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Your Misfortune Is Also Mine: Land Expropriation, Property Rights Insecurity, and Household Behaviors in Rural China

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ABSTRACT

Using a unique nationwide survey of rural China, we examine the effects of property rights insecurity (PRI) created by undercompensated land requisitions (ULRs). To preclude the confounding impact of land losses on the behavior of displaced households, we adopt a novel approach comparing unaffected households in counties with massive ULRs and their counterparts in land-requisitioned counties without widespread ULRs, adjusted by their respective control group households in adjacent non-land-requisitioned counties. The group from counties with widespread ULRs exhibits significantly lower trust in local governments, employs risk-proof strategies to cope with perceived PRI, and experiences a decline in farming efficiency and household welfare.

1. Introduction

There is widespread global concern about undercompensated land expropriation by the state through eminent domain (Behrer et al., 2021). In the developing world, the state requisition and conversion of agricultural land for nonagricultural uses is much more frequent as a prelude to industrialization and urbanization. Broad interpretations of the "public interest" and weak judicial systems often enable the state and industrialists to implement undercompensated land requisitions (ULRs), which benefit themselves at the expense of displaced rural households, thus creating social tension (Singh, 2012; Ghatak and Mookherjee, 2014). Whether or not displaced rural households receive adequate compensation is a primary indicator of property rights security and is instrumental to equity and efficiency in public policy making and the maintenance of social stability.

As a complement to the prevailing research on the incentive effects of land titling reforms, we attempt to fill a gap in the literature by gauging the adverse effects on rural household behavior and welfare generated by ULRs and the resulting property rights insecurity (PRI). One empirical challenge typically encountered in this field of work is that the loss of land lots forces the affected agrarian households to change or diversify their livelihoods, which mingles the wealth effect with the incentive effect. For example, the affected

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households could reduce agricultural investments because of their shrinking landholdings or the disincentives created by land expropriations or both. This study adopts a novel approach to preclude the wealth effect and highlight the disincentive effects of ULRs. Specifically, we examine the spillover of perceived PRI from undercompensated farmers to unaffected neighboring households within the same village community. Although their landholdings remain intact at present, they may fear that one day they will suffer from a similar misfortune under a predatory local government. This perceived PRI, indicated by their likely lower trust in local governments, prompts them to adopt risk-proof household behaviors as a precaution. Examining this empathy effect enables us to assess how perceived PRI affects household behaviors and to separate the impact of actual property rights encroachment from that of expected PRI. This approach allows us to gauge the negative externality effect of ULRs on economic efficiency and welfare in rural areas.

Using a unique nationwide household survey dataset covering land expropriations administered by county governments in rural China in 2011, 2013, and 2015, we collected a sample of counties having experienced land requisitions. Among them, we identified a set of PRI-treated counties in which the majority of the affected rural households received land-requisition compensation lower than official compensation standards promised by the county governments. To attenuate the selection bias and distinguish the effect of perceived PRI from the effect of wealth losses following land plot expropriation, we employ an identification strategy based on contiguous control groups. In particular, we first examine the difference in the behavioral pattern between unaffected households in PRI-treated counties and households in adjacent control counties (without land expropriation experiences). We then use panel difference-in-differences (DID) analysis to compare this difference with the difference in such aspects between unaffected households in non-PRI-treated counties and households in their contiguous control counties. We find robust evidence that unaffected households within PRI-treated counties exhibit more significant risk-proof behaviors than unaffected households in non-PRI-treated counties, after adjusting for the differences between them and the corresponding bordering counties. Specifically, relative to the unaffected households in the non-PRI-treated counties, the unaffected households in PRI-treated counties reduced their investment in agricultural production, curtailed entrepreneurial activities, and switched to wage-earning jobs, increased the size of land lots leased to others, and cut the size of land lots leased from others. In addition, predatory land expropriation decreased agricultural production efficiency and the welfare of villagers, as reflected in lower household income and consumption expenditure. The negative effects of ULRs on efficiency and welfare therefore go well beyond the affected households and spill over to unaffected neighboring households that anticipate that similar predatory events will occur in the future.

Our identification strategy is based on the assumption that both affected and unaffected households share similar perceptions of the property rights environment. To test the existence of the empathy effect, we use the information regarding villagers' *ex post* trust in local governments' policy promises—that is, whether or not they still believe that local governments will honor their promises to fulfill their obligations in the provision of pensions in the future—as an indicator of rural households' trust in the credibility of the policy commitment made by local governments. As expected, we find that only within PRI-treated counties do both the affected household group and the unaffected household group share deteriorated perceptions of the local PRI environment.

This study contributes to the literature on property rights security and its effects on household behaviors in two ways. First, for many developing countries, the PRI problem arises from not only the absence of well-defined *de jure* property rights but also predatory governments that lack the incentive or capacity (or both) to keep their commitment to abstain from preying on those they should otherwise protect (Besley and Ghatak, 2010). Existing micro-level research on the importance of property rights has largely focused on how rural households respond to governments' weak property rights protection in the form of property titling and issuing property certifications (Banerjee et al., 2002; Besley and Ghatak, 2010; De Janvry et al., 2015; Goldstein et al., 2018;Jacoby et al., 2002). Research in this area has seldom considered how households respond to governments' predatory interventions.[1] By comparing the actual compensation that a large proportion of households received with the official land-taking compensation standard set by the county governments, we capture the predatory nature of local governments' land expropriations and explore its effects on households' economic behaviors. Our study sheds light on the consequences of ULRs, which are a prevalent social issue around the world.

Second, our research design allows us to distinguish the channels through which land expropriations affect households' investment decisions and labor allocation. That is, ULRs could expose households to the government's expropriation threat and thus distort their behavior, such as by reducing agricultural investment. This can also happen when land requisitions lead to a reduction in land holdings *per se* that can be transferred or used as a productive asset. In this study, we exploit the empathy unaffected households feel for affected households within the same PRI-treated county to present evidence of the PRI effect on household behavior. This approach also sheds light on the negative externality generated by PRI.

The remainder of this article is organized as follows. Section 2 introduces China's land expropriation and compensation policy, discusses the implications of government land acquisitions for PRI as perceived by rural households and their likely responses, and proposes the testable hypotheses. Section 3 introduces the data and key variables. Section 4 discusses the identification strategy. Section 5 examines the impact of ULRs on rural households' trust in the policy promises of local governments. Section 6 investigates households' behavioral responses to land expropriations. Section 7 concludes.

[1] Some researchers have studied peasants' responses to socialist agricultural collectivization under communist regimes, including the Soviet Union and China (Lin, 1990; Chen and Lan, 2017), which do not grant private property rights at all.

2. Under the Shadow of Local Developmentalism

2.1. Local Governments' Unchecked Power and ULRs

Rural land in China is collectively owned by farmers and is collectively administered on behalf of farmers by village committees. Farmers only have land use rights. Over the past few decades, rapid industrialization and urbanization have generated an increasing demand to convert rural land to urban use. Typically, a potential land developer must seek permission from the local (county) government, which then implements land requisitions in the name of the public interest and carries out a land transaction with the potential land developer.

As many have observed (Su and Tao, 2017; Zhang et al., 2017), to accelerate industrialization and urbanization, local governments often strategically provide industrial land at lower-than-market prices to attract industrial firms to settle in their jurisdictions. Most observers, however, have overlooked the fact that the linchpin of this growth strategy lies in the local government's capacity to acquire cheap land at the expense of powerless farmers by cutting compensation payments and thus reducing the outlays for land development before public auctions or direct contracting.[2] This generates tremendous government revenue and constitutes the cornerstone of the land finance strategy (see Online Appendix A).

ULRs often give rise to disputes and social unrest. [3] In light of this dissent, China's central government and legislature have taken steps to uphold farmers' rights. The *Property Law* of 2007, China's first comprehensive civil property code, stipulated that land rights transfers must adhere to such principles as voluntariness, free negotiation, compensation, and freedom from compulsion. *The Decision on Several Important Issues of Rural Reform*, released in 2008, addresses the thorny issue of land requisitions by distinguishing between public interest use and commercial use when converting agricultural land into urban land and requires that conversions for commercial use outside the planned urban areas not be made through eminent domain expropriation. In addition, in various laws and regulations, the central government has set out guiding rules for the provision of sufficient compensation to displaced village households upon land requisition. The general principle is to restore farmers' original standard of living and ensure their long-term livelihood.

Despite the seeming *de jure* property rights and legal protections granted by the central government, ensuring fully secure, marketable, and long-term land rights for all farmers remains extremely challenging. Land expropriation is plagued by many problems, including ambiguous and discretionary definitions of public interest, unfair calculations of resettlement subsidies, excessive interception of compensation by village committees and county governments, and the absence of procedural safeguards (Asian Development Bank, 2007). The biggest obstacle lies in the lack of checks and balances under China's authoritarian regime; this enables local bureaucrats to enjoy all the power to set up local land-taking compensation policies and exercise discretion in making subsequent adjustments (Liu, 2014).

Generally speaking, county officials publicly disclose compensation standards in the form of offering a lump sum per *mu* (1 mu = 0.067 hectares). This practice complies with laws and central government regulations. When making actual compensations to displaced rural households, however, the county governments often cannot keep their promises and succumb to the temptation to increase profits from land requisitions and conversions by cutting compensation to affected farmers. Without the extensive participation of the affected peasants in the negotiation process, the county government often easily persuades or coerces the village committee to accept subpar compensation schemes. Both parties may come up with excuses to justify their decisions. More importantly, local bureaucrats do not hesitate to resort to various means, both legal and illegal, [4] to suppress discontented villagers' objections and resistance. The affected peasants have very few effective means, such as launching collective actions or complaining to upper-level governments, to resist the encroachment of local governments.[5]

As a result, despite their policy commitments, county governments frequently fail to deliver on their promises to provide displaced peasants with adequate compensation that meets the standards they have established. Hence, in the absence of a set of prerequisites, including constraints on executive power and an appropriate legal framework, China's land expropriation is characterized by frequent inadequate compensations to peasants and widespread discontent among displaced rural households.

Land grabs by local governments have generally coincided with the ongoing process of China's strengthening of land tenure security, which, as part of the global trend (Djankov et al., 2020), has made great strides since the 1990s. The tenure length of rural land use rights had been extended from the original 3–5 years to 30 years by 1993 and, as of 2017, was allowed to be automatically

[2] Compensation costs include the costs for rural land and property requisition, resettlement, social security and subsidies to affected farmers, and allowances to the affected workers of state or collective enterprises that are restructured or dissolved as part of the land requisition process. Development costs refer to government expenditures to develop and provide basic infrastructure before land transfer.

[3] Land disputes were found to be the most frequent trigger of social tension in China, accounting for 65% of all cases of unrest (Gobel and Ong, 2012), and inadequate compensations have become the flashpoint for the tension between displaced peasants and local governments. The annual frequency of land-related conflicts that usually were triggered by inadequate land-taking compensations has recently increased to the staggering level of four million or so (Liu, 2014, p. 71–72).

[4] These include sending bulldozers to demolish peasants' houses, hiring thugs and hoodlums to beat peasants who refuse to give in to the government's land-taking schemes, and using repressive state organs—including public security agents—to arrest and imprison restive peasants. For an example of how local governments have implemented land expropriation, see a *New York Times* article on the topic at https://www.nytimes.com/2016/07/16/business/international/china-gdp-growth-stimulus.html.

[5] For an account of how local governments can easily preempt or dissolve local dissidents' collective action, see Lee and Zhang (2013). For an experimental study on the dynamic interactions between the elite and the masses in rural China, see Chong et al. (2017).

renewable for another 30 years when the first 30-year tenure was due. Since 2015, the Chinese government has implemented a nationwide pilot program to issue land tenure certificates to rural households (*que quan* in Chinese) and formalized land registration in some experimental sites so that the receivers could transfer land rights or use them as collateral. Titling and certificate issuance have occurred, however, at the same time as massive land grabs by local governments over the past two decades, which suggests that tenure security alone has failed to protect peasants from local government encroachment. Although the existing literature has tended to model property rights security from the perspective of tenure security (Jacoby et al., 2002), *de jure* land tenure security can deviate considerably from *de facto* land tenure security under an authoritarian regime.

2.2. Effects of Land Expropriation on Rural Household Behavior

Undercompensated compulsory land acquisitions can have disruptive effects on the affected rural households. They can also have serious negative effects on unaffected rural households living in affected counties or villages that have observed how their neighbors have suffered from land expropriation. Specifically, undercompensated land acquisitions could cast a shadow on the perception of property rights security for such households, as they fear their neighbors' misfortune could befall them too.[6] This leads to a decline in trust in local governments' commitment to protecting property rights.

Hypothesis 1: Undercompensation in land requisitions increases the perception of property rights insecurity by unaffected households in the treated counties.

Unaffected village households might also respond to a possible threat to property rights security by adjusting their behavioral patterns. Applying Hirschman's classic categories of exit, voice, and loyalty to rural household behavior under the threat to property rights, we argue that, in addition to using their "voice" against predatory local governments,[7] rural households can follow an "exit" strategy, which is a more realistic way to cope with PRI to minimize both economic costs and political risks. Namely, the unaffected rural households can employ risk-proof self-protection strategies by shifting their resources and efforts away from the spheres that are more susceptible to government trespass into those that are more immune to such infringement. Often, these risk-proof strategies can be a reduction in household investments in illiquid physical assets that are more likely to be captured by predatory local governments or suffer a loss once expropriation happens. Specifically, unaffected households would tend to reduce land-related investments and entrepreneurial activities under the shadow of eviction and put more resources, money, and labor into activities and spheres that are less subject to government expropriation. Thus, we predict the following:[8]

Hypothesis 2.1: Unaffected households in affected counties will reduce their investments in agricultural productive assets and production inputs.

Hypothesis 2.2: Unaffected households in affected counties will have less entrepreneurial activity—that is, they will have less incentive to start businesses and, in the meantime, a greater incentive to engage in wage-earning jobs.

Hypothesis 2.3: Unaffected households in affected counties will increase the practice of leasing their land lots to others and decrease the practice of leasing land lots from others.

Thus, the empathy effect from land expropriation is expected to deter the unaffected rural households in PRI counties from making investments in land and other production factors for agricultural activities or from starting their own businesses, as these assets and investments are vulnerable to government infringement.

3. Data and Variables

3.1. Data

We utilize data from the *China Household Finance Survey (CHFS)*, a nationwide household survey with a primary emphasis on collecting information on household income and wealth, assets and liabilities, and expenditure, which is administered by the Southwestern University of Finance and Economics (SWUFE). We acquired permission from SWUFE to access the data and conducted all empirical analyses through remote processing of the data via the mainframe computer located at SWUFE. The survey was conducted in three waves in 2011, 2013, and 2015, which covered 25, 29, and 29 provinces; 80, 262, and 363 counties; and 8,438, 28,000, and 40,000 rural and urban households across China, respectively. Because of the stratified random sampling method adopted in the survey design, the firsthand raw data are nationally representative.[9] A unique strength of the survey lies in the availability of information on rural households' experiences of land requisitions and compensations. The central and provincial governments might occasionally initiate land appropriations for important projects, such as a high-speed railway system, and directly set the compensation standards. In the overwhelming majority of cases, however, county governments initiated and implemented land acquisitions and also set the

[6] ULR reflects just one aspect of the predatory nature of local governments, which also can be predatory in other ways.

[7] In the political science literature, this is usually framed as collective resistance to the government, see O'Brien and Li (2006).

[8] In addition to Hypotheses 2.1–2.3, we could have formed the hypothesis that the unaffected households in affected counties would increase their activities as migrant laborers in other localities. However, owing to scarce information on households' migrant decisions, we cannot test such a hypothesis using the available data. By the same token, we do not know where households earned their wages (e.g., from working for local firms or from migrant jobs in other counties or provinces).

[9] The survey employs a stratified three-stage probability proportion to size random sample design to randomly select counties, villages, and households at each stage, respectively. For details on the stratification method, see Gan et al. (2014, p.1–4).

nominal and actual compensation standards. In our sample, we verified that all land requisitions were administered by local (county) governments that also set the compensation standards. None of the sample counties was located next to a high-speed railway.

In each sample village, all of the surveyed households were asked the question, "Has your family ever experienced compulsory land requisitions by the local government? If yes, in which year did the latest one take place?" In each village with compulsory land requisitions in the period 1990–2015, some surveyed households were affected by having their land lots requisitioned, whereas others were not, which facilitates our analysis of the impact of land requisitions on the mentality and behavior of the unaffected households in the affected villages. Among a total of 265 counties with rural household observations, 172 (64.9%) experienced land expropriations. Of a total of 20,145 rural households, 885 (4.4%) had some of their land plots requisitioned by local governments, and among them, 97.2% experienced land requisitions after 1998 and 73% after 2007.

To derive the information on compensation standards for rural land requisitions, we took more than a half year to glean documents issued by county governments in different provinces on the compensation policies for land acquisitions and the relevant information from government websites and land resource websites (primarily from various county-level Land and Resources Bureaus). The compensation standards typically are expressed in one of two ways. One is to stipulate the annual normal agricultural output of arable land per *mu* as a benchmark for the calculation of land requisition compensation and to state explicitly how much the requisition compensation should be relative to the annual normal agricultural output. The other way, which is much more common in practice, is to assign explicitly a lump-sum land acquisition compensation for a specific area within a village, county, or prefecture-level city. Based on the information retrieved from the above sources, we obtain the specific rural land requisition compensation standards for sample counties—that is, the unit price of land (in 10,000 yuan/*mu*) a county government should pay to peasants whose parcels of land have been requisitioned. In a few cases, the land-taking compensation standards vary with the quality of farmland to be expropriated, and we take the stated compensation level for the lowest quality plots as the minimum compensation the county government should pay to the affected households. Ultimately, we included 172 counties in our empirical analyses, with information on compensation standards spanning the period from 1998 to 2015.

Table 1 shows the mean and median values of the compensation standards and the actual compensation paid for the requisitioned agricultural land per *mu* in the years 2010–2011, 2012–2013, and 2014–2015 separately for the sample counties. The average official compensation standards hovered from around 37,400 yuan to 48,500 yuan per *mu*, whereas the median values fluctuated from 31,900 yuan to 39,800 yuan per *mu*. By contrast, the mean actual compensations were approximately 20,900 yuan to 32,600 yuan per *mu*, whereas the median actual compensations ranged from 13,200 yuan to 18,000 yuan per *mu*. These findings are comparable to a 2011 nationwide survey of nearly 1,800 rural households across 17 provinces in which local governments paid peasants an average compensation of approximately $17,850 per acre (= 18,996 yuan/*mu* at the then exchange rate; Landsea, 2012).

The ratio of the median actual compensation to the median official compensation standards was 0.38, 0.39, and 0.57 in 2010–2011, 2012–2013, and 2014–2015, respectively, all of which are far below 1. Thus, by 2012–2013 (2014–2015) more than half of the affected households still received at most 40% (57%) of the lowest compensation level promised by the county governments.

Finally, Table 1 reports the ratio of official compensation standards to the average price of land for industrial use. Note that the sales prices for land for industrial development were typically much lower than those for commercial or residential development purposes because local governments used low-cost land for industrial use to lure foreign or domestic industrial investments. As expected, in all surveyed periods, the median of the ratio is stunningly low: 0.05 in 2010–2011 and 0.13 in 2014–2015. These results provide strong prima facie evidence for the predatory and opportunistic nature of land expropriation by county governments in minimizing the land-taking cost and maximizing the net land concession income. This is a striking sign of how repressive local governments are in expropriating land plots from agrarian households.

3.2. Variables

We place primary emphasis on the empathy effect of ULRs—that is, the unaffected rural households that have witnessed the misfortune befalling their neighboring affected households and that have changed their perception of the threat to property rights security. Conceivably, the perceived PRI would be aggravated when a large fraction of the affected households in the county was undercompensated. To capture the predatory nature of land requisitions, we construct a county-year dichotomous indicator, $APPROPRIATION_{kt}$. For a county that experienced land requisition in a given survey period, *Appropriation* takes a value of one if no less than 50% of the affected households in the county received a compensation below the standard announced by the county government, and zero otherwise.[10] In Appendix Table 2, we observe that seven counties (seven counties) in 2010–2011, 68 counties (28 counties) in 2012–2013, and 102 counties (34 counties) in 2014–2015 take the value one (zero) for *Appropriation*, which indicates the prevalence of massive undercompensated land expropriations. Based on the indicator $Appropriation_{kt}$, we classify two types of treated counties that have experienced land requisitions: (1) PRI counties if *Appropriation* takes the value one in at least one of the three survey periods, and (2) non-PRI counties if *Appropriation* takes a value of zero in all three survey periods.

We examine the impacts of the ULR experience on a host of household behaviors for the unaffected households in the affected counties. We first look at *Total Agricultural Investments*—that is, the total value of investments in various types of agricultural inputs. We also look at two variables reflecting households' entrepreneurial activities. One is *the Number of Entrepreneurs in a Household*—that is, the number of family members who embarked on their own nonagricultural business ventures (e.g., opening a grocery store or

[10] The results remain basically the same if we raise the threshold proportion from 50% to a higher one, say 60%, 70%, or 80%.

Table 1
Official Land-Taking Compensation Standards vs. Actual Land-Taking Compensation, 10,000 yuan/mu.

	Year	Mean	Median	SD	Max	Min
Compensation standards	2010–2011	4.71	3.82	3.13	17.50	0.00
	2012–2013	4.85	3.98	3.42	23.38	0.06
	2014–2015	3.74	3.19	2.42	14.91	1.05
Actual compensation	2010–2011	2.76	1.32	4.16	26.67	0.00
	2012–2013	2.09	1.58	3.19	41.11	0.00
	2014–2015	3.26	1.80	7.68	66.67	0.00
Actual compensation/compensation standards	2010–2011	0.96	0.38	2.59	21.62	0.00
	2012–2013	0.63	0.39	1.06	12.11	0.00
	2014–2015	1.07	0.57	2.54	21.16	0.00
Actual compensation/average price of industrial land use	2010–2011	0.17	0.05	0.31	2.07	0.00
	2012–2013	0.16	0.11	0.26	3.51	0.00
	2014–2015	0.29	0.13	1.03	10.05	0.00

Note: This table provides the summary statistics (mean, median, standard deviation, maximum, and minimum) for the official land-taking compensation standards and the actual compensations for land expropriation in 172 sample counties in three periods: 2010–2011, 2012–2013, and 2014–2015. Both types of prices are in terms of 10,000 yuan per *mu*. The data on official compensation standards are collected from county government documents and government websites, and data on actual compensations are derived from the China Household Finance Survey (CHFS). The data on price of industrial land use are collected from a website of land transactions (www.landchina.com) and calculated by the authors.

hardware shop). The other is *Having Wage-Earning Employees in a Household*, a dummy that takes a value of 1 if at least one family member has become a wage-earning employee. We do not have information on the number of employees in a household. Finally, we look at two variables regarding households' land leasing—that is, the area of land plots leased out and the area of land plots leased by households.

In addition to these outcome variables, we also discuss the impact of ULRs on unaffected households' trust in local government in Section 5 and the impact on unaffected households' welfare in terms of household income and consumption expenditure levels in Section 6.

4. Empirical Strategy

4.1. Adjacent Counties as a Control Group

If we compare PRI and non-PRI-treated counties directly, the differences in household behaviors may capture not only the effects of undercompensated land expropriation but also the impact of substantial differences in natural endowments, local culture, social norms, and socioeconomic conditions, many of which are unobservable or at least are hard to measure. For example, the decisions of rural households to engage in entrepreneurial activities or to take on wage-earning nonagricultural jobs could be influenced by the local people's attitudes toward entrepreneurship and business risk-taking, emotional attachment to land and farming, and the local culture of engaging in commerce and industry. Furthermore, additional factors also could affect households' decision-making processes, such as industrial and urban development (and thus business or job opportunities in various cities in the province or neighboring provinces), physical distance, and changing transportation conditions from the county to the noted cities and to booming metropolitan cities elsewhere in the country. For instance, Huangzhong County in Qinghai Province is one non-PRI-treated county located in the landlocked western hinterland megaregion, while Laixi County in Shandong Province is a PRI-treated county situated in the dynamic eastern coastal megaregion. The two counties differ tremendously in terms of natural endowment, climate, and socioeconomic development. The economic development of the cities in their respective provinces and neighboring or nearby provinces—and thus the nonagricultural employment or business opportunities—also differ considerably. Huangzhong County is close to few booming cities in the same or nearby provinces, whereas Laixi County enjoys many such cities. Clearly, household behaviors in these two counties may well be shaped by factors other than ULR.[11]

To minimize the impact of such extraneous factors, we employ a comparison group of adjacent counties for both PRI and non-PRI-treated counties. These adjacent counties share a common border with the land-requisitioned counties but have not experienced any land expropriation since 1998. Adjacent counties typically share a similar natural endowment, climate, and geographic and topographic features, and they usually have a similar local culture, socioeconomic conditions, and potential for economic development. Moreover, comparing rural households in the treated counties and those in the neighboring counties helps to control for the effects of time-varying developments that may simultaneously apply to contiguous counties and affect rural households' agricultural and nonagricultural activities. Using adjacent control counties to make adjustments can maximize the similarity in these unobservable or unmeasurable locality-specific factors and minimize the impact of extraneous unobservable factors. For example, migrant labor

[11] We compare county socioeconomic characteristics between land requisition counties (PRI and non-PRI counties) and non-land-requisition counties, as well as those between PRI counties and non-PRI counties, by employing the *t*-test of the means of the same county-level variables as those in Table 2. Most results are statistically significant, suggesting it is necessary to avoid comparing the PRI/land requisition counties and non-PRI/non-land-requisition counties directly. Due to limited space, we do not report these results, which are available on request.

opportunities generated by rapid urbanization and industrialization in nearby or distant places would be similar for residents in the treated counties and those in neighboring control counties. Similarly, business or infrastructure projects are likely to benefit both the land-requisitioned counties and adjacent counties. With a similar local culture and social norms, rural households in contiguous counties probably would have similar responses to migrant labor opportunities. Hence, adjusting household behaviors in the land-requisitioned counties by those in adjacent counties can preclude, as much as possible, the impact of these unobservable extraneous factors on the differences in household behaviors in PRI-treated counties and the non-PRI-treated counties, and highlight the effects of ULRs as the primary force shaping behavioral differences.

We identified 15 land-requisitioned counties (both PRI and non-PRI-treated counties) that have adjacent counties covered in our sample to form county pairs.[12] All but one of the adjacent counties are located in the same province. The matching process generated 11 and 12 pairs for 2010–2013 and 2014–2015, respectively. The downside of this matching process, however, is the significant drop in the number of valid observations (see details in Section 4.2).

To check whether the land-requisitioned counties and their adjacent control counties are similar in terms of socioeconomic development, we compare basic county-level features in the prior years 2006–2010 (see Table 2A). The county-level data are obtained from *Chinese Statistical Yearbook (County Level)* (CSYCL) for various years. We first look at the size of the rural sector. We do not find a significant difference between the two groups of counties in terms of the proportion of rural residents in the total population, rural population size per township, and rural population size per village. We then look at socioeconomic development characteristics. No significant differences are detected in gross domestic product (GDP) per capita; average population size for counties, townships, and villages; rural-urban population structure; rural and urban household bank savings per capita; fiscal revenue per capita; and the ratio of budget balance to GDP, among others. These comparisons show that the land-requisitioned counties and their adjacent control counties were comparable in terms of the size of the rural and urban sectors and shared similar statuses and situations of socioeconomic development before the sample period. Thus, the differences in the mentality and behaviors between the rural households in the land-requisitioned counties and those in the adjacent control counties (e.g., engagement in nonagricultural employment) were unlikely to be attributable to differences in the fundamental characteristics (e.g., industrial sector or urban sector development) of these two groups of counties.

We also compare the sample households in the land-requisitioned counties and those in their adjacent control group counties along several observable dimensions (Table 2B). We do not find any statistically significant differences in household size; the gender, average education level, age, or marital status of the household head; the average arable land area per capita; and the proportion of households having at least one Chinese Communist Party (CCP) member. This suggests that the sample households in the land-requisitioned counties and those in the adjacent counties were largely comparable before the sample period in terms of demographic characteristics, land endowment, and households' human and political capital. The differences in the behavioral patterns between the rural households in the land-requisitioned counties and those in the adjacent control counties were unlikely to be primarily driven by differences in household demographics, human and political capital, or other features.

4.2. Regression Framework

To investigate the disincentive impact of land expropriations, we compare the difference in various household behaviors between the unaffected households in PRI counties and households in their adjacent control counties with the difference in such aspects between the unaffected households in the non-PRI counties and households in their adjacent control counties. After being adjusted by the households in the adjacent control counties, the differences in unaffected household behaviors between PRI counties and non-PRI counties likely are driven primarily by ULRs. Because of data limitations, the sample counties and the prefecture-level cities in which these counties are located do not remain constant from period to period. Nevertheless, adjusting by the comparison groups in the adjacent control counties can mitigate the concern about the effects of the selection of land-requisitioned counties as well as land-requisitioned households on unobservable attributes. This regression framework is analogous to a DID estimation. Moreover, as noted, by adjusting the dependent variables—that is, households' behavioral patterns—against the benchmark of those in the adjacent counties, we can largely control for county-specific institutional and cultural factors that shape the variations in these aspects across sample counties.[13]

Rather than using the whole sample of 15 land-requisitioned counties (10 PRI counties and five non-PRI counties, with 1,338 unaffected households) and 15 corresponding adjacent counties (with 1,058 households), we instead examine a subsample of unaffected households in 11 land-requisitioned (affected) counties (seven PRI counties and five non-PRI counties, with 741 households) and their corresponding adjacent control counties (with 519 households). This subsample has continuous observations during the whole sample period, which enables us to conduct a within-household comparison before and after land expropriation. We also identify the control group households with continuous observations in the adjacent control counties. We then compare the households

[12] To construct such pairs, we first determined the land-requisition counties' bordering counties from the corresponding annual provincial yearbooks. Then, based on that information, as well as on the county names and location in the corresponding province provided in the CHFS dataset, we sorted the adjacent counties for each land-requisition county.

[13] We also conduct the regressions by simply comparing the unaffected households between PRI counties and non-PRI counties, without adjustment by taking the households of the adjacent counties into account. Although the estimated coefficients have the same signs as those derived from Equation (1), they are statistically not significant in almost all regressions. For space reasons, we do not report these results, which are available on request.

Table 2A
Comparing County Characteristics.

	Mean (County-Year Obs.)	Stand Err.
A. County rural population/Total county population		
(1) Counties with land expropriation	0.85 (61)	0.01
(2) Matching bordering counties	0.87 (50)	0.01
Diff.: (2)-(1)	0.02 (p = 0.17)	0.01
B. County rural population/Number of towns in the county (10,000)		
(1) Counties with land expropriation	3.55 (61)	0.15
(2) Matching bordering counties	3.53 (50)	0.17
Diff.: (2)-(1)	−0.02 (p = 0.92)	0.22
C. Total county population (10,000)		
(1) Counties with land expropriation	84.66 (62)	4.56
(2) Matching bordering counties	79.04 (51)	4.11
Diff.: (2)-(1)	−5.62 (p = 0.36)	6.13
D. Per capita bank savings of urban and rural residents (1,000 yuan)		
(1) Counties with land expropriation	7.94 (62)	0.48
(2) Matching bordering counties	7.03 (51)	0.65
Diff.: (2)-(1)	−0.91 (p = 0.28)	0.83
E. Total county fiscal revenue/Total county population (yuan)		
(1) Counties with land expropriation	511.3 (62)	66.62
(2) Matching bordering counties	467.1 (51)	57.87
Diff.: (2)-(1)	−44.2 (p = 0.63)	90.30
F. County per capita GDP (10,000 yuan)		
(1) Counties with land expropriation	2.47 (49)	0.23
(2) Matching bordering counties	2.26 (40)	0.29
Diff.: (2)-(1)	0.21 (p = 0.39)	0.59
G: County fiscal capacity, defined as the ratio of (county fiscal revenue-county fiscal expenditure)/fiscal expenditure		
(1) Counties with land expropriation	0.63 (61)	0.06
(2) Matching bordering counties	0.69 (50)	0.03
Diff.: (2)-(1)	0.06 (p = 0.36)	0.06

Note: This table conducts mean comparison tests for several county-level characteristics between the treated countries that experienced land requisitions and their adjacent control counties in the years 2006–2010. The characteristics include the proportion of rural population out of the total population, the average rural population size of each township, the total county population, the per capita bank savings of urban and rural residents, the county's per capita fiscal revenue, the county's per capita GDP, and the county's fiscal capacity defined as the ratio of the county's fiscal surplus to its fiscal expenditure. The mean and standard deviation of each sample and the *p*-values of *t*-tests are reported in the table. The county-level data are obtained from the Chinese Statistical Yearbook (county level) (CSYCL) for various years.

in PRI counties and those in the non-PRI counties within the group of affected counties. That is, we look at the changes in the perception of PRI as well as the various household behaviors after land expropriation for the unaffected households in PRI counties and those for the unaffected households in the non-PRI counties. We examine these changes relative to the corresponding changes for their respective comparison group households in the adjacent counties, which constitutes a household-level panel DID regression analysis.[14] The regression model is specified as follows:

$$Y_{ikt} = \alpha + \beta_1 PRI_{kt} + \beta_2 X_{ikt} + \varphi_i + \lambda_k + \nu_t + e_{ikt}, \quad (1)$$

where Y_{ikt} refers to the outcomes of household i in county k and year t (i.e., 2010–2011, 2012–2013, and 2014–2015); φ stands for household fixed effects; and λ and ν are prefectural-level cities (where county k is located) and year fixed effects, respectively, which we use to control for time variations and city-level unobservable factors, such as the city governments' policy toward migrant laborers and credit support to the countryside within their jurisdictions, city leadership changes, and the resulting changes in policies and governance style. As households in adjacent counties can belong to the same prefecture-level city, a separate city fixed effect is included. PRI_{kt} is an indicator variable that takes a value of one for all unaffected households in county k in year t and subsequent years if county k once experienced land expropriation in year t and at least 50% of the affected households were undercompensated in the land requisition, and zero otherwise.

[14] Albeit with a reduced sample size, the panel DID regressions have a significant advantage in exploiting within-household variations in PRI perception and various household behaviors across the survey periods. Note that the panel setting is superior to the pooled cross-section DID regressions, in which we pool the whole sample observations together and treat them as separate observations. This helps us substantiate that the regression results indeed reflect changes in household behaviors rather than systematic differences between PRI and non-PRI counties or the adjacent control counties. In other words, in the panel DID setting, we no longer require the assumption that systematic differences do not exist between households in PRI counties and those in non-PRI counties or the adjacent control counties. All results derived from the pooled DID regressions are included in Appendix C for reference.

Table 2B
Comparing Household Characteristics.

	Mean (County-Year Obs.)	Stand Err.
A. No. of household family members		
(1) Counties with land expropriation	3.87 (22)	0.12
(2) the Matching bordering counties	3.80 (38)	0.11
Diff.: (2)-(1)	−0.07 (p = 0.68)	0.18
B. Gender (0 = female, 1 = male)		
(1) Counties with land expropriation	0.88 (22)	0.01
(2) Matching bordering counties	0.87 (38)	0.02
Diff.: (2)-(1)	0.01 (p = 0.79)	0.02
C. Education—values range from 1 (no schooling) to 7 (college degree or above)		
(1) Counties with land expropriation	2.58 (22)	0.05
(2) Matching bordering counties	2.42 (38)	0.11
Diff.: (2)-(1)	0.16 (p = 0.15)	0.11
D. Age of household head		
(1) Counties with land expropriation	54.41 (22)	0.77
(2) Matching bordering counties	56.10 (38)	0.80
Diff.: (2)-(1)	−1.68 (p = 0.17)	1.20
E. Marriage (0 = No, 1 = Yes)		
(1) Counties with land expropriation	0.89 (22)	0.01
(2) Matching bordering counties	0.88 (38)	0.02
Diff.: (2)-(1)	0.01 (p = 0.84)	0.02
F. Per capita arable land area (mu)		
(1) Counties with land expropriation	3.42 (22)	1.52
(2) Matching bordering counties	3.77 (38)	1.41
Diff.: (2)-(1)	−0.35 (p = 0.88)	2.27
G. Party membership (proportion of household families that have at least a CCP member)		
(1) Counties with land expropriation	0.22 (22)	0.06
(2) Matching bordering counties	0.27 (38)	0.04
Diff.: (2)-(1)	−0.05 (p = 0.49)	0.70

Note: This table conducts mean comparison tests for the sample households in land-requisitioned counties and those in their adjacent control counties along several observable dimensions. They include the number of household members, gender of the household head, the highest education attained by the household head, marriage status of the household head, per capita arable land area, and the proportion of household members who are Chinese Communist Party (CCP) members. The mean and standard deviation of each sample and the *p*-values of the *t*-tests are reported in the table. The data are obtained from CHFS.

We control for *X*, a set of time-varying household-level demographic attributes, including household land holdings, household annual net income, CCP membership, and age of the household head.[15] Because land expropriation could take place in any year from 1998 to 2015 in the sample,[16] for the unaffected households in the affected counties with land requisitions taking place in 1998–2011, 2012–2013, and 2014–2015, we adopt the values in 2011, 2013, and 2015, respectively, for their household-level control variables.

One concern could be whether the *PRI* indicator is a sensible proxy measure of the predatory nature of land acquisitions by local governments, because it only captures the inadequacy of compensation in pecuniary terms. In practice, local governments also offer nonmonetary compensations on many occasions as implicit compensation to dislodged peasants. For instance, the village collective may claim a part of the land-taking compensation provided by the county government and then may share the profits of village-owned businesses in subsequent years through dividend payments to peasants, including the displaced households. County governments also may offer alternative compensation, such as government-administered endowment insurance or pensions to be honored when due in the future. In Appendix B (including Appendix Table 1), we provide *prima facie* evidence suggesting that these alternative options pose no threat to using the *PRI* indicator to measure the shock to property rights security perceived by the majority of villagers. The test results in Section 5 also make a strong case for the adoption of the *PRI* indicator in the empirical analysis.

Another concern is whether the parallel trends assumption of the DID approach holds. To test this assumption, we compare the behavioral patterns of unaffected households in the land-requisitioned counties with those of households in the adjacent control counties in the periods before the land requisitions. As shown in Appendix Table 4, we find no significant differences between them. This further supports the idea that ULRs created a shock, thereby altering the behaviors of the affected households in PRI counties.

5. Testing the Perceptions of County-Level PRI

Our identification strategy also relies on the assumption that an empathy effect exists among village households living in proximity

[15] Appendix Table 3 lists the descriptive statistics for the Y and X variables. We also look at the results after controlling for whether the household head is a government cadre or a CCP member. Although this leads to a large drop in the number of observations, the results remain basically unchanged.

[16] As mentioned in Section 3, households whose land plots were expropriated before 1998, which account for less than 3% of total households that experienced land requisitions in the survey, do not enter our analysis, as the relevant information on land compensation standards is not available.

to each other—that is, that the unaffected households in a land-requisitioned county tend to form their perceptions of property rights security according to whether the majority of the affected households received substandard compensation. This is primarily because land is the most valuable asset that village households possess and is the primary means of production on which their livelihood depends. The local government's disposal of no other assets would have an impact of similar magnitude on villagers' perception of property rights security. Thus, the unaffected households in PRI counties and their counterparts in the non-PRI counties are likely to exhibit significant differences in their perception of property rights protection. In addition, because land requisitions are implemented by county governments, it would be unlikely for villagers in adjacent counties without land expropriation to significantly change their perception of property rights security.

People may doubt the validity of these assumptions. For instance, even in a village where most of the affected households are undercompensated, other peasant households' perceptions might be too divergent to reach a consensus about the county's property rights environment. This is likely when apathy abounds in the community instead of empathy, because of the lack of frequent social engagement and interaction within the community to connect villagers, or the affected and unaffected households may have serious conflicts of interest regarding the distribution of land compensation.

Although we do not have direct information on villagers' perception of their PRI, fortunately, in the surveys from 2013 and 2015, respondents were asked the question "If you are required to purchase endowment insurance or a government-administered pension, do you believe the local government will deliver the payment or honor its promise when it is due?" According to villagers' answers, which range from strongly mistrust to mistrust, not sure, believe, and fully believe, we construct the variable *Trust* with a five-level scale of 1–5, where a larger value corresponds to a higher level of trust in the local government. Appendix Table 5 gives the summary statistics for all the sampled villagers' levels of trust in 2013 and 2015. We can test the empathy effect using this variable as a proxy measure for individual villagers' overall trust in the policy commitment by the local government in general and the county-level PRI in particular. Because ULR is a flagrant breach of the county government's policy commitment to the displaced rural households, it likely would undermine the trust of rural households in other policy promises given by the county government, including those related to endowment insurance and pension payments. In counties experiencing land requisitions, changes in the villagers' trust in the policy commitment of county governments should largely reflect the changes in their perceptions of county-level property rights protection. As pointed out by the literature on property rights protection (Hou, 2019;Thomas and Worrall, 1994), whether or not the government can honor its policy commitments to the public is the linchpin of the perception of property rights security.

Table 3A reports the results of our study. In Panel A, we first compare the mean value of the trust index between the affected and unaffected households in the land-requisitioned counties (including both PRI counties and non-PRI counties). The mean test results confirm that statistically significant differences do not exist between the two groups of households. In Panel B, we confine the mean test between the affected and unaffected households to the PRI county sample with massive ULR, and again statistically significant differences do not exist between the two types of households.

ULRs might affect only some of the villages within a PRI county. Indeed, some of the unaffected households within PRI counties lived in land-requisitioned PRI villages, whereas others lived in villages without such experience. Therefore, in Table 3A, we compare the level of trust in the local government between these two types of households. In Panel C, the mean degrees of trust do not exhibit significant differences between these two groups of unaffected households. In combination, this series of tests verifies the existence of the empathy effect in PRI counties—that is, the unaffected households had a level of trust in the local government's policy commitment that was similar to that of their affected counterparts in the same village or same county who were subject to ULR.

We then conduct cross-sectional mean tests between the unaffected households in the land-requisitioned (PRI and non-PRI) counties and households in the adjacent control counties. In Table 3A, Panel D, we compare the trust levels between the unaffected households in PRI counties and the households in the adjacent control counties. The former group displayed a significantly lower level of trust in local governments than the latter group. Then, in Table 3A, Panel E, we compare the level of trust in the local government between the unaffected households in the non-PRI counties and those in the neighboring control counties. The mean test results show that the two groups did not exhibit statistically significant differences.

A subsample of unaffected households in PRI counties has continuous observations in both the pre- and post-requisition periods. We draw on this longitudinal data to conduct the following tests. First, in Table 3A, we compare trust in local governments among these households before and after land requisition. As shown in Panel F, after witnessing the ULR, these unaffected households indeed displayed a statistically significant drop in their level of trust in local governments.

Second, in Table 3A, we compare the level of trust in local governments between the unaffected households in PRI counties and those households in the adjacent control counties, as shown in Panel G to Panel I.[17] Panel G compares the two groups as a whole, and unaffected households in PRI counties displayed a significantly lower level of trust than the latter group. Next, in Panel H, we compare the levels of trust among households in the neighboring control counties before and after the land requisition in their matching PRI counties. The mean test results show no significant changes. Finally, in Panel I, among the unaffected households in PRI counties, we observe a significant decline in the trust index value in the post-requisition period. In combination, these results suggest that the unaffected households in PRI counties exhibited a significantly lower degree of trust in the policy commitment of local governments than did their counterparts in the neighboring control counties. This effect appears to stem primarily from the deterioration in trust among the former group of households in local governments after witnessing ULRs.

We conduct panel DID regressions according to Model (1) to examine the impact of ULRs on rural households' trust in local

[17] Those households in PRI counties having no matching neighboring counties are excluded from Test 3-G to Test 3-I.

Table 3A
Comparing Villagers' Trust in the Policy Commitment of Local Governments.

	Mean (Obs.)	Stand Err.
A. H0: No difference between (1) and (2)		
(1) Affected households in all treated counties	4.26 (639)	0.12
(2) Unaffected households in all treated counties	4.33 (7535)	0.04
Diff.: (2)-(1)	−0.06 (p = 0.70)	0.16
B. H0: No difference between (1) and (2)		
(1) Affected households in PRI counties	4.29 (423)	0.05
(2) Unaffected households in PRI counties	4.35 (5338)	0.01
Diff.: (2)-(1)	−0.07 (p = 0.18)	0.04
C. H0: No difference between (1) and (2)		
(1) Unaffected households in affected villages within PRI counties	4.34 (2749)	0.02
(2) Unaffected households in non-affected villages within the same PRI counties	4.37 (2589)	0.01
Diff.: (2)-(1)	−0.03 (p = 0.19)	0.03
D. H0: (1) < (2)		
(1) Unaffected households in PRI counties	4.29 (574)	0.05
(2) Households in the matching neighboring counties	4.39 (875)	0.04
Diff.: (2)-(1)	−0.09 (p = 0.02)	0.06
E. H0: No difference between (1) and (2)		
(1) Unaffected households in non-PRI counties	4.46 (123)	0.07
(2) Households in the matching neighboring counties	4.12 (17)	0.27
Diff.: (2)-(1)	0.34 (p = 0.12)	0.22
F. H0: (1) > (2)		
(1) Unaffected households in PRI counties before land expropriation	4.49 (1115)	0.03
(2) Unaffected households in PRI counties after land expropriation	4.33 (6906)	0.01
Diff.: (2)-(1)	0.16 (p = 0.00)	0.03
G. H0: (1) < (2)		
(1) Unaffected households in PRI counties, restricted to Panel Setting	4.16 (230)	0.06
(2) Households in the matching neighboring counties, restricted to Panel Setting	4.44 (207)	0.06
Diff.: (2)-(1)	−0.28 (p = 0.00)	0.09
H: H0: No difference between (1) and (2)		
(1) Households in PRI counties' neighboring counties before land expropriation, restricted to Panel Setting	4.51 (39)	0.14
(2) Households in PRI counties' neighboring counties after land expropriation, restricted to Panel Setting	4.42 (168)	0.06
Diff.: (2)-(1)	0.08 (p = 0.57)	0.15
I: H0: (1) < (2)		
(1) Unaffected households in PRI counties before land expropriation, restricted to Panel Setting	4.42 (59)	0.14
(2) Unaffected households in PRI counties after land expropriation, restricted to Panel Setting	4.16 (264)	0.07
Diff.: (2)-(1)	0.27 (p = 0.05)	0.16

Note: This table reports a series of mean comparison tests for an index of rural households' trust in the credibility of the county government to honor, in the future, its promise of payment to endowment insurance/government-administered pensions purchased by farmers, where a higher index value corresponds to a higher level of trust. The data are obtained from CHFS.

governments (see Table 3B). Both regressions confirm that, after adjusting by their respective contiguous control counties, the unaffected households in PRI counties had a significantly lower level of trust in local governments after ULRs than those in non-PRI counties, which is consistent with the empathy effect hypothesis.

6. Land Requisitions and Household Behaviors

ULRs raised the perceived PRI for unaffected village households, who in turn adopt risk-avoiding strategies—that is, they shifted their resources and efforts away from the spheres more likely to be liable to predatory government interventions to spheres more likely to be immune to government expropriations. Thus, as a response to property rights risks in their hometown, the unaffected households in PRI counties were expected to reduce their agricultural investments (Hypothesis 2.1), reduce the likelihood of engaging in entrepreneurial activities and increase the likelihood of seeking employment as wage-earners (Hypothesis 2.2),[18] and lease fewer land plots from others and lease more land plots out to others (Hypothesis 2.3).[19]

6.1. Baseline Regression Results

Table 4 presents the panel DID regression results for the effects of ULRs on the behavior of unaffected households in PRI counties

[18] Theoretically, this also includes increasing their likelihood of being outward migrant laborers in localities other than their home counties. Because we lack information on migration destinations and on how many family members were migrant laborers, we cannot test this hypothesis.
[19] If all villagers within the same village or county have lost the motivation to lease land from each other, then, in equilibrium, both lease-in and lease-out activities would diminish. In practice, however, there are a variety of types of demand for leased-in land by outside participants, such as agricultural companies, so that it is still possible for villagers to lease out more of their land plots.

Table 3B
Villagers' Trust in the Policy Commitment of County Governments.

	(1)	(2)
PRI	−0.10***	−0.08***
	(0.00)	(0.01)
Household fixed	Y	Y
City-year fixed	Y	Y
Controls	–	Y
No. of observations	1,579	1,578

Note: This table presents the panel DID regression results of the impact of PRI-treated county on the rural households' trust in county governments. The dependent variable Trust is a categorical variable with a five-level scale of 1–5, where a larger value corresponds to a higher level of trust in the local government. The key explanatory variable is an indicator variable for a PRI-treated county. Control variables include the gender, age, and education of the household head, and the number of household family members. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors clustered at the county level are contained in the parentheses.

relative to unaffected households in non-PRI counties and adjusted by households in the adjacent control counties. From Column (1), we can infer that unaffected households in PRI counties, after witnessing predatory land expropriations, reduce agricultural investments by 44% on average. Because we do not have a detailed breakdown of the total investments into categories (e.g., durable capital goods or land leveling or irrigation facilities), we cannot jump to the conclusion that the drop in total investments resulted primarily from a decline in large, long-term investments in agricultural machinery or land improvements or from a reduction in other categories of agricultural investment.[20]

In addition, as shown in Table 4, Column (2), for unaffected households in PRI counties, a smaller number of residents chose to become self-employed entrepreneurs in nonagricultural lines of business. Unaffected household members in PRI counties were more likely to opt for employment as wage earners (the probability rises by 5%, as shown in Column (3)). Clearly, both fixed and liquid assets in family business activities were directly exposed to local government expropriations, while wage-earning jobs faced much less risk of asset expropriation. These results suggest that villagers witnessing a deterioration in property rights protection tended to become less entrepreneurial and turned to less risky wage-earning jobs.

On the subject of land leasing, given that, in practice, villagers likely leased out and leased in land lots simultaneously, the ideal approach to measuring villagers' land leasing activities would be to calculate the net land area leased in or leased out in a given year. Nevertheless, very few households (under 150 households in total) in our sample reported information on both leased-in and leased-out land plots, while most households lacked information on either leased-in or leased-out land plots, or both. Thus, we adopt two alternative approaches. First, we use leased-out and leased-in land plot areas separately as the dependent variable in Table 4, Columns (4) and (5), respectively. According to the results, unaffected households in PRI counties indeed would, relative to their counterparts in non-PRI counties and adjacent control counties, increase the area of the land plots leased out after witnessing predatory land requisitions, while the land area leased in underwent no significant changes. Second, we use the change in leased-in land area (i.e., $\Delta t = (leased - in)_t - (leased - in)_{t-1}$) and the change in leased-out land area separately as the dependent variables and, in unreported results, reach conclusions very similar to those shown in Table 4, Columns (4) and (5).

Overall, these results are consistent with Hypotheses 2.1, 2.2, and 2.3, in that the unaffected households in PRI counties demonstrated a striking behavioral pattern of reducing their engagement in agricultural production by lowering their investments in agriculture, and becoming less likely to be entrepreneurs and more likely to be wage-earners. This change represents a shift away from activities that are easily subject to local government expropriation.

6.2. *Heterogeneity in Household Behavior*

We regard unaffected households within a PRI county as a homogeneous group, in that they had the same responses to predatory land requisitions. It is legitimate to wonder whether there were variations in the villagers' behavioral responses even when they, as a whole, drew close qualitative conclusions pertaining to local property rights protection. To investigate this possibility, we first look at the intra-PRI county household behavior heterogeneity, by comparing the behaviors of the unaffected households residing in PRI villages (i.e., the villages hit by ULRs) in PRI counties and those residing in unaffected villages within the same counties. The results of the panel DID regressions are shown in Table 5 and suggest that predatory land requisitions had different impacts on unaffected households residing in the affected and unaffected villages in PRI counties. Among other results, relative to residents in the unaffected villages, unaffected households residing in PRI villages had greater expenditures on agricultural inputs. They also had more family members embarking on nonagricultural businesses and were less likely to have wage-earning household members. These results

[20] We thank an anonymous reviewer for reminding us of this issue. An illuminating example appears in the findings of Jacoby et al. (2002), that higher expropriation risk (captured by the likelihood of land reallocation by village cadres rather than land requisition by county officials) decreases organic fertilizer use but does not curb the use of the two chemical fertilizers.

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Table 4
Baseline Panel DID Regression Results.

	Agricultural input (log) (1)	No. of family members engaging in family-owned business (2)	Having family members as wage earners (3)	Area of leasing-out land plots (4)	Area of leasing-in land plots (5)
PRI indicator	−0.44***	−0.04***	0.05**	3.66***	−0.69
	(0.05)	(0.01)	(0.02)	(0.94)	(1.74)
No. of observations	1,893	1,893	1,893	986	1,009

Note: The dependent variables are the logarithm of agricultural inputs, the number of family members engaged in family-owned business, a dummy for having family members as wage-earning employees, the area of land plots leased out, and the area of land plots leased in. The key explanatory variable is an indicator variable for a PRI-treated county. Control variables include the gender, age, and education of the household head, and the number of household family members. We control for household, city, and year fixed effects in all regressions. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors clustered at the county level are contained in the parentheses.

Table 5
Heterogeneity Analysis Regression Results I: Panel DID Regression Results.

	Agricultural Inputs (log) (1)	No. of family members engaging in family-owned business (2)	Having family members as wage-earners (3)	Area of leasing-out land plots (4)	Area of leasing-in land plots (5)
PRIindicator × *PRIvillage*	3.04***	0.29***	−1.08***	2.46	−3.12
	(0.71)	(0.03)	(0.04)	(1.55)	(2.12)
PRI indicator	−0.58	−0.004	−0.01	2.72**	1.79
	(0.38)	(0.027)	(0.03)	(1.22)	(1.62)
PRI village	−2.77***	−0.36***	1.18***	−0.58***	−0.45
	(0.05)	(0.01)	(0.01)	(0.03)	(0.94)
No. of observations	1,893	1,893	1,893	9,86	1,009

Note: This table analyzes the differences in behaviors between the unaffected rural households in PRI-treated villages within PRI-treated counties and those in non-land-requisitioned (nontreated) villages in the same PRI-treated counties. The dependent variables are the logarithm of agricultural inputs, the number of family members engaged in family-owned business, a dummy for having family members as wage-earning employees, the area of land plots leased out, and the area of land plots leased in. The key explanatory variable is the interaction term of an indicator variable for a PRI-treated county and an indicator variable of PRI-treated village. Control variables include the gender, age, and education of the household head, and the number of household family members. We control for household, city, and year fixed effects in all regressions. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors clustered at the county level are contained in parentheses.

suggest that unaffected households in unaffected villages in PRI counties displayed more striking behavioral responses to predatory land acquisitions than did their counterparts in PRI villages. Because the unaffected households in PRI counties shared a close perception of property rights protection by local governments and similar socioeconomic conditions, the household heterogeneity between PRI and unaffected villages must be driven by something that elicited these differential behavioral patterns despite sharing the same perceptions. Given that land requisitions already had taken place in PRI villages, a plausible explanation is that unaffected rural households in these villages might expect land expropriations to be less likely to take place again in their own villages in the near future. By contrast, households in the unaffected villages within PRI counties might expect to face an increasing risk of land expropriation over the next few years.[21]

We further add an interaction term between $PRI\ County_{ikt}$ and household original income structure (HOIS), calculated as the fraction of agricultural income in a household's aggregate income (defined as the sum of household agricultural income and nonagricultural income, including investment income, wages, and other miscellaneous income) in the earliest period in the sample. HOIS thus measures the original extent to which a household relied on agriculture to earn its income. [22] The rationale underlying this investigation is that unaffected households in PRI counties whose incomes initially came primarily from agricultural activities were likely to be adversely affected, to a larger extent, by potential predatory land requisitions in the next few years. The results in Table 6 show that, after predatory land requisitions, unaffected households with a greater initial agricultural income ratio had fewer family members engaging in self-employment businesses, were more likely to seek wage-earning jobs, and leased out more land plots. We also look at the conditional effects of villagers' demographic and socioeconomic attributes (e.g., age, education, arable land area per capita). In unreported results, we find no evidence that the effect of *PRI County* varies with these personal or household idiosyncratic conditions.

6.3. Land Requisitions and Household Welfare

Predatory land requisitions could adversely affect the well-being of unaffected households in PRI counties in two ways. First, a worsening of the property rights environment would repress agricultural investment, reduce agricultural production efficiency, and curb entrepreneurial activities (see Table 4). This would drive households away from the efficient use of their resources and expertise, resulting in lower agricultural and, potentially, total income levels. Second, although households could resort to risk-proof strategies to protect themselves from the likely encroachment on the part of the predatory government, they had to incur extra transaction costs to divert resources and make efforts to implement these strategies. These costs, coupled with the decline in household income, might decrease household-level consumption expenditure.

Table 7A presents the results for the effect of PRI on household income. Because we have no accurate information on households' nonagricultural income—including income from migrant jobs—the outcome variable is net agricultural income (i.e., total agricultural income minus agricultural input costs) per capita in a household. Column (1) displays the panel DID estimates. As shown, predatory

[21] We are not able to explore this hypothesis systematically in this paper, which we leave to future research.
[22] We do not directly include a household's agricultural income ratio because it is liable to the impact of PRI and is subject to endogeneity to some extent (see section 6.3).

Table 6
Heterogeneity Regression Results II: Panel DID Regression Results.

	Agricultural Inputs (log) (1)	No. of family members engaging in family-owned business (2)	Having family members as wage-earners (3)	Area of leasing-out land plots (4)	Area of leasing-in land plots (5)
*PRI indicator*HOIS*	1.08	−0.42***	0.44***	-9.26	−0.65
	(0.97)	(0.12)	(0.05)	(9.01)	(1.01)
PRI indicator	−1.69**	0.24**	−0.22***	8.23**	0.79
	(0.64)	(0.09)	(0.05)	(4.85)	(0.53)
No. of observations	1,346	1,346	1,346	700	768

Note: This table analyzes the differences in behaviors among rural households with differentiated fractions of agricultural income in total household income in PRI-treated counties, relative to those in non-PRI-treated counties and adjacent control counties. The dependent variables are the logarithm of agricultural inputs, the number of family members engaged in family-owned business, a dummy for having family members as wage-earning employees, the area of land plots leased out, and the area of land plots leased in. The key explanatory variable is the interaction term of an indicator variable for a PRI-treated county and the fraction of agricultural income in a household's aggregate income (defined as the sum of household agricultural income and nonagricultural income, including investment income, wages, and other miscellaneous income) in the earliest period in the sample (HOIS). Control variables include the gender, age, and education of the household head, and the number of household family members. We control for household, city, and year fixed effects in all regressions *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors clustered at county level are contained in parentheses.

Table 7A
Household Welfare: Household-Level Agricultural Income and Technical Efficiency in Agricultural Production.

	Per capita net agricultural income (log): panel DID results (1)	Household technical efficiency index: panel DID results (2)
PRI indicator	−0.83***	−0.14***
	(0.37)	(0.03)
No. of observations	1,893	1,325

land requisitions statistically significantly diminished the average household agricultural income per capita. The drop was also economically significant: on average, land requisitions led the average household net agricultural income per capita to drop by 83%.[23]

The decline in household agricultural income could stem from the fact that the unaffected households in PRI counties diverted resources away from agricultural activities into nonagricultural activities to reduce their exposure to land expropriation risks. It also could be a result of unaffected households' diminished incentive to pursue agricultural production, which reduced production efficiency in the face of land appropriation risks. To investigate this potential mechanism, we examine the effect of PRI on the frontier technical efficiency of agricultural production. First, we estimate a stochastic frontier production function using households' input and output information. Based on these estimation results, we calculate households' technical efficiency in agricultural production in light of the actual output achieved compared with the potential level (i.e., the production frontier) (Kumbhakar and Lovell, 2000) when agricultural inputs are in efficient use.[24] We then estimate the effect of PRI on technical efficiency, and the estimation results for panel DID regression are presented in Table 7A, Column (2). Clearly, predatory land requisitions significantly reduced agricultural production efficiency. Thus, undercompensated land expropriation produced severe incentive problems by not only reducing the unaffected households' agricultural inputs but also stunting their incentives for and efficiency in agricultural production, which in turn caused the decline in their agricultural income.

One concern is that the decline in agricultural income and efficiency could be offset by gains in nonagricultural income from, for example, wage-earning nonfarming jobs. As we lack data on total income, we further examine the effect of PRI on the consumption of the unaffected households, which should better reflect overall household-level welfare than household-level agricultural income does. Table 7B, Column (1), shows the estimates for the panel DID regression. On average, ULRs induced a decline of approximately 29% in overall consumption per capita for unaffected households in PRI counties.[25] This effect is statistically significant and economically sizeable.

When households' consumption goes down, we believe they will prioritize cutting expenditure on luxury items with a high level of income elasticity. Although data limitations make it hard to dissect the composition of the decline in different categories of household consumption, we fortunately have data on household-level expenditure on food and tourism, and Table 7B, Columns (2) and (3), present the estimated results, respectively. Clearly, the PRI shock precipitated a significant decline in the tourism consumption of unaffected households (on average by 45%), whereas the decline in food consumption was relatively much smaller (on average by 19%).

The decline in the consumption of unaffected households could stem from a decline in total household income, with no appreciable change in their propensity to consume. It could also be the case that unaffected households in PRI counties cut their consumption and raised their savings to build a buffer to cope with the potential future negative income shocks produced by the predatory local government (i.e., they lowered their propensity to consume).

Finally, Table 7C examines the effect of ULRs on households' liquid asset holdings—that is, cash holdings (Column (1), excluding savings in the current account in banks) and bank savings (Column (2)), which together accounted for more than 80% of households' total financial assets in the survey sample. The panel DID regression results show that, after land requisitions, unaffected households in PRI counties held more of both types of liquid assets than their counterparts did in non-PRI counties. We further examine the ratio of cash holdings to savings in Table 7C, Column (3), and observe a significant positive effect of PRI on this ratio. That is, after observing predatory land requisitions, households preferred holding cash to saving deposits in banks, indicating that villagers viewed cash as a safer asset than bank deposits, because banks in China are liable to government intervention.[26]

Hence, the results shown in Table 7C have several implications. First, they show that the unaffected households in PRI counties

[23] If the outcome variable is total agricultural income rather than net agricultural income, predatory land requisition leads to a 55.5% drop in household income per capita. In addition, as an alternative to total household income, we calculate the aggregated household income, defined as the sum of agricultural income plus investment income (derived from financial assets such as banking deposits), wage-earning income, and other miscellaneous income items (but excluding transferred income from the local government such as subsidies), and use it as the outcome variable in the panel DID regression. In this case, land requisitions led the average household income per capita to drop by 38%.

[24] Appendix Table 6 presents the estimation results for a household-level stochastic frontier production function to derive household technical efficiency in agricultural production. These regressions are conducted through STATA 15 using the FRONTIER command.

[25] Given that we lack information on migration destinations and the number of migrant laborers in the family, we cannot rule out the possibility that rural households' migrant laborers may be living elsewhere. Because we are unable to control for the number of household members living at home, we acknowledge this limitation to these findings (we thank an anonymous reviewer for pointing out this). We thus also look at the results when the outcome variable is household total consumption, and in this case, ULRs caused total consumption to drop by 31%.

[26] In addition, by the same logic, villagers in PRI counties should prefer current-account savings to deposit-accounts savings, and savings in national banks (beyond the sphere of influence of local governments) to local banks (which are susceptible to local government interference). However, we lack the data to test these conjectures.

Table 7B
Household Welfare: Household-Level Consumption.

	Per capita consumption (log): panel DID results (1)	Per capita consumption on food (log): panel DID results (2)	Per capita consumption on tourism (log): panel DID results (3)
PRI indicator	−0.29***	−0.19***	−0.45***
	(0.02)	(0.07)	(0.08)
No. of observations	1,893	1,852	1,891

Table 7C
Households' Cash Holdings and Bank Savings.

	Cash holdings (log) panel DID results (1)	Bank savings (log) panel DID results (2)	Cash/Bank savings (log) panel DID results (3)
PRI indicator	0.35***	0.18***	0.096***
	(0.05)	(0.04)	(0.02)
No. of observations	1,800	1,813	1,670

Note: Column (1) of Table 7A report panel DID regression results for the impact of ULRs on agricultural income per capita. Column (2) of Table 7A report panel DID regression results for the impact of ULRs on the household-level agricultural production technical efficiency index. Column (1) of Table 7B present panel DID regression results for the impact of ULRs on rural household per capita consumption. Columns (2) and (3) of Table 7B present panel DID regression results for the impact of ULRs on rural household per capita consumption expenditure on food and tourism, respectively. Columns (1), (2), and (3) in Table 7C present panel DID regression results for the impact of ULRs on rural households' cash holdings, bank savings, and the ratio of cash holdings to bank savings, respectively. Control variables include the gender, age, and education of the household head and the number of household family members. We control for household (county) fixed effects in panel (cross-section) regressions. All regressions include city and year fixed effects. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are in parentheses and are clustered at county level.

responded to PRI by holding more financial assets with adequate liquidity, especially cash outside the purview of the banking system, even at the expense of future returns. Second, the increase in holdings of liquid assets could stem partly from a shift from physical asset investments and holdings to liquidity holdings, which is consistent with the findings shown in Tables 7A and 7B. It also could be an outcome of the reduction in consumption expenditure and the increase in savings as a buffer against future potential property rights expropriation. Third, it reveals another channel through which predatory land requisitions affect households' consumption, as witnessed in Table 7B: alongside the decline in agricultural income—and possibly even total income—households that chose to hold more liquid assets had to suppress their consumption to make ends meet.

6.4. *Two Alternative Hypotheses and Discussions*

Our argument is that unaffected villagers witnessing predatory land requisitions reallocate their resources and efforts to shun the risk associated with an increasingly insecure property rights environment. We find two alternative explanations. One is that those land-requisitioned counties were undergoing rapid urbanization and industrialization centered on their county seats, and the expansion of urban and industrial areas led to land requisitions in some villages, including those undercompensated ones. Thus, households in those villages with land requisitions—as well as in those without—were prone to pursuing nonagricultural undertakings, including reducing agricultural investments and seeking outside wage-earning jobs. With this interpretation, rural households are expected to be the beneficiaries of urbanization and industrialization, as these processes would provide them with nonagricultural employment or business opportunities, or might change their identity from villagers to urban residents, thus enabling them to increase their income, enjoy more social welfare benefits, and promote their level of consumption. These benefits might overwhelm the negative effects of undercompensated land expropriations such that rural households would embrace the modernization campaign and have greater trust in local governments.

Our results do not seem to support this optimistic view. For example, we find a decline of trust in local governments among unaffected households in PRI counties (Section 5), a more salient change in the behavior of unaffected households in unaffected villages than among unaffected households in PRI villages within PRI counties (Section 6.2), and declines in household consumption expenditure among unaffected households in PRI counties (Section 6.3). Moreover, none of the sample households included in our analysis had ever had their household registration identity changed from rural to urban status. We therefore have no basis to believe that the behaviors of unaffected households were driven by their new identity as urban residents rather than as rural villagers.

The other alternative explanation could be that counties administered land expropriations to introduce manufacturing firms that would be located within or very close to the affected villages, which in turn would provide nonagricultural job opportunities and accordingly lead to changing behavior among the villagers. Although this does not deny the predatory nature of the land grabs, it does indeed introduce a different way to interpret our findings. Although we have no direct evidence to distinguish between the two competing hypotheses, we believe our empirical strategy addresses the concern in favor of our hypothesis. First, in the land-requisitioned counties, the majority of the sample households (70%) were living outside the affected villages (which experienced no land requisition), whose behaviors were less likely to be affected by the introduced manufacturing investments in the affected villages. Evidence from Table 5 also goes against the alternative hypothesis, in that unaffected households in the affected PRI villages

actually were less likely to take wage-earning jobs and increased their agricultural investment. This indicates that they did not, apparently, participate in the introduced industrial projects, if there were any. Moreover, most of the household behavioral changes observed in our sample actually took place shortly after the land requisitions. They could hardly be attributed to the introduction of manufacturing projects, because typically there was a time lag between the unveiling of land appropriations and the operation of industrial or commercial projects, as county governments needed to prepare the land for industrial or commercial use before selling it. Second, our empirical design compares PRI counties and non-PRI land-requisitioned counties. As both types of counties were likely to introduce manufacturing firms in the post-requisition periods, the comparison of differences in household behavior and PRI perceptions minimized the effect actuated through the mechanism of newly introduced manufacturing investments. Finally, the introduction of manufacturers and industrial jobs was expected to improve the livelihoods of households in the land-requisitioned counties, but the findings of the dwindling household welfare in the post-requisition periods (Section 6.3) are more consistent with our hypothesis.

6.5. *Further Checks*

In previous sections, we discussed and provided tests to support the validity of the identifying assumptions of this study. Another potential threat to the identification strategy in Equation (1) is that the adjacent counties used as the comparison group actually underwent land requisitions during the concerned period, although they showed no sign of land expropriation in the dataset. Take an imagined case: county X is a control group county, and its village Y is randomly chosen and included in the survey. Moreover, all of the sample households of village Y did not report land expropriation experience. Nevertheless, it is still possible that land requisitions did take place in other non-Y villages in county X, whose affected households were not covered in the survey. Consequently, county X was identified as a no-land-requisition control county, but it should have been regarded as an affected county. Although the random sampling approach adopted in the survey minimizes this possibility, we modify the specification of Equation (1) by dropping all control group counties and consider only the within-household differences before and after the PRI shock caused by land requisitions for the unaffected households in PRI counties. Columns (1)–(5) of Table 8 present the regression results, for which most (e.g., those on agricultural inputs and land plots leased in and out) are still consistent with our hypotheses, while the remaining results are not statistically significant.

Finally, to substantiate that the association between predatory land requisitions and household behaviors is not driven by chance, we conduct a placebo test by randomly assigning PRI county treatment across land-requisitioned counties and redo the regressions of Equation (1). We repeat the exercises 500 times and find that the majority of the estimated coefficients are not statistically significant from zero at the 5% level or have signs opposite to those in our tables.[27] These results boost our confidence that the PRI did indeed have an impact on household behavior as hypothesized.

7. Conclusion

The economic consequences of PRI in developing countries pose a fascinating and challenging issue for social scientists. Drawing on a unique survey of households and villages across different provinces in China, we analyze how predatory land requisitions by local governments broke their own land-taking compensation commitments and led to a deterioration in rural property rights security and changes in rural households' economic behaviors. One analytical challenge is to diminish selection bias and distinguish between the effects resulting from changes in households' land endowment and the effects stemming from deteriorating property rights security. We depart from the conventional approach that examines differences within the same county between affected households whose land lots were expropriated and unaffected households whose land lots were not. Instead, we take the unaffected households in counties experiencing land requisitions as the treatment group and their counterparts in the matching border counties that did not experience land requisitions as the control group to examine differences in their economic behaviors. We detect a strong empathy effect: within the same county, trust in the local government's policy commitment among unaffected households parallels that of affected households living in the same neighborhood. Furthermore, we indeed find robust and statistically significant changes in the unaffected households' economic behaviors. This result supports the hypothesis that they resorted to risk-reducing economic strategies in response to predatory land requisition, and their welfare declined correspondingly.

Our research suggests that, in a rapidly developing authoritarian regime like China, a strong local state can be both beneficial for businesses and predatory for the powerless. We find evidence that local governments expropriated land at low costs for industrial use and real estate development but provided inadequate compensation to ordinary villagers, regardless of their stated commitment to pay those displaced villagers a minimum amount of compensation. The villagers were forced to opt for risk-proof strategies that they might not have chosen without the land requisition, and as a result, their income and consumption declined. Our research sheds light on the costs of efficiency and equity borne by powerless villagers during processes of industrialization and urbanization and raises the need for better property rights protection to achieve inclusive economic development.

[27] In the case of agricultural investments, 81% of the estimated coefficients are not significant at conventional levels or have signs that are opposite to those in our tables. In family-owned businesses, wage-earning activities, and land plots leased out, the figures are 87.8%, 67.2%, and 82%, respectively. Appendix Figure 1 plots the *t*-value distributions of these coefficients derived from baseline regressions of Equation (1) (i.e., Table 4 results).

Table 8
Analysis of Within-Household Comparison Before and After Land Requisition: No Matching Border Counties.

	Agricultural inputs (log) (1)	No. of family members engaging in family-owned business (2)	Having family members as wage earners (3)	Area of leasing out land plots (4)	Area of leasing in land plots (5)
PRI County Indicator	−0.27**	0.02	−0.02	0.45***	−1.29***
	(0.11)	(0.02)	(0.02)	(0.17)	(0.11)
No. of observations	6,854	6,854	6,854	4,060	3,808

Note: This table examines the within-household changes in behaviors among unaffected households in PRI-treated counties after ULRs. The non-PRI-treated counties and the adjacent control counties are dropped from the sample. The dependent variables are the logarithm of agricultural inputs, the number of family members engaged in family-owned business, a dummy for having family members as wage-earning employees, the area of land plots leased out, and the area of land plots leased in. The key explanatory variable is an indicator variable of a PRI-treated county for an unaffected rural household residing in it, which takes the value one after the county experienced a land expropriation and more than half of the affected households were undercompensated. Control variables include gender, age, and education of the household head, and the number of household family members. All regressions include household, city, and year fixed effects. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors clustered at the county level are in parentheses.

Supplementary materials

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