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<http://dx.doi.org/10.1016/j.worlddev.2013.10.009>

# Moving Off the Farm: Land Institutions to Facilitate Structural Transformation and Agricultural Productivity Growth in China

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**Summary.** — Agriculture made major contributions to China's growth and poverty reduction, but the literature has rarely focused on the institutional factors that might underpin such structural transformation and productivity. Drawing on an 8-year panel of 1,200 households in six provinces, we find that land tenure insecurity, measured by past land reallocations, discourages households from quitting agriculture, and the recognition of land rights through formal certificates encourages the temporary migration of rural labor. A sustained increase in nonagricultural opportunities will reinforce the importance of secure land tenure, a precondition for successful structural transformation and continued economic attractiveness of rural areas.

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*Key words* — China, agricultural productivity, structural change, nonagricultural development, allocative efficiency

## 1. INTRODUCTION

Agriculture has made enormous contributions to poverty reduction and overall development in China. However, in the presence of other impediments to the free movement of factors, growth of economic opportunities and demand for labor in the nonagricultural sector has given rise to significant inter-sectoral and -regional income disparities that are a concern for policy-makers. The magnitudes involved can be appreciated by noting that, while agriculture's contribution to the economy declined from 40% in 1970 to less than 10% now, the share of labor employed in the sector in 2005, though down from 81% in 1970, still stood at 45%. This raises the question whether China can release labor from agriculture in a way that enhances productivity and brings about gradual increases in farm size and adoption of mechanized labor-saving methods of cultivation rather than relying on potentially distorting subsidies and at a pace that is fast enough to prevent further rapid widening of the gap between rural and urban incomes.

While policy-makers are aware of these issues and have tried to address them through a number of measures, including the 2003 rural land contracting law (RLCL), evidence on the effectiveness of these provisions remains limited. Understanding of whether they had the desired impact and the magnitude of any effects on shifting labor out of agriculture to bring about rural

structural transformation will be important in light of a number of recent concerns. These include, in addition to rising rural–urban inequality, the challenges posed by a gradual exhaustion of the pool of cheap labor in the country's interior, an aging rural population, and a need for continued agricultural productivity growth to overcome land and water scarcity.

Institutional arrangements for the functioning of land and labor markets are a determinant of the ease with which this objective can be achieved. It is well known that restrictions on migrants' ability to gain urban residency permits (*hukou*) may impede migration, thus driving a wedge between the returns to labor received by farmers working their own plot and the wages they could earn outside of agriculture. This paper explores how land tenure arrangements can affect allocative efficiency and thus productivity of land use by either reducing the ease of transferring land temporarily to take up nonfarm employment or by precluding exit from agriculture.

\* Financial support from the Knowledge for Change Trust Fund is gratefully acknowledged. The views expressed in this paper are those of the authors and do not necessarily reflect those of the World Bank, its Board of Executive Directors, or the countries they represent, of the Michigan State university, and of the Central University of Finance and Economics. Final revision accepted: October 6, 2013.

Our central argument is that, as long as there is a residual threat of land redistribution, maintaining some labor supply to farming and not exiting agriculture altogether can help reduce the probability of losing land. Temporary off-farm work and exit from agriculture are thus distinct processes that respond to different institutional arrangements. In particular, land certificates can reduce the transaction cost of transferring land to those who can make more productive use of it. However, while certificates can increase the number of efficiency-enhancing land transactions, they are issued and enforced locally. If households have reason to fear that local leaders may not honor existing property rights and redistribute land at some point in the future, they are likely to conclude that certificates alone are insufficient and cultivation will be required to guard against the possibility of land loss. While they may join nonagricultural activities temporarily, they may not exit agriculture unless the risk of redistribution is very low.

This generates testable hypotheses regarding impacts of land institutions on allocative efficiency that go beyond the impacts of tenure security on attached investment studied in a large existing literature: First, land *certificates* are expected to encourage part-time participation in nonagricultural employment but have no effect on exit from the agricultural sector. Second, low *expropriation risk* (as proxied by village leaders' adherence to the 2003 rural land contracting law that explicitly proscribes reallocations) is conducive to exit from the agricultural sector but will have little impact on short-term leasing within the village economy.<sup>1</sup>

Panel data covering a period of almost 10 years (2000–08) with information on whether households took up (part-time) nonagricultural employment or exited the sector can be used to empirically test these hypotheses. Methodologically, this allows us to use panel estimators to control for unobserved time-invariant household characteristics which, if there are no pre-existing structural differences between treated and control groups—a notion supported by the failure to reject the parallel trends assumption in the pre-2000 period—can be interpreted as causal effects. Substantively, the period covered is characterized by far-reaching economic and institutional changes in terms of off-farm labor market participation and agricultural productivity changes; real output per mu more than doubled from Y 2,550 to Y 5,588, despite declining staple crop prices. Some 15% of sample households exited agriculture and the mean share of household labor supplied to the nonagricultural sector increased from less than 50% to more than 60%.

We find that tenure insecurity, as measured by recent land reallocations, and transferability of land, as proxied by the share of households with certificates in a village, indeed affect nonagricultural labor supply very differently. Having experienced land reallocation discourages exit from agriculture but has no impact on labor supply to the nonfarm sector. Coverage with land certificates, a variable rarely considered in the literature, is estimated to have potentially large effects on participation in off-farm work and short-term migration but does not affect exit from agriculture. The size of estimated impacts on labor supply are not inconsequential; compared to a village with no land documents, the average household in a village fully covered with certificates is estimated to supply about half a person-year more to nonfarm labor markets via migration. Security against reallocation and the ease of transferring land are thus likely to play important but very different roles as determinants of China's ability to transform its rural sector.

To the extent that they affect households' labor supply, we would expect certificates and land redistribution to also impact agricultural productivity. Significant and quantitatively large productivity-effects are indeed confirmed by the data.

Having been affected by reallocation after 2000 is estimated to reduce productivity by some 30% whereas possession of a land certificate in either period increases productivity by between 30% and 32%. These effects are quantitatively large and, in both cases, seem to be driven by allocative efficiency than by investment-effects considered in the literature.

The paper is structured as follows: Section two provides context by reviewing the role of agriculture in China's long-term development, recent institutional challenges in this respect, and legal initiatives taken to deal with them. Section three discusses the data used in more detail, reporting descriptive statistics on movement out of agriculture as well as agricultural productivity, in addition to introducing the conceptual framework for subsequent analysis. Section four presents econometric results to quantify impacts of institutional arrangements on partial or full movement out of agriculture and agricultural productivity. Section five concludes by drawing out implications for policy and possible future research.

## 2. BACKGROUND AND CONTEXT

While agricultural growth in China has made unprecedented contributions to poverty reduction, institutional factors also pose enormous challenges to the smooth movement of labor out of the agricultural sector into higher-paying nonagricultural pursuits and to market-based land transfers to more productive farmers who can then expand the scale of their operations. Such transfers will become more important to prevent or limit widening of rural–urban income gaps in light of the challenges posed by rapid aging of the rural population, a tighter overall labor supply, and environmental issues arising from scarcity of land and water resources. We review evidence of how reallocations and lack of documented property rights in the past limited investment and farmers' movement out of agriculture, the legislative measures taken to address this, and ways in which institutional changes could affect outcome variables included in our data.

### (a) *Agriculture in China's economic development: Past contributions and future challenges*

Growth of the rural economy, driven by agriculture, and distributed equally as a consequence of egalitarian access to land, has been a key reason for rapid poverty reduction in China. In 1981, China was sixth-poorest country in the world,<sup>2</sup> with a poverty headcount of 84%. Growth in the primary sector, i.e., mainly in agriculture was four times more effective in reducing poverty than growth in secondary or tertiary sectors (Ravallion & Chen, 2007); it helped to reduce the poverty headcount to 16% by 2005, well below the developing world average of 26% (Ravallion, 2011).

While improved technology created the preconditions for rural growth, institutional changes that made property rights more secure and transferable, thereby facilitating a shift of labor out of agriculture, were critical in facilitating this transition. After an eventful history,<sup>3</sup> the first step was the 1978 Household Responsibility System (HRS) that made households residual claimants to output by contracting land from collectives to cultivators, initially for a period of 15 years. It set off unprecedented increases in productivity (Lin, 1992; McMillan, Whalley, & Zhu, 1989). However, the long-term effect was limited as many contracts remained verbal and failed to provide protection against administrative land reallocations (Rozelle, Brandt, Guo, & Huang, 2002). Land transfers were

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