integrative program in different periods and should provide inclusive institutions for the programs to achieve their potential positive effects.

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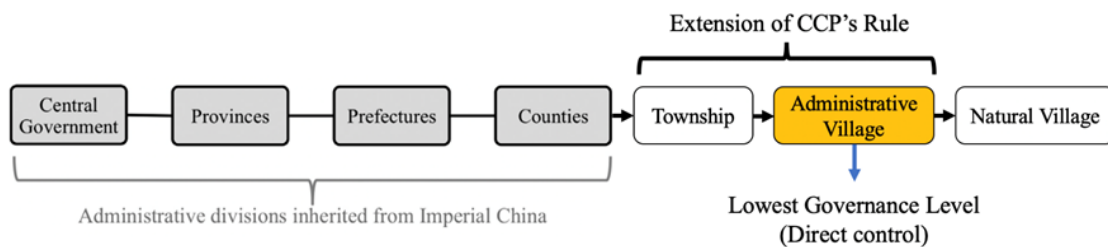
Figures and Tables

Figure 1: Main Events in The Analysis
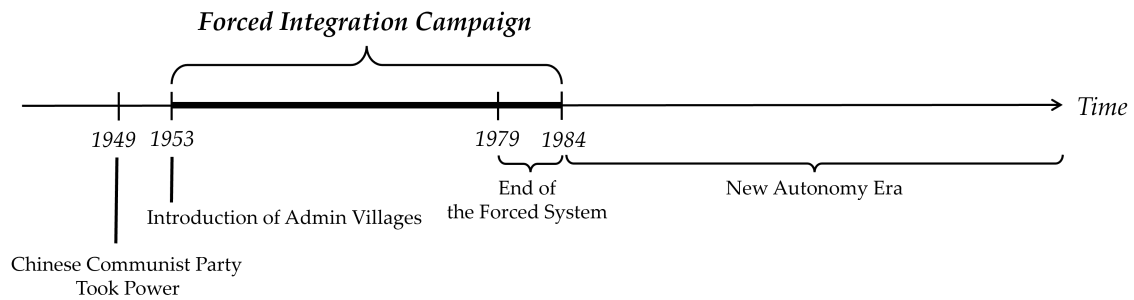
Notes: Figure 1 illustrates the main events mentioned in this analysis. The forced integration campaign is the main event that shaped the independent variable. Voluntary formation of farmer co-ops is the main outcome variable.

Figure 2: The Administrative Hierarchy in China

Notes: Figure 2 illustrates the administrative hierarchy in China. While the left part of the graph shows the traditional administrative hierarchy before the CCP's governance in 1949, the right part of the graph illustrates how the CCP's governance constructed new administrative layers to govern natural villages in rural China after 1949.

Figure 3: Geographic Distribution of Ethnic Diversity in Co-ops
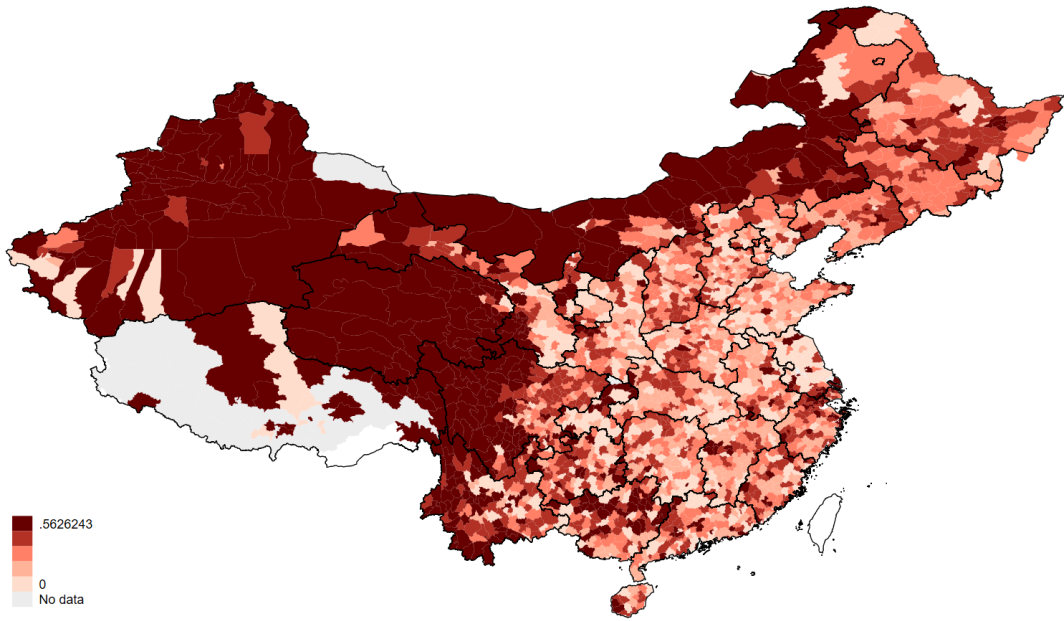
Notes: Figure 3 shows the geographic distribution of ethnic diversity in co-ops. The ethnic diversity index is defined in Section 3.3.

Figure 4: Geographic Distribution of Counties in Sample
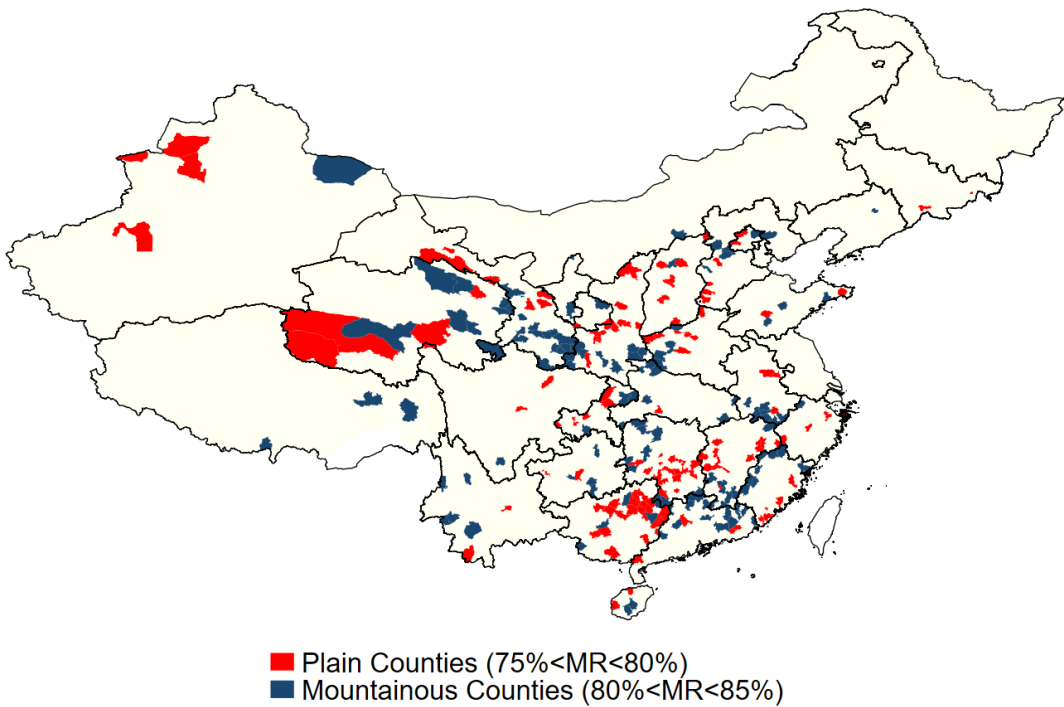
Notes: Figure 4 shows the geographic distribution of the two types of counties in our analysis. "Mountainous Counties" with "Mountainous Ratio" (MR) above 80% are marked as red, while "Plain County" with MR below 80% are marked as blue. "Mountainous Counties" experienced weaker treatment of forced integration in the AVS system. Detailed are discussed in Section 4.1.

Figure 5: RDD Plot on Average Number of Nature Villages in An Admin Village

Note: Normalized MR = -(MR-0.8)
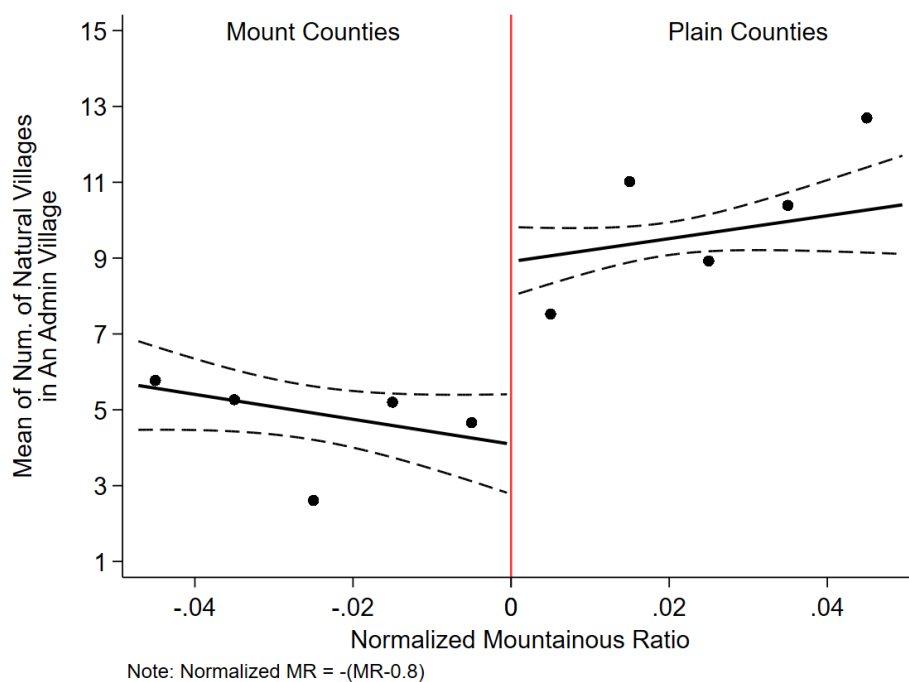
Notes: Figure 5 shows the result of the RDD analysis in Section 4.2 by estimating equation (2). The 95% confidence intervals around the estimated lines are shown as dash lines. The outcome is the average number of natural villages in an admin village. The mountainous ratio (MR) is normalized. Normalized MR equals to -(MR-0.8).

Figure 6: RDD Plot on Average Ethnic Diversity in Admin Villages
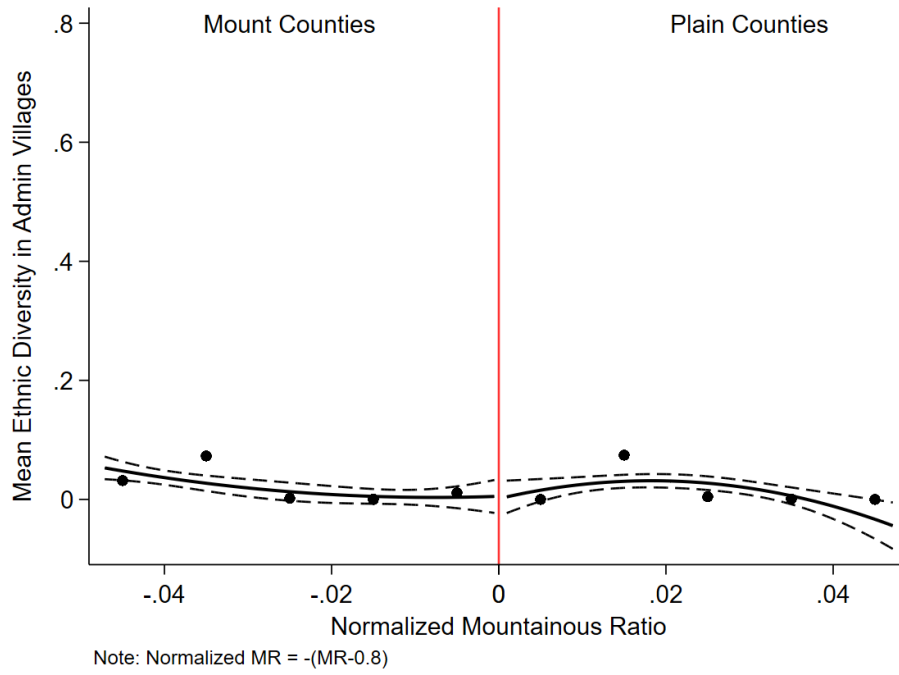
(a) Counties without Ethnic Minority Groups
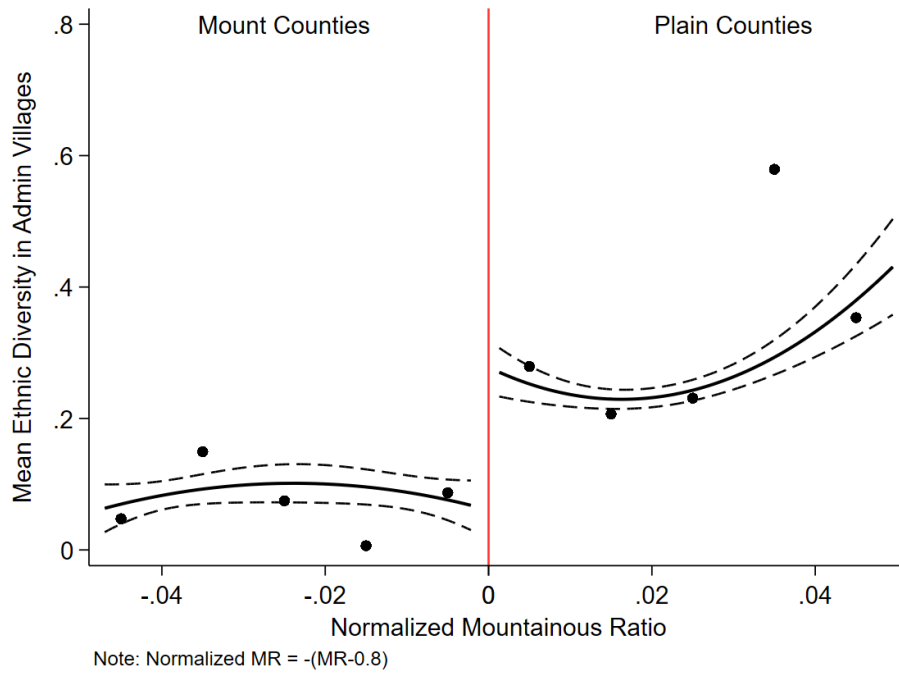
(b) Counties with Ethnic Minority Groups

Notes: Figure 6 shows the result of the RDD analysis in Section 4.2 by estimating equation (2). The 95% confidence intervals around the estimated lines are shown as dashed lines. The outcome is the average ethnic diversity in admin villages. The mountainous ratio (MR) is normalized. Normalized MR equals to $-(MR - 0.8)$.

Figure 7: No Sorting Test
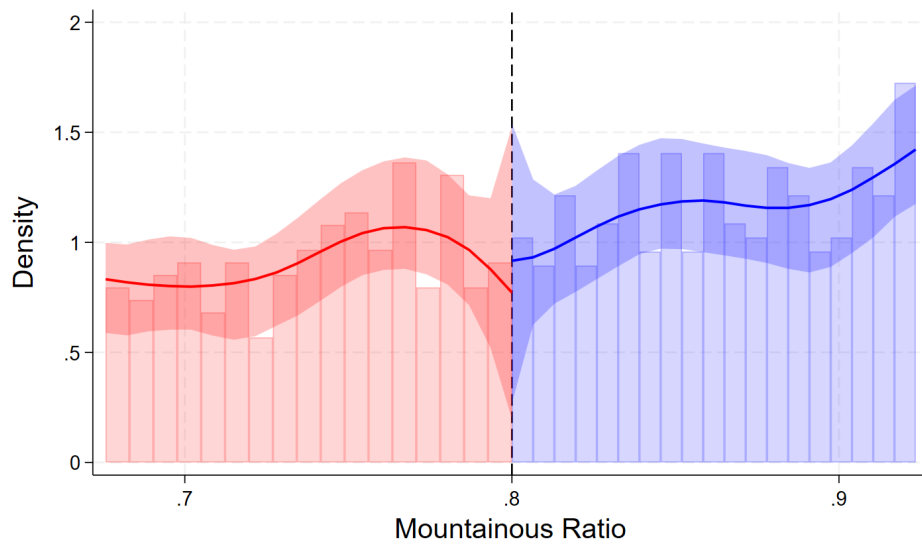
Notes: Figure 7 shows the pattern of the no sorting test in Section 4.3. The test is conducted based on Cattaneo et al. (2018). It illustrates that there is no discontinuous change in the number of observations in each bin around the cut-off point.

Figure 8: Balance Checks on Initial Characteristics
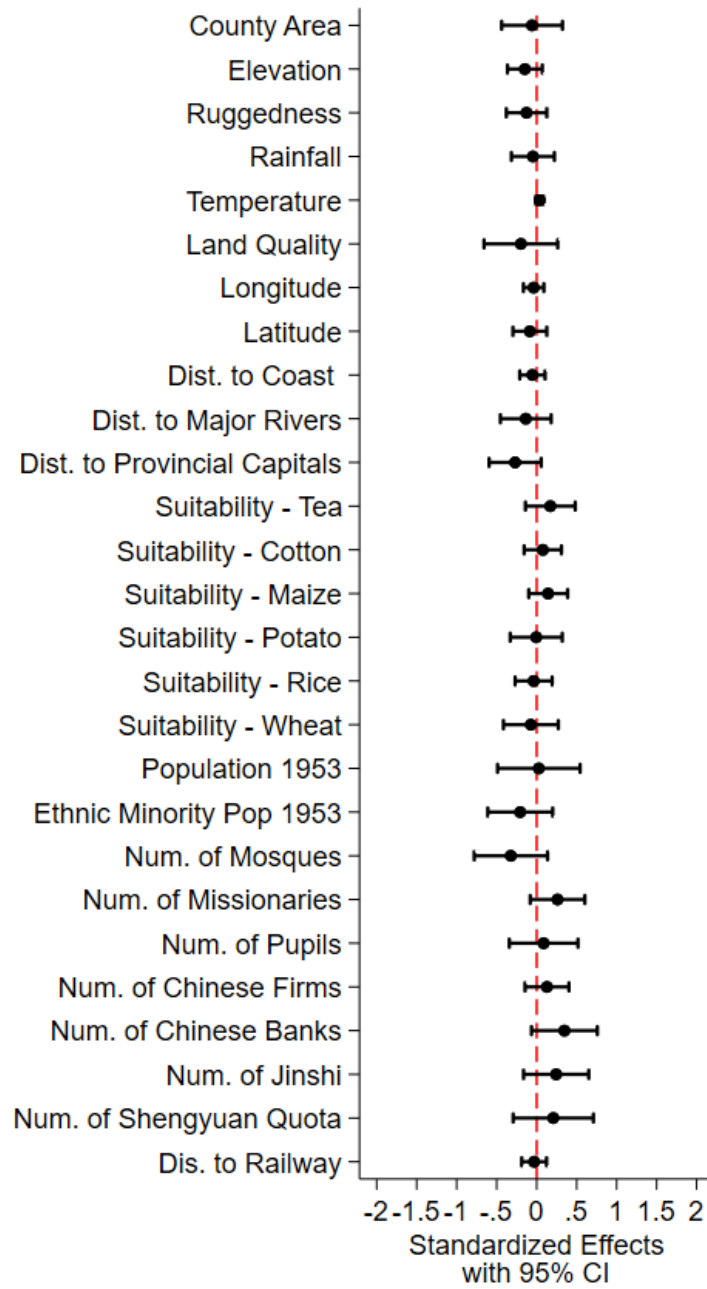
Notes: Figure 8 conducted RDD Analyses on the initial characteristics of the counties included in our sample based on the equation (2). All regressions include a local linear polynomial in the outcome variables estimated separately on each side of the 80% MR cutoff. The bandwidths are equal to 0.05. Standard errors are clustered at the county level.

Figure 9: RDD Plot on Average Ethnic Diversity in Co-ops
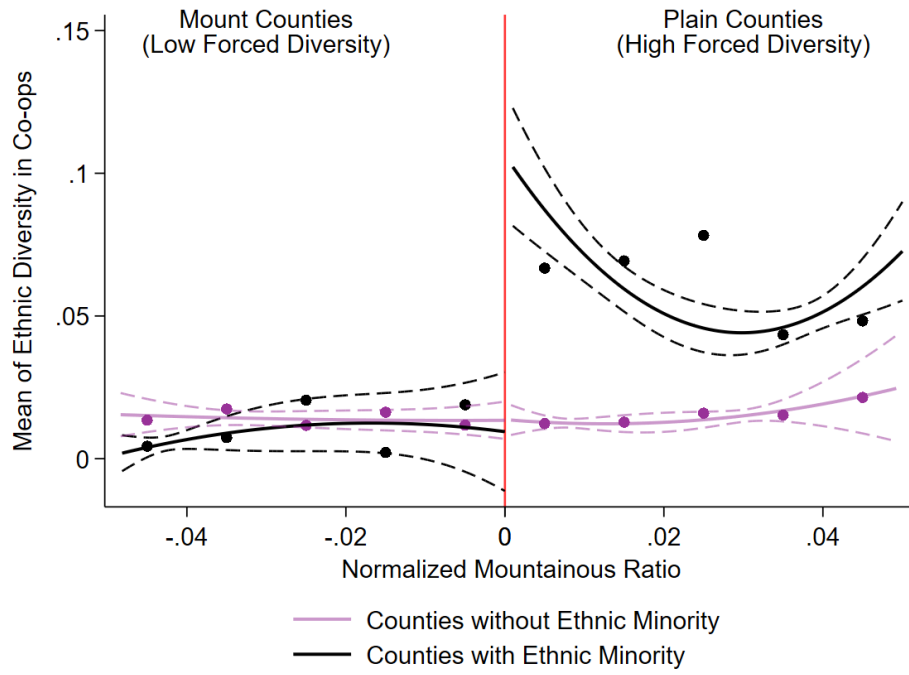
Notes: Figure 9 plots the average ethnic diversity in co-ops for counties with different MR to show the RDD pattern around the 80% MR cutoff point. The 95% confidence intervals around the estimated lines are shown as dash lines. The mountainous ratio (MR) is normalized. Normalized MR equals to -(MR-0.8). The details are discussed in Section 5.1.

Figure 10: Dynamic Effect on Average Ethnic Diversity in Co-ops
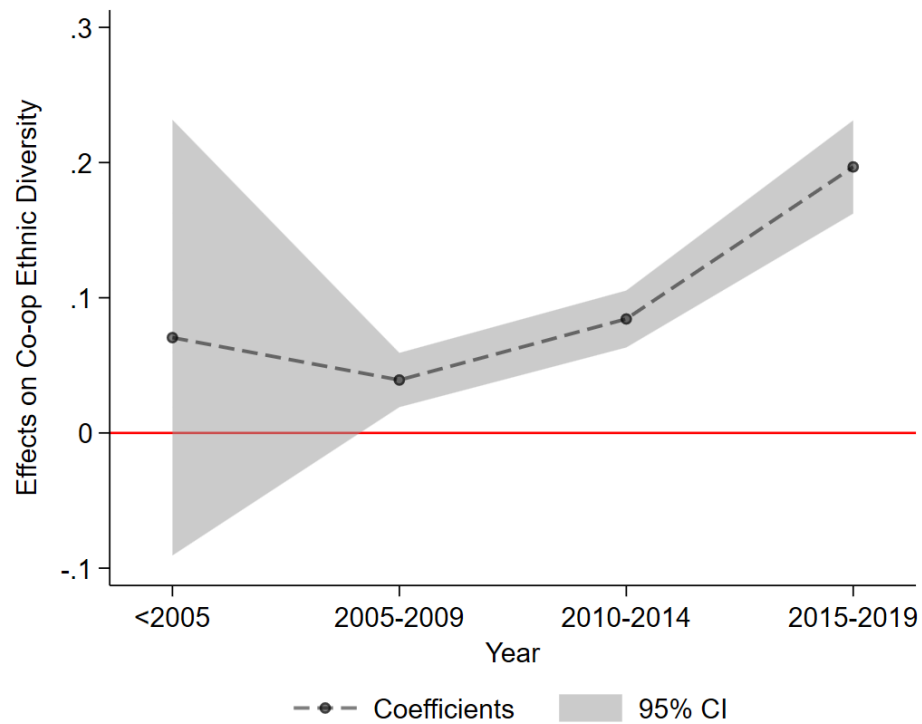
Notes: Figure 10 plots estimated coefficients with 95% confidence intervals from the analysis on the dynamic effect of ethnic diversity on ethnic diversity in co-ops discussed in Section 5.1. The same RD setups are applied as in the baseline analysis or as discussed in Section 4.1.

# Figure 11: RDD Plot on Other Characteristics of Co-ops
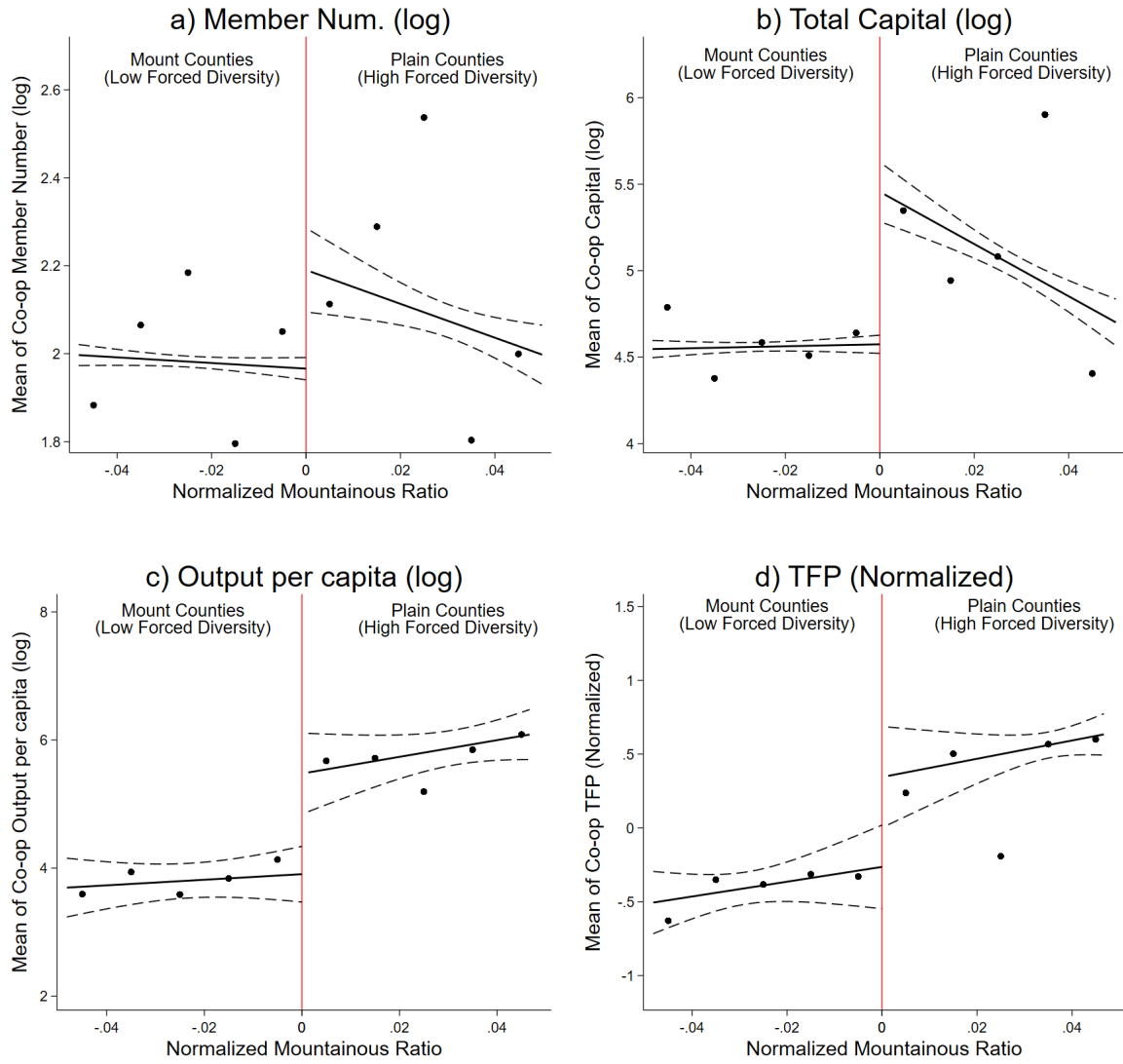
Notes: Figure 11 plots the average characteristics of co-ops for counties with different MR to show the RDD pattern around the 80% MR cutoff point. The 95% confidence intervals around the estimated lines are shown as dash lines. The mountainous ratio (MR) is normalized. Normalized MR equals to -(MR-0.8). The details are discussed in Section 5.2.

45

Figure 12: Summary of Robustness Checks
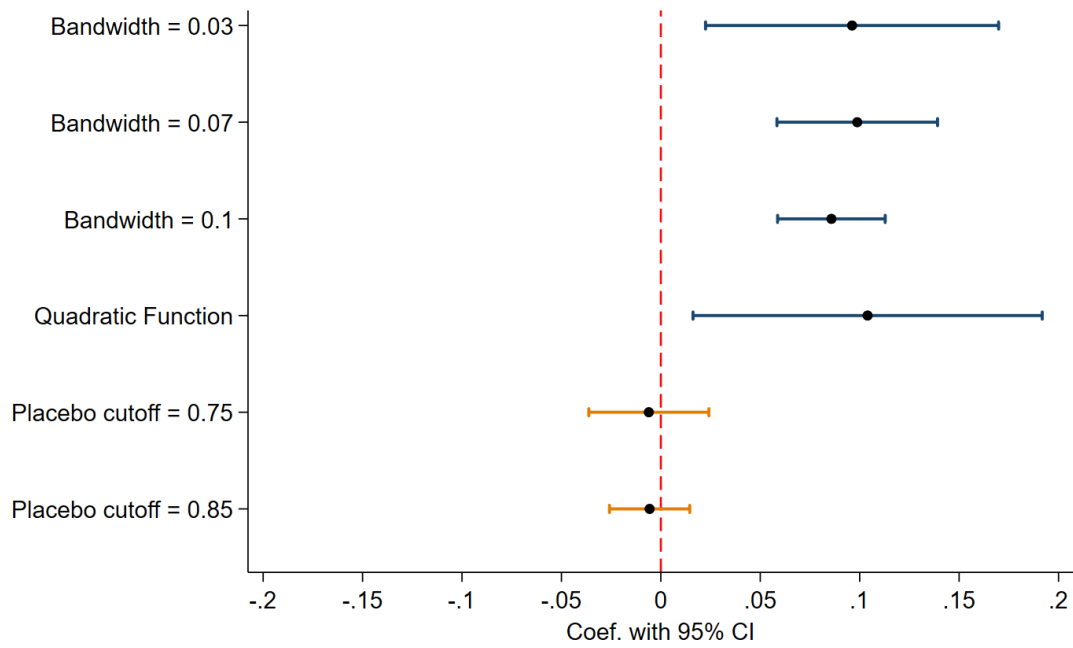
Notes: Figure 12 plots estimation coefficients with 95% confidence intervals from the robustness checks discussed in 5.3.

Figure 13: Effects on Interethnic Marriage and County-level GDP per capita
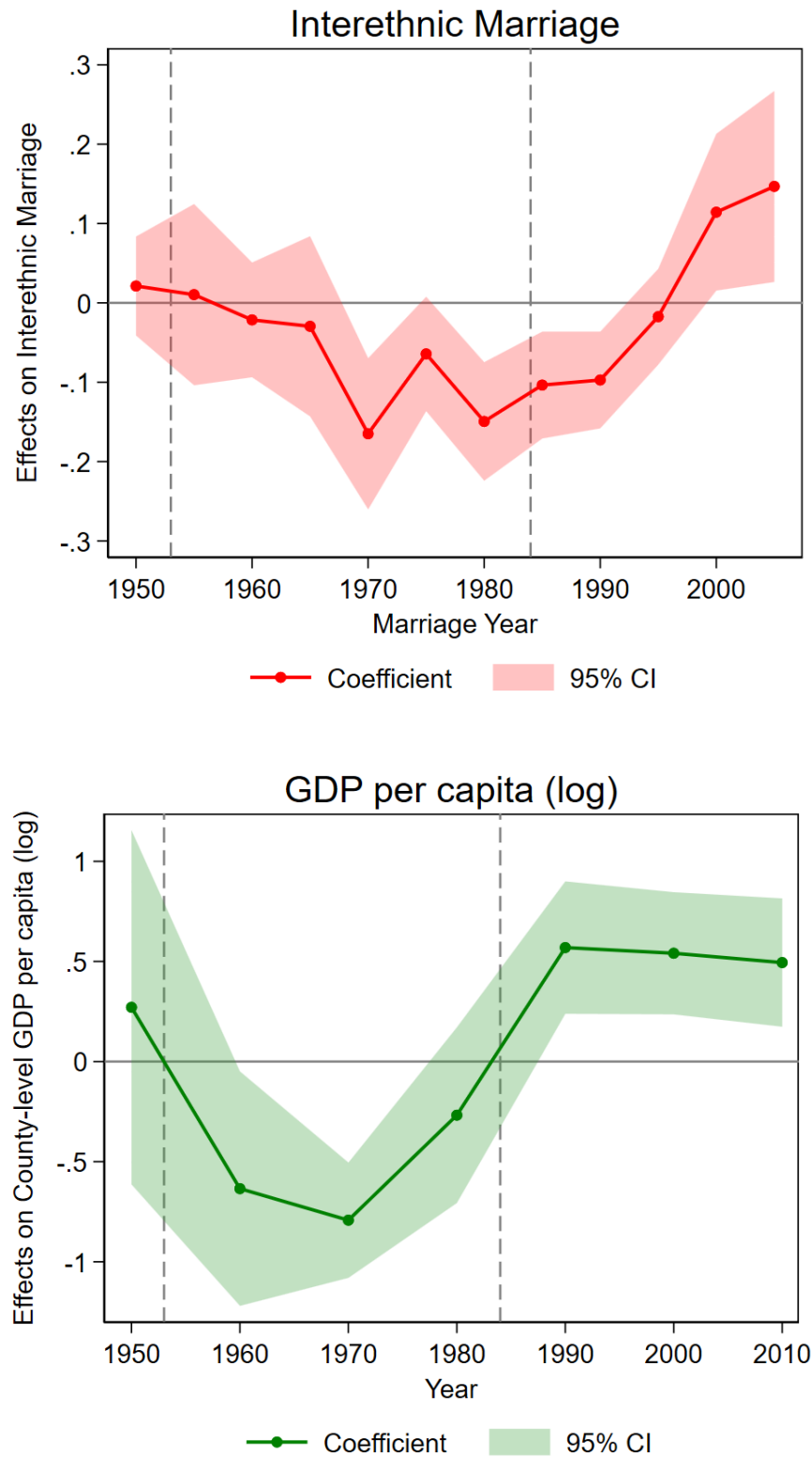

Notes: Figure 13 shows the result of the DDRD analysis on interethnic marriage and GDP per capita in Section 5.4 by estimating equation (3). The 95% confidence intervals around the estimated lines are shown as dash lines. The unit of analysis for interethnic marriage is individual, while the unit of analysis for GDP per capita is county. The two gray vertical dash lines indicate the start year (1953) and the end year (1984) of the forced integration program.

Figure 14: Heterogeneous Effects before/after SEZ Establishment
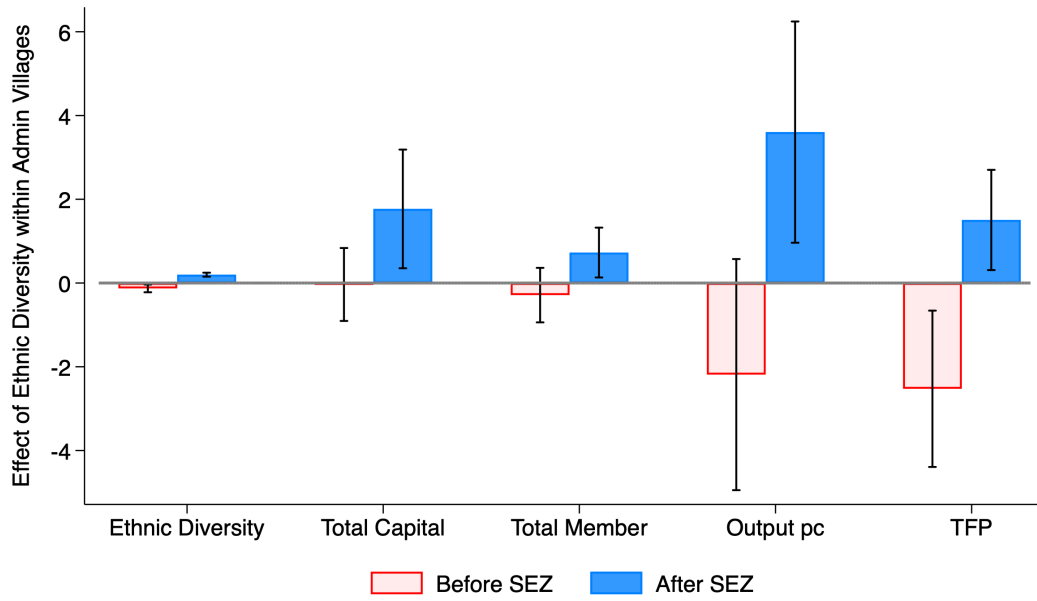
Notes: Figure 14 plots estimated coefficients with 95% confidence intervals on the effect of ethnic diversity on different co-op outcomes discussed in baseline analysis. The estimates are based on Equation (5) in 6.3. The full sample is divided into two periods: before and after SEZ establishment in each certain county. The effects of ethnic diversity are estimated separately in both periods.

Figure 15: Event Study on the Effect of Marketization
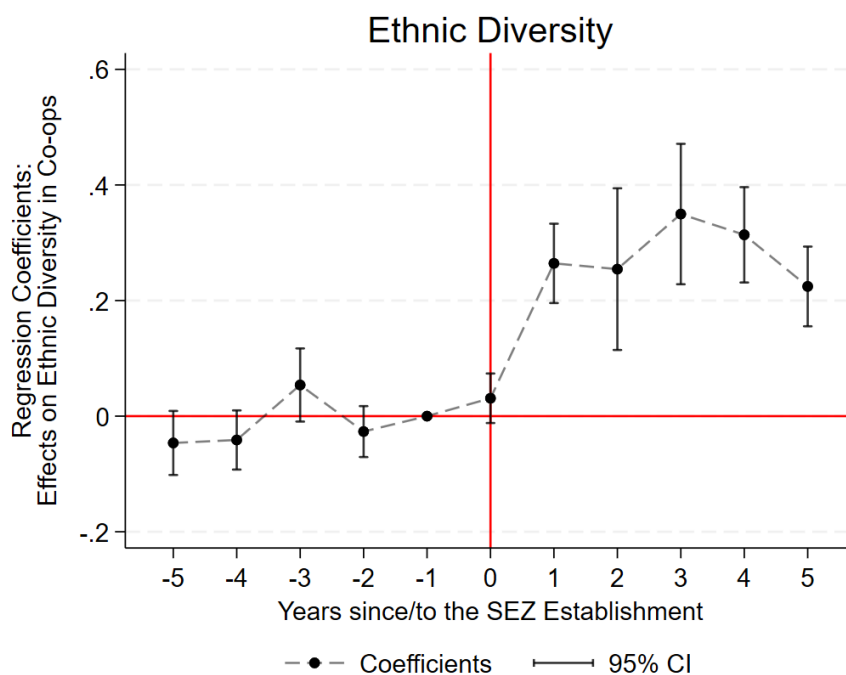
Notes: Figure 15 plots estimated coefficients with 95% confidence intervals from the event study on the impact of SEZ establishment on the effect of ethnic diversity during the forced integration campaign on ethnic diversity in co-ops discussed based on Equation (5) in 6.3.

Table 1: First-Stage Regressions

| | Num. of Natural Villages within Admin. Village | | Ethnic Diversity within Admin. Villages | | | | | |
| | Full Sample | | Counties without Ethnic Minority | | Counties with Ethnic Minority | | Full Sample | |
	(1) Linear	(2) Quadratic	(3) Linear	(4) Quadratic	(5) Linear	(6) Quadratic	(7) Linear	(8) Quadratic
I(MR<80%)	4.427***	4.522**	0.0227	-0.00405	0.130***	0.217***		
	(1.542)	(2.203)	(0.0203)	(0.0162)	(0.0299)	(0.0336)		
I(MR<80%) × Ethnic Minority							0.1076***	0.221***
							(0.0360)	(0.0373)
Observations	10688	10688	6264	6264	5120	5120	11384	11384
Counties	249	249	160	160	89	89	249	249
Mean Dep. Var.	7.378	7.378	0.021	0.021	0.17	0.17	0.085	0.085
SD Dep. Var.	4.918	4.918	0.087	0.087	0.16	0.16	0.143	0.143

Notes: Standard errors in parentheses, * p<0.1, ** p<0.05, *** p<0.01. The outcomes are the number of natural villages in an administrative village in Columns 1 and 2 and ethnic diversity in administrative villages in other columns. Robust standard errors clustered at the county are applied. The RDD Analyses are conducted based on the equation (2) and (3). All regressions include a local linear or quadratic polynomial in the outcome variables estimated separately on each side of the 80% MR cutoff. Bandwidths are equal to 0.05 as chosen by the MSE optimal procedure suggested by Bartalotti and Brummet (2017).

Table 2: Baseline Effects on Co-op Ethnic Diversity

	Reduced Form	2SLS
	(1)	(2)
I(MR<80%) × Ethnic Minority	0.080	
	(0.0265)***	
	[0.0137]***	
Ethnic Diversity in Admin Villages		0.743
		(0.3501)**
		[0.2794]***
Provincial × Establishment Year FE	Y	Y
Observations	60712	60712
Counties	249	249
Bandwidth	0.05	0.05
Mean Dep. Var.	0.0168	0.0168
SD Dep. Var.	0.0681	0.0681

Notes: The unit of observation is the co-ops. The outcome variable is ethnic diversity in co-ops. Standard errors adjusted for clustering by counties are in parentheses. Conley standard errors are in brackets. All regressions include a local linear polynomial in the outcome variables estimated separately on each side of the 80% MR cutoff. Bandwidths are equal to 0.05 as chosen by the MSE optimal procedure suggested by Bartalotti and Brummet (2017). We denote: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 3: Effects on Interethnic Relationships

	Trust (log)		Labor Market		Land Market	
	(1) Strangers	(2) Close Relatives	(3) Working in Other Villages (Yes=1)	(4) Days per Year Working in Other Villages	(5) Transacted Area with Other Villages (m2)	(6) Share of Area Transacted with Other Villages (%)
I(MR<80%) × Ethnic Minority	0.272***	0.001	0.493***	10.996***	28.21***	0.095***
	(0.067)	(0.025)	(0.042)	(2.029)	(4.384)	(0.006)
Observations	4,274	4,274	33,575	33,575	33,575	33,575
Bandwidth	0.05	0.05	0.05	0.05	0.05	0.05
Mean Dep. Var.	0.896	2.163	0.774	6.969	6.792	0.009
SD Dep. Var.	0.744	0.214	0.418	36.394	127.498	0.093

Notes: Standard errors in parentheses, * p<0.1, ** p<0.05, *** p<0.01. Standard errors adjusted for clustering by counties are in parentheses. The RDD Analyses are conducted based on the equation (2). All regressions include a local linear polynomial in the outcome variables estimated separately on each side of the 80% MR cutoff. Bandwidths are chosen using the MSE optimal procedure suggested by Bartalotti and Brummet (2017).

Table 4: Effect on Interethnic Inequality on Education

	Education Level (normalized)		Education Inequality (normalized)	
	Birth Year <1950 (1)	Birth Year ≥1950 (2)	Birth Year <1950 (3)	Birth Year ≥1950 (4)
I(MR<80%) × Ethnic Minority	0.0756	-0.0259	-0.0163	-0.5234***
	(0.0794)	(0.1463)	(0.0203)	(0.1934)
Provincial FE	Y	Y	Y	Y
Observations	249	249	249	249
Counties	249	249	249	249
Bandwidth	0.05	0.05	0.05	0.05

Notes: The unit of observation is county. Standard errors adjusted for clustering by counties are in parentheses. All regressions include a local linear polynomial in the outcome variables estimated separately on each side of the 80% MR cutoff. Bandwidths are equal to 0.05 as chosen by the MSE optimal procedure suggested by Bartalotti and Brummet (2017). We denote: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 5: Effect of SEZ Establishment

	Co-op	Co-op Size		Co-op Efficiency	
	Ethnic Diversity	Member Number (log)	Total Capital (log)	Output per capita (log)	TFP (Normalized)
	(1)	(2)	(3)	(4)	(5)
I(MR<80%) × Ethnic Minority × SEZintro	0.332***	0.165	1.435**	5.519***	3.237***
	(0.060)	(0.611)	(0.579)	(1.031)	(0.295)
County FE, Provincial × Year FE	Y	Y	Y	Y	Y
Observations	60712	60712	60712	504	502
Counties	249	249	249	112	112
Bandwidth	0.05	0.05	0.05	0.05	0.05
Mean Dep. Var.	0.0168	1.967	4.670	4.635	0.000
SD Dep. Var.	0.0681	0.728	1.499	2.121	1.000

Notes: The unit of observation is the co-op. Standard errors adjusted for clustering by counties are in parentheses. All regressions include a local linear polynomial in the outcome variables estimated separately on each side of the 80% MR cutoff. Bandwidths are equal to 0.05 as chosen by the MSE optimal procedure suggested by Bartalotti and Brummet (2017). We denote: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

A   Appendix Figures and Tables

Figure A.1: Map of Ethnic Distribution in China

Notes: Figure A.1 is a map that shows the distribution of officially recognized ethnic groups in China. The source is Hallet IV et al. (2014).

Figure A.2: Illustration of the Forced Integration Experience during the Campaign

Living   *Farming*   *Constructing*

Notes: Figure A.2 contains pictures that provide an illustration of how people with different identities interact with each other when they are organized to live, farm, and build irrigation systems collectively.

Figure A.3: An Example of the Local Gazetteers and Relevant Information

Notes: Figure A.3 offers an illustration of the gazetteers used and the specific types of information they contain for constructing the index of ethnic diversity within administrative villages.

## Figure A.4: An Example of the Co-op Registration Records

Notes: Figure A.4 illustrates an example from the National Enterprise Credit Information Publicity System, the primary source of data on co-ops. It provides detailed information such as co-op names, addresses, establishment dates, capital, member lists, and scope of business.

Figure A.5: Spatial Distribution of Co-ops in the Samples

● Full Sample   ● Survey Sample
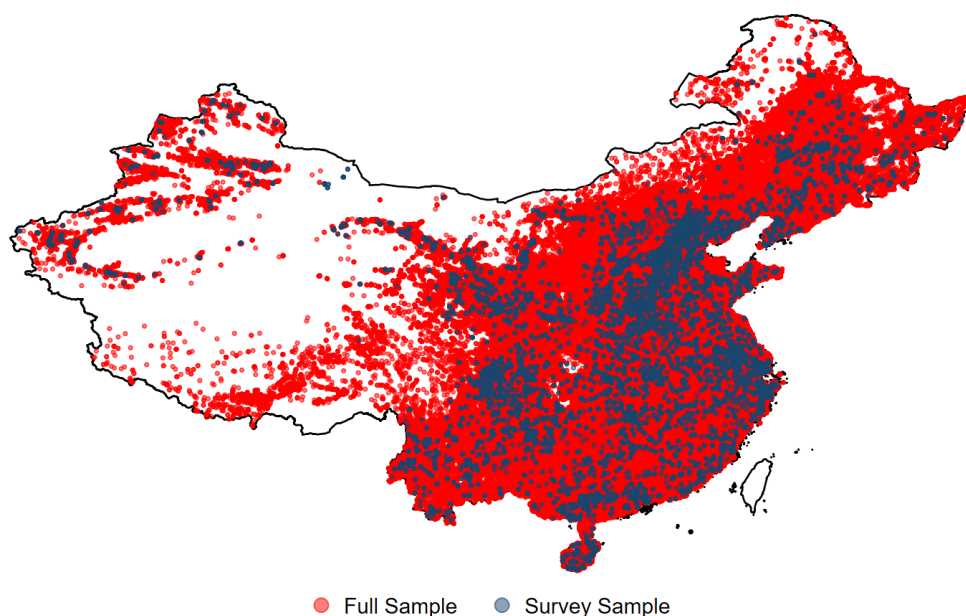
Notes: Figure A.5 provides an illustration of the spatial distribution of the co-ops in the two samples used in this analysis. The red dots represent the co-ops in the full sample from the National Enterprise Credit Information Publicity System, while the blue dots denote the co-ops in the sample from the National Tax Survey Database.

Figure A.6: Reliability of Mountainous Ratios in Archival Records
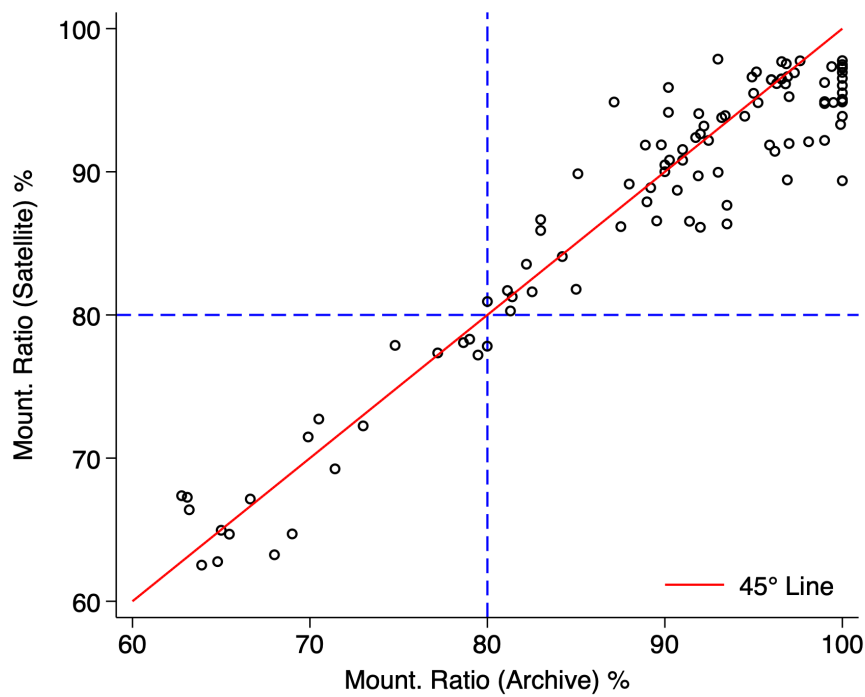
Notes: Figure A.6 compares historical mountainous ratio data from archival records with contemporary satellite-based measurements to assess the consistency between the two sources.

Figure A.7: Geographic Distribution of Newly Established SEZs
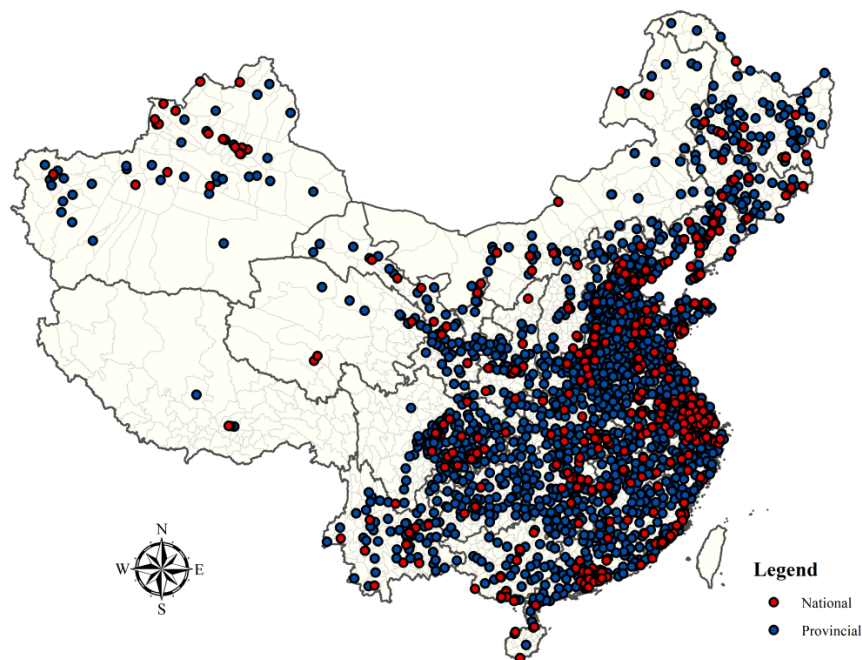
Notes: SEZ = special economic zone. Figure A.7 maps out the spatial distribution of SEZs in China in 2018. Red circles represent national SEZs, and blue circles represent provincial SEZs.

Table A.1: Effect on Other Co-op Characteristics

	Co-op Size		Co-op Efficiency	
	Member Number (log)	Total Capital (log)	Output per capita (log)	TFP (Normalized)
	(1)	(2)	(3)	(4)
I(MR<80%) × Ethnic Minority	0.160***	1.112***	1.608*	0.878**
	(0.0576)	(0.371)	(0.859)	(0.436)
Provincial × Establishment Year FE	Y	Y	Y	Y
Observations	60712	61804	504	502
Counties	249	249	112	112
Bandwidth	0.05	0.05	0.05	0.05
Mean Dep. Var.	1.967	4.670	4.635	0.000
SD Dep. Var.	0.728	1.499	2.121	1.000

Notes: The unit of observation is the co-op. Standard errors adjusted for clustering by counties are in parentheses. Conley standard errors are in brackets. All regressions include a local linear polynomial in the outcome variables estimated separately on each side of the 80% MR cutoff. Bandwidths are equal to 0.05 as chosen by the MSE optimal procedure suggested by Bartalotti and Brummet (2017). We denote: * p<0.1, ** p<0.05, *** p<0.01.