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Do Rural Land Markets Increase Inequality? Evidence from a Chinese Province

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Summary. Using a 2001 provincial survey, we find that disparities in land-rights distribution have greatly increased in rural China, and the growth of land markets is directly responsible for that. The land markets tend to concentrate land in those who can more efficiently use it. This translates disparities in land-rights distribution to magnified inequality in farm income. However, such widening disparities caused by land markets have compensatory effects on overall rural inequality, as land markets tend to bring up families who would fall at the bottom of income distribution in the absence of such markets. Expansion of markets, in this case, widens the access to market opportunities and help to reduce inequality in an economy that is undergoing both fast development and a transition to market.

Key words – Asia, China, land markets, inequality, income distribution, transition

1. INTRODUCTION

When China's Ministry of Agriculture first conducted a survey on the emerging land rental markets in rural China in 1993, they found that 2.3 percent of surveyed rural households had participated in such private exchanges of land-use rights and 2.9 percent of arable land had changed hands (Chen & Han, 2002). Six years later, when a similar survey was conducted again, not much change was detected. The proportion of arable land exchanged on the primitive land rental markets remained at between 3 to 4 percent. Zhejiang Province, located on the eastern coast, emerged as a leader then, with a 7 percent market participation (Kung, 2002; Zhang, 2002). Since then, land rental markets in rural China experienced rapid growth. One survey of rural Zhejiang in May 2001 finds the proportions of rural households and arable land involved in market exchanges rising to 20.8 and 13.1 percents, respectively (CARD, 2001). Alerted to this fast growth and to the fact that a regulative legal framework was absent, the central government had to issue a guiding directive in November 2002, and then the national legislature passed the new Rural Land Contract Law, taking effect in March 2003, to regulate this evolving field.

The emergence of market-mediated allocation of rural land rights is no small matter for a country that has a large amount of surplus rural labor and faces severe land scarcity. It raises many pressing questions. Do rental markets increase inequality in land-rights distribution? Does inequality in income derived from agricultural production subsequently rise as well? Does the market-mediated movement of land rights help to increase farm productivity? Furthermore, what effects do land rental markets have on the overall income inequality in rural China?

The emerging land markets could usher in a decisive departure from the previous egalitarian, administrative allocation of land rights in rural China. When decollectivization was implemented in rural China at the outset of the Reform, use rights of collectively owned rural land were individualized and allocated to rural households on the basis of egalitarian principles (Kung, 1995; Putterman, 1993). Studies later find that, in the course of the Reform, egalitarianism still prevailed in land rights distribution within villages, as villages reshuffled land allocation to undo the inequality created by demographic changes, often disregarding the central government's call for long-term tenure security (Kung, 2000; Liu, Carter, & Yao, 1998). But these egalitarian

outcomes could soon be reversed when market exchanges of land rights replace administrative allocation. Rental markets could hasten China's "retreat from equality by allowing better endowed families having expanded land holdings, while others being dispossessed.

When equality is given priority under this system of land-rights allocation, efficiency in land utilization retreats to a second place.[1] Reallocations of land are found to have attenuated tenure security and reduced investment in land (Brandt et al., 2002). Allocation of land on the basis of ascriptive membership and the difficulty for land rights to circulate among villagers also resulted in the mismatching of land with other productive resources and loss in efficiency.[2] Studies also find the coexistence of severe land scarcity on the one hand and increasing idling and under-utilization of land on the other (Wang, 2002). Market-mediated allocation of land rights can, therefore, help to raise agricultural output and efficiency. Conceivably, rental markets could also move land from land-rich families, who lack adequate labor to utilize it, to land-scarce ones, who have surplus labor to spare, and therefore maintain equality as well as increase efficiency.

This research uses data from a unique farm survey to address the four questions raised above. The rest of the article is organized as follows. Section 2 establishes a baseline of rural inequality before land markets developed, providing a base for over time comparison. Against that backdrop, Section 3 then presents evidence of increasing inequality in land rights distribution and connects it to the growth of land rental markets. These changes in land distribution had notable impacts on farm income and farm productivity, and evidence on that is presented in Section 4. Following that, Section 5 then investigates whether these changes compensate or further polarize overall rural income inequality. Section 6 concludes the paper.

2. RURAL INEQUALITY BEFORE THE LAND MARKET

To assess the status of inequality in rural China before land rental markets developed, the two large-scale surveys (the Chinese Household Income Projects, henceforth CHIP) jointly conducted by a group of Chinese and American scholars in 1988 and 1995 and the publications that ensued provide the best benchmarks (Griffin & Zhao, 1993; Khan & Riskin, 1998, 2001). Four major findings concerning inequalities among rural households *within* a given region are particularly noteworthy. First, compared to income distribution, wealth was more equally distributed among rural households. Second, land dominated the many components of wealth and was the most equally distributed asset. In 1988, the Gini index for land distribution is 0.54, when land is measured in physical unit, and 0.31 when measured in output value (McKinley, 1993). In 1995, they change to 0.43 and 0.39, respectively (Brenner, 2001). This more equal distribution of land means that incomes derived from land could offset inequalities generated from other sources and have equalizing effects on rural income distribution. However, these studies also find that, in terms of income determination, land only had a minimal effect on total household income, which means that its more equal distribution largely failed to translate into more equal distribution of household income. Last but not the least, the most important source of income inequality in rural China was incomes from off-farm wages, which constituted 40 percent of overall inequality in rural income distribution in 1995 (Khan & Riskin, 1998). The distribution of wages has also become more unequal over the years. The Gini index for wages increased from 0.71 in 1988 to 0.74 in 1995, when the Gini index for total income was only 0.34 in 1988 and 0.42 in 1995.

Overall, it is fair to conclude from these findings that, if we bracket urban-rural, inter-regional, and gender inequalities, then inequalities among rural households were mainly caused by unequal access to off-farm wage employment, whereas both land holdings and incomes generated from land in farming productions were highly equally distributed. The trend over time

suggested increasing inequality. The contribution of wage employment to household income rose from 8.7 percent in 1988 to 22.38 in 1995, at the same time, that from household production dropped from 74.2 to 56.2 percent, meaning that an increasingly large proportion of rural household income was becoming highly unequally distributed.

The 1988 and 1995 CHIP surveys covered the first two thirds of the post-reform era in China with the best data available and offered accurate accounts of inequality in rural China during those times. After another eight years have passed since the data were gathered, an update is much needed, and the effect of new developments such as the land rental markets on the trends picked up in these studies requires new analysis. In this study, I employ data generated from a provincial survey toward this goal. The data were collected from a multi-stage stratified random survey conducted in Zhejiang Province in Eastern China during the summer of 2001. The survey covered 7 of the province's 10 sub-regions in the mainland and have representative counties from each of the three geographic regions in the province. Interviews were conducted both with randomly selected rural households in a village and with the village head. Thus, data were collected at both the household and village level. The final household sample contains 972 valid cases and the village sample 58 villages.[3]

3. INEQUALITY IN LAND-RIGHTS DISTRIBUTION

Except for some state-owned forest and pasture, most rural land in China is collectively owned. This is a direct legacy of the collectivization campaign in the late 1950s, which undid the earlier Land Reform by eliminating private land ownership, forming productive cooperatives (and eventually collective communes), and locating land ownership in such collective units. The decollectivization reform in the early 1980s only individualized the use rights of rural land, but left land ownership in the hands of rural collective organizations. Thus, land markets in rural China are only rental markets, where the use rights of land, not ownership, are exchanged. In this paper, land distribution and land exchange all refer to that of use rights, not ownership.

The collective land ownership determines that in distributing the individualized use rights of collectively owned land, egalitarian principles should be followed and all members of collective organizations were equally entitled to the access to this important means of production. Empirical studies conducted in the 1980s and 1990s have consistently found that the egalitarian distribution of land use rights was indeed the norm in real practices (Kung, 1995; Liu et al., 1998; Ye, Prosterman, Schwarzwalder, & Kuang, 2000; Zhu, 1995).[4] When land was distributed on the basis of household demographic features, not surprisingly, demographic changes over time would render previous distribution unequal and generate demands for reallocation. Most studies found the frequency of village-wide reallocation during the 80s and 90s to be once in every eight to ten years, supplemented by partial reallocations of smaller scales (Brandt et al., 2002; Li & Rozelle, 1998; Liu et al., 1998).

However, not all reallocations were caused by demographic changes or intended to equalize land distribution. Several other forces have also been discussed as potential causes (Kung, 2000; Li & Rozelle, 1998). So theoretically, reallocations could cut both ways with respect to inequality in land distribution. So far, there has been no decisive evidence on the effect of reallocation on the extent of inequality in land distribution. But the two CHIP surveys, 7 years apart, do reveal some interesting patterns. Brenner (2001) finds that in physical terms, land holdings became more *equally* distributed in 1995 than in 1988, as shown in the decline of the Gini index from 0.54 to 0.43 in columns 3 and 4 in Table 1. He suspects that villages' land reallocations, "dominated by egalitarian considerations (p. 252)," are a major cause. But when

measured in value terms of agricultural output, there was an increase in land inequality, shown in the rise of the Gini index from 0.31 to 0.39 between 1988 and 1995.[5]

On the basis of the best evidence available, we could conclude that administrative land reallocations alone would not lead to substantial increase in inequality in land distribution. Against this backdrop, if we find dramatic changes in land distribution since the growth of land rental markets have accelerated in the late 1990s, then such changes are primarily attributable to the growth of land rental markets.

(a) *Increasing inequality in land-rights distribution*

Table 1 reports the distribution of arable land among rural households in the 2001 Zhejiang sample and compares it with findings from the two CHIP surveys. The most remarkable finding is the highly unequal distribution of physical units of land. In the Zhejiang sample, 60 percent of all arable land concentrates in the top 10 percent of households, ranked by household land holding. Half of the households (the top five deciles) have nearly 90 percent of all arable land.[6] Given the fact that half of all arable land in our sample is irrigated and the productivity differential between irrigated and unirrigated land could be large, I also report distribution of irrigated land in Table 1. The inequality in that distribution is only slightly less pronounced than that in undifferentiated land. At the two extremes of the distribution, we find very different rural households. There are 43 rural households that have rented out all their land and transferred all their working members to off-farm jobs. On the other hand, while the average farm size is only 6.04 mu, there are 16 families have farms larger than 50 mu and seven of them over 100 mu,[7] all having acquired most of their land from rental markets.

[Table 1 about here.]

The contrasts with findings from the 1980s and 90s are striking. The Gini index for distribution of land units in the 2001 sample is 0.67, significantly higher than the comparable national figures of 0.54 in 1988 and 0.43 in 1995.[8] A few caveats here. First, the two studies using the CHIP data only reported the distribution of *land value* by decile, but not that of land in physical units. Therefore, those figures are not exactly comparable to ours. However, they did report inequality measures (both Gini index and coefficient of variation) for distribution of land in physical units, allowing direct comparison. Second, figures from the CHIP data were national, while our figures are provincial. But given the wide interregional disparities in China, the national data in fact would only enlarge the extent of inequality. Consider the contrast between Zhejiang and Jilin, two of the provinces covered in the CHIP surveys. In 1995, the per capita cultivated land in Zhejiang is only 0.91 mu, less than one sixth of that in Jilin (5.58 mu) (State Statistical Bureau, 1996). The Gini index for Zhejiang in those years would only be smaller and thus, the distribution more equal. Third, the Zhejiang survey measures land in its physical unit. Obviously, land quality varies a lot and, in an ideal situation, should be factored in as well. However, my data do not have that information.[9] Therefore, the distribution reported in Table 1 only applies to the absolute volume of physical land. The distribution of productivity-adjusted land could be less unequal, but could also be more. McKinley (1993) and Brenner (2001) adjusted productivity differential by imputing a value of land from the agricultural income it produces.[10] For the 1988 data, the Gini index dropped from 0.54 for distribution of physical land units to 0.31 for that of land value and the coefficient of variation dropped from 3.51 to 0.76. But in the 1995 data, the difference between these two measures is much smaller. To draw a closer comparison, I did the same exercise (imputing a value of land from the agricultural income it produces), but the results still show significant increase in inequality: Gini index remains at a high level of 0.57 (compared

to 0.39 in the 1995 CHIP data) and the coefficient of variation is 1.85 (compared to 1.17 in 1995). So I am confident that the finding of increased inequality in land-rights distribution would stand even if land quality could be fully factored in.

(b) *Land rental markets as a cause of increasing inequality*

Earlier I hypothesized that the increase in land distribution inequality, if any, is most likely caused by the growth of land rental markets. Now that we have found evidence of increasing inequality, the question becomes: Can we ascertain that the growth of rental markets contributes to such increasing inequality? To address this question, I apply the village-level data in the Zhejiang survey and try to find out whether land distribution inequality is greater in villages where the land rental market is more active.

I use the Gini coefficient of households' land holdings in a village as the dependent variable, measuring the extent of inequality in land distribution. Among the independent variables, the level of off-farm development is measured by the percentage of village labor force employed in off-farm jobs. The level of rental-market development is measured by the percentage of total village land exchanged on rental markets. I also include measures of two alternative modes of land rights movement: administrative land reallocation (measured in number of reallocations) and expropriation of collective land by state agencies (measured in the percentage of a village's arable land being expropriated).

A brief explanation about land expropriation is in order. Rural land in China is collectively owned, but Chinese laws give the state the power to expropriate rural land from its collective owners and divert it to non-agricultural uses. In a village where land is expropriated, affected villagers may lose some or even all of their land holdings. Sometimes they are compensated in money, sometimes offered off-farm jobs and resettled. The village may also reallocate its land to accommodate these dispossessed villagers, but practices varied. In our sample, 47.5 percent of villages have had land expropriated. Since a great majority (68.8 percent) of these expropriations took place after 1998, their effects on village land distribution may still be observable.

[Table 2 about here.]

Results from the regression analysis are reported in Table 2, lending support to my hypothesis. *In villages where more arable land is exchanged on rental markets, land rights are significantly more unequally distributed,* resulting in greater Gini coefficients. Higher level of per capita income and less arable land in a villager are also found to be associated with more unequal land distribution. Higher levels of income allow greater investment in land acquisition and larger sizes of transaction by each household. Thus, even though the same amount (or proportion) of village land is exchanged, the land can be concentrated in a smaller number of households in villages with greater capital endowments, accentuating land inequality.[11]

The two alternative modes of land rights movement do not have significant effects. Because most of the reallocations (averaging 3.8 times for villages in the sample) happened *before* land markets developed, I suspect that their equalizing effects on land distribution have been netted out by the disequalizing effects of later market transactions. When land-market development is controlled, growth in off-farm employment is not significant either. This suggests that without the venue supplied by the land rental markets, growth of off-farm employment and transfer of agricultural labor to industries alone do not necessarily lead to movement of land rights from households with off-farm jobs to those without. In the absence of evidence to the contrary, the evidence above confirms that the development of land rental markets indeed contributed to the widening disparities in land-rights distribution.

4. EFFECTS OF LAND MARKETS ON FARM INCOME

Using the CHIP data, Khan (pp. 98-100, 1993) finds that in 1988 each additional mu of land only contributes 1.18 yuan to the annual household income from farm production. The trend is similar in 1995: one percent change in land holding gives rise to only 0.16 percent change in household farm income (p. 218, Zhang, 2001). Although these figures should not be taken literally as a measure of land productivity in rural China, they do indicate that land is not a major contributor to differences in income rising from farm production. Substantively, it means that by having more land alone, a household will only be marginally better off financially, because for some reason, they do not seem to be able to generate much value from those additional land. The analysis above shows that land has now become more unequally distributed in rural Zhejiang. But if the financial pay-off from land is still minimal, as it was in the past, then such unequal distribution of this productive asset will be inconsequential, as far as income inequality is concerned. Does the more unequal distribution of land rights now translate to more unequal distribution of incomes generated from the land? Can rural households get more out of their land through farming production? Is land becoming more significant in determining farm incomes?

Behind these empirical questions, there is a more theoretical one: Are land markets allowing land to be more efficiently used, so that land becomes more valuable and tilling the land now generates greater value than before? The emerging land market could differ from the traditional method of land allocation in rural China in one important aspect: it allocates land to families that can make better use of it. The traditional method allocates land to families primarily on the basis of their ascriptive membership in the collective organization, sometimes taking into consideration their labor endowment, but often disregarding their command over other complementary resources. This traditional method could, as Brandt et al. (2002) argue, increase allocative efficiency with regard to labor, because it tends to equalize the land-to-labor ratio across households. But this could in fact be a very *inefficient* allocation, if we take into consideration of variations among households in their command over other productive resources, such as farm machines, draft animals, financial capital, and human skills. This could be the reason behind the extremely low impact that land has on farm income in China during the 80s – land is not matched with other productive resources, resulting in its under-utilization (Khan 1993).

The rental markets, however, operate differently. Villagers increase or reduce their farm size voluntarily. It would not be far-fetched to assume in this situation that villagers are strategically allocating their resource endowment to seek greater financial returns. Those who think additional land can help them make better use of their resource and skill endowments seek to increase their land holdings, creating a movement of land from less efficient users to more efficient ones and, in turn, resulting in greater financial returns to land-based productive activities.

This section therefore focuses on these two issues: first, whether land now has greater effects on farm income, and second, whether land markets help to create more efficient use of land, contributing to the rising returns to land. Table 3 reports results from two nested regression models.[12] (For variable definitions and descriptive statistics, see Appendicx A.)

[Table 3 about here.]

Model 2 contains household characteristics and six regional dummies to control inter-regional variation.[13] This model differs from conventional models of income-determination analysis in that it does not include any human capital variables, such as age and education. A rural household's human capital endowments largely determine its income strategy (de Brauw, Huang, Rozelle, Zhang, & Zhang, 2002; Zhang, Ma, & Xu, forthcoming), as younger and better educated

households favor off-farm employment, whereas older and more experienced farmers rely more on farm income. These income strategies then affect household income through the mediation of labor force allocation and capital investment. Thus, fitting human capital variables and farm size and farm labor into the same model causes multicollinearity. Because our main interest here is in the effect of farm size on farm income, not on the rewards to human capital, I decide to exclude the human capital variables. I also include two variables (use of farm machines and cash cropping) to control the heterogeneity of conditions under which land is used in different households. Appendix D summarizes steps taken in selecting the final model.

When holding all other things equal, one percent change in farm size leads to nearly one percent (0.95) change in household farm income, a much stronger effect than the 0.16 percent change found in the 1995 CHIP data (p. 218, Zhang, 2001).[14] The trend seems to be clear: rural households in Zhejiang can now generate much more output and income from the land.

The question then becomes: What have contributed to this rise in farm productivity? Many causes are relevant, for instance, greater investment in infrastructure, more use of technology, improved seeds and fertilizers and so on. But I suspect that the land rental market also made a difference through more efficiently allocating the land. To test this, in Model 3, I add in two variables measuring a household's land-market participation.[15] What I want to know here is whether market participation affects farm output and income, when farm size is controlled. If exchanges on rental markets only affect the size of one's land holding, then when the size is controlled, market participation would make no difference on output, measured as farm income. Otherwise, market participation then affects not just farm size, i.e., the scale of production, but is correlated with a household's productive *efficiency* as well.

The models show strong and highly significant effects of both types of market exchanges on farm income, when farm size is controlled. The coefficient of having inflow transactions is 0.55, meaning that if two households have the same farm size, other variables controlled, the one household that have chosen to rent more land from the market (a *lessee*) is able to get 73 percent more farm income than the one whose land is not market allocated.[16] Similarly, a family that chose to rent out land on markets (a *lessor*) were only able to get 29 percent as much income from the same scale of farm production as those who did not choose to do so. Clearly, lessee and lessor families have very different efficiencies in utilizing the land. The evidence suggests that rental markets indeed have created the type of land movement I hypothesized – *away* from less efficient users, and *toward* more efficient ones.[17] At the aggregate level, this leads to the observed greater returns to land.

These findings suggest that different types of market participation (could also be thought as different investment strategies) are associated with different levels of farm productivity. Two mechanisms could produce such an outcome. First, there can be a sorting mechanism that select differentially endowed rural residents into different sectors.[18] It is widely accepted that the younger and the better educated have comparative advantages in off-farm works and many in fact left villages (and rent out land) without having any full-time farming experiences (de Brauw et al., 2002). On the other hand, facing participation constraints in the off-farm sector, the older and the more experienced farmers find expanding farm production a better alternative (Zhang et al., forthcoming). Second, besides this sorting mechanism that selects more productive farmers into expanding farm production, the market-mediated change in the scale of production itself can also affect farm productivity, as increased farm production benefits from the economy of scale. To find out whether lessee families are more productive in using the land, I run two regression models to further assess the effect of market transaction on farm productivity.[19]

[Table 4 about here.]

In Table 4, when farm size is controlled, we find that the lessee households (i.e., the "inflow" variable) have 72 percent higher land productivity (Model 4) and 75 percent higher labor productivity (Model 5) than the rest. In these households, each unit of land can generate 72 percent more agricultural output, and each farm laborer can get 75 percent more income, than counterparts in other households with the same farm size.[20] In contrast, the lessor families (the "outflow" variable) have significantly lower land productivity (71 percent less) and labor productivity (70 percent less) than ordinary families. The more able-bodied members in these households probably have moved to better-paying off-farm jobs, resulting in decline of land utilization and thus land and labor productivity.[21] This further demonstrates that the movement of land rights regulated by the rental market is concentrating land in households that can better use it, and as a result, raising overall efficiency in land use and financial returns to land. This marks a clear departure from the administrative allocation of land, which, based primarily on families' labor endowment, tends to equalize land-to-labor ratio across families and maintain allocative (static) efficiency at the expense of productive efficiency.

Farm size also significantly affects productivity. In the context of severe land scarcity and labor surplus in rural China, increased farm size allows underutilized surplus labor to be better used, resulting in improved labor productivity (Model 5). However, this also causes reduction in the intensification of land use, as labor-to-land ratio declines. Thus, we find larger farm size associated with reduced land productivity (Model 4). Farm labor also shows expected effects on productivity. When more labor is employed, it intensifies land use and increases land productivity (Model 4, each additional labor increases land productivity by 38 percent); but as land-to-labor ratio declines, it also causes labor productivity to decline (Model 5, each additional labor decreases labor productivity by 16 percent). There are also pronounced regional variations. The four counties located in the Yangzi Delta area, which traditionally has been one of China's most fertile regions, have significantly higher land productivity.

Overall, two important findings have transpired. First, land has become a stronger factor in determining farm income, and consequently, a more valuable asset than before. If Zhang (2001) is correct, in 1995, having one percent less land only cost a family 0.16 percent in production income. No big deal. But in 2001, one percent less land may cost a family in rural Zhejiang 0.94 percent of their farm income. The stake on farm land has risen considerably. Second, the rental market not only created disparities in land rights across rural households, it did so in a way that magnifies income disparities generated from the land. Not only more productive farmers are expanding their farm production through renting more land, the larger scale of production also raises their labor productivity, increasing their returns from working on the land and thus translating disparities in land rights to magnified inequalities in farm income.

5. EFFECTS OF LAND MARKETS ON HOUSEHOLD INCOME

Discussions above seem to portray the land rental markets emerging in rural China as a polarizing force, increasing disparities in land-rights distribution and farm income. However, it is premature to reach a verdict on the effect of land markets on *overall* rural inequality, as the discussion so far has been limited to incomes from farm productions. Income from off-farm sources has not been considered yet, which virtually all studies of income determination in rural China during the post-reform era find to be the most significant source of income inequality.[22] As far as rural land is restricted to agricultural uses only, which is still mostly true in China, inequality in land-rights and farm income and that in off-farm income are two distinctive

dimensions, which could either reinforce each other or cancel out each other. We already know that land markets help a fraction of the rural population to get better off, but do land markets bring up families at the bottom of the scale of off-farm income (i.e., being *compensatory* to off-farm inequality), or those already better off (i.e., being *reinforcing*)?

Findings in the above already offer some clues. For instance, in Model 3 we find that cadre and entrepreneurial households, which have been consistently found to have better access to off-farm wage incomes (Walder, 2002), had either disadvantages or no advantage in farm income. Furthermore, education has not been found to have positive effects on farm income and farming productivity (results not shown here), in contrast to the finding that participation in off-farm jobs rewards education (Nee, 1996; Parish et al., 1995). This would encourage families with greater educational capital to enter off-farm jobs, while encourage a very different group – those with low educational attainment – to choose to improve their lot through expanding farming. Both these findings suggest that land markets are more likely to be compensatory.

[Table 5 about here.]

To confirm this, I look at profiles of households with different types of participation in the land markets. In Table 5, we can observe almost a linear pattern on all the variables in the three types of households. The lessor families have the smallest family size and largest number of family members working in off-farm jobs, indicating that these families probably parted with their land because they had better-paying off-farm jobs to guarantee subsistence. These families also have greater human capital in terms of higher educational attainment and younger labor forces. As a proxy for experience, age, in rural China's context, is correlated with experience in farming, a type of human capital not transferable to off-farm works. Moreover, it in fact is a liability in off-farm jobs, as farmers-turned-workers are wanted mostly for their physical labor power (de Brauw et al., 2002). Furthermore, both cadre and entrepreneur households have the strongest presence in this group of households, both 40 percent higher than in the overall sample. In direct contrast, lessee families have the largest family size and the smallest number of off-farm jobs. These families also have the lowest educational attainment. But they have older labor forces, indicating more age-based human capital in farming. The presence of cadre and entrepreneurs in this group is also the lowest. Households that did not participate in land markets are sandwiched between these two types.

The next four columns in Table 5 show the results of households' participation in both land and labor markets. The difference in farm size is striking. It clearly shows that the land market, unlike administrative reallocations, did not move land from land-rich families to land-poor ones and equalize land holdings. Instead, it dramatically increased disparities in land holdings. The 138 lessee families have more land (3,109 mu) than families in the other two categories combined (2,674 mu), which are six times as large in number.

To return to our question about whether land markets are compensatory or reinforcing to inequality from off-farm sources, the results suggest that land markets are indeed compensatory. Families that have the least amount of land, became so not because they were forced out of their land. Instead, they were more successful in obtaining better-paying off-farm jobs and thus leaving agriculture, thanks to their higher education, younger labor forces, and special status (as cadres or entrepreneurs). As studies have long found, this is the group that has got ahead in rural China. But the more interesting comparison is between the lessee households and those who did not participate in land markets. If we have learned anything from two decades' studies of inequality in post-1978 rural China, we would conclude that the former group, with the least number of cadres and entrepreneurs, the lowest level of education, and the least number of off-farm jobs,

would be at the very bottom of the scale of income distribution, were there not land rental markets. But land markets have brought up this group from the bottom by offering an alternative venue for increasing income – through expanding farming production, which caters to their specific resource endowment. Now, as a group, these families are better off (17 percent higher per capita income) than the latter group, which constitutes the majority of the population.

To measure the magnitude of this observed welfare effect of rental markets on overall income distribution, I decompose total household income into two income sources – farm and off-farm incomes – and compare their Gini coefficients.[23] When households are ranked by the annual income from each specific source, the Gini coefficient for farm and off-farm incomes is 0.67 and 0.46, respectively; whereas the Gini coefficient for total household income is only 0.37. The fact that both components of total income are more unequally distributed than total income already indicates that unequal distributions of the two do not overlap, but instead partly cancel out each other. This is better shown when we calculate the aggregate-ranked Gini coefficient for each component, in which we rank households by their *total* income. This enables us to determine whether the distribution of a particular type of income accentuates or diminishes inequality in total income. The aggregate-ranked Gini coefficient for farm and off-farm incomes is, respectively, 0.22 and 0.41. Compared to the Gini coefficient for total income (0.37), it shows that farm income has an equalizing effect, whereas off-farm income has a disequalizing effect. Furthermore, when we calculate the Gini coefficient for land using the aggregate ranking by total income, it becomes only 0.16, showing a strong equalizing effect of land distribution on total income inequality. Elsewhere, through regressing participation in rental markets on household characteristics, I also found that more off-farm jobs significantly increase a household's likelihood of renting out land, but decrease that of renting in land (Zhang et al., forthcoming). In sum, by moving land to rural families with fewer off-farm income sources, the rental markets allowed these families to have larger shares of arable land and farm income, offsetting their disadvantages in off-farm sources and equalizing overall income distribution.

6. DISCUSSION

In rural Zhejiang, where land rental markets have experienced fast growth in recent years, we find that disparities in land-rights distribution increased greatly and the growth of land markets is directly responsible for that. The rental markets allocate land very differently from the more egalitarian administrative allocation, and tend to concentrate land in those who can more efficiently use it. This, on the one hand, increases productivity in farming production; and on the other hand, translates disparities in land-rights distribution to magnified inequality in farm income. However, we find that such increasing inequality caused by the emerging land markets is in fact compensatory to overall rural inequality, as land markets tend to bring up families who would fall at the bottom of rural income distribution in the absence of such markets. Land markets, therefore, offer an alternative venue to off-farm employment, which previously has been the primary source of the inequitable growth of rural incomes, and help to offset the inequality thus created.

Although the findings in Zhejiang could be a harbinger of what is to come in other parts of the country, it should not be hastily generalized. The encouraging developments in Zhejiang's rural land markets cannot overshadow the increasing stress rural residents are experiencing in many parts of China (Bernstein & Lu, 2003; Khan & Riskin, 2001). Furthermore, this study has not been able to measure the effect of rural households' capital endowment on participation in rental markets. It is possible that a threshold in capital endowment excluded families at the very

bottom from taking advantages of rental markets.[24] Thus, the rental market does not extend its equalizing effect to the entire rural population, nor is it sufficient in protecting the very poor. We should be cautious in drawing optimistic conclusions from this account.

The findings here, however, do speak to two strands of theories, one economic, one sociological. On the relationship between economic transition and inequality, we find two opposing predictions from economic and sociological theories. In economics, Kuznets (1955) offers his famous inverted U-shaped curve, depicting the worsening of income inequality at the early phases of economic growth, followed by a leveling off in later stages. In sociological studies of transition from socialist redistributive to market economies, scholars instead theorize a U-shaped trajectory (Szelenyi & Kostello, 1996). When market mechanism first emerged in the form of restricted "local markets", it acted as a compensatory one to the dominant redistributive mechanism and helped to bring up peoples at the bottom and reduce inequality. However, as market penetration deepens, the elite started to capture the market and were able to reproduce and reinforce their privileges through markets. As a result, inequality grows as the transition moves into the stage of "mixed economies."

Today's China is undergoing both fast economic growth *and* a transition to a market economy. But does it follow a U-shaped or inverted U-shaped trajectory in terms of changes in inequality? To address this debate is beyond the competence of this paper. Furthermore, with the short distance we have from the still fast-evolving reality, it probably is impossible to pin down which phase China's growth and transition are at now, let alone to draw a trajectory. But since both theories predict a seemingly inevitable widening of inequality at some stages of the process, we therefore want to look at whether the inequality-reducing effects of land markets in rural Zhejiang could shed some light on how to containing such widening of inequality.

One of the reasons that Kuznets thought cause widening of income inequality in early phases of economic growth is the "dislocating effects of agricultural and industrial revolutions (p. 18, 1955)," which bear upon the lower-income groups particularly hard. In China's case, I believe, the two-tiered land tenure system has acted as an important check on such dislocating effects of industrialization. The collective ownership of rural land guarantees farmers the access to land on the basis of their ascriptive membership in the collective communities and makes this access largely *economically inalienable*. It therefore prevents urban and industrial capital from dispossessing farmers of their land. The coupling of this collective ownership and the rising land markets, which nevertheless enables land rights to circulate, manages to allow family-based subsistence farming to continue on the one hand, while on the other hand, give the more adventurous, who want to either move to off-farm jobs or enter larger-scale commercial farming, the opportunity to exchange and specialize. Of course, this kind of institutions that safeguard the disadvantaged from the dislocating effects of transition are not a new invention (Polanyi, 1944). China's East Asian neighbors also put restrictions on private land ownership during their take-off phases. Taiwan, for instance, restricted the private transfer of both land ownership and use rights (Zhu, 1995). South Korea enforced a three-hectare ceiling on land ownership and largely eliminated free markets in land transactions (Lee, 1979). Zhejiang's case once again demonstrates the utility of such safeguarding institutions.

As China's transition moves the country into a "socialist mixed economy", there is little doubt that in rural China market has become one of the dominant mechanisms in the "dual system of inequality", and is a major source of inequality. As market penetration deepens and market increasingly becomes *the* dominant mechanism, Szelenyi & Kostello (1996) predict that the former nomenklatura will become the biggest winners, and the earlier gains made by direct

producers and petty bourgeoisie will be squeezed out, resulting in increasing inequality. The only relief will come from the redistributive intervention of the state, which then serves as the compensatory mechanism. However, findings here suggest that Nee's (1996) prediction that further expansion of markets leads to gains for direct producers could stand scrutiny, at least in this limited study. *If* market expansion widens access to market opportunities and make markets less restricted, or even monopolized by the elite, it could deliver the expected equalizing effects, even as it is becoming the dominant mechanism in allocating resources. In other words, market expansion does not have generic effects on inequality. It can both widen and reduce inequalities, depending the specific institutional constitution of the markets.

In rural China's experience, when the labor market that allocates better-paying off-farm jobs becomes the dominant source of income inequality, and cadres enjoy privileges in that market (Parish et al., 1995; Walder, 2002), it is the opening of the land market, where the playground is still even, that helps to bring relief to families that are disadvantaged in the off-farm sector, so that they can now also benefit from market opportunities. In other words, when access to the dominant mechanism (labor market, in this case) is restricted, the disadvantaged do try to find a compensatory mechanism. But such mechanism does not have to be a redistributive one. In this case, it is the expansion of markets into a new field that comes to their rescue. This suggests that further opening of rural markets (including land, grain and credit markets) could be the remedy to the widening inequality in rural China, as others have argued (Khan & Riskin, 2001). For instance, giving poor households access to credit markets can help them overcome the capital endowment threshold and thus reap the benefit from participating in rental markets.

But how long can this new field remain leveled? Will Szelenyi's prediction about elite's capturing of markets eventually prove to be right even for the land markets? The jury is still out. It is certainly possible that the elite will be able to reap more benefit from this market by transforming market institutions in their favor. In fact, some of this is already occurring. There are already reports of coercive dispossessing of farmers of their land – in the name of promoting market development – by cadres, who then sell the land rights to higher outside bidders and pocket the profit (Song & Chen, 2001). On these questions, we wait for further studies.

NOTES

[1] The egalitarian nature of such allocations should not be taken too far. Village authorities often do have other goals to meet in such allocations, one of them being raising agricultural output so that village grain quota is fulfilled. On the diverse forces driving land reallocation, see (Brandt, Huang, Li, & Rozelle, 2002; Kung, 2000; Li & Rozelle, 1998; Liu et al., 1998). However, it is safe to say that egalitarian concerns often take priority over productivity.

[2] One estimate (Brandt et al., 2002) puts the loss caused by misallocation of land across households at eight percent of median household income for medium-sized farms and nearly 10 percent for small farms.

[3] All households in the sample have rural registration and are members of rural collectives. They are entitled to, and did, receive allocation of collective land, although some of them chose to relinquish their land rights on markets.

[4] The exact principle of land distribution varied across localities. Some villages distributed land equally by household population, others by household labor force, still others by some combination of household population and labor force. Liu et al (1998), for instance, find the percentage of villages using these three principles to be 16.7, 26.7 and 53.3, respectively, with only 3.3 percent using some unidentified other methods.

[5] Brenner (2001) finds no conclusive explanations for the rising disparities in agricultural output, his proxy for land value. But differential access to markets for farm products and differential labor inputs across regions are likely to be the most important causes.

[6] I also tried ranking cases not by household land holding, but by land per capita. The distribution is in fact slightly more unequal in that case.

[7] One mu equals 0.067 hectare.

[8] The Gini index is scaled to vary from a minimum of zero to a maximum of one, zero representing no inequality and one representing a maximum possible degree of inequality. The convention wisdom is that any change in the Gini index of 10 percent or greater is considered significant, although it is not possible to statistically establish that a 10 percent or larger difference is significant. See Khan & Riskin (1998) for a discussion.

[9] In fact, neither do the CHIP data, or any other large-scale surveys, for that matter, have that type of detailed information on land quality. McKinley (1993) and Brenner (2001) both tried to compensate this by assigning different weights to various types of land, treating one unit of irrigated land as equivalent of two units of unirrigated land, a rather arbitrary practice.

[10] This method, however, is far from satisfactory, as it conflates productivity differential caused by other factors of production (labor, capital, and access to product markets, for instance) into that caused by land.

[11] The direction of causality between income and land rights distribution can be ambiguous. My interpretation is only speculative, and readers are free to draw their own conclusions.

[12] These two models are run on a sub-sample, containing only those households that have land under cultivation and have any income from agricultural sources. This is because our interest here is not in the distribution of farm income per se, but rather the effect of land rights on the generation of farm income.

[13] The omitted category is Dongyang County, an interior sub-region, the least developed in the sample.

[14] The right skewed distribution of farm size requires that we transform the variable by taking the natural log. Since the dependent variable has also been log-transformed, the coefficient for the log-transformed farm size variable can be interpreted as the percent change in household farm income resulting from one percent change in this variable.

[15] Because farm size is at least partly an *outcome* of land-market transactions, not surprisingly, adding in the two land-transaction variables causes multicollinearity to rise in the model. The Pearson's r correlation between farm size and inflow transaction is 0.51, significant at 0.01 level. However, because all three variables are highly significant and the theory requires an investigation of their independent effects, they are kept in the model.

[16] The coefficient b here can be transformed through $100 \times [\, e^{\,b} - 1 \,]$ to give us the percent change in the dependent variable (farm income) caused by one unit change in the market-transaction variable.

[17] Theoretically, the difference in land quality could be another explanation. If land transacted on the rental markets are consistently of higher quality than the rest, then those who rent such higher-quality land would have better farming productivity, while those who parted with such higher-quality land and left for themselves worse land would have lower productivity. However, substantively there is no reason to see why households choose to *consistently* rent out higher-quality land. Neither was this found to be the case in the interviews. In fact, even if that indeed were the case, it would still need the market to work it out. In other words, it is still the rental markets that made the difference by allowing this to happen.

[18] I am indebted to a reviewer for clarifying this causal relationship.

[19] I also tried fitting Model 3 with an interaction term between farm size and inflow transaction. However, due to collinearity caused by the high correlation between the two (r = 0.51), the interaction term is not significant.
[20] As I noted before, farm size and land inflow have a significant correlation of 0.51. This cautions us in interpreting the *independent* effects of land inflow in Model 4, when holding farm size constant, because land inflow often results in increasing farm size. The standardized coefficients (beta) for these two variables in Model 4 are, respectively, -0.21 for farm size and 0.12 for land inflow, meaning that the loss in land productivity caused by increased farm size is greater than the gain resulting from the land inflow transaction.
[21] It is also possible that their low-quality land makes farm production less profitable and thus leads them to move to off-farm jobs and lease out their land. But this is less plausible.
[22] The literature on this topic is vast. For some representative examples, see Parish, Zhe, & Li (1995), Kung & Lee (2001), and Walder (2002).
[23] I am indebeted to a reviewer for suggesting this exercise.
[24] I thank a reviewer for bringing up this point.

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Table 1. *The Distribution of Arable and Irrigated Land, and Inequality Measures.*

	2001 Zhejiang data		1988 & 1995 CHIP data	
	Total arable land	Irrigated land	1988	1995
Distribution by decile				
Lowest	0.4%	0.0%	3%	2.3%
Second	1.8%	1.0%	5%	4.7%
Third	2.3%	3.2%	7%	5.9%
Fourth	2.6%	4.9%	8%	7.1%
Fifth	3.7%	5.1%	8%	8.2%
Sixth	5.0%	6.2%	10%	9.3%
Seventh	6.7%	7.5%	12%	10.6%
Eighth	7.2%	8.2%	12%	12.5%
Ninth	10.9%	12.4%	15%	15.0%
Highest	59.3%	51.4%	20%	24.2%
Inequality measures				
Coefficient of variation	3.14	4.52	3.51 (.76)	.92 (1.17)
Gini coefficient	.67	.61	.54 (.31)	.43 (.39)

Source: First two columns are based on the author's survey in Zhejiang, China (2001). There are 968 valid cases. The last two columns are adopted from McKinley (1993) and Brenner (2001).
Note: The distribution by decile in the last two columns differ from figures in the first two in two respects: a) the deciles are ranked in terms of per capita total wealth, instead of per household land holding; b) the percentages reported are those of land value, not of land in physical units. Numbers in parentheses in columns 3 and 4 are inequality measures for distribution of land measured in land value (agricultural output).

Table 2. *Model Coefficients From Regressing Village-Level Gini Coefficients of Land-Rights Distribution.*

	Model 1		
	B	Standardized Coefficients	Std. Error
(Constant)	.332*		.151
Total village land (mu, x 100)	-.005‡	-.247	.003
Number of reallocations	-.014	-.092	.019
Expropriated land	.001	.057	.002
Level of land-market development	.002*	.286	.001
Level of off-farm development	-.001	-.076	.001
Per capita income (yuan, x 100)	.003**	.350	.001
R-square		.35	
Number of valid cases		53	

Source: Zhejiang Survey, 2001.
Statistical significance: ‡ $p < .10$; * $p < .05$; ** $p < .01$ (two-tailed test).

Table 3. *Model Coefficients From Regressions of Household Farm Income.*

	Model 2		Model 3	
Independent Variables	B	S. E.	B	S. E.
Intercept	4.58***	.21	4.97***	.20
Farm operation				
Farm size (ln)	.95***	.07	.77***	.08
Farm labor	.33***	.06	.33***	.06
Mechanized production	.07	.11	.04	.10
Cash cropping	.94***	.13	.74***	.12
Household characteristics				
Cadre household	-.62**	.21	-.50*	.20
Entrepreneur household	-.04	.13	.02	.13
Regional location				
Deqing County	.59**	.20	.87***	.19
Tongxiang County	.85***	.19	.93***	.18
Xiaoshan County	1.53***	.20	1.47***	.19
Shaoxing County	.57**	.19	.69***	.18
Taizhou County	.65‡	.38	.50	.36
Rui'an County	-.16	.23	-.14	.22
Land-market activities				
Land outflow (Lessor)			-1.24***	.14
Land inflow (Lessee)			.55***	.16
R square	.44		.50	
Degree of freedom	12		2	
F-change	52.65***		51.52***	
N	823		823	

Source: Same as Table 2.
Statistical significance: ‡ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

Table 4. *Model Coefficients From Regressions of Farming Productivity Measures*.

	Model 4 Land productivity		Model 5 Labor productivity	
Independent Variables	B	S. E.	B	S. E.
Intercept	5.77***	.20	5.44***	.20
Farm operation				
Farm size (ln)	-.45***	.08	.75***	.08
Farm labor	.32***	.06	-.18**	.06
Mechanized production	.01	.10	.03	.10
Cash cropping	.72***	.12	.72***	.12
Household characteristics				
Cadre household	-.47*	.20	-.49*	.20
Entrepreneur household	.01	.13	.04	.13
Regional location				
Deqing County	.76***	.19	.90***	.19
Tongxiang County	.79***	.18	.98***	.18
Xiaoshan County	1.38***	.19	1.52***	.19
Shaoxing County	.67***	.18	.72***	.18
Taizhou County	.43	.36	.52	.36
Rui'an County	-.13	.22	-.09	.21
Land-market activities				
Land outflow (Lessor)	-1.25***	.14	-1.21***	.14
Land inflow (Lessee)	.54***	.16	.56***	.16
R square	.32		.46	
N	823		823	

Source: Same as Table 2.

Statistical significance: ‡ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

Table 5. *Profiles of Households With Different Types of Participation in Land Rental Markets.*

Category	Family size	Off-farm jobs	Average education [a]	Average age [a]	Cadre household (%)	Entrep. household (%)	Farm size (mu)	Total household income	Percentage of off-farm income	Per capita income	N
Total	3.8	1.4	8.2	42.8	6.8	24.5	5.95	26551	77.20	7131	972
Lessor	3.7	1.7	8.5	40.9	9.4	34.2	2.31	32523	94.09	8942	266
Ordinary	3.9	1.3	8.1	43.5	6.3	21.1	3.61	23219	75.65	6240	568
Lessee	4.0	1.3	7.9	43.4	3.6	19.6	22.53	28753	51.14	7315	138
ANOVA [b]	3.30*	14.87***	7.22***	10.49***	2.62‡	9.60***	73.37***	16.11***	127.30***	19.74***	

Source: Same as Table 2.

Notes: [a] Average age and education measure the average attributes of household members who are in the labor force. [b] Figures reported are F statistics. I conducted Games-Howell post hoc tests (the Games-Howell test can adjust for unequal variances and sample sizes in the groups). On all measures, means of the lessor group significantly differ from that of at least one of the other two groups.

Statistical significance: ‡ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).