LAND RIGHTS IN RURAL CHINA: FACTS, FICTIONS AND ISSUES

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China's rural economic reforms radically altered land tenure in rural China. With the granting of land use rights and residual income rights to farming households between 1979 and 1983, agriculture shifted from a collective-based to a family-based system. Land was not privatized, however. Ownership remained "collective", with local officials, typically at the village level, exercising a major influence over the allocation of land and the way households could use land.

The initial land allocations to families were typically based on household size, household labour supply, or both. The central government's policy was that these allocations were supposed to be for 15 years. In some villages, land use contracts have been respected; in other villages, however, local leaders have periodically redistributed land among households and have intervened throughout the reform period to determine how farmers are able to use the land.

The initial reforms triggered an unprecedented acceleration of agricultural growth in China. From 1979 to 1984, the gross value of agricultural output increased in real terms at an annual rate of 7.6 per cent, and grain production rose by 4.9 per cent annually.[1] Empirical studies attribute a significant part of this increase to enhanced incentives, as farmers were able to keep the output and

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1 *Zhongguo tongji nianjian, 1989* (China Statistical Yearbook) (Beijing: China Statistical Publishing House, 1989).

profits that came from their own efforts.[2] The growth in production was so fast that some policymakers began to worry about there being a grain surplus. After 1984, however, agricultural output growth, especially of grain, started to slacken. From 1985 to 1994, grain output rose by only 0.9 per cent a year[3] despite the government's efforts to improve the marketing environment in which farmers could sell their output and buy fertilizer and other inputs.

There has been considerable debate about the reasons for the slowdown. Some observers have pointed to weaknesses in the way land is allocated to farmers, and in China's land management system more generally. This is the aspect of farm policy that has been least altered since the initial reforms. In a large number of villages, they claim, tenure insecurity has discouraged investment in agriculture and lowered growth.[4] There have therefore been calls for either land privatization or the extension of land contracts to 30 or more years. In the late 1990s, the government directed that henceforth all land contracts would be for 30 years.

Other researchers have denied there is any need for extended tenure or privatization. They blame low farm-gate prices, not problems over land rights, for the sagging productivity. Household surveys in some regions report that a majority of the farmers surveyed oppose extended tenure or privatization, preferring instead a system that guarantees continued access to sufficient land through periodic land reallocations to meet the household's needs as the family grows or contracts.[5] Others have argued that China currently lacks the complementary institutions that are required to make land privatization successful. Poorly developed credit markets, the lack of a land registration system and an incomplete legal system mean that privatization at the current time would be inefficient and possibly cause social instability.[6]

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2 John McMillan, John Whalley and Lijing Zhu, "The Impact of China's Economic Reforms on Agricultural Productivity Growth", *Journal of Political Economy*, No. 97 (1989), pp. 781–807; Justin Yifu Lin, "Rural Reforms and Agricultural Growth in China", *American Economic Review*, Vol. 82, No. 1 (1992), pp. 34–51; Jikun Huang and Scott Rozelle, "Technological Change: Rediscovering the Engine of Productivity Growth in China's Rural Economy", *Journal of Development Economics*, Vol. 49, No. 2 (1996), pp. 337–67.

3 *Zhongguo nongye nianjian, 1995* (China Agricultural Yearbook), (Beijing: China Statistical Publishing House, 1995).

4 Roy Prosterman, Tim Hanstad and Ping Li, "Can China Feed Itself?", *Scientific American* (November 1996), pp. 90–6.

5 James Kung, "Equal Entitlement Versus Tenure Security under a Regime of Collective Property Rights: Peasants' Preference for Institutions in Post-reform Chinese Agriculture", *Journal of Comparative Economics*, Vol. 21 (1995), pp. 82–111; James Kung and Shouying Liu, "Farmers' Preferences Regarding Ownership and Land Tenure in Post-Mao China: Unexpected Evidence from Eight Counties", *The China Journal*, No. 38 (July 1997), pp. 33–63; and Xiaoyuan Dong, "Two-Tier Land System and Sustained Economic Growth in Post-1978 Rural China", *World Development*, Vol. 24, No. 5 (1996), pp. 915–28.

6 Xiaoyuan Dong, "Two-Tier Land System".

Unfortunately, little empirical support has been mobilized by either side in the land rights debate, even though the consequences are enormous. This paper examines how cultivated land is organized and used. It looks at whether the land management system has been providing sufficient incentives for farmers to utilize land efficiently and to make investments, while simultaneously helping to improve welfare and equity.

Although we cite the work of other researchers inside and outside of China, we draw heavily on our own research, using the results of our individual and collaborative studies on China's land system. Our findings are based on primary data that we have collected from communities and farm households in many parts of China over the past eight years. It is necessary first, though, to put the case of China into context by examining the potential economic consequences of alternative systems of land rights.

Land Rights and Productivity

Property rights affect how cultivated land is used—thus, productivity. Any restrictions limiting crop choice or the ability to convert land to alternative agricultural uses, for example, affect how much the land produces and the income earned from farming. Property rights also influence productivity through their effect on investment incentives and the way land is allocated across households.

When productivity differentials exist among households in a village (i.e., when there is allocative or static inefficiency), a reallocation of land toward households with relatively more labour and a greater desire to work the land (i.e., households with a higher marginal productivity of land) and away from those with a lower marginal productivity should lead to higher output overall. This can be done administratively, as when local cadres reallocate land among households, or can occur in a decentralized way if farmers are able to rent their land to other households through local rental markets. In a transitional economy, however, where markets are underdeveloped, high transaction costs may limit the number of rentals, and in general, these constraints on rentals will affect productivity.[7]

Security of tenure and the right to rent land are likely to improve long-run productivity through increasing the incentives to invest in and properly manage the land. Policies that frequently reallocate land among households or prohibit permanent land bequests may undermine tenure security. Short-term tenures or uncertainty over the duration of tenure can lower the household's expected returns to its investment and reduce the optimal level of investment.[8] By contrast, farmers with well-defined tenure rights will be more likely to invest in land-saving, productivity-enhancing activities such as irrigation, drainage and

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[7] Hans Binswanger and Mark Rosensweig, "Behavioral and Material Determinants of Production Relations in Agriculture", *Journal of Development Studies*, Vol. 22 (1986), pp. 503–17.

[8] Harold Demsetz, "Toward a Theory of Property Rights", *American Economic Review,* Vol. 57, No. 2 (1967), pp. 347–59; Almen Alchian, and Harold Demsetz, "The Property Rights Paradigm", *Journal of Economic History*, Vol. 33, No. 1 (1973), pp. 16–27.

terracing. They will also be more likely to convert land to higher-value uses; or maintain soil fertility through practices such as the application of organic fertilizers. The returns to these types of investment are usually insufficient to pay back the initial outlay in a single year but are spread over a longer period. Freedom to rent out land also enhances investment incentives because it strengthens a household's future ability to capture the returns to its current investment in the land should it later opt not to farm the land.[9]

Proponents of this viewpoint also argue that insecure rights over land use may discourage households from investing in labour-saving, productivity-enhancing farm machinery and other capital goods. This type of investment is particularly important in areas where there are good off-farm opportunities. Insofar as there are technological possibilities for substituting capital for labour—and experience elsewhere in Asia suggests there are—incomplete markets for renting farm machinery or weak incentives to invest may hamper the growth of land and labour productivity, and agricultural growth more generally.[10]

Certain factors, however, can dampen the adverse effect of insecure tenure on long-term investment and reduce the imperative to solidify rights. If some supra-household organization, such as the village, made the investment decisions, the negative impact of poor land rights could be mitigated.[11] Indeed, many farm investments require coordination among households, and a collective organization that has its own resource base and/or ability to mobilize households could be effective in making fixed investments in the land.[12]

Ultimately land rights may have longer-run, economy-wide implications for rural development. Proponents of land privatization argue that well-defined land rights provide small-scale farmers with a form of collateral that will assist the development of formal and informal rural credit markets.[13] Most farm households in China, like those in many other developing countries, are effectively excluded

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9 Timothy Besley, "Property Rights and Investment Incentives: Theory and Evidence from Ghana", *Journal of Political Economy*, Vol. 103, No. 5 (1995), pp. 903–37. We already see this happening in many of China's coastal areas. In recent remarks at a conference on land policy in China, D. Gale Johnson stressed the need to consider the potential effects of the rapid reduction in the farm labour force over the next several decades. A way of increasing returns would be for farmers in poor areas to farm under some type of cross-country rental contract as farmers in the richer regions enter the local off-farm labour market. Similar arrangements have been occurring in China's large cities.

10 Prahbu Pingali, Mahabub Hossein and Roberta Gerpacio, *Asian Rice Bowls* (London: CAB Publishing, 1997); Hans Binswanger and Mark Rosenszweig, "Material Determinants".

11 Xiaoyuan Dong, "Public Investment, Social Services and Productivity of Chinese Household Farms", *Journal of Development Studies*, Vol. 36, No 3 (2000), pp. 99–121.

12 A similar kind of organization with a legal right to mandate investments that obtain majority community support can also help get around problems posed by small average farm landholdings and investments that are indivisible.

13 Besley, "Property Rights".

from formal channels of credit.[14] Land also provides a productive asset that farmers can invest in for their old age.[15] Historically, elderly farmers have been able to maintain their consumption and incomes in old age by accumulating land earlier in life.[16]

As well as being a productive asset for farming, land plays a number of other roles in rural China. Most importantly, farming provides jobs and security. When credit markets are poor and labour markets underdeveloped, access to land enables families, especially those who are poorer and less educated, to more effectively use their labour, which is often their most abundant resource. And, when markets are unreliable and the transaction costs of buying and selling grain and other commodities are high, access to land can provide rural people with a cheap source of food.[17]

In part because farmland has multiple roles, land rights have implications for both equity and growth, and policymakers face potentially complicated trade-offs in deciding land policy. For instance, a system of land rights designed to meet equity goals, through an egalitarian distribution of land involving frequent and comprehensive land reallocations in response to demographic changes, may not be conducive to growth if it discourages farm consolidation and investment. By the same reasoning, a system of entirely private landholdings may have inegalitarian consequences, eventually leading to landlessness among some households. The loss of land will be more harmful in the early stages of economic development when rural markets are poor than when the rural economy is better developed and most households have access to more secure off-farm jobs.

Survey Data

The data that we draw on derive from two main sources—a village-level survey undertaken in 1996, which because of its widespread coverage provides a rough estimate of nationwide trends and variations, and a household survey undertaken in Liaoning and Hebei provinces in 1995.

The two surveys together covered 215 villages in eight provinces—the richer coastal provinces of Liaoning, Shandong and Zhejiang; Hebei, Hubei and Sichuan in the inland agricultural heartland of the upper and middle Yangtze River valley; and two of China's poorest provinces, Shaanxi in the northwest and Yunnan in the southwest. In all of the provinces except Liaoning and Hebei,

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[14] Albert Park, "Risk and Household Grain Management in Developing Countries", Department of Economics working paper, University of Michigan, 1999.

[15] D. Gale Johnson, "Property Rights in Rural China", Department of Economics working paper, University of Chicago, 1995.

[16] Dwayne Benjamin, Loren Brandt and Scott Rozelle, "Aging, Well-being, and Social Security in Rural North China", *Population and Development*, Supplement to Vol. 26 (2000), pp. 89–117.

[17] Albert Park, "Grain Storage"; John Giles, "Off-Farm Labor Markets, Insecurity, and Risk Aversion in China", Department of Economics working paper, University of California, Berkeley (1998).

counties were ranked on the basis of per capita industrial output. In five of these six provinces, eight counties per province were randomly selected, two from each of the quartiles of the ranked list. A similar sampling procedure was used in each county to select two sample townships and in each township to select two sample villages. In each of these five provinces, 32 villages—four in each of the eight counties—were surveyed. In Yunnan 24 villages were chosen from four counties. In 1995, 31 other villages were surveyed in Hebei and Liaoning. That the combined sample is representative of farming in China is borne out by the fact that it generates statistics that are similar to those found in national surveys by China's statistical bureaus.[18]

The enumerators gathered detailed data from three leaders in each village: the Party secretary, the chair of the village committee or the village head, and the village accountant. These people were chosen because they were best placed to answer questions about current and past village institutions. The 10-part questionnaire included sections on off-farm labour, land management, local industrial management, local credit markets, periodic markets, agricultural input and output markets, and the local political environment. We asked for information about two years, 1995 and 1988, and about changes since household farming was reintroduced. Detailed questions were asked about the frequency, average size and timing of the village's land readjustments, and about each village's rental activities and related institutions, including local rules concerning renting, how many households rented land in and out, who participated, and how much land was rented.

The 1995 household survey of 780 households in Hebei and Liaoning studied the impact of tenure types and land rights on production in 31 villages. Located in the north of China, Hebei and Liaoning are two of China's major agricultural provinces, and the six sampled counties in the two provinces are located in core agricultural regions. Most agricultural producers in the surveyed counties produce grain or cash crops. Maize accounts for about 70 per cent of the total sown area, but soybeans, rice and cotton are also grown.

Detailed information about household characteristics and agricultural production was recorded. After counting the number of plots worked by each household and obtaining information about each plot, two plots from each household were investigated more carefully. Information was collected about tenure status, specific land rights, all inputs and outputs, and land quality. After data cleaning, the sample consisted of 1,073 plots from 612 households.

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[18] For example, compare our estimates of the areas covered by different land tenure types (in the section below). The survey also collected data on labour movement and labour market participation, and our estimates are nearly identical to the point estimates released by the State Statistical Bureau. See Scott Rozelle, Guo Li, Minggao Shen, Amelia Hugart and John Giles, "Leaving China's Farms: Survey Results of New Paths and Remaining Hurdles to Rural Migration", *China Quarterly*, No. 158 (June 1999), pp. 367–93.

Land Tenure Types and Rights

Two decades after the initial rural reforms, land ownership remains vested with the collectives, and farm households cannot own land. The collective usually refers to the village or some sub-village entity. However, ambiguity over ownership has arisen in some areas of China. There are several reasons for the ambiguity, including the numerous changes in land ownership and in tenure regulations since 1949, the uneven application of tenure regulations, and the amalgamations and sub-divisions of villages over the past five decades.

After the decentralization of ownership to the production team in the early 1960s, the *xiaozu,* or village small group (the former production team) became the de facto owner of the land in most villages. In some regions, however, ownership lies with the village itself (the former production brigade). In a small minority of cases, ownership reportedly resides with the township, the former commune. Ministry of Agriculture and rural officials report increasing disputes between village groups and villages over land ownership.[19] Land conversion to non-agricultural uses and the rising commercial and residential value of land make ownership a particularly contentious issue in some areas. These issues also surface in the context of the need to reallocate land within and across villages.

Five major tenure types are officially sanctioned by the national government: (1) responsibility land (*zeren tian*), (2) grain ration land (*kouliang tian*), (3) contract land (*chengbao tian*), (4) private plots (*ziliu di*) and (5) reclaimed land (*kaihuang di*). The tenure types, in turn, are packaged into several land tenure systems, including the two-field system (*liangtian zhi*), which combines responsibility and grain ration land, and the three-field system (*santian zhi*), which adds contract land.

Responsibility land is allocated on the basis of the number of family members, the number of labourers in each family, or the desire and/or ability of the household to engage in agricultural production. In exchange for use rights, farmers must deliver a mandatory quota of grain or other specified commodities to the state at a below-market price. There may be restrictions on how they can use the land. Users of responsibility plots also face the possibility that some of the land may be taken away and the use rights allocated to other households.

Grain ration land is typically allocated on the basis of household size to ensure that each household produces enough for its own consumption needs. The use of the land does not usually entail quotas or other obligations.

A small amount of land was provided to rural households for *private plots* during the period of collective agriculture, and farmers retained this land when China reverted to family farming. In some villages households formed today by young newlyweds are also granted private plots. Households have almost complete control over the short-term and long-term management of the private

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[19] Concerns about the shift of ownership from sub-village groups to villages have been expressed by Du Ying, the director of the Law and Economics Department of the Ministry of Agriculture, and by Chen Xiwen, the head of the Rural Development Group in the State Council's Development Research Council.

plots, with the exception of the right of title transfer. In some villages farmers can bequeath their private plot to their children.

Contract land is rented to households by the villages for a fixed cash payment (*chengbao fei*). The length of these contracts varies considerably from community to community. While the cultivator of such land may incur a delivery quota, the defining feature is that rent is paid by the farmer to the village or the small group in return for use rights. Farmers may bid on the land at a community auction or the fee may be set by village authorities.

Farmers can also acquire use rights to *reclaimed land* that was previously uncultivated. There are usually no quotas or fees tied to the use of the land. In some villages rights to develop wasteland are currently being auctioned off (*huangshan paimai*).

A survey by the State Statistical Bureau in 1992 of 274 villages provides an estimate of the percentage of land in the first three of these tenure types.[20] Responsibility land, the most significant, made up 84.5 per cent of cultivated land. Only 8.4 per cent of cultivated acreage was grain ration land, while 6.2 per cent was cultivated as private plots (Table 1).

Our community-level survey, also reported in Table 1, provides similar results. The slightly lower percentage of land in responsibility fields (78.1 per cent versus 84.5 per cent) is largely explained by the fact that 5.2 per cent of the land in our survey was contract land. The SSB survey did not make a distinction between contract land and responsibility land. Our survey estimates that private plots accounted for 5.9 per cent of total acreage.

Tenure types are not uniform throughout China's villages. According to our survey data, 91 per cent of villages had responsibility land (Table 1). In the remaining villages, this designation was not used because they were not subject to procurement quotas. The second most common tenure type, the private plot, appeared in 54 per cent of the villages, while 37 per cent of all villages contracted out some land and 19 per cent of the villages allocated grain ration land.

We focus on three specific land rights in this paper: security of tenure, transfer or rental rights, and crop selection. The first two rights are likely to affect the distribution of land among the local farming community (i.e., static efficiency) and long-run productivity. The third right may affect the returns to farming more generally.

Security of Tenure

Tenure is secure when farmers have long-term rights to use specific plots of land. In most Chinese villages, these rights are lost or gained during village-wide reallocations. According to our household-level data, roughly three-quarters of all changes in landholdings were related to village-wide reallocations. Much of the remaining quarter occurred when the contracts on contract land expired, when

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[20] The results of this survey were reported in Cheng Yuk-shing and Tsang Shu-kai, "Agricultural Land Reform in a Mixed System: The Chinese Experience of 1984–1994", *China Information*, Vol. 10, Nos 3 and 4 (Winter 1995–96), Table 1, row 1.

families divided up their land at the time of a son's marriage, or when village governments responded to changes in the size of particular households without resorting to mass reallocations of land throughout the village. In contrast, in the periodic village-wide reallocations, a great deal of land changes hands simultaneously. For example, village leaders will shift land from a household where a death has occurred or where a daughter has married out of the village since the last reallocation, to a household where an infant has been born or where a man has gained a wife from another village during the same period. During this process households are not usually compensated for any investments they have made in the fields that are transferred away from them.

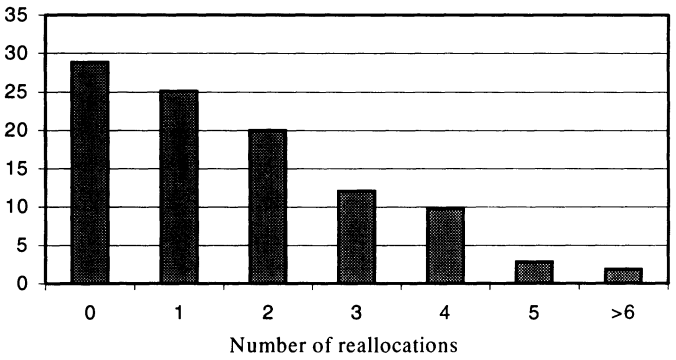
Table 1: Structure and incidence of land tenure types in China, 1992

	Private plots	Respons-ibility land	Ration land	Contract land	Other
Share in total farmland (% of farmland)					
SSB survey (n=274)	6.2%	84.5%	8.4%	–	–
1995 village survey (n=215)	5.9%	78.1%	9.5%	5.2%	0.8%
Incidence of tenure types (% of villages reporting)					
SSB survey (n=274)	–	–	23.0%	–	–
1995 village survey (n=215)	54.0%	90.7%	19.0%	36.7%	11.2%

Source: Adapted from Cheng Yuk-shing and Tsang Shu-kai, "Agricultural Land Reform in a Mixed System: The Chinese Experience of 1984–1994", *China Information*, Vol. 10, Nos 3 and 4 (Winter 1995, Spring 1996).

Considerable differences exist among provinces in the average number of reallocations per village since household farming was introduced, with a national average of 1.7 times (Table 2). Local leaders in Liaoning, Shaanxi and Hubei provinces adjusted land more frequently, while those in Yunnan and Sichuan provinces intervened relatively infrequently. In 28 per cent of the 215 villages in our community-level survey, the land had not been reallocated since 1983; whereas in a small number of villages, a reallocation occurred annually (Figure 1). Land had been reallocated once in one-quarter of the villages, and twice in 20 per cent of the villages.

Figure 1: Villages undertaking land reallocations since 1983 (per cent)



Source: Authors' data.

Our data confirm that the right to reallocate land is typically vested in the village government—86 per cent of villages reported that this decision was village based (Table 2).[21] In some parts of China, though, the decision to reallocate was made at the township level. In Yunnan two-thirds of the villages reported that reallocation decisions were made by the township government. In Hebei and Liaoning, one-third and one-quarter of the surveyed villages, respectively, reported that township leaders made these decisions.

The pattern of reallocations over time was consistent with the idea that villages and townships made the decisions to reallocate in a decentralized way, without much regard to the national policy of maintaining allocations for 15 years. Figure 2 reports the percentage of villages in our sample that reallocated land for each year between 1983 and 1995. In any given year, 10 per cent of all villages had reallocated land. While there is no definitive long-term trend, land adjustments were more common in years associated with periods of macroeconomic tightening, as in 1989–90 and 1994–95.[22]

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[21] Even in villages in which ownership is with the small group (the former production team) and land reallocation occurs among households within the small group, decisions regarding the timing and nature of the reallocations appear to reside in most cases with the village government.

[22] As discussed below, quota fulfilment is a motivation for land reallocation. During boom periods, grain prices have typically increased, as has the implicit tax associated with the quota. This makes quota fulfilment more difficult, and effectively reduces the demand for land on the part of farmers. The slight increase in the incidence of reallocations may be related to both these factors.

Table 2: Land reallocations 1983–95

	Average number of reallocations per village	Size of most recent reallocation (% of land)	Per cent of households affected by most recent reallocation	Reallocation decision made by township (% of villages reporting)
Zhejiang	1.2 (1.3)	60.8% (40.6)	91.8% (57.9)	6.2%
Sichuan	0.3 (0.5)	28.6% (33.1)	58.6% (36.8)	3.1%
Hubei	2.8 (1.6)	55.0% (39.8)	71.1% (33.9)	3.1%
Shaanxi	2.8 (1.2)	34.8% (36.7)	62.8% (29.1)	6.2%
Shandong	1.9 (1.0)	74.5% (39.8)	71.2% (33.7)	0.0%
Yunnan	0.4 (0.6)	31.3% (39.6)	61.4% (45.3)	66.7%
Hebei	1.5 (1.0)	75.0% (37.1)	82.5% (23.4)	33.3%
Liaoning	3.4 (3.6)	91.1% (22.2)	93.1% (17.9)	25.0%
Total	**1.7** **(1.8)**	**57.6%** **(41.3)**	**74.4%** **(37.3)**	**14.4%**

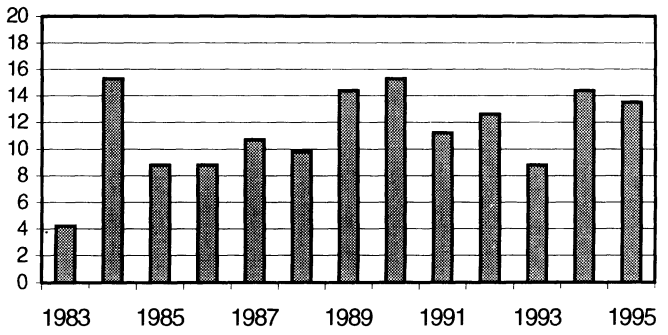
Note: Standard errors are reported in parentheses; the total number of villages surveyed is 215.

Source: Authors' field surveys, 1996 and 1997.

Reallocations differed in size and scope. On average, a reallocation involved slightly more than one-half of a village's land and three-quarters of its households (Table 2). In villages where there was more than one reallocation, the amount of land reallocated was about the same each time. On average, slightly more than half (53.4 per cent) of all cultivated land in our sample of villages had

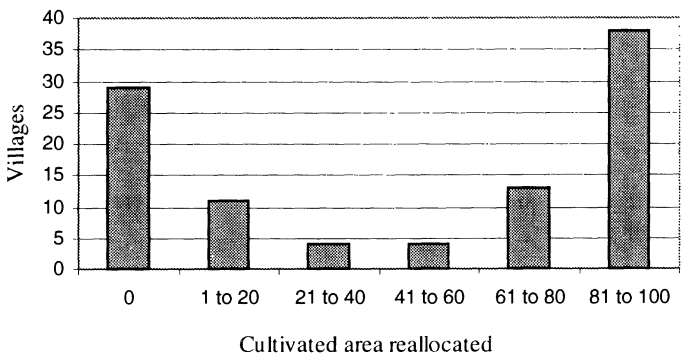
been reallocated at least once (Figure 3).[23] The distribution is also bimodal; a nearly equal percentage of village leaders (about 40 per cent) reported that nearly all or, contrarily, none of the land had been reallocated since the beginning of household farming.

Figure 2: Villages carrying out major land reallocations, by year (per cent)



Source: Authors' data.

Figure 3: Share of cultivated area that has been reallocated since 1983 (per cent)



Source: Authors' survey.

[23] The survey question asked for the percentage of land that has not been reallocated since the initiation of family farming. The remaining percentage has been reallocated *at least once*.

The more times that land was reallocated in a village, the more likely that a farmer would lose a particular plot of land. Insecurity was exacerbated if the dates of a village-wide adjustment were not known well in advance. The survey asked whether leaders announced beforehand the date of the first impending adjustment at the time that household farming was implemented. In nearly half of the villages, a date had not been announced. A similar percentage of villages also reported that households did not know the date of the next adjustment.[24] All three factors—the frequency, size and uncertainty regarding the date of the next reallocation—potentially contributed to farmers' concerns over the security of their land use rights.

Transfer or Rental Rights

Zhuanbao, literally "passing on a contract", refers to the transfer of land use rights between two households and is comparable to the notion of a land rental. The transfer is typically short term and usually entails the payment of a fee and assumption of agricultural taxes and mandatory delivery quotas by another household in return for the use of the land.[25] In 1995, 71.6 per cent of the villages reported that households had complete freedom to rent out their land (Table 3), about the same as in 1988. In the remaining 28.4 per cent of villages, households faced some sort of constraint, most often in the form of restrictions on renting to non-villagers or the need to obtain authorization from village leaders. Leaders only rarely imposed a complete moratorium on rental transactions.

Despite the high percentage of villages reporting that households had unconstrained rights to allow other households to use their land, a remarkably low percentage of land was rented out (Table 3). Back in 1988 only 0.6 per cent of cultivated land was rented, and nearly three-quarters of the villages reported no land rental at all. By 1995, although more than 75 per cent of local leaders reported rental activities in their villages, farmers still rented out less than 3 per cent of their land, and most of this rental activity occurred between relatives.

Crop Selection and Land Conversion

In nearly 75 per cent of the villages surveyed, households could freely decide on the crop mix. In several of the provinces, notably Hubei, Shandong and Yunnan, leaders in about one-third of the villages regulated these decisions. During the survey work we conducted in Zhejiang, farmers showed us a directive from

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[24] In almost 60 per cent of the villages that had previously had land reallocated, the date of the next reallocation had been announced. In contrast, the date of the first reallocation had been announced in only 15 per cent of the villages where land was yet to be reallocated. These percentages are open to several interpretations, but certainly the villages that had not yet reallocated land did not appear to face a higher probability of reallocation in the near future.

[25] A related concept is that of *zhuanrang*, which usually refers to a permanent transfer of use rights between households and often carries the connotation of a "quasi-sale" (as opposed to the rental) of use rights. But the terms *zhuanrang* and *zhuanbao* are not used consistently throughout China.

township leaders requiring all farmers in the village to plant a two-crop rice variety under threat of a fine, even though the trend in the area was to use one-season varieties or to move into horticultural production.

Table 3: Rental and use rights in China's villages, 1988 and 1995

	Percentage of land rented in 1988	Percentage of land rented in 1995	Unencumbered right to rent (% of villages) 1995	Right to decide crop mix in 1995 (% of villages)	Right to convert land to alternative uses (% of villages)
Zhejiang	1.6% (3.3)	6.9% (10.3)	93.8%	74.1%	40.7%
Sichuan	0.2% (0.5)	2.1% (2.6)	93.8%	93.8%	68.9%
Hubei	0.3% (1.1)	3.6% (8.3)	59.4%	66.7%	41.4%
Shaanxi	0.8% (2.1)	2.2% (2.9)	65.6%	93.8%	84.4%
Shandong	n.a.	1.1% (1.8)	46.5%	60.0%	60.7%
Yunnan	1.3% (0.5)	0.9% (2.2)	66.7%	66.7%	45.8%
Hebei	0.3% (0.6)	2.1% (2.2)	80.0%	84.6%	53.8%
Liaoning	0.1% (0.3)	3.6% (5.0)	62.3%	93.8%	6.3%
Total	**0.6% (1.8)**	**2.9% (5.8)**	**71.6%**	**73.4%**	**53.6%**

Note: Standard errors are reported in parenthesis; the total number of villages surveyed is 215.

Source: Authors' field surveys, 1995 and 1996.

Contractual obligations such as mandatory grain or cotton quotas can affect crop choice. In the villages in Liaoning province, for example, grain quotas in 1995 averaged nearly 25 per cent of gross output. Officials typically did not allow farmers to fulfil their obligations with a cash payment, and insisted on deliveries of grain. Cotton quotas in parts of Hebei, Hubei and Shandong provinces had a similar effect. Some of the farmers in these areas complained that they would rather plant cash crops but must plant grain or cotton. Quotas were usually lower in poor areas, rarely exceeding 10 per cent.

Local leaders placed more severe constraints on the ability of farmers to convert land to non-crop uses (Table 3). Rules often prohibited farmers from converting cultivated land to orchards or fishponds or as sites for greenhouses or brick kilns. Officials in Liaoning province were especially strict. Throughout China only around half of the farming population can make significant permanent changes to their land use without the authorization of local leaders.

Land Rights Determination

A popular view expressed in some of the earlier work about how land rights are determined was that land rights and land policy are uniformly decided by the central government.[26] Policy pronouncements by the State Council on issues such as land tenure security convey this impression. However, the observed heterogeneity in property rights discussed in the previous section essentially undermines this view. Land security and transfer rights have not only differed among provinces, but also from township to township within a county and among villages within a township (Table 4). Townships in 39 of the 44 sample counties (88 per cent) reported different frequencies of land readjustments at the village level; and villages in 52 out of 92 townships (57 per cent) reported different frequencies. Similar patterns appear with respect to land rental rights. Townships in 30 out of 44 counties (68 per cent) reported different land rental rights at the village level; while villages in 33 out of 92 townships (36 per cent) reported different rental rights. In our sample of 31 villages in six counties in northeast China, land resources were organized in almost 20 different ways. Similarly, a Chinese researcher discovered that leaders in 40 Yunnan and Fujian villages managed their forestry land in nearly 30 different ways.[27] Throughout China, diversity in land management policies is observed at every administrative level, suggesting that central or regional policymakers are not the final arbiters in land management issues.

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[26] See, for example, Prosterman et al., "Can China Feed Itself?". An exception is Michael Carter, Shouying Liu and Yang Yao, "Dimensions and Diversity of Property Rights in Rural China", Department of Agricultural and Applied Economics working paper, University of Wisconsin-Madison, 1995.

[27] Qiao Fangbin, "Property Rights and Forest Land Use in Southern China", unpublished Masters thesis, Graduate School of Chinese Academy of Agricultural Sciences, Beijing, 1997.

Table 4: Heterogeneity of land security and rental rights within counties and townships in China

	Reallocation or not	Frequency of land reallocations	Land rental rights or not
County sample size: 44			
Counties reporting differences in rights between villages within the county	24 (55%)	39 (88%)	30 (68%)
Township sample size: 92			
Townships reporting differences in rights between villages within the township	27 (29%)	52 (57%)	33 (36%)

Source: Authors' field survey.

The pattern of land rights suggests that village leaders are normally the source of this widely observed heterogeneity.[28] This conclusion is consistent with several studies that show central policymakers are less able to affect local development programs because of the increased independence of village leaders.[29] Some argue that decision-making powers have already shifted from central to local and village authorities to such a degree that China is now one of Asia's most decentralized countries.[30]

Central policy and laws provide for a considerable degree of decentralization. The Organic Law of Village Committees vests village

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[28] An analysis of variance (ANOVA) highlights the role of local factors. Differences among provinces only explain 31.5 per cent of the variation in the frequency of land reallocations across villages; inter-county differences are the source of 44.6 per cent of the variation, while inter-township differences explain 71.3 per cent. This leaves almost 30 per cent to differences within townships or villages.

[29] See, for example, Daniel Kelliher, "The Chinese Debate over Village Self-Government", *The China Journal*, No. 37 (January 1997), pp. 63–86.

[30] Michael Carter and Yang Yao, "Property Rights, Rental Markets, and Land in China", Department of Agricultural and Applied Economics working paper, University of Wisconsin-Madison, 1998.

governments with the legal authority over land rights. One of the primary responsibilities of the village leader is to manage village land and guide farmers in their use of local natural resources.[31] On major decisions about land allocation, the timing and method of land readjustment, and rules regarding land rentals, many local leaders use their authority derived from the Organic Law to side step centrally proclaimed edicts.[32] If village leaders have discretion in overseeing land, a fundamental question is on what basis do they make land reallocation decisions. In all likelihood, in any given village there will be more than one motivation for the reallocations. We present three possible reasons for land redistributions and examine existing empirical support for these explanations.

Hypothesis 1: Demographic Change and Equal Access to Land

With the introduction of household farming, local leaders typically allocated land to households in a fairly egalitarian way based on a combination of family size, demographic composition and labour supply.[33] With land collectively owned, a case can be made that *all* villagers, both present and future, are entitled to equal access to this common property resource. This requires village officials to reallocate land on an ongoing basis.[34] This kind of behaviour might be reinforced by preferences among villagers (or key constituencies within a village) for an egalitarian land reallocation[35] and a village-level decision-making process that reflects villager sentiment. Pressures to redistribute use rights to maintain adequate consumption for all households within a village may be tied to local economic conditions and the extent and security of opportunities outside of farming. If demographic rules are a determinant for land allocation, we would expect to find a strong relationship between household demographics and land allocations, and village reallocations would be positively correlated with demographic change.

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31 According to Article 4 of the Organization Law of the Village Committee, a responsibility of the village committee is "to manage the land and other assets belonging to the collective, to guide villagers to use natural resources properly, and to guide villagers to protect and improve the natural environment". Article 4 of the Organization Law is reprinted in *Zhongguo nongye nianjian*, 1988, pp. 459–60. Also see Kelliher, " The Chinese Debate".

32 Kevin O'Brien and Lianjiang Li, "Selective Policy Implementation in Rural China". *Comparative Politics*, Vol. 31, No. 2 (January 1999), pp. 167–86.

33 Louis Putterman, *Continuity and Change in China's Rural Development: Collectives and Reform Eras in Perspectives* (New York: Oxford University Press, 1992).

34 There are ways to accomplish the same ends other than through village-wide reallocations. In some villages, a portion of village land, *jidong tian*, was retained at the time of the introduction of household farming to accommodate these future demands. Other villages used land returned by out-migrating households or adjusted tax and quota obligations, and newly formed or newly enlarged households "lined up" for land as it became available.

35 Kung, "Equal Entitlement".

Hypotheses 2: The Interests of the State and Village Leaders

D. Gale Johnson[36] argues that village leaders use their power over villagers to extract benefits during the periodic reallocation of land. Village leaders may also receive sizeable advantages through their control over the sale of village land for industrial development and other purposes.[37] Johnson contends that a system of land titling would free villagers from the arbitrary and capricious exercise of power by local cadres.

But far more often, reallocations may serve the more legitimate purposes of village leaders. Rozelle and Li hypothesize that village heads have used their power over the periodic redistribution of land to extract compliance and cooperation from villagers in meeting tax payments, family planning goals or grain, oil and cotton quotas. The village leaders could assign more land to a household as a reward, and take land from villagers who do not fulfil their obligations.[38] The village leaders' incentive for doing so would lie in the potential rewards from higher-level officials for meeting these targets through job security, promotion opportunities and, in some cases, bonus payments.[39] Hypothetically, village leaders would be more likely to use land reallocations to meet these ends if they highly value remaining in office and if farmers in the village highly value their access to land. Local leaders frequently pointed out in our interviews that the willingness of higher officials to overlook deviations on policies such as land reallocations are directly linked to requests for village leaders to meet other, more crucial targets.

The relatively low incidence of quota defaults limits the explanatory power of the hypothesis that reallocations are due to officials' efforts to enforce quotas.[40] Our survey data suggest that less than 1 per cent of households defaulted on their quotas, with default rates similar in the villages that carried out land reallocations and those that did not. In addition, this kind of behaviour on the part of local leaders does not map easily onto the land reallocation behaviour actually observed. If allocating less or poorer land to households as a form of punishment

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36 Johnson, "Property Rights".

37 There is anecdotal support for this kind of self-interested behaviour on the part of village leaders in the wealthy industrializing parts of the countryside. This appears to be increasingly common, as suggested by comments by Chen Xiwen and Du Ying in presentations made at a recent conference in Beijing on land policy. However, such sales were rarely observed in any of the 215 randomly selected villages in our sample.

38 Scott Rozelle and Guo Li, "Village Leaders and Land-Rights Formation in China", *American Economic Review*, Vol. 88, No. 2 (May 1998), pp. 433–38. In principle, leaders could also assign better land to those who cooperate, and poorer land to those who do not.

39 Scott Rozelle and Richard Boisvert, "Quantifying Chinese Village Leaders' Multiple Objectives", *Journal of Comparative Economics,* Vol. 18 (February 1994), pp. 25–45; Scott Rozelle, "Decision-Making in China's Rural Economy: The Linkage between Village Leaders and Farm Households", *China Quarterly*, No. 137 (1994), pp. 99–124; and Samuel Ho, *Rural China in Transition* (New York: Oxford University Press, 1994).

40 Non-compliance of other forms may be higher, but we have no evidence of this.

was a credible threat, we would expect that reallocations for these purposes will occur fairly regularly but only involve a small number of households. As described above, however, village-wide reallocations have occurred, on average, only once every six to eight years and have involved a significant portion of a village's land (over 50 per cent). In addition, more than three-quarters of the shifts in household land allocations occurred as part of these village-wide reallocations, with the remainder a result of family divisions, village recognition of births, and so on.

Even if not used directly to enforce quotas, reallocations could conceivably still assist in the fulfilment of delivery quotas and other agricultural targets.[41] With the growth of off-farm opportunities and the increase in the returns to labour off the farm, quotas will increase the likelihood that the return to labour in agriculture will fall below that offered by outside work.[42] Our observations in China are that if the quota became too burdensome, villagers tried to persuade local leaders to have their landholdings reduced, even as they continued to deliver the quota. Reallocating the land to households for whom farming remains relatively attractive helps ensure that quotas are more easily met, and could increase efficiency. Hence, one prediction of this hypothesis would be that reallocations will occur more frequently in villages with larger delivery quotas.

D. Gale Johnson hypothesizes that a more open political process at the village level through community elections could reduce reallocations by acting as a powerful check on cadres.[43] Conversely, of course, in villages in which local residents prefer reallocations, contested elections could be expected to lead to more frequent reallocations. In a general sense, honest and open village elections increase accountability, but it is not clear how they affect land policy if villagers' preferences toward reallocations differ across villages.

Hypothesis 3: Efficiency Gains and Missing Markets

Over time household labour supplied to agriculture changes in response to changes in off-farm opportunities and household labour endowments or both. Since markets for land rental and for hired farm labour are incomplete in most

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41 See Matthew Turner, Loren Brandt and Scott Rozelle, "Local Government Behavior and Property Right Formation in Rural China", Department of Economics working paper, University of Toronto, 2000.

42 This also implies that the "rent" associated with the land is effectively negative or at least quite low.

43 Implicit in Johnson's analysis is the assumption that villagers universally prefer secure tenure. If Kung and Liu, "Farmers' Preferences Regarding Ownership and Land Tenure", and Carter et al., "Dimensions and Diversity" are correct, however, a majority of villagers favour reallocations. The size of the constituency in support of reallocations differs among villages and is tied to household demographics, the local economic environment, and the extent and security of opportunities outside of farming. See also Jean Oi and Scott Rozelle, "Elections and Power: The Locus of Decision Making in Chinese Villages", *China Quarterly*, No. 162 (June 2000), pp. 513–39.

parts of China, households cannot adjust easily to emerging imbalances. As a result, land and labour will gradually become less well matched, productivity differences will increasingly arise between households and village profits from agriculture will fall.

Village-wide reallocations are a way to correct such a mismatch. Interviews with village leaders who have carried out reallocations, however, revealed that the process is time consuming and entails considerable administrative expense. As such, we only expect village-wide reallocations to occur when the land–labour match deteriorates sufficiently and the returns from adjusting the landholdings justify the transaction costs. These costs are likely to differ across villages, reflecting differences in village size, land types and the attributes of leaders. Put formally, the hypothesis is that land reallocations maximize the discounted present value of agricultural profits, net of the costs of conducting reallocations. Less formally, the hypothesis is that administrative reallocations are a substitute for the exchange of land that would occur if households rented land to each other.

There are several reasons why this hypothesis may be significant in explaining the reallocations that we recorded. First, to the extent that villagers are able to affect reallocations by lobbying village leaders, we expect households that value land more highly to lobby more effectively for favourable reallocations. Second, as the village's agricultural profits increase, it is probably easier for the village leader to collect taxes and agricultural quotas. Since these responsibilities are an important part of the leaders' job evaluation, they may have an incentive to perform profit-increasing trades. Third, insofar as equity is a consideration, it will involve a reallocation of land from households with low labour–land ratios to those with high labour–land ratios. All of these forces would tend to push reallocated land into the hands of households with a higher marginal productivity of land, which increases the prosperity of agriculture in the village.

Central to this interpretation of the role of land reallocations is the fact that farm rental markets are incomplete or relatively thin. There are a number of possible explanations for this. First, the past two generations of farmers and local leaders have grown up with a Communist ideology that regards land rentals and the hiring of labour as exploitative. Alternatively, market participation may be low because households are reluctant to use an unfamiliar method of exchange. This explanation, however, is not consistent with the rapid development of the market economy that has occurred throughout rural China.

Second, households renting land usually must assume responsibility for delivering the quota for that land. In the event of default, however, leaders typically hold the household that was originally allocated the land liable for the quota. Administering such a system may require considerable effort and provide leaders with an incentive to discourage rental transactions. Our data provide some support for this.[44] In 1995, for villages in our national sample that did not have to

[44] These descriptive statistics should not be taken to be conclusive. Studying the determinants of rental market activities is a complicated task and there might be other factors that are correlated with the presence or absence of quotas that could be contributing to our observations.

meet quotas, farmers rented an average of 7.9 per cent of village land; those in villages with quotas only rented 2.2 per cent of the land.

More generally, there are no formal institutions that enforce land rental contracts. Courts are not resorted to. Land registration does not exist in most villages. The transaction costs associated with finding a potential renter, agreeing to the rental terms and enforcing the agreement may be prohibitive, especially given the small size of China's farm plots. The fact that most rentals were between relatives appears to corroborate such an explanation: transaction costs are likely to be lower because of a higher level of mutual trust.

Finally, rental transactions may signal to leaders that opportunities exist for gains from the exchange of land. As Johnson argues, self-interested leaders may want to capture some of the gains for themselves through their role in overseeing the administered reallocation of land. There is anecdotal support for the view that village leaders in some areas regard such rental transactions as a signal of land misallocation, and shift land away from households that rent out.[45] In such a case, since rentals invite dispossession, no one will rent out land.

To analyse the importance of village profit maximization in explaining reallocations, we developed a model that assumes village leaders act rationally, generates predictions for decisions relating to the time between reallocations and the size of the reallocations, and shows how the size and timing of reallocations are related.[46] Our predictions link reallocation choices to changes in family labour supply and demographic composition, transaction costs, the level of farming technology and the attributes of village leaders. Transaction costs include the costs of carrying out the reallocation (e.g., the time spent assessing household changes and redividing plots), and the disruption to agriculture caused by the reallocations.

We expect, however, administrative reallocations to be only an imperfect substitute for a decentralized system of exchange based on rental. Village leaders would require an enormous amount of information to be able to match optimally their villagers' supply and demand for land to the extent that a well-functioning rental market could. If the costs of collecting the information needed to reallocate land and implement the reallocation plan are high, leaders will carry out reallocations only infrequently, and inefficiency in the allocation of land will be the norm.

The Empirical Evidence

The empirical research examined four key areas: (1) the criteria by which land was allocated; (2) the extent of inefficiency (static or allocative) caused by any inability to allocate optimally across farm households; (3) the effect of the current property rights regime on investment incentives; and (4) the possible reasons for differences across villages in land reallocation policies.

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[45] Guo Li, "Land Rights, Tenure, and Leaders in China", unpublished Ph.D dissertation, Food Research Institute, Stanford University, 1999.

[46] See Turner et al., "Local Government Behavior".

Land Allocation Criteria

Most other village-level survey work suggests that land is allocated to households on a per capita basis, possibly adjusted for differences in demographic composition.[47] But few researchers have examined household-level data to analyse villages' different allocation rules. Robin Burgess, using 1990 State Statistical Bureau data for over 5,000 households from Zhejiang and Sichuan, shows that demographic variables and village-specific dummy variables explain 75 per cent of the variation in household landholdings.[48] In this sample, all but a handful of households possessed land. Allocations were not carried out on a strict per capita basis, but rather reflected the age composition of the household. Children and the elderly received less land. In this respect, the allocations resembled "demogrants", land transfers that are a function of the demographic characteristics of the household. In addition, village leaders allocated less land to individuals working off the farm, an empirical result also found by Kung and Liu.[49] Burgess asserts that this egalitarian access to land was central to increasing calorie consumption in parts of China.[50]

Using our own 1994 household data from Hebei and Liaoning, we arrived at results that are largely consistent with Burgess's, except in a few respects.[51] Out of a sample of nearly 780 households, we found a slightly higher percentage of households that voluntarily did not have land to farm.[52] Controlling for systematic differences across villages, we cannot reject Burgess's finding that cultivated land is allocated on average in direct proportion to family size. Unlike Burgess's results, however, the coefficients on the variables capturing the demographic composition of household are usually insignificant. When we added a variable representing the number of household members participating in off-farm work, we found that households with members who engaged in non-agricultural work received less land per capita. Apparently, villages are taking into account the importance of farming to the household, and are reallocating land from the partly

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47 Putterman, "Continuity and Change".

48 Robin Burgess, "Land, Welfare, and Efficiency in Rural China", London School of Economics working paper, 1997. The village dummies or "fixed effects" help absorb cross-village heterogeneity in farm size that might also be correlated with family size.

49 Kung and Liu, "Farmers' Preferences".

50 If rural residents in some of the remote regions relied on purchasing grain from markets that were subject to high transaction costs (given their location and the fact that markets were relatively underdeveloped and unreliable), according to Burgess there would have been more nutritional problems.

51 Dwayne Benjamin and Loren Brandt, "Property Rights, Labor Markets, and Efficiency in a Transition Economy: The Case of Rural China", Department of Economics working paper, University of Toronto, 2000.

52 A total of 50 out of the 780 households did not have land. Most of these households were involved exclusively in non-agricultural activities, and returned their land to the village to avoid having to farm it.

non-agricultural households to those solely engaged in agriculture. Overall, the explanatory power of the household demographic variables is significantly less than Burgess finds; the variables only explain half of the variation in landholdings among the households in these two provinces. One interpretation of this finding is that factors other than demographic and labour-supply variables in our sample increasingly matter for household land allocation, and that village leaders' discretion is becoming more important in the allocation of land.

Static Inefficiency

Static or allocative inefficiency is caused when there is a misallocation of resources across households, which in China's case may arise for a fairly straightforward reason. At the outset of decollectivization, the land was allocated in a roughly egalitarian way to reflect household size and composition, and in some cases off-farm employment. Over time, however, demographic changes—births, deaths, the growth of children into teenagers, marriages and family divisions—all affect the household's total labour supply and its consumption needs, while the dependence on farming has lessened because of the increase in off-farm opportunities.[53] If there are no changes to the initial allocation of land to households, the demographic changes and differential access to off-farm opportunities would lead to a less than perfect fit between a household's landholdings and its endowment of labour (which is exactly the meaning of allocative or static inefficiency).

If land is not allocated so that all households have the same land–labour ratio, land-scarce households will be supplying more labour per unit of land (i.e., there will be a mismatch between land and labour). In principle, this can give rise to an "inverse relationship" between farm size and land productivity, with output per unit of land higher on smaller farms.

We examined this inverse relationship as an indicator of static inefficiency in our sample villages. We find that as farm size rises, labour use per unit of land falls, output per unit of labour rises, and output per unit of land remains constant.[54] These findings can only be reconciled by a view that there is inefficiency in the use of labour. Farmers who cannot access sufficient land apply more labour per unit of land and earn relatively less in return for their extra time. We also examined whether the severity of the inefficiency is correlated with the

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[53] Births as well as deaths of elderly members of the household do not affect the number of individuals of working age in the household, but the number of individuals that need to be fed can affect how much work other members of the family decide to do through a variety of channels.

[54] See Benjamin and Brandt, "Factor Markets". Burgess in "Land, Welfare, and Efficiency" also utilizes the inverse relationship, but looks only at output and not labour inputs or labour productivity because of data limitations. He finds support for a fairly severe inverse relationship in Sichuan but only a small one in Zhejiang, which he attributes to differences in off-farm opportunities in the two provinces. Failure to control for differences in land quality, as well as missing information on labour inputs, leaves these results open to several interpretations.

way local leaders allocate land. We find that villages that undertook larger and more comprehensive land reallocations eliminated some of the labour inefficiency. When there are inefficiencies in the distribution of land and labour, reallocations partially mimic the outcome of a well-functioning land rental market by reallocating land from land-rich households to land-poor ones.[55] This helps to equalize the marginal product of labour across households and enables the same level of output to be produced with less labour. However, even after the reallocations, we still find that significant inefficiency remains.

We also find that well-functioning local labour markets and other sources of off-farm employment significantly reduce the inefficiency in farm labour use. Empirically, off-farm opportunities are much more important than reallocations of land in alleviating static inefficiency.

Is static inefficiency a serious problem? We find that the cost of the inefficiency amounts to about 8 per cent of median household income for medium-sized farms and nearly 10 per cent of median income for small farms. In contrast, a paper by Michael Carter and Yang Yao, drawing on data for 200 rice-farming households in Zhejiang, suggests the cost of static inefficiency arising from restrictions on transfer rights is only around 2 per cent of output.[56] Since rental markets in most developing countries do not function perfectly, it is unclear how much gain there would be if all transfers among households relied on rental markets. Because of the substantial off-farm opportunities in the areas surveyed by Carter and Yao, however, the costs are probably lower than they are in other areas where income from farming is much more important.

Perhaps the most important finding on the impact of land reallocations on household welfare is that reducing static inefficiency does not have to come at the cost of rising inequality. Our work, as well as that of Carter and Yao, suggests that reallocating land across households (by either the market or administratively) simultaneously improves *both* efficiency and equity. The critical question is how best to conduct the reallocations. In principle, well-defined rights to rent land could alleviate the allocative inefficiency, although it might be that high transaction costs in rental markets rather than village-level policy is what is preventing these markets from developing. The reason for the limited amount of land transacted through rental markets needs to be more carefully examined.

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[55] The welfare implications of administrative versus market allocation differ because under these mechanisms the rents accrue to different sets of individuals. However, if markets are more efficient than administrative reallocations in allocating land, poorer households lacking off-farm opportunities might actually fare better with market rental. Because of the opportunity to rent in more land, these households will be able to more fully utilize their family's labour, and thus increase their income over what they could earn under a system dominated by administrative reallocations. The additional returns to their labour from renting in more land might more than offset the land rents they pay to other households.

[56] Carter and Yao, "Property Rights, Rental Markets".

Investment Incentives and the Costs of China's Property Rights Regime

The major rationale behind the recent government directive to extend land tenure to 30 years is the belief that this will enhance incentives to invest in the land. To date, however, in addition to our own work, only the study by Carter and Yao[57] has examined the effects of tenure security and related rights on household investment behaviour. While the results of both studies are useful, they use imperfect data, address only some of the issues, and are small samples in only one region of China.

There are several kinds of investment that can affect land productivity and output growth. There are investments to augment land quality, such as expenditures on irrigation, drainage and wells. There are also investments in long-term soil fertility through the use of organic fertilizers and green manure. Empirically, the key is to link levels of investment to the land rights that households enjoy, notably security of tenure and freedom of rental, while simultaneously controlling for household characteristics and inherent differences in land types and quality that may influence household investment decisions. We used the plot-by-plot data collected in our Hebei and Liaoning household surveys to analyse the incentive effects of property rights on the use of agricultural inputs and the propensity to invest.[58]

In a sub-sample drawn from one county in Hebei province, we find that yields on private maize plots were significantly higher than on responsibility maize fields. On average, private plots yielded 25 per cent more than responsibility plots.[59] When cultivating their private plots, farmers used more labour (11 per cent more), draft animals (3 per cent more), nitrogen fertilizers (5 per cent more), organic fertilizers (35 per cent more) and phosphates (22 per cent more). Note that the greatest differences were in organic fertilizer and phosphate use, the two inputs with the greatest long-term impact on the land.

The key question is to what extent can these differences in input use be attributed to property rights? A major difference in the sample between private plots and responsibility plots is the length of tenure. For private plots, the average length of tenure was over twice that for responsibility land (21 years versus 9

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57 Ibid.

58 Of the total of 735 households in our survey who farmed, 664 had more than one plot. After obtaining basic information about each plot, two plots (of different tenure types when possible) were selected from each household to investigate more carefully. Enumerators asked about the plot's tenure status, land rights, all inputs and outputs, and land quality. See Guo Li, Scott Rozelle and Loren Brandt, "Tenure, Land Rights, and Farmer Investment Incentives in China", *Agricultural Economics*, Vol. 19 (1998), pp. 63–71.

59 These differences are actually small when compared to the gaps existing between private and collective fields in the pre-reform period. S. J. Burki, *A Study of Chinese Communes* (Cambridge: Harvard University Press, 1969), observed that private plots had a yield averaging more than twice the collective yield. This can likely be attributed to the fact that the differences in the residual income rights between private and collective plots in the Maoist era were much greater than that between private and responsibility plots today.

years). Also, for nearly 40 per cent of the responsibility plots, the household's contract was expected to expire the following year. Although this finding suggests that security of tenure is an important factor, several other factors, such as the size of the plot, the quality of the land and the distance of the plot from the household (private plots are closer to home), may also be important. In fact, differences in yield and input intensity may be a product of differences in these plot characteristics and be unrelated to property rights.

To test these different factors, inter-plot comparisons were made using regression analysis. Controlling for differences in land quality, plot location and other key variables, we find that weaker property rights, either in the form of poorer tenure security or constraints on rental rights, adversely affect incentives to invest in medium-term inputs such as organic manure. In fact, these two variables explain much of the difference in organic manure use between the two kinds of plots. The effect of these same variables on other inputs was insignificant.[60] The relatively low effect of organic fertilizers on output suggests that only a small percentage of the differences in output between the two kinds of plots is solely related to property rights.

One potential shortcoming of the above findings is that the length of time that a household has held a plot may not be a perfect measure of tenure; it could be that the longer a plot has been held, the more likely the land will be taken away.[61] To overcome some of these problems, we performed a hazard analysis of individual plot tenures that relates the predicted probability of having a plot expropriated to land-specific investment, specifically organic fertilizer use. We can do this analysis since our plot-by-plot tenure data collected in Hebei and Liaoning provide a mirror that reflects the recent history of land expropriation. Using this analytical framework, we can create an objective measure of tenure insecurity and assess who would benefit from the policies designed to reduce tenure insecurity.

Our empirical results support the view that a heightened risk of expropriation dampens investment in rural China, although the impact may not be large. Farmers living in villages with more frequent land reallocations—or those who were at a higher risk of losing a plot—used organic fertilizer less intensively. The opposite was true of chemical fertilizers, which have only a short-term effect on soil quality. Despite having a negative impact on investment in soil quality, land reallocation appeared to have only a modest cost—about 5 per cent of production, a figure that is above that estimated by Carter and Yao, but still relatively low.[62]

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60 This is as expected given that the impact of these other current inputs on productivity does not extend past the current agricultural year.

61 Hanan Jacoby, Guo Li and Scott Rozelle. "Hazards of Expropriation: Tenure Insecurity and Investment in Rural China", Research Department working paper, World Bank, 1998.

62 Carter and Yao, in "Property Rights, Rental Markets", consider several investment activities in the context of a structural econometric model that allows for three kinds of effects of property rights. These include: (1) the effect of tenure security on the household's investment; (2) the effect of the right to rent the land on the households' investment

While all studies to date have failed to find a significant connection between land tenure and production, we hesitate to make too much of these findings. It may be that organic manure, the variable we chose, does not have a significant enough effect on soil quality for its underutilization to matter much. Moreover, to the extent that many of the more capital-intensive agricultural investments are undertaken at the village level, any underinvestment by households attributable to the land reallocations may not be a large problem. No study has yet obtained sufficient data to estimate the impact of China's land management systems on other types of land-augmenting investments and crop choice.

Frequency and Time between Reallocations

Previous studies that have tried to explain differences in land reallocation behaviour across villages using village-level data have focused primarily on the frequency of village-wide reallocations.[63] In addition to differences in the frequency of reallocations, the size of reallocations also differs. We believe that tenure security is best thought of as a function of both the frequency of the reallocations and the size of the typical reallocation. This complicates the interpretation of the effect of key factors on tenure security because they may influence tenure security separately through the timing and size of land readjustments.

The frequency of reallocations since the introduction of family farming and the time since the last reallocation is significantly related to changes in village demographics. For example, in villages where changes in household populations are greater, the frequency of reallocations rises and the time since the last reallocation falls. The timing decisions are also sensitive to the amount of off-farm opportunities. These findings are consistent with the view that reallocation behaviour is partially tied to the need to accommodate demographic changes and to the view that reallocations help to eliminate inefficiency in the allocation of land across households resulting from differential access to off-farm

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incentives; and (3) the effect of rental rights on the equalization of the returns to labour and other current inputs across households. Drawing on a two-year panel of data for 214 households in Zhejiang, they estimate the effect of these property rights on investment and labour-supply decisions conditional on households' decisions regarding land rental. They find that the most important effect derives from the influence of tenure security vis-à-vis household investment. The right to rent does not have a significant effect on investment, while neither tenure security nor the right to rent appear to be affecting labour intensity.

63 See, for example, Carter, Liu and Yao, "Dimensions and Diversity". This and other papers on this subject, including several of our own, differ in their methodological sophistication and their attention to a number of econometric issues that arise in analysing duration-related behaviour of this sort. Empirical problems are compounded by the fact that the regressions are often of a highly reduced form, which leaves their results open to a number of alternative interpretations. At a minimum, however, the papers as a group suggest that land reallocation is tied to village population growth, the growth of off-farm opportunities, the need to eliminate inefficiencies in the allocation of land across households and quota fulfilment. In the rest of this section, we draw heavily on Turner et al., "Local Government Behavior". We believe that this work examines the broadest number of institutional factors.

opportunities. It also appears that the effects of population growth are attenuated in villages that have adopted alternative land management practices to deal with population growth. For example, villages can use land set aside explicitly for these purposes, or village leaders can readjust the household's procurement quotas.

A number of non-demographic factors also appear to affect the timing of reallocations. Variables capturing the size of the fixed and variable costs associated with reallocation (such as the size of the village or the average number of plots that households possess) have a significant effect on timing decisions: reallocations are less frequent in villages where fixed or variable costs are higher. Village leaders also reallocate land more frequently in areas with higher quotas, a finding consistent with the analysis we examined earlier about how quotas may affect village behaviour. Finally, reallocations are less likely in villages where decisions about reallocations are made by the township government. In fact, reallocation is rare in such townships, which largely enforced the 15-year tenure provision of the national Household Responsibility System Law. Interestingly, in villages with contested elections, in which two or more candidates vied for the position of village leader, the time between reallocations is shorter. This suggests that when in a position to influence policy, many households prefer more frequent reallocation, perhaps as a means of meeting the household's livelihood needs.

The Determinants of the Size of Reallocations

The amount of land that is reallocated depends significantly on the length of time since the last reallocation. Estimates suggest that the amount of land redistributed increases by about 6 per cent for every additional year since the last reallocation.

Demographic variables, as in the case of the frequency and timing of reallocations, also have an important effect on the size of the reallocation. This is positively related to the rate of change in the village population and the growth of off-farm opportunities. Notably, though, our regression analysis suggests that the changes in off-farm opportunities are more important than population changes in explaining differences between villages in the size of the reallocations. In fact, only 20 per cent of the differences between villages in the amount of land reallocated can be attributed to differences in the rate of change in the population.[64]

Although transaction costs are difficult to estimate, our analysis suggests that timing decisions will be influenced by both fixed and variable transaction costs, while the size of the reallocations should only be affected by variable costs. We presume that the variable costs of reallocation increase with the average number of plots per household and the percentage of land that is rice paddy. Apart from the possibility that reallocating paddy reduces investment—paddy requires more

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[64] Insofar as these reallocations entail reallocating land from land-rich to land-poor households, they also help to lower inequality. One does not have to appeal directly to a preference for equity to explain reallocations that help in this dimension.

ongoing investment—the cost of subdivision is higher on paddy fields because paddy fields have well-defined perimeters.

Quotas also have an important effect on the size of the reallocations. As quotas increase, the percentage of land that is reallocated increases. Moreover, this effect appears to be most significant in areas where off-farm wages are the highest. This finding is consistent with the view that quotas reduce the returns to farming and provide both villagers and village leaders with incentives to reallocate land to households that can farm profitably even with the quotas. This effect of quotas on reallocation behaviour is significantly reduced when quotas become convertible into cash, a move that helps to reduce the distortions related to the quota, and thus the need to reallocate.

Finally, although a contested election reduces the time since the last reallocation, it also reduces the amount of land reallocated. Village leaders will need to be careful about reshuffling land beyond the desires of their constituents if they wish to be re-elected to office or otherwise advance their careers.

Administrative versus Market Exchange

The effect of off-farm opportunities on village reallocations, along with other findings from our work, suggest that certain kinds of land reallocations will help to eliminate inefficiency in the allocation of land across households, albeit incompletely.[65] In this respect, administrative reallocation plays a role analogous to that played by land rental markets. The question is, how are these two systems of exchange related and are they substitutes for each other?

When we include measures of land rental activity in our analysis of the size of the reallocations, we find that reallocations are smaller where rental markets are more active. Although there may be certain statistical questions that arise in such an analysis (for instance, the size of the reallocations and the freedom to rent may be determined simultaneously), the findings raise an important question: if reallocations are a substitute for rental markets, which villages are most likely to select the former over the latter?

Using the full sample of 215 villages from our village survey, we find that reallocations are more frequent in villages with higher quotas, older leaders and contested elections; rentals, on the other hand, are more prominent in villages with smaller quotas and younger and better-educated leaders. Both administrative reallocations and market rentals are positively correlated with the growth in off-farm opportunities.

Land allocations and rentals may have important cause-and-effect linkages. An interpretation consistent with (but not necessarily proven by) these results is that where rental markets fail it is partly because leaders discourage them in order to preserve their role as intermediaries in land exchange. In villages where this is relatively more important to leaders, either because the quotas are larger, or because villagers put a higher value on land, or because of the leader's attributes, we observe more administrative reallocations. This, in turn, discourages or

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[65] See Benjamin and Brandt, "Property Rights, Labor Markets", for more details.

crowds out rental transactions in these villages.[66] This interpretation suggests that a reduction in quotas, a reduction in agricultural land rents, and increases in the accountability of leaders will cause a shift from administrative to market exchange.

Conclusions and Policy Implications

The allocation of property rights is widely recognized to have important implications for resource use and the distribution of household welfare. The introduction of household farming in the early 1980s extended use rights to cultivated land on a fairly egalitarian basis. Over the past two decades, control over allocating farmland has remained in the hands of local leaders. In evaluating China's land tenure system from a policy perspective, the critical question is how effective the system has been in providing households with the necessary incentives to ensure rational land use and investment, while simultaneously helping local communities to meet households' needs. Looking past 2001, how well does the system fit the needs of China's rapidly evolving economy?

Our survey work suggests enormous heterogeneity at the village level. In some villages farmers seem to hold relatively long tenures and have the right to select crops, convert land to alternative agricultural uses and rent out land, all of which are typically associated with a private property regime, albeit short of being able to buy or sell the land. In other villages, tenure is shorter and the use of the land is constrained in various ways.

We have examined a number of explanations for this heterogeneity. A number of factors appear to underlie reallocations: the desire to maintain equal access to land among villagers, a need to ensure that quotas are fulfilled, the fact that rental markets are underdeveloped, and rent-seeking behaviour on the part of local leaders. The role of reallocations in assuring equal access can only explain a small portion of the reallocation behaviour; the other explanations, all of which are linked to the incentives of local leaders, appear to be more important in explaining decisions with respect to the timing and size of reallocations. These incentives, in turn, are directly tied to leaders' responsibilities for fulfilling state policy, and possibly also to opportunities for rent seeking.

So to what extent has China's land management system increased or decreased efficiency and equity? Our work (and that of others) on the impact of the land tenure system on growth, efficiency and distribution is limited, but a number of observations can be made. First, the effect on production, through the incentives to undertake investment, appears relatively modest. One possibility is that leaders are "internalizing" these costs in making decisions; in other words, in

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[66] Crowding out might occur because the reallocations effectively reduce the supply of rental land. During the past five years, for example, the amount of contract land has increased significantly as households with off-farm opportunities have been allocated less land. These households are the most likely suppliers of rental land. Unfortunately, mechanisms of allocating contract land do not appear to be very successful in getting more land to those households with the greatest demand for land.

locations where the potential costs of tenure insecurity are high, reallocation is less likely. Some village governments have also invested heavily in agriculture, diminishing the need for individual investment. Since we do not have the basis for estimating investment, crop choice and output under a counterfactual in which households enjoy all of the rights associated with private property, we hesitate to push this conclusion too far.

Although village-wide reallocations help to move land to households that have surplus labour and a higher marginal productivity of land, significant inefficiency remains because of the difficulty of administrative methods to efficiently allocate resources. Yet alongside considerations of efficiency, land allocation also has important equity implications. In the 1980s equal access to land played an important role in meeting the basic nutritional needs of households in an environment in which food markets were highly imperfect and off-farm opportunities were limited. Needs have changed, however, as grain markets have developed, off-farm opportunities have expanded and rural incomes have risen. These developments have decreased the demand for land in some regions, and therefore in some places the land tenure system may actually be adversely affecting income distribution. Households differ considerably in terms of their ability to access off-farm opportunities. It is likely that poorly developed rental markets have prevented households who have limited access to off-farm opportunities from fully utilizing their labour and earning more income through expanding the size of their farm operations. The land system may have discouraged some households from specializing in agriculture, which is an issue that will become more important over the next decade as the farm labour force continues to shrink and as the demand for food increases.

Most economists believe that in the long run China needs a land management system that provides long-term security of tenure and promotes the efficient use of land. The decision to lengthen tenure to 30 years and allow only small adjustments to accommodate demographic changes is a step in that direction. These small adjustments may be enough to meet distributive concerns. As we noted above, only a small percentage of the land that is reallocated appears related to the desire to maintain equal access, and so small adjustments are likely to be able to meet this need. Secure use rights and the expansion of rental markets are ways to facilitate the reorganization that is required in the farm sector.

If the past is any clue, however, this policy will only be effective if the incentives of local leaders are aligned in this direction. During the past few years, the decline in farm prices below the fixed quota price and the consequent inadvertent conversion of the quota tax into what is tantamount to a subsidy has reduced the benefits to local leaders of maintaining control over land. Rental activity appears to have increased as a consequence. A rise in farm prices and a reintroduction of quotas would once again put a premium on the ability to control land and, without secure land rights, would likely reverse the recent trend. If land is not to be privatized, additional reforms, including eliminating quotas and encouraging contested elections, are likely to be needed to sustain the current trend. This highlights once again the strong connection between property rights and the political economy, and how political reforms at the local level are needed to provide the kinds of property rights a rapidly growing economy requires.