

New Opportunities for Economic Assessment with Rural Household Data in China*

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Abstract

This paper provides an overview of the response the social science community has made to generate appropriate data for researching changes in China's rural economy since reforms began in 1979. We emphasize the importance of price, wage and household-level data to examine policy questions in this new environment. There is increasing need to take into account how off-farm income and wages affect farm resource allocation as well as movement from subsistence to commercial agriculture. Consumption patterns are also changing rapidly as rural households purchase more of their food consumption rather than produce it themselves, and these changes are important to keep in consideration when assessing the impact of agricultural policies. Data that includes such variables at the household level is increasingly becoming available to social scientists in China. However, to keep abreast with China's rapidly changing rural economy, several components of the statistical system could be improved.

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Rural China has undergone enormous changes since economic reforms were introduced in the late 1970s. Ultimately, the impact of these reforms depends on how households respond to the new economic environment. Hence, the analysis and assessment of policies must view the household as an economic unit. Prior to reforms, China collected aggregate agricultural production and input data, but this was unsuitable for conducting household-level analysis. Since reforms, the Chinese government has collected vast amounts of household survey data that document the enormous changes in rural China and track the status of rural households since economic reforms were introduced in the late 1970s. In addition, understanding the impact of the reforms and subsequent policy initiatives on rural households requires data that was not collected by state agencies during the planned economy era (prior to 1979). State agencies and independent research organizations in China have modified existing survey instruments or developed new ones to address these new data requirements.

This paper provides an overview of the changes underway in rural China and the response of the social science community to generate appropriate data for researching these changes. Currently, farming represents roughly half of rural household income in China. The farm share of income is declining as workers move out of agriculture and into local wage employment, self employment or internal migration. In addition, an increasing share of farm income is received in cash as households move away from subsistence production and into cash crops and market-oriented agriculture. These changes are examples of how rural households are responding to the increased economic autonomy provided by the reforms. To understand the entire scope of economic activity for rural households in China, it is important to measure farm and off-farm income and wealth, production costs and returns to various crops, allocation of labor and land, and consumption and housing decisions.

In particular, we emphasize the importance of including information on household economic activities as a whole rather than focusing on agriculture alone, as well as price and wage data to examine policy questions in this new environment. Economics asserts that prices, wages and transaction costs guide farm household decisions to move out of agriculture and out of subsistence crop production. Under the planned economy prior to reforms, such information was unnecessary since production and resource allocation was guided by planners. Since reforms, however, more detailed household-level data is becoming available as government agencies modify their data collection efforts and independent research institutes develop their own survey instruments. We provide examples of how these new data sources have allowed social scientists

to better understand important phenomenon such as the movement of labor out of agriculture and the growth of commercial agriculture. In closing, we address some of the remaining issues regarding data availability and accessibility and how these issues affect the capacity of the research community to carry to address important social science questions.

Changes in Rural China: 1979-2004

Under the strictly planned economy that existed in China prior to the reform period initiated in 1979, rural China was segmented into roughly 24,000 communes, each meant to be a self-sufficient economic entity with almost no internal trade between regions other than planned rural-to-urban transfers of agricultural products. Laborers were not allowed to work in cities or even move from one commune to another. Agriculture was carefully planned with most labor and land allocated to producing staple grains as well as other crops and livestock according to state plans. Planners emphasized production of rice, wheat and other food grains to ensure the country's basic food security (interpreted to mean self-sufficiency by China's leaders). Households were allocated small "private plots" (usually less than 5% of all cultivated land) which they could use as they pleased to grow vegetables and other non-grain crops to consume themselves, exchange with neighbors, or sell in limited informal markets.

The reforms initiated in 1979 restored household production autonomy, allowing households to reallocate land and labor. Communes were broken up and land was allocated to individual households, who were obligated to deliver a fixed grain quota at a government-set price. Beyond this they were free to farm what they chose. Prior to reforms, 80-to-90% of area was sown to grain, but the share fell below 80% as households gained more autonomy in planting decisions and planted more land in more profitable cash crops like vegetables, melons, fruit orchards, and cotton. By 2003, the grain share of sown area was down to 65%. Interestingly, grain production actually increased from about 300 million tons in 1978 to more than 500 million tons during the 1990s, despite falling area sown to grain (fig. 1). Households increased the productivity on their farms when they received the returns to their efforts. A rapid expansion of rural industry and relaxed restrictions on moving to cities allowed rural households to allocate more labor to non-farm employment for which they received higher returns to labor than from farm work. Over time, not only were production practices reformed but also institutions involved in marketing agricultural products, allowing more opportunities to specialize and trade.

After 25 years of reform policies and increasing economic liberalization, households in rural China have undergone an enormous transformation. Today, roughly one half of rural household income is from non-farm sources. Household farm production has also become far more commercialized, producing more horticultural and other cash crops rather than staple grains.

While grain production increased by more than 50 percent since 1980, fruit and vegetable production increased by nearly 300 percent over that period, and the rate of increase has accelerated in recent years. Along with the increasing wealth, farm households are eating more and more diverse diets. The number of rural residents that cannot afford a diet of 2,000 calories a day has fallen by hundreds of millions since 1979, and rural households are consuming far more pork, poultry and fish in their diets.

These dramatic changes, however, have not occurred at the same pace throughout China's countryside. Rural households in coastal provinces have benefited far more than those in inland areas have. Many rural households in coastal provinces have exited agriculture entirely, either by migrating to urban areas or through the development of rural industrial enterprises. Others still earn nearly all their income from non-farm sources and maintain agricultural production only as a small part of their income portfolio. Some households that remain in agriculture earn relatively high incomes by specializing in cash crop production rather than traditional staple grains.

For households in inland provinces and more remote regions, these economic opportunities are less available. Migration to coastal areas is an option, but it is more difficult than for households in the coastal provinces who are closer to these cities, speak dialects more similar to those spoken in nearby cities, and are more likely to have relatives living in the coastal cities that can help them get started. Opportunities to specialize in commercial crops are also fewer. Transportation and information costs are higher in remote villages, and the lack of off-farm opportunities makes remote households more dependent on their own production for their consumption, dampening the incentive to produce for the market.

China's rural economy is not only diverse but also unique to developing countries in significant ways that make analysis at the household level even more important. A primary difference between China and other low-income agrarian economies is the land tenure system. China's land tenure system provides all rural households access to land, but falls short of full ownership. Thus, China has almost no rural landless population as is found in most other countries at the same level of development. However, China has many land poor: households with plots sizes insufficient or barely sufficient to produce for their own consumption. The land rental market is developing but still small, making it more burdensome for households to specialize. Those who want to specialize in agriculture find it difficult to accumulate land and take advantage of economies of size and scale. Households who want to specialize in off-farm opportunities may find it difficult to rent out their land and will likely be fined, or have their land reallocated to other households, if they leave it fallow. Thus a very high proportion of households in rural China allocate labor to both non-agricultural activities and their farms.

Implications for Policy Analysis

China has a high demand for sound and timely policy analysis. It is well known that China is rapidly developing, maintaining one of the highest growth rates in the world throughout the reform period. In addition, China is undergoing a complex transformation process moving from a planned to a market oriented economy. But many of China's underlying policies and institutions are carryovers from the planned period and desperately need reform. Thus the need to determine the effects of these policies and the effects of policy reform is great, greater than in a less rapidly changing economic environment.

The current economic environment in rural China, however, makes analyzing the effects of policies more difficult than if it were a more homogeneous and static environment. The diversity of farm households is one major obstacle because policies will affect different households in different ways. Take for example price support policies intended to increase the prices farmers receive for selected commodities. Such policies may increase the incomes of farmers that produce the selected commodities, but if households consume most of what they produce, then the effect on cash earnings will not be so high. Some farm households may even be net consumers of these products so the policy will have negative effects on their welfare if they generate higher market prices overall.

In such a diverse economic environment with growing non-farm participation and cash-crop agriculture, price support policies may have less effect on farm income than policies that are not directly targeted to agriculture. Investments in transportation infrastructure to facilitate market development and reduce transaction costs will help farm households specialize and trade in a larger market. Investments in rural education may facilitate the transfer of labor out of agriculture or the adoption of modern agricultural techniques. Investment in a legal system to enforce contracts (especially land contracts) will serve to support specialization and market development. These types of public policy choices may have a more profound affect on farm incomes than price support policies targeted specifically to agriculture.

Data Requirements

To carryout high-quality economic and other social science research on the effects policies have on rural households, detailed household-level data must be available. Understanding the costs and benefits of decisions to move into commercial crops or allocate labor outside of agriculture requires information on labor costs (both family labor and labor acquired on the market), the costs and availability of critical inputs as well as farm output. Ideally, such data includes the

prices of inputs and output over time and wages for labor of varying skills. To understand the determinants of these choices in order to assess how policies might influence them, even more information on rural households is useful. For example, information on the education, age and gender of the members of rural households will help researchers determine the roles these play on the decision to leave agriculture or commercialize. The distance of households to paved roads, rural markets or urban areas also can contribute to the understanding of how investments in infrastructure can facilitate these economic trends.

Under the planned economy prior to reforms, households did not make important economic decisions so such data was not important and was not traditionally part of the state data collection system. The data collected prior to reforms was primarily production data aggregated up from the village, with village leaders reporting to the township authorities, who then reported to the county, who then sent the estimates on to the provincial authorities. This system, called the Complete Reporting System, reported basic data such as the number of households, the number of workers, crop planted area, yields and livestock numbers. China's National Bureau of Statistics (NBS, formerly known as the State Statistical Bureau, or SSB) and the Ministry of Agriculture (MOA) both had parallel reporting systems. The accuracy of this system depended heavily on the accuracy of the original village leader's estimates.

Response of the Social Science Community

Government agencies and independent research institutions have responded to provide more useful data given that households now make most economic decisions and the rural economy is rapidly changing. Both the MOA and the NBS began conducting household surveys shortly after reforms began, in some cases even surveying the same villages and households (but not entirely overlapping). This was in part to check the accuracy of the reported data but also because the reforms significantly diminished the role of the village leader in the rural economy, thus making it more difficult for village leaders to obtain accurate estimates of the requested statistics. As the private sector developed and workers began migrating greater distances and for longer periods, it became even more difficult for village leaders to report accurately on employment and labor allocation .

The strength of China's rural statistical system is the vast amount of household survey data it has collected since the beginning of economic reforms in 1978. The Rural Survey Organization of the National Bureau of Statistics conducts an ongoing survey of 68,000 rural households and the Ministry of Agriculture Research Center for Rural Economy conducts a similar household survey. These household data allow Chinese officials to track indicators of rural household welfare, including income, consumption, agricultural marketings, and purchases. The data also allow

analysts to observe household adjustments to a changing economic environment. In addition, these surveys have been modified over the years to include recent phenomenon, such as trends in labor allocation, livestock and cash crop operations, and food consumption outside of the home.

Despite the attempts to maintain integrity in the system by combining sample surveys and administrative reports filed by local government officials, there is still considerable uncertainty about the accuracy of aggregate production and input statistics. There have been many questions about the accuracy of agricultural production, input and labor statistics. For example, the area of cultivated land was understated by roughly 35% until a revision following China's first agricultural census in 1997. Livestock and meat statistics were overstated by 30% until a revision following the agricultural census. There are also widely varying estimates of rural population and labor force from different sources.

These problems stem from a combination of factors and are not entirely unique to China. First, the task of making a complete count of such a large country, with many rural areas poor and inaccessible is very difficult. China's first agricultural census, which uncovered the reporting problems addressed above, took many years of preparation, was funded by several outside research institutes as well as China's government, and ultimately surveyed nearly 200 million rural households. Second, officials and households have incentives to underreport or overreport various data items to avoid penalties or taxes, meet government quotas or achieve government plans. In addition, it has been common practice for local officials to adjust the recorded size of land holdings for quality differences. For example, officials may have reported a 1.5-*mu* plot of low quality land as one *mu* for official purposes. There are also sampling issues that may obscure important trends and reduce the usefulness of the data. In particular, household surveys in China are thought to underrepresent households at both income extremes. The wealthiest households are underrepresented because they do not have time to spend being surveyed or filling in consumption log books for the small sum most survey teams pay for household participation. The poorest households are underrepresented, some claim, because their poor human capital and illiteracy increases the chances that they cannot read the survey forms or do not understand the questions, making them difficult to survey accurately.

China also has yet to fully incorporate economic variables into its data collection efforts, specifically price and wage data. Price data is collected by China's Price Bureau, and recently by the MOA, but much of these data are proprietary for government use or sold on a market for information to recover some of the costs of data collection, and therefore are not always available to the research community. These data are also difficult to link with the available household data so limited in their usefulness for household analysis. Some price information can be inferred using household surveys by dividing marketing income by the amount sold for

specific commodities, if the surveys have these data (the NBS rural survey does). Information on wages, however, is not currently available from state agencies.

Finally, in addition to the annual surveys conducted by NBS and MOA, numerous one-time, small-scale surveys are undertaken by government agencies, research organizations, universities and other institutions. Institutions such as the World Bank, the Asian Development Bank, the Chinese Academy of Sciences, the Chinese Academy of Social Sciences, the Chinese Academy of Agricultural Sciences and the Research Center for Rural Economy (the latter two are both affiliated with the Ministry of Agriculture) and several universities have all conducted independent surveys, often with collaborators from outside of China. Many of these surveys are conducted with funding for research on specific policy issues, such as land tenure or rural employment and migration. As such, they usually are not nationally representative, but often ask questions that provide important details to examine the effects of policies and institutions. In addition, these surveys often include price and wage information, and are generally more available to researchers than data collected by state agencies. However, most all are only cross-sectional data without time series to research trends over time or control for various fixed effects.

Reducing duplication and increasing the availability of the data collected will improve the usefulness of the household data collection efforts in China. For example, there little need for both the NBS and the MOA to conduct independent rural household surveys and would be less costly to conduct one survey. The one survey could then be made more detailed and cover more households, making them more valuable to researchers and capable representing national trends. Data collected by independent research institutes also often duplicates data collected by another. Increasing the coordination and cooperation among the research institutes that conduct surveys and use household-level data could improve survey efforts and the subsequent research.

Results of Analysis of New Data

Off-Farm Employment. With the data provided by the new questions and survey efforts, we now understand the changes underway in China in ways that have important implications for policymakers. Clearly the movement of labor out of agriculture has not caused a decline in agricultural productivity. Indeed, grain production rose steadily from 1980-2000 while roughly 200 million workers found non-farm employment (Rozelle; Zhang, 2002). We also know that workers moving out of agriculture have a variety of choices: self-employment, local wage employment or various types of temporary or permanent migration, both rural-rural and rural-urban. Each of these types of off-farm employment are important parts of the rural economy but may be affected differently by various policies. Clearly rural-urban employment opportunities are affected by urban industrial policy, as well as a collection of policies in China often used to

limit rural-urban migration (called *hukou*, or household registration policies). Also, different types of off-farm work are more or less available in different areas and attract different kinds of workers. Local wage employment is largely confined to coastal provinces and suburban areas, while temporary migration draws largely from poorer inland provinces such as Sichuan, Anhui and Hunan, and some from the poorer areas of the coastal provinces as well.

Social scientists have been able to dig even deeper into the workings of the rural labor market in China to understand important linkages and its role beyond a source of income. Evidence is increasing that China's rural labor market is affected by China's idiosyncratic land tenure institutions. Land tenure policies may be causing rural households to allocate more labor to agriculture and discourage them from participating in the labor market (Lohmar). In addition, since the rights to land are determined in large part by village residence, land tenure policy may discourage whole households from moving into areas where employment opportunities are more abundant. This would explain why so many rural migrants are young members of established rural households engaging in temporary migration. This linkage also allows the village economy to serve as a shock absorber to swings in the industrial economy. When jobs are plentiful, migrants are drawn out of villages, but can return and engage in agricultural production if the industrial economy suffers a slowdown (Zhang, 2001).

Commercialization. New data sources are also helping social scientists understand how farm households are moving out of subsistence agriculture and into more commercialized ventures. In the early 1980s, households produced grain for their own consumption and to fulfill their grain quota delivery obligation. Over time, the grain quota became less constraining and households have sold more grain directly to the market. Diets have also been adjusting in rural China as incomes increase and rural consumers move away from staple grains and consume more fruits, vegetables and livestock products. Since households consume less grain, they do not need to grow as much for their own consumption, so even though production has been falling in recent years, farmers have been increasing the amount of grain they sell on the market (fig. 2). And as off-farm income rises, households have more opportunities to purchase grain on the market, freeing up land to specialize in the horticultural crops that are in increasing demand.

The development of the livestock sector has been a particularly interesting story in China over the last twenty years. Communally-owned livestock were divided up among households after reforms. Most livestock production is still largely in small "backyard" household operations of just a few animals. However, the share of livestock products produced by larger specialized household operations and industrialized nonhousehold operations has been increasing (Liu), and the structure of production is expected to shift back to larger operations in coming years. Since different types of operations use different feed inputs and exhibit different conversion ratios, the

changing structure of the industry has implications for feed grain demand. Larger more commercialized operations also are able to enforce stricter sanitary standards for more conscientious urban consumers and export markets, an effect that may accelerate movement of livestock production into fewer, larger operations.

Horticultural production is also beginning to be a major component of China's agricultural sector. Production of fruits and vegetables has increased many times faster than grain production, and acreage in these crops has more than doubled in the last two decades. Until recently, movement into horticultural production served the growing domestic market for these products as incomes grew in urban and coastal areas. More recently, China has become a major exporter of horticultural products. The trend toward increasing exports is expected to continue since most horticultural production is labor-intensive and China is labor abundant vis-à-vis other countries, and WTO accession will serve to open China's borders to agricultural trade.

Understanding these trends is important if policymakers are to effectively guide China through further reform induced by WTO accession and economic development more generally. China's traditional emphasis on grain self-sufficiency is being revived in some circles due to falling grain production over the last few years and increasing imports in 2004. Farmers, however, are shifting out of grain production primarily because they can make more money producing other crops. This transfer out of grains thus increases rural incomes, which is another important policy goal of China's leaders, and this transfer is expected to continue as farmers specialize in labor-intensive production. Understanding this contradiction, and other important aspects of the rural economy, will help policymakers establish policies that promote both grain production (or availability) and rural income growth at minimal distortion of market outcomes.

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Figure 1. Grain Production has Increased While Sown Area has Declined in China

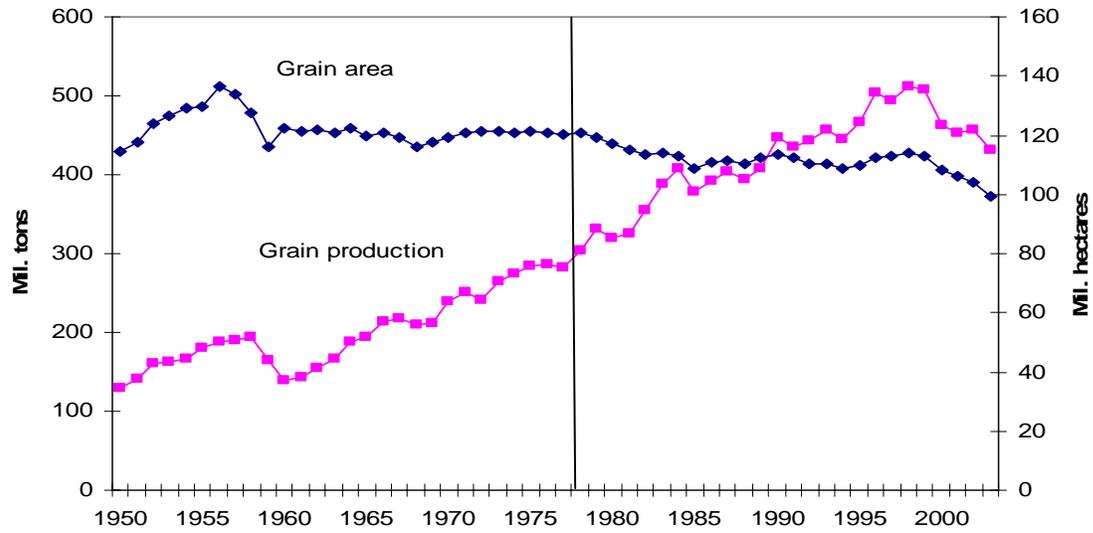


Figure 2. Percapita Consumption and Production of Grain in China, 1990-2003

